

**FINAL REPORT OF  
INSTITUTIONAL EVALUATION  
UNICAMP 2014 – 2018**





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**CAMPINAS**

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## FINAL REPORT OF INSTITUTIONAL EVALUATION UNICAMP 2014 – 2018

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# LIST OF ACRONYMS

AAPG	Advancing the World of Petroleum Geosciences
ABC	Brazilian Academy of Sciences
ABCOL	Brazilian Association of Dairy Sheep Breeders
ABEP	Brazilian Association of Population Studies
ABI	Basic Area of Admission
ABNT	Brazilian National Standards Organization
AEPECT	Asociación Española para la Enseñanza de las Ciencias de la Tierra
AEPLAN	Office of Economy and Planning
Agemcamp	Campinas Metropolitan Agency
ALAP	Latin American Integration Association
ALB	Brazilian Reading Association
AMEs	Specialty Outpatient Clinics
ANA	National Regulatory Agency for Water and Hydric Resources
ANEEL	Brazilian Electricity Regulatory Agency
ANP	National Agency of Petroleum, Natural Gas and Biofuels
ANPOCS	National Association of Graduate Studies and Research in Social Sciences
ANPOF	National Association of Graduate Studies in Philosophy
ANPPOM	National Association for Research and Graduate Studies in Music
ANS	National Agency for Supplementary Health
ANVISA	Brazilian Health Regulatory Agency
APM	Parent-Teacher Association (PTA)
APQA	Artisanal Cheese Association of São Paulo
AT	Technical Assistant (TA)
AUGM	Montevideo Group Association of Universities
BCCL	Central Library Cesar Lattes
BEPE	Research Internship Abroad
BI	Business Intelligence
BIOEN	Bioenergy Research Program
BNCC	Brazilian Common Curriculum Core
BRAFITEC	Brasil France Ingénieur TEChnologie
BRAMAZOS	Brazilian Mapping for Agricultural Zoning System
BRICS	Brazil, Russia, India, China and South Africa
CAAC	Committee for Analysis of Agreements and Contracts
CAC	Community Affairs Committee
CAD	Administration Chamber
CADI	Evaluation and Development Committee
CAF	Employee Assistance Center
CAF	Science & Arts Camp
CAI	Interdisciplinary Activities Committee
CAISM	Women's Hospital "Prof. Dr. José Aristodemo Pinotti"

CAPES	Coordination for the Improvement of Higher Education Personnel
CAPI	Committee of Support for Institutional Projects
CAs	CNPq Advisory Committees
CBMAI	Brazilian Collection of Microorganisms from the Environment and Industry
CBMEG	Center for Molecular Biology and Genetic Engineering
CBO	Brazilian Classification of Occupations
CCA	Aphasia Center
CCD	Chamber of Faculty Contracts
CCG	Central Committee of Undergraduate Studies
CCRH	Main Human Resources Committee
CCSNano	Center for Semiconductor Components and Nanotechnologies
CCUEC	Computing Center
CDA	Agricultural Defense Coordination
CEB	Center for Biomedical Engineering
CECI	Children Living Center
CECI FOP	Children Coexistence Center of the Piracicaba School of Dentistry
CECOM	Coordination of Social Services
CEDES	Center for Education and Society Studies
CEDU	Urban Documentation Center
CEE	State Board of Education
CEL	Language Teaching Center
CEMEQ	Center for Equipment Maintenance
CEMIB	Multidisciplinary Center for Biological Investigation on Laboratory Animal Science
Cemmaneco	Manoel José Gomes Music School Center
CEMT	Technical and High School Committee
CEP	Petroleum Sciences and Engineering
CEPAGRI	Center for Meteorological and Climatic Research Applied to Agriculture
CEPE	Teaching, Research and Extension Chamber
CEPETRO	Center for Petroleum Studies
CEPID	Research, Innovation and Dissemination Centers (RIDC)
CEPRE	Center for Studies and Research on Rehabilitation
CERES	Center for Rural Studies
CERFE	Educator Training Reference Center
CESCON	Student Community Center
CESOP	Center for Studies on Public Opinion
CG	Graduate Program Committees
CGU	General Coordination of the University
CID	Interdepartmental Council
CIDD	Internal Chamber of Faculty Development
CIDDIC	Unicamp Center for Integration, Documentation and Cultural Dissemination
CIDF	Internal Technical and Administrative Staff Development Chamber
CIEGIB	Computer Center for Undergraduate Teaching of the Institute of Biology
CIHA	Comité International d'Histoire de l'Art
CINDA	Centro Interuniversitario de Desarrollo
CINE	Center for Innovation on New Energies



CIS – Guanabara	Cultural Center for Social Inclusion and Integration
CITIC	Integrated Coordination of Information and Communication Technology
CLE	Centre for Logic, Epistemology and the History of Science
CLT	Consolidation of Labor Laws
CMU	Unicamp Memory Center
CNAE	Classification of All Economic Activities
CNCI	Category Normalized Citation Impact
CNPEM	Brazilian Center for Research in Energy and Materials
CNPq	Brazilian National Council for Scientific and Technological Development
CNS	Central nervous system
COBEQ	Brazilian Congress of Chemical Engineering
COCEN	Coordination Office for Interdisciplinary Research Centers
COLE	Reading Congress of Brazil
COMVEST	Permanent Entrance Exams Committee
CONAD	National Council on Drug Policy
CONBRAN	Brazilian Congress of Nutrition
CONDEC	Cultural Development Council
Conex	Extension Council
Consed	National Council of Secretaries of Education
Consu	University Council
CoordU	Unity Coordinators
COP	Budget and Heritage Committee
COPA	Doors Open COTIL
COPEI	Strategic Planning Committee
COREN	Regional Nurse Council
COTIL	Technical High School of Limeira
COTUCA	Technical High School of Campinas
CPC	Preliminary Course Concept
CPDIUEC	Committee for Full Dedication to Teaching and Research
CPE	Engineering Research Center
CPFP	Permanent Faculty Training Committee
CPG-FEF	Graduate Programs Committee of the School of Physical Education
CP-ISRA	CP International Sports and Recreation Association
CPMA	Medicinal and Aromatic Plant Collection
CPO	Project and Work Management Office
CPQBA	Pluridisciplinary Research Center for Chemistry, Biology and Agriculture
CPROJ	Project Management Office
CQMED	Center for Medicinal Chemistry
CREA	Regional Council of Engineering and Agronomy
CRO	Yield Coefficient
CRQ	Regional Chemistry Council
CRUESP	Council of Rectors of the Universities of the State of São Paulo
CSARH	Sectoral Human Resource Monitoring Committee
CSS	Coordination of Social Services
CT	Technical High School Course (TC)

CTB	Brazilian Traffic Code
CTBE	Brazilian Bioethanol Science and Technology Laboratory
CTEA	Technical Chamber of Environmental Education
CVD	Faculty Recruitment Committee
CVND	Non-Faculty Recruitment Committee
DAAD	Deutscher Akademischer Austauschdienst
DAB	Council of Assistance and Benefits
DAC	Office of the Registrar
DAPI	Automated Diagnosis of Intestinal Parasites
DCN	National Curriculum Guidelines
DCult	Culture Council
DEA	Executive Board of Administration
DEAS	Executive Board of the Health Area
DEDH	Executive Board of the Human Rights
DEdIC	Division of Early Childhood and Supplementary Education
DEEPU	Executive Board of the Pre-University Education
DEER	Special Education and Rehabilitation Faculty
DEPI	Executive Board of Integrated Planning
DERI	Executive Board of International Relations
DGA	General Board of Administration
DGRH	General Board of the Human Resources
Dinter	Interinstitutional Doctorate
DL	Distance Learning
DMAN	Maintenance Division of Unicamp
DOI	Digital Object Identifier
DP	Permanent Faculty
DPCT	Department of Science and Technology Policy
DPE'S	Division of Educational Programs
EA	Open Learning
EAD	Distance Education
EC	External Concomitance
ECTS	European Credit Transfer System
EDICC	Meeting for Dissemination of Science and Culture
EDUCORP	School of Corporate Education
EGS	Educational Guidance Service
ELM	Free School of Music
EMBRAPA	Brazilian Agricultural Research Corporation
EMBRAPII	Brazilian Company of Research and Industrial Innovation
ENADE	National Assessment of Student Achievement
ENEM	National High School Exam
ESF	Engineers Without Borders (EWB)
ESPCA	São Paulo Schools of Advanced Science
Esunicamp	Statute of Unicamp Servers (labor regime)
EXTECAMP	Unicamp Extension School
FAEPEX	Fund for the Support of Education, Research and Extension



FAPEAM	Amazonas State Research Support Foundation
FAPERO	Rondonia Foundation to Support Scientific and Technological Development of the State of Rondonia
FAPESP	São Paulo Research Foundation
FAUBAI	Brazilian Association for International Education
FCA	School of Applied Sciences
FCF	Faculty of Pharmaceutical Sciences
FCM	School of Medical Sciences
FE	School of Education
FEA	School of Food Engineering
FEAGRI	School of Agricultural Engineering
FEC	School of Civil Engineering, Architecture and Urbanism
FEEC	School of Electrical and Computer Engineering
FEF	School of Physical Education
FEIA	Festival of the Arts Institute
FEM	School of Mechanical Engineering
FENF	School of Nursing
FEQ	School of Chemical Engineering
FEUSP	School of Education of the University of São Paulo
FGV	Getúlio Vargas Foundation
FIAP	Individual Evaluation Files
FICC	Campinas Cultural Investment Fund
FIG	International Gymnastics Federation
FINEP	Study and Projects Financing Institution
FIPE	Institute of Economic Research Foundation
FLAUC	Fudan-Latin America University Consortium
FNDE	National Fund for Educational Development
FOP	School of Dentistry of Piracicaba
FORPROEX	Forum of Outreach Vice-Rectors of Brazilian Public Universities
FT	School of Technology
FUNCAMP	Foundation for Unicamp's Development
GAIA	Gallery of Unicamp's Arts Institute
GASTROCENTRO	Center for the Diagnosis of Diseases of the Digestive Tract
GCUB	Coimbra Group of Brazilian Universities
GDI	Global Performance Index
GEA	Grupo de Estudio sobre Arte Público en Latinoamérica
GER	Robotics Study Group
GGBS	Social Benefits Management Group
GGTE	Educational Technologies Management Group
GGU	Unicamp Gymnastic Group
GGUS	Sustainable University Management Group
GLU	Global Labour University
GR	Rector's Office
GRSS	Geoscience and Remote Sensing Society
GT	Working Group (WG)

HC	University Hospital
HEMOCENTRO	Center of Hematology and Hemotherapy
HIGS	International Hub for Sustainable Development
IA	Arts Institute
IASPM	International Association for the Study of Popular Music
IB	Institute of Biology
IC	Scientific Initiation
IC	Internal Concomitance
IC	Institute of Computing
ICHSA	Interdisciplinary Graduation Program in Applied Human and Social Sciences
ICMS	State tax on the circulation of goods and services
ICOMOS	International Council on Monuments and Sites
ICT	Information and Communication Technologies
IdEA	Institute for Advanced Studies
IDG	Global Performance Index
IE	Institute of Economics
IEL	Institute of Language Studies
IFCH	Institute of Human Sciences and the Humanities
IFGW	“Gleb Wataghin” Institute of Physics
IFS	Federal Institute of Sergipe
IG	Institute of Geosciences
IGC	General Index of Courses
IGEO	International Geoscience Education Organization
IGPDI	General Price Index – Internal Availability
IMECC	Institute of Mathematics, Statistics and Scientific Computing
Incamp	Unicamp’s Incubator of Technology-Based Enterprises
INCT	National Institutes of Science and Technology
INHIGEO	International Commission on the History of Geological Sciences
INOVA	Unicamp Innovation Agency
INPI	National Institute of Industrial Property
INSA	Institut National des Sciences Appliquées
INSS	National Social Security Institute
IPC	Consumer Price Index
IPCA	Extended Consumer Price Index
IPEA	Institute for Applied Economic Research
IPHAN	National Institute of Historic and Artistic Heritage
IQ	Institute of Chemistry
ISBN	International Standard Book Number
ISI	Institute for Scientific Information
ISSN	International Standard Serial Number
ITCP	Technological Incubator of Popular Cooperatives
IUFoST	International Union of Food Science and Technology
IWBC	International Workshop Bioactive Compounds
JEESP	School Games of the State of São Paulo
Labjor	Laboratory of Advanced Studies in Journalism



LAE/FE	Internship Support Laboratory
LAFEA	Physical Evaluation Laboratory for Adapted Exercise and Sport
LAMULT	Laboratory of Machinery and Precision Agriculture Projects, Multi-User Laboratory
LNBio	Brazilian Biosciences National Laboratory
LNCC	National Laboratory for Scientific Computing
LNLS	Brazilian Synchrotron Light Laboratory
LOA	Annual Budget Law
LUME	Interdisciplinary Center for Theatrical Research
MAs	Multidisciplinary Activities
MAV	Museum of Visual Arts
MCTIC	Ministry of Science, Technology, Innovations and Communications
MD/PhD	Physician-Scientist Program
MEC	Ministry of Education
MIA	Women's Center of the Arts Institute
Minter	Interinstitutional Graduate Program
MIT	Massachusetts Institute of Technology
MMA	Advanced Materials Manufacturing (AMM)
MSF	Math Without Borders
MST	Secondary Technical Professorship
MTS[	Higher Technical Professorship
NAPEM	Center for Evaluation in Medical Education
NDE	Structuring Teaching Core
NEPA	Center for Food Studies and Research
NEPAM	Center for Environmental Studies and Research
NEPO	"Elza Berquó" Population Studies Center
NEPP	Center for Public Policy Studies
NICS	Interdisciplinary Nucleus for Sound Studies
NIED	Nucleus of Applied Informatics to Education
NIPE	Interdisciplinary Center of Energy Planning
NIR[	Internal Regulation Center
NOAA	National Oceanic & Atmospheric Administration
NPO	Standard Admission Score
NUDECRI	Creativity Development Nucleus
OBA	Brazilian Astronomy Olympiad
OBFEP	Brazilian Physics Olympiad of Public Schools
OBI	Brazilian Olympiad in Informatics
OBMEP	Brazilian Mathematics Olympiad of Public Schools
OBR	Brazilian Robotics Competition
OCRC	Obesity and Comorbidities Research Center
ODAAE	Organización de las Americas para la Excelência Educativa
ODS	Sustainable Development Goals (SDG)
OEA	Organization of American States
OMU	Unicamp Math Olympiad
ONG	Non-Governmental Organization (NGO)

ONU	United Nations (UN)
ORCID	Open Research and Contributors Identification
OS[	Service Order
PA	Emergency Psychiatry
PAA	Academic Support Plan
PAAEC	Employee Onboarding and Monitoring Program
PAAIS	Affirmative Action and Social Inclusion Program
PAD	Didactic Support Program
PADEMT	Program of Didactic Support for High School and Technical Teaching
PAEG	Program of Support for Undergraduate Teaching
PAEP	Professional Support for Teaching, Research and Extension
PAGU	Center for Gender Studies
PAPE-G	Projects of Support for the Permanence of Undergraduate Students at Unicamp
PAQPP	Program of Support for Research Quality and Productivity
PBE-Edifica	Visiting Specialist Professor Program
PCIU-UDUAL	University Collaboration and Integration Program of Latin America and the Caribbean
PDDE	Program of Direct Investment in Schools
PDE	Graduate Program in Economic Development
PDL	Leadership Development Program
PDSE	Doctoral Program Sandwich Abroad
PEC	Community Outreach Projects
PECIM	Multi-Unit Graduate Program in Science and Math Education
PED	Teaching Internship Program
PEE	Energy Efficiency Program
PEHCT	Graduate Program in Teaching and History of Earth Sciences
PEHCT	Teaching and History of Earth Sciences
PEX	Outreach projects
PG	Attorney General (AG)
PGR	Waste Management Plan
PIBIC	Institutional Scientific Initiation Scholarship Program
PIBID	Institutional Teaching Initiation Scholarship Program
PIF	Integrated Training Program
PLANES	Strategic Planning
PMP	Building Maintenance Program
PNAIC	National Pact for Literacy at the Right Age
PNLD	National Textbook Program
PNPD	National Post-Doctoral Program
PNRS	National Solid Waste Policy
POGP	Operational Research and Process Management
POLIMI	Politecnico di Milano
PPDs	Process of Postdoctoral Researchers
PPEC	Electronic Portal of Scientific Journals
PPEVG	Visiting Specialist Professor Program

PPG	Graduate Programs
PPG – DCC	Graduate Program in Popularization of Science and Culture
PPG – PCT	Graduate Program in Science and Technology Policy
PPG – A	Graduate Program in Administration
PPG- ICHSA	Graduate Program in Interdisciplinary in Applied Human and Social Sciences
PPG-ADC	Graduate Program in Performing Arts
PPGAN	Graduate Program in Food and Nutrition
PPGAS	Graduate Programs in Social Anthropology
PPG-AS	Graduate Program in Social Anthropology
PPGATC	Graduate Programs in Architecture, Technology and the City
PPG-ATC	Graduate Program in Architecture, Technology and City
PPGAV	Graduate Program in Visual Arts
PPG-AV	Graduate Program in Visual Arts
PPG-BA	Graduate Program in Animal Biology
PPG-BBD	Graduate Program in Oral Biology
PPG-BCE	Graduate Program in Cellular and Structural Biology
PPG-BCE	Graduate Program in Cellular and Structural Biology
PPG-BTPB	Graduate Program in Biosciences and Technology of Bioactive Products
PPG-BV	Graduate Program in Plant Biology
PPGCA	Graduate Program in Food Science
PPGCA	Graduate Program in Food Science
PPG-CA	Graduate Program in Food Science
PPG-CC	Graduate Program in Surgical Sciences
PPG-CE	Graduate Program in Economics
PPG-CEP	Graduate Program in Petroleum Sciences and Engineering
PPG-CF	Graduate Program in Pharmaceutical Sciences
PPG-CM	Graduate Program in Internal Medicine
PPG-CM	Graduate Program in Medical Sciences
PPG-CNEM	Graduate Program in Nutrition, Sports and Metabolism Sciences
PPG-CO	Graduate Program in Clinical Dentistry
PPG-CP	Graduate Program in Political Science
PPG-CS	Graduate Program in Social Sciences
PPG-DCC	Graduate Program in Scientific and Cultural Dissemination
PPGE	Graduate Program in Education
PPG-E	Graduate Program in Education
PPG-EA	Graduate Program in Agricultural Engineering
PPGEC	Graduate Program in Civil Engineering
PPG-EC	Graduate Program in Civil Engineering
PPG-EE	Graduate Program in Electrical Engineering
PPG-EF	Graduate Program in Physical Education
PPGEM	Graduate Program in Mechanical Engineering
PPG-EM	Graduate Program in Mechanical Engineering
PPG-Enf	Graduate Program in Nursing
PPGEPM	Graduate Program in Production and Manufacturing Engineering
PPG-EPM	Graduate Program in Production and Manufacturing Engineering

PPG-FEQ	Graduate Program in Food Engineering
PPG-FEQ	Graduate Program in Chemical Engineering
PPG-FM	Graduate Program in Medical Pathophysiology
PPG-Geociências	Graduate Program in Geosciences
PPGH	Graduate Program in History
PPG-H	Graduate Program in History
PPG-LA	Graduate Program in Applied Linguistics
PPG-MA	Graduate Program in Applied Mathematics
PPG-MD	Graduate Program in Dental Materials
PPGMM	Graduate Program in Multimedia
PPG-MM	Graduate Program in Multimedia
PPGO	Graduate Program in Dentistry
PPG-O	Graduate Program in Dentistry
PPG-PCT	Graduate Program in Scientific and Technology Policy
PPG-RO	Graduate Program in Oral Radiology
PPGS	Graduate Program in Sociology
PPG-S	Graduate Program in Sociology
PPGs	Stricto Sensu Graduate Programs
PPG-SCA	Graduate Program in Child and Adolescent Health
PPI	Black, mixed race and indigenous people
PPP	Political-Pedagogical Project
PPPD	Postdoctoral Researcher Program
PQO	Operational Qualification Program
PRDU	Office of University Development
PREAC	Office of Extension and Community Affairs
PRG	Office of Undergraduate Studies
PRHI	Human Resources Development and Exchange Program
PrInt	Institutional Program for Internationalization
ProAC	Cultural Action Program
ProAfri	Training Program for Higher Education Faculty of African Countries
PROAP	Graduate Support Program
PRODECAD	Program for the Development and Integration of Children and Adolescents
PROEC	Office of Outreach and Culture
PROEX	Outreach Support Program
PROFBIO	Professional Graduate Program in Biology Education in the National Network
PROFHISTÓRIA	Professional Graduate Program in History Education
ProFIS	Interdisciplinary Higher Education Program
PROFMAT	Professional Graduate Program in Math Education in the National Network
Projecta	Career Guidance Program
PRP	Office of Research
PRPG	Office of Graduate Studies
PRS	Server Relocation Program
PSE	Energy Systems Planning
PUCRS	Pontifical Catholic University of Rio Grande do Sul
PUCSP	Pontifical Catholic University of São Paulo



QS	Quacquarelli Symonds
QUALIS	CAPES qualification of journals
R&D	Research and Development
RAIS	Annual Report on Social Information
REDEFOR	São Paulo Teacher Training Network
REVLAT	Red de Estudios Visuales Latinoamericano
RGPS	Social Security System
RI	Repository of Scientific and Intellectual Production of Unicamp
ROLAC	Regional Office for Latin America and the Caribbean
RSC	Royal Society of Chemistry
RTE	State Treasury Resources
RU	University Restaurant
RUF	Folha University Ranking
SACI	Integrated Communication Support System
SAE	Society of Automotive Engineers
SAE	Student Help Center
SAPPE	Psychological and Psychiatric Service for Students of Unicamp
SAR	Regional Administration Secretariat of Limeira and Piracicaba
SAS	Server Support Service
SBU	Unicamp Library System
SEC	Executive Communication Secretariat
SEDA	Campinas Audiovisual Week
SEMALIM	Food Engineering Week
SENAD	National Anti-Drug Secretariat
SENAI	National Industrial Training Service
SESC	Social Service of Commerce
SG	General Secretariat
SGC	Structural Genomics Consortium
SIARQ	System of Archives of Unicamp
SIC	Citizen Information Service
SIGA	Academic Management System
SLACA	Latin American Symposium on Food Science
SMILE	Student Mobility in Latin America, Caribbean and Latin America
SOBRAC	Brazilian Society of Acoustics
SOE	Educational Guidance Service
SPEC	São Paulo Excellence Chair
SPPREV	São Paulo Social Security
SPPrevCom	Foundation for Supplementary Pensions of the State of São Paulo
SPSAS	São Paulo Schools of Advanced Sciences
SUS	Brazilian Health System
SVC	Campus Life Secretariat
TCC	Senior Thesis
TT	Average Training Time
TTO	Technology Transfer Office
TWAS	World Academy of Sciences

UDUAL	Association of Universities of Latin America and the Caribbean
UEP	Teaching and research units
UER	Referenced Urgency and Emergency
UFMG	Federal University of Minas Gerais
UFPE	Federal University of Pernambuco
UFPR	Federal University of Paraná
UFRGS	Federal University of Rio Grande do Sul
UFRJ	Federal University of Rio de Janeiro
UFSCar	Federal University of São Carlos
UNDIME	National Union of Municipal Education Managers
UNEB	Bahia State University
UNESP	São Paulo State University
UNHCR	United Nations High Commissioner for Refugees
UNICAMP	University of Campinas
UNIVESP	Virtual University of the State of São Paulo
UPA	Doors Open UNICAMP
USP	University of São Paulo
UTFPR	Federal University of Technology – Paraná
VA	Meal Voucher
VALPET	Laboratory of Petroleum Valuation
VPN	Virtual Private Network
VRERI	Executive Assistant Dean of International Relations
WITS	University of Witwatersrand
WoS	Web of Science

# SUMMARY

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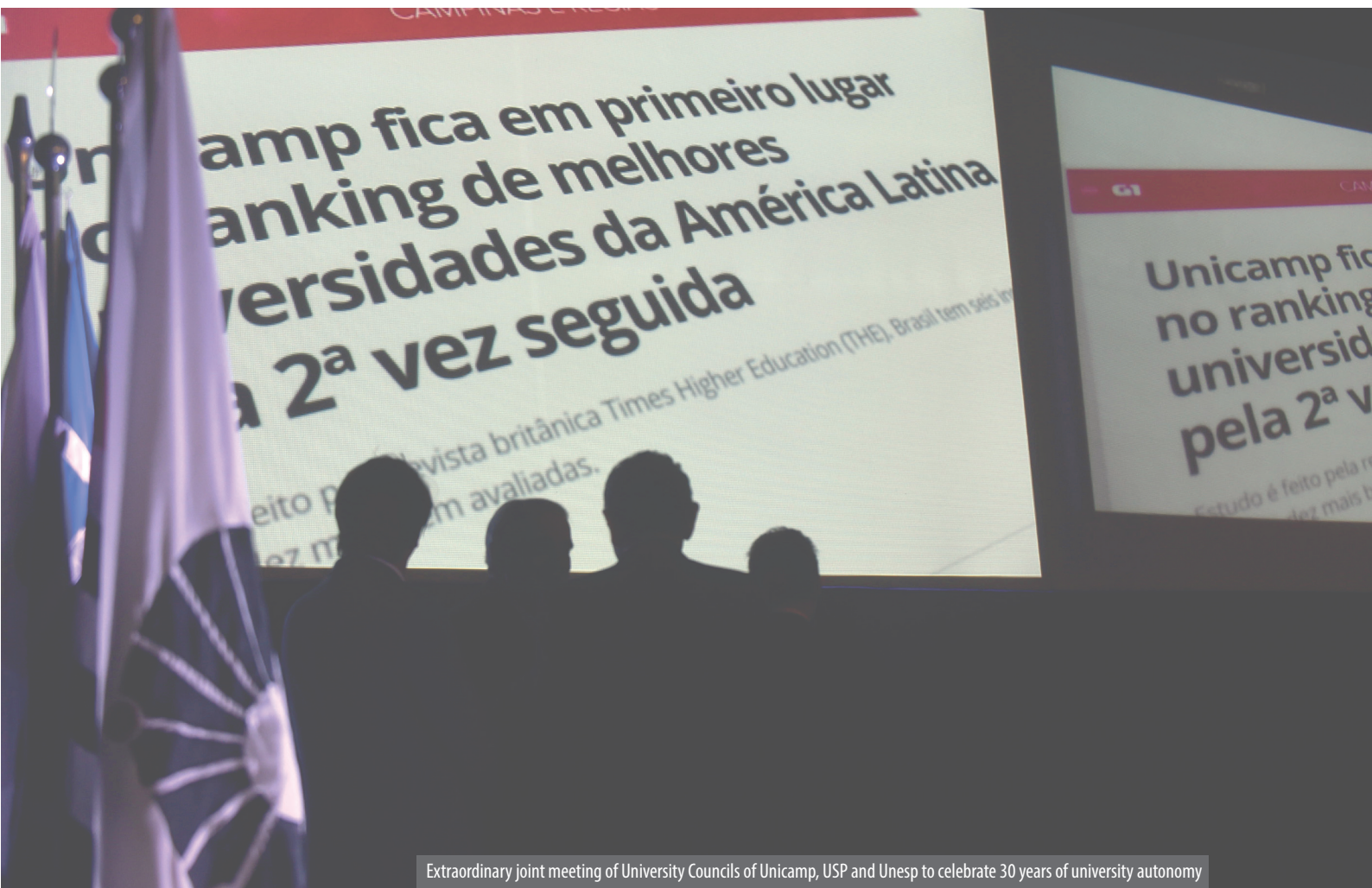


1.

## PRESENTATION



Cerimony of Launch of Commemorative Stamp 50 years of Unicamp



Extraordinary joint meeting of University Councils of Unicamp, USP and Unesp to celebrate 30 years of university autonomy





The period from 2014 to 2018, to which this report refers, represented an important moment in the history of the University of Campinas (Unicamp). On the one hand, the university held two major celebrations, the first in 2016 commemorating the 50th anniversary of its foundation and the second between 2018 and 2019 for the 30 years of academic, financial, and management autonomy. Along with the festivities, the university also experienced major challenges in terms of finances and external debate of its importance. Therefore, the aim of this report is to answer the questions put by the society that finances us and to present the development of the activities, their results and impacts to fulfill the mission of “creating and disseminating scientific, technological, cultural and artistic knowledge in all fields of knowledge through teaching, research, and outreach; and training professionals capable of innovating and seeking solutions to the challenges of contemporary society so as to fully exercise citizenship”.

Unicamp occupies a prominent place in the national and international scenario of Higher Education, Science, Technology, and Innovation. In 2018, 37,927 students were enrolled, including regular and special ones, in 66 undergraduate and 159 graduate programs, with about half at each level. In addition to this unique feature in the Brazilian scenario of balancing undergraduate and graduate education, Unicamp also concentrates more than half of undergraduate enrollments in Engineering and Technology and Exact and Earth Sciences.

Maintaining its commitment to inclusion, in 2018 Unicamp made significant changes in the way it selects new students for undergraduate education, expanding affirmative actions for indigenous, black, and multiracial/pardo people, students from public schools, and also including talent attraction through performance in national and international scientific and knowledge Olympics. The combination of these actions resulted in greater diversity for the university, and the total of 3,516 freshmen in 2019 in undergraduate programs and in the Interdisciplinary Higher Education Program (ProFIS) is made up of 50% students from public schools, 35.6% self-declared black or brown, and 2% indigenous people. Affirmative actions were also included for the access of self-declared black and brown candidates and also for indigenous people in 17 graduate programs, most of them in the fields of Arts and Humanities.



Antonio Scarpinetti/SEC – Unicamp.

Overall, students, faculty, researchers, and other employees have contributed to maintaining the university's leadership in scientific and technological production in terms of, for example, patents and number of articles per capita published annually in journals indexed in the ISI/WoS database. In 2018, Unicamp was ranked by Times Higher Education as the best University in Latin America for the second year in a row. It was also considered the best university in Brazil, according to the 2018 continuous General Course Index (IGC) of the Ministry of Education (MEC), released in 2019. In addition, in 2016 Unicamp reached the milestone of 1000 patents filed with the National Institute of Intellectual Property with a technology that increases the production of ethanol from modified yeast<sup>1</sup>.

In just over five decades, Unicamp has trained more than 65,000 young professionals in its undergraduate programs and more than 70,000 in graduate programs (specialization, master, and doctorate degrees). Moreover, thousands of university graduates work in companies, government, and social organizations, contributing to the economic and social development of the country. As a scientific and cultural center, the University has brought together big names in academia, including Cesar Lattes, Paulo Freire, André Tosello, Gleb Wataghin, Vital Brasil, Giuseppe Cilento, Octávio Ianni, Almeida Prado, Rubem Alves, Miriam Dupas Hubinger, Elza Berquó and Bernardo Caro, among many others.

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1. The invention was developed by Professor Gonalo Amarante Guimarães Pereira, of the Institute of Biology, and students Leandro Vieira dos Santos and Renan Augusto Siqueira Pirolla, and was supported by the São Paulo Research Foundation (Fapesp).



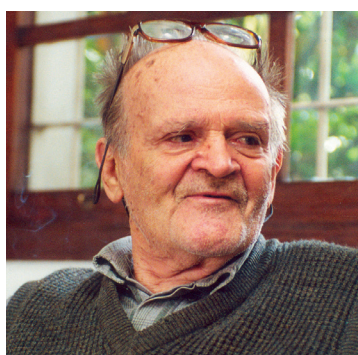
Almeida Prado



André Tosello



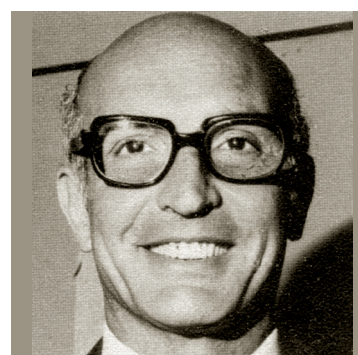
Bernardo Caro



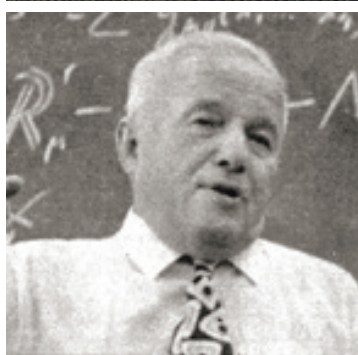
César Lattes



Elza Berquó



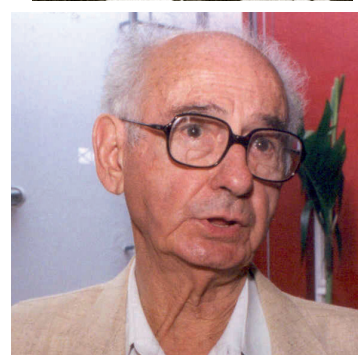
Giuseppe Cilento



Gleb Wataghin



Miriam Dupas Hubinger



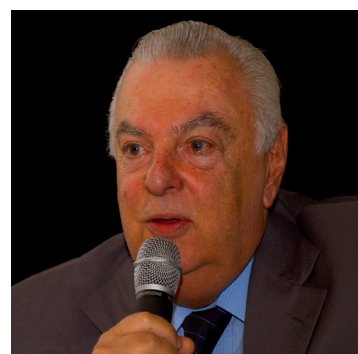
Octavio Ianni



Rubem Alves



Sandra Brisolla



Rubens Murillo Marques

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In addition to its strong performance in teaching, research, and extension, Unicamp plays an important role in the health care of the macroregion of Campinas, other cities beyond its coverage area, as well as other states. In 2018, the University conducted, in its own health units and at the two hospitals it administers in the cities of Sumaré and Piracicaba, a total of 39,100 hospitalizations in 868 beds; 747,200 outpatient consultations; 36,500 surgeries; 5,300 deliveries; 5.3 million laboratory tests; and 365 corneal, heart, bone marrow, kidney, and liver transplants. Unicamp was also responsible for the management of seven Medical Specialist Outpatient Clinics (AMEs), located in the municipalities of Amparo, Limeira, Mogi Guaçu, Piracicaba, Rio Claro, Santa Bárbara D'Oeste, and São João da Boa Vista.

Unicamp was conceived by a well-structured project in 1966, with the emblematic figure of Professor Zeferino Vaz as its first dean. Its organizational structure was strengthened with the promulgation of the Federal Constitution of 1988, which, in its article 207, established the principle of academic, financial, and management autonomy of universities in the country. The issue of financial autonomy in the state of São Paulo was complemented by Decree 29,598/89, which linked the university's budget to the collection of the Tax on Circulation of Goods and Services (ICMS). The three public universities linked to the State of São Paulo (USP, UNESP, and Unicamp) are special state autarchies, and their budgets are linked to a fixed percentage of ICMS collection, whose distribution was defined by the Council of Rectors of the State Universities of São Paulo (CRUESP). Today, the percentage of State Treasury Resources (RTE) is 9.57% of the ICMS collection, with Unicamp receiving 2.1958%.

In these 30 years of the autonomy decree, Unicamp has greatly expanded its activities, as summarized in Table 1.1, which brought gains in terms of quality, but also challenges for university management.

TABLE 1.1 – EVOLUTION OF THE KEY INDICATORS OF UNICAMP BETWEEN 1989 AND 2018

Item	1989	2018	Variation
Undergraduate programs	36	66	83%
Undergraduate vacancies	1,615	3,340	107%
Undergraduate enrollments	7,280	20,081	176%
Graduates in undergraduate degrees	917	2,821	208%
Master programs	37	83	124%
Doctorate programs	21	72	243%
Graduate enrollments*	7,523	17,846	137%
Master theses	408	1,364	234%
Doctorate dissertations	134	994	642%
Faculty with doctorate degrees	59%	99%	68%

Source: Aeplan.

Note: \* Includes master, doctorate, specialization and special students.

In terms of spatial organization, Unicamp is a multi-campus university, with units located in the cities of Campinas, Paulínia, Limeira, and Piracicaba. The university has a 694,994 m<sup>2</sup> built up area out of a total of 4,924,599.50 m<sup>2</sup>. Campinas houses the main campus, called Barão Geraldo Campus, and two units located in rented properties – the Technical High School of Campinas (COTUCA) and the Interdisciplinary Center of Theatrical Research (LUME).

Paulínia houses the Multidisciplinary Center of Chemical, Biological and Agricultural Research (CPQBA). Limeira, in turn, has two Unicamp campi. Campus 1 houses the Limeira Technical High School (COTIL) and the School of Technology (FT), and campus 2 houses the School of Applied Sciences (FCA). Piracicaba houses the School of Dentistry of Piracicaba (FOP).

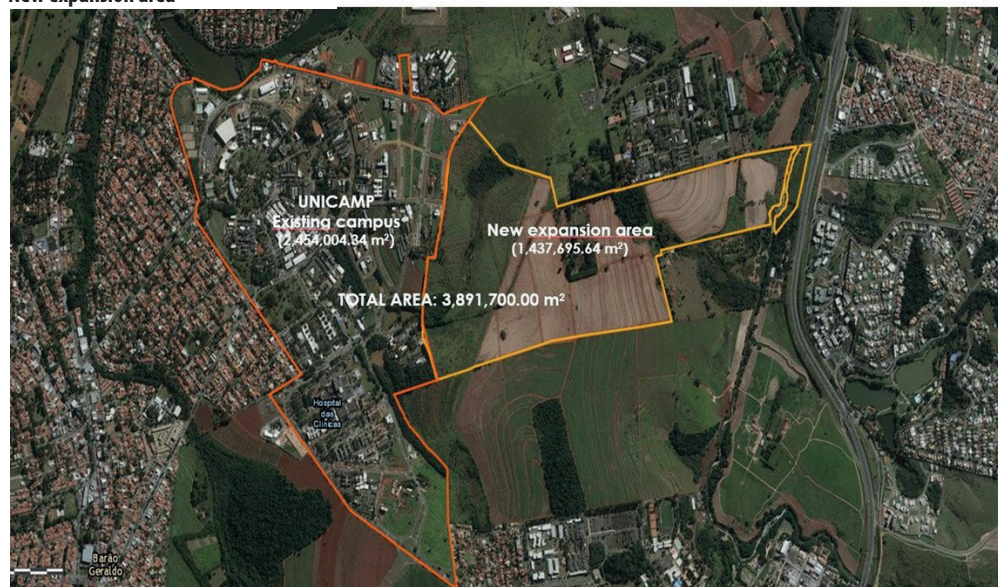
Since 2017, with the implementation of the Integrated Planning Executive Board (DEPI), Unicamp started to discuss and implement various guidelines related to land occupation and enterprise management and adopted the 17 Sustainable Development Goals (SDG) shown in the description of the strategic projects.

The images below show aerial views of the various spaces of the university, making it possible to see the impact of Unicamp on the cities, especially regarding the Barão Geraldo campus and campus 2 in Limeira.

#### AERIAL IMAGES OF UNICAMP CAMPI



#### New expansion area



Pictures reproduced from Depi /Unicamp (photo archive)

In academic terms, Unicamp is structured in 24 Teaching and Research Units (hereinafter called schools and institutes), 21 Interdisciplinary Research Centers, 2 Technical High Schools, 4 High Complexity Hospitals, multiple Management Bodies, an Innovation Agency, and a Technology and Science Park. From the managerial point of view, it is organized with the Rectory, General Coordination of the University (which acts as the Vice-Rector), Pro-Rectories (Undergraduate – PRG; Graduate – PRPG; Research – PRP; University Development – PRDU; and Extension and Culture – PROEC), Executive Boards (Administration – DEA; International Relations – DERI; Integrated Planning – DEPI; Pre-University Education – DEEPU; Health Area – DEAS; and Human Rights – DEDHU), and Coordination Office for Interdisciplinary Research Centers (Cocen). Table 1.2.

TABLE 1.2 – ACADEMIC UNITS BY AREA OF KNOWLEDGE AND LOCATION

Area of Knowledge	Academic Units	Location
Biological and Health Sciences	School of Medical Sciences – FCM	Barão Geraldo Campus
	School of Physical Education – FEF	
	School of Nursing – FEnf	
	Institute of Biology (IB)	
	Faculty of Pharmaceutical Sciences – FCF	
	School of Dentistry – FOP	Piracicaba Campus
Exact and Earth Sciences	Institute of Mathematics, Statistics and Scientific Computing – IMECC	Barão Geraldo Campus
	“Gleb Wataghin” Institute of Physics – IFGW	
	Institute of Geosciences – IG	
	Institute of Chemistry – IQ	
Arts and Humanities	School of Education – FE	Barão Geraldo Campus
	Arts Institute – IA	
	Institute of Economics – IE	
	Institute of Human Sciences and the Humanities – IFCH	
Multidisciplinary	School of Applied Sciences – FCA	Campus 2 of Limeira
Engineering and Technology	School of Agricultural Engineering – FEAGRI	Barão Geraldo Campus
	School of Civil Engineering – FEC	
	School of Food Engineering – FEA	
	School of Electrical and Computer Engineering – FEEC	
	School of Mechanical Engineering – FEM	
	School of Chemical Engineering – FEQ	
	Institute of Computing – IC	
	School of Technology – FT	Campus 1 of Limeira
Technical High Schools		
Technical High School of Limeira – COTIL		Campus 1 of Limeira
Technical High School of Campinas – COTUCA		Taquaral in Campinas
Interdisciplinary Research Centers – Cocen System		
Center for Molecular Biology and Genetic Engineering – CBMEG		Barão Geraldo Campus
Center for Semiconductor Components and Nanotechnologies – CCS		
Center for Integration, Documentation and Cultural Dissemination – CIDDIC		
Center for Biomedical Engineering – CEB		
Multidisciplinary Center for Biological Investigation on Laboratoty Animal – CEMIB		
Center for Meteorological and Climatic Research Applied to Agriculture – CEPAGRI		
Center for Petroleum Studies – CEPETRO		



TABLE 1.2 – ACADEMIC UNITS BY AREA OF KNOWLEDGE AND LOCATION

continued

Interdisciplinary Research Centers – Cocen System	Location
Center for Studies on Public Opinion – CESOP	Barão Geraldo Campus
Centre for Logic, Epistemology and the History of Science – CLE	
Memory Center Unicamp – CMU	
Population Studies Center “Elza Berquó” – NEPO	
Center for Public Policy Studies – NEPP	
Center for Food Studies and Research – NEPA	
Interdisciplinary Nucleus for Sound Studies – NICS	
Center for Gender Studies – PAGU	
Nucleus of Applied Informatics to Education – NIED	
Interdisciplinary Center on Energy Planning – NIPE	
Creativity Development Nucleus – NUDECRI	
Center for Environmental Studies and Research – NEPAM	
Interdisciplinary Centre for Theatrical Research – LUME	
Pluridisciplinary Research Center for Chemistry, Biology and Agriculture – CPQBA	Paulínia Campus
Interdisciplinary Center of Theatrical Research – LUME	Barão Geraldo in Campinas

Unicamp has a long and relevant tradition of Institutional Assessment, both in the Interdisciplinary Research Centers, whose first experience occurred in 1988, and in the Teaching and Research Units, which carried out the first evaluation in the beginning of the 1990s. The latter resulted in the publication of the first report: “Unicamp Institutional Assessment: Process, Discussion, and Results”. This initiative, headed by the then Dean of Graduate Studies, José Dias Sobrinho, aimed to introduce the culture of collectively surveying and analyzing information, seeking to know the institutional difficulties and advances, reinforcing that university management gained organizational learning and institutional development at each reflection process. This process was more systematically restarted in the early 2000s to comply with State Education Council Resolutions (CEE 04/99<sup>2</sup>; CEE 04/00<sup>3</sup>). In addition, the recertification of the university with the CEE has since 2003 been linked to the Institutional Assessment<sup>4</sup>.

The process gained greater institutionality through University Council Deliberations, with the setting up of the Committee of Interdisciplinary Activities (CAI/Consu) in 1989 (Deliberation CONSU 15/89<sup>5</sup>) and the Strategic Planning Committee (COPEI) in 2001 (Deliberation CONSU-A-015/2001<sup>6</sup>).

In addition to Unicamp’s internal regulations, the institutional evaluation process is regulated by Deliberation CEE 160/2018<sup>7</sup>, which foresees that the self-evaluation process should be continuous and permanent, encompassing the different aspects of teaching,

2. <http://www.ceesp.sp.gov.br/ceesp/textos/1999/d4-Ind6-99.pdf>

3. <http://www.ceesp.sp.gov.br/ceesp/textos/2000/D4-Ind4-00.pdf>

4. According to Deliberation CEE N° 32/2003. Previous deliberations that regulated institutional recertification and the renewal of course recognition (Deliberations CEE 5/98, 8/98 and, 7/2000) placed these procedures as not being connected with institutional evaluation at different times.

5. [https://www.pg.unicamp.br/mostra\\_norma.php?id\\_norma=2396](https://www.pg.unicamp.br/mostra_norma.php?id_norma=2396)

6. [http://www.cgu.unicamp.br/planes/comissao\\_de\\_planejamento/del-consu-15.pdf](http://www.cgu.unicamp.br/planes/comissao_de_planejamento/del-consu-15.pdf)

7. <http://www.ceesp.sp.gov.br/ceesp/textos/2018/14-18-Delib-160-18-Indic-165-18-2.pdf>

research, outreach, and management. In addition, the deliberation states that “institutional self-evaluation should include a global and integrated analysis of the institution’s activities, structures, relationships, social commitment, purposes, and social responsibilities, considering at least the following aspects: I – effectiveness and efficiency of its education and professional training; II – general and specific conditions of undergraduate and graduate programs; III – appreciation of the extension and interaction with the community; IV – relevance of its research programs; V – relevance of its cultural and scientific production; VI – quality of administrative and financial management, including the management of teaching and administrative human resources; and VII – adherence of undergraduate licentiate courses to the reality of Primary Education”.

The evaluation process of the Institutes, Schools, and Technical High Schools had three five-year cycles: 1999-2003, 2004-2008, and 2009-2013. The Interdisciplinary Research Centers, in turn, had four biennial cycles (1989-1990, 1991-1992, 1993-1994, and 1995-1996), three three-year cycles (1997-1999, 2000-2002, 2003-2005), and two five-year cycles (2004-2008 and 2009-2013). The 2009-2013 cycle, in addition to synchronizing the period for Schools, Technical High Schools, and Interdisciplinary Research Centers, also included ProFIS, implemented in 2010<sup>8</sup>.

From 2013 onwards, the institutional evaluation started to be articulated with the Strategic Management Cycle, coordinated by PRDU/COPEI (Deliberation CONSU-A-020/2013<sup>9</sup>). Thus, the strategic planning actions were combined with institutional evaluation mechanisms, involving all Units and Bodies, and including goals, procedures, and lines of action to build the future of the University in the medium and long term and produced the basis of Strategic Planning – Planes 2016-2020<sup>10</sup>. In this sense, institutional evaluation is a process that fulfills at least two roles: (i) diagnosis of the university’s performance, by data and information collection and analysis; and (ii) accountability of a public institution to society and to the control and regulatory bodies (such as the State Board of Education).

Currently, the governance process of Institutional Assessment, as well as Strategic Planning (Planes), is carried out by the University General Coordination (CGU). This change is in line with a diagnosis, already seen in the previous institutional evaluation, that these two processes need to be integrated, composing and institutionalizing strategic management. The evaluation makes it possible to carry out an internal diagnosis that allows the proposition of strategic projects, composing the strategic cycle with the perennial incorporation of the transformations desired by the strategic projects in the work processes of the bodies.

Unicamp implemented its first structured strategic planning process (Planes) in 2004-2008, subsequently, but independently from, the 1999-2003 Institutional Assessment process. During this period, a few structuring strategic actions were implemented, limited to the university management scope. However, only from 2017 did Unicamp advance in adapting strategic management methodologies, with effective processes for project selection and for monitoring their execution. The main product of this process was the

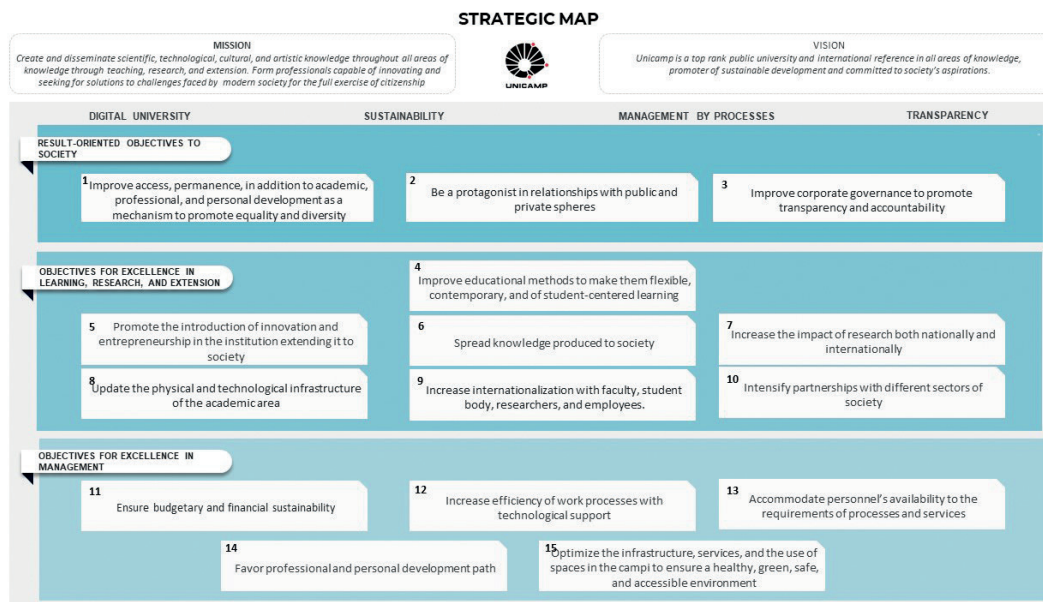
8. Institutional evaluation reports for previous periods are available from: <https://www.cgu.unicamp.br/avaliacao>

9. [https://www.pg.unicamp.br/mostra\\_norma.php?id\\_norma=3487](https://www.pg.unicamp.br/mostra_norma.php?id_norma=3487)

10. <http://www.prdu.unicamp.br/areas2/planes/planejamento-estrategico>

possibility, based on the diagnosis of academic units, of reviewing Unicamp's planning and providing more substantive document – Planes 2016-2020<sup>11</sup>, with a well-established Mission and Future Vision, which clarified the institution's principles and values and defined the strategic areas and corporate strategies (Figure 1.1). Strategic programs and projects started to be associated with these corporate strategies.

FIGURE 1.1 – STRATEGIC MAP OF UNICAMP'S PLANES 2016-2020



Source: Geplanes.

The difficulties, however, were not small during the 2014-2018 period, given the enormous economic and social difficulties that Brazil is going through, with profound impacts on the ICMS collection and, therefore, on the university budget. The economic difficulties that combined a drop in collection with a set of expansionary actions taken by management led to a budget deficit that has been covered with the accumulated financial balance over the past several years. The persistence of the real drop in tax collection with payroll growth led Unicamp to work with a deficit throughout the 2014-2018 period. That is, the collection via State Treasury Resources (RTE) was substantially lower than university expenses, a fact that only began to change in 2017, when strong restrictive measures started to be taken. It can be stated, that for October 2019, when this report was being written, that the budget deficit was still unresolved, so that important institutional efforts must continue to be made, either on expenditure cuts or increase of additional revenues to the RTE. It is in this context of huge budgetary difficulties that the activities developed in the 2014-2018 period are reported.

On the other hand, Unicamp has a huge capacity to enable projects with multiple public, private, or third sector national and international funding agencies, which allow its research and development activities. Data for the 2014-2018 period show that around

11. Available from: <https://www.geplanes.cgu.unicamp.br/geplanes/planes.html> Access on May 26, 2019.

30% of its annual budget comes from these other sources. These are the resources that guarantee the quality of research and innovation promoted by the university and that help the management of its hospital complex.

Another point to be considered is more complex, as it involves the perception of external stakeholders about the quality of university management, especially the State Government, the Legislative Assembly of the State of São Paulo, the media, and the control agencies, in particular the Court of Auditors of the State of São Paulo. The Public University, at this moment of Brazilian history, is under intense questioning, partly because most public authorities see the university as a questioning body of those who publicly express disregard for science and knowledge. This adverse scenario leads to the challenge of broadening the articulation with society, to better communicate the results of university activities and ensure best governance and management practices in the administration of public resources.

The tools for the 2014-2018 Institutional Assessment were improved and revised compared to the 2009-2013 period, based on the analysis of COPEI, CAI/CONSU, Pro-Rector, and Executive Board members. The computerized Institutional Assessment System was updated, and support data were provided so that the Internal Assessment Committees had as many subsidies as possible for their analyses. Following this preparation step, the Institutional Assessment is made up of five additional steps:

1. Internal Evaluation carried out by 48 committees (24 by institutes and schools, 21 by interdisciplinary research centers, 2 by technical schools and ProFIS) that worked on answering questions about teaching, research, outreach, innovation, graduates, internationalization, and management;
2. Consolidation of information by a Working Group made up of representatives of the Vice-Rectories, Executive Boards, and CAI/Consu, which resulted in the preparation of this Preliminary Report of Institutional Assessment;
3. External Assessment that will be carried out by two committees, as explained below;
4. Preparation of the Final Report of the Institutional Assessment, with the integration of the opinions of the external committees, which, after approval by COPEI, CAI/Consu, and Consu, will be sent to the State Board of Education; and, finally,
5. Meta-evaluation of the Institutional Assessment process to evaluate the evaluation processes and products and suggest improvements for the next cycles.

An important element to be pointed out in this report, which represents an important change from the previous evaluations, was the incorporation of Interdisciplinary Research Centers in the analyses of the schools, regarding the assessed dimensions. This shows an important conceptual change on the role of interdisciplinary research centers, which have a strong connection with institutes and schools by the faculty participating in each one and by the role of researchers in establishing partnerships in research projects, either by their participation in graduate or in outreach programs. In this sense, the recognition is that the Interdisciplinary Research Centers and units jointly contribute for Unicamp to fulfill its mission.

Two other novelties of this report are the incorporation of two new chapters, addressing the social and technological innovations resulting from the application of knowledge generated at the University and the professional destiny of graduates from technical high schools, undergraduate and graduate programs.

Thus, the assessed dimensions were:

1. Pre-University Education
2. Undergraduate Programs and ProFIS
3. Graduate Programs
4. Research
5. Outreach and Culture
6. Internationalization
7. Social and technological innovation
8. Alumni
9. Management

Pre-University Education (topic 1) was evaluated by an external committee consisting of five members of the national academic community in February 10-12, 2020:

1. Huyra Estevão de Araújo – Federal Institute of Education, Science, and Technology of São Paulo, Piracicaba Campus
2. Maria Helena Guimarães de Castro – National Council of Education
3. Isnard Domingos Ferraz – COLUNI School (Federal University of Viçosa)
4. José Vitório Sacilotto – Paula Souza Center
5. Maria Antonia Ramos de Azevedo – Unesp Rio Claro

Topics 2 through 9 will be evaluated by an external committee consisting of seven members of the international academic community<sup>12</sup> from March 23 to 27, 2020:

1. Thomas Maack – Cornell University, USA
2. Valentin A. Bazhanov – Ulyanovsk State University, Russia
3. Silvia Braslavsky – Max Planck Institute for Chemical Energy Conversion, Germany
4. Francisco Marmolejo – Qatar Foundation, Qatar
5. Naziema Jappie – University of Cape Town, South Africa
6. Patti McGill Petterson – American Council on Education, USA
7. Luiz Enrique Orozco Silva – Ibagué University, Colombia

The 2014-2018 Institutional Assessment is fundamentally important, since it will be used as one of the components of the internal environment analysis for the 2020 review of the Institutional Strategic Planning, Planes 2021-2025.

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12. The committee also has Andrés Bernasconi, from the Pontifical Catholic University of Chile, as a stand-in.





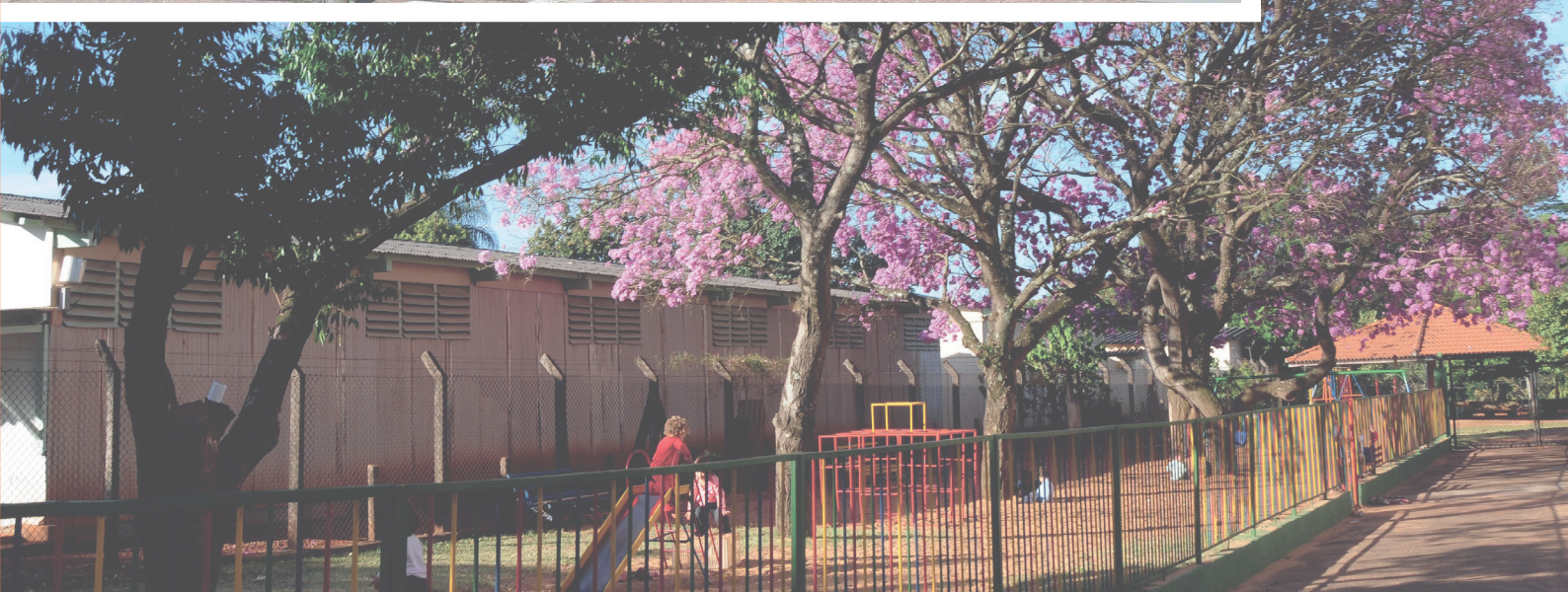
# **INTERNAL EVALUATION**





2.

## PRE-UNIVERSITY EDUCATION







The Pre-University Education Executive Board – DEEPU created by GR Resolution No. 27/2017, of May 5, 2017, aims to propose a pre-university education policy that involves basic education (early childhood education, elementary education, secondary education and vocational education); representing Unicamp in relation to the State and Municipal Secretaries; advising in conjunction with the central administration issues related to the management of the Pre-University Education system; managing political-pedagogical and administrative activities of pre-university education units at their different levels, stages and modes of teaching/education always acting in accordance with the guidelines established by the Federal Constitution of 1988, by the Ministry of Education and Culture (MEC), by the Law of Guidelines and Bases of Education in force, by the Statute of Children and Adolescents, and by the State Council Deliberation No. 152/2017, that delegates to universities and public university centers belonging to the State Education System the competence to authorize the operation and supervise educational establishments providing programs of basic education and technical and vocational education and training at upper secondary education level, and is therefore not subordinate to the respective agencies in the municipal, state or federal spheres.

The Executive Board of Pre-University Education has an Executive Board composed of the Directors of the Technical College of Campinas, Technical College of Limeira and Division of Early Childhood and Supplementary Education – DEdiC, being chaired by the Executive Director and the Secondary and Technical Education Commission (CEMT) that was created by GR Resolution No. 58, of August 19, 2003. CEMT aims to assist the University with regard to the policy of Technical and Vocational Secondary Schools.

In order to plan, develop, institutionally enable the management of institutional actions, projects and programs that concern Pre-University Education, all decisions arising from the strategic vision, based on compliance with the guidelines established by MEC, Law of Guidelines and Bases of Education and Statute of Children and Adolescents, must be submitted to this Board by the units that compose it. After analysis, evaluation and opinion of the Executive Board the documents will be submitted to the University Council (CONSU) for final approval.

DEEPU is responsible for communicating to the State Council of Education (CEE) the implementation of new programs, important curricular modifications, changes in the Management Plan, Pedagogical Project, Regulations and School Rules always after approved by the Executive Board and submitted for approval in the CONSU.

Pre-University Education Educational Units that compose the DEEPU:

- Division of Early Childhood and Complementary Education of Unicamp (DEdiC) comprising:
  - Early Childhood Education (for children aged 6 months to 5 years and 11 months), *Centros de Convivência Infantil* (CECI – Children Coexistence Centers) – CECI Parcial, CECI Integral and CECI FOP;
  - Complementary Education in the non-formal mode (for children/adolescents aged 5 years and 11 months to 14 years), *Programa de Desenvolvimento e Integração da Criança e do Adolescente* (Child and Adolescent Development and Integration Program) – PRODECAD.

- Limeira Technical Secondary School (COTIL): It provides Secondary Education and technical-level vocational training. It trains technicians in: Buildings, Nursing, Geodesy and Cartography, Informatics, Mechanics, and Quality and Productivity.
- Campinas Technical Secondary School (COTUCA): It operates in vocational training at upper secondary education level and provides secondary education in some of its programs. The programs provided by COTUCA cover six major areas: Industrial, Informatics, Health, Telecommunications, Management and Environment.

Since its creation, DEEPU has had a prominent position in the central administration of the university. Its establishment resulted in a growth process among the units that compose it.

## 2.1 Division of Early Childhood and Complementary Education of Unicamp (DEdIC)



Antonio Scarpinetti/SEC – Unicamp.

The Division of Early Childhood and Complementary Education was called so for the first time in 2008 and in terms of formal registration there are documents from 2009. Previously, there were the Children Coexistence Center of the School of Dentistry in Piracicaba (established in 1979); *Cantinho da Física* (Physics Corner) (1982); *Creche Área da Saúde* (Health Area Daycare) (1987) and the Child and Adolescent Development and Integration Program (1987). In 1998, the Division of Educational Programs (DPE'S) was constituted, linked to the General Directorate of Human Resources, and which became DEdIC<sup>1</sup>. In 2017,

1. That document was prepared using data from the socio-educational service; social assistance; regulatory documents regulating DEdIC and which are in force, namely: DEdIC (Division of Early Childhood and

DEdIC became part of DEEPU, in an institutional partnership with DGHR, but politically, pedagogically and administratively subordinated to DEEPU.

Although originally derived from specific locus, DEdIC emanates from an effervescent historical context in which the rights of women and babies were considered as intertwined. This is a local history of Unicamp, but which related to the entire broader social and political movement: the rights of women, workers, mother in the exercise of motherhood; babies, of the struggle to defend the children's rights to childhood. They combine with female workers' policies; from permanence to the broader social rights.

As "social benefit," the service gained momentum, as the tensions and social struggles changed. From social benefit of working women at Unicamp, it was expanded to working women of the Unicamp Development Foundation (FUNCAMP). And so, successively, it was expanded to undergraduate and graduate students.

### 2.1.1 Political and Pedagogical Project

DEdIC's Political and Pedagogical Project (PPP) systematizes the operations of the educational units and presents the compilation of Work Plans prepared by early childhood education professionals from each of the units that compose the Division. It is a multiannual document (triennial or quadrennial). On the other hand, the work plans of teachers and education professionals are annual.

Work plans are prepared at the beginning of the first trimester and, according to the interaction between babies, children and adults, the proposal may be revised. Accordingly, from the point of view of DEdIC's board, the desire and demand for the possibility of "flexibilization" of this document, reinvention and reorganization of pedagogical times and spaces is reiterated, so these are chronological times permeated with political and pedagogical and poetic, esthetic sensibility and significance. It is, therefore, a matter of having the educational interaction and intentionality as central points of the PPP.

The autonomy of pedagogical work is another central aspect in DEdIC. The work plans are built by the professionals with the socio-educational and instructional mediation of coordinations. Therefore, diversity can be observed in the propositions and work in the almost 50 classes where more than 120 early childhood education and comprehensive education teachers work in DEdIC.

### 2.1.2 Extracurricular Projects and Activities

Since 2017, DEdIC's management group spared no effort to encourage the entire pedagogical and administrative team to improve professional performance by the development of extracurricular projects and activities.



In line with the pedagogical proposal of the Division, the developed curricular and extracurricular projects address different objectives that generally involve the development of processes that focus on professionals who work in educational spaces geared toward the development of babies and children.

Accordingly, educational actions related to the promotion of self-care, promotion of health, prevention of accidents in childhood, practice of motor activities, musical presentations, playing and child well-being, the child as a social and cultural being, experiences of healthy food preparation, experience with animals and plants, use of contemporary computational technologies and development of typical skills of the 21st century are examples of some subjects developed and studied thus far.

These activities are conducted within the various spaces of DEdIC by volunteers, staff, students from schools and institutes of the university. It should be mentioned the participation of collaborators from the School of Physical Education (FEF), School of Nursing (FEn), Institute of Computing (IC), School of Food Engineering (FEA), Arts Institute (AI), School of Electrical Engineering and Computing (FEEC), Institute of Economics (IE), Institute of Language Studies (IEL), School of Education (FE), Community Health Center (CECOM), General Directorate of Human Resources (DGRH) and Student Support Service (SAE); Division of the Environment; School of Medical Sciences (FCM), Institute of Biology (IB), among others.

For the execution of specific actions conceived during the team's pedagogical planning, DEdIC receives financial aid from the Unicamp Social Benefits Management Group (GGBS), such as: monitored visits, theatrical presentations, meeting with families, integration between professionals – DEdIC (Jornada/ Encontro); pedagogical dialogue meetings; etc. This is *DEdIC Ação* (DEdIC Action).

Moreover, there is the partnership with the Unicamp Student Support Service (SAE). Annually, the team of professionals submits projects for Social Assistance scholarships that comply with the PPP in force. Over the past two years there have been more than 40 Social Assistance scholarship holders each year.

In dialogue with the School of Education in 2017, the workload of paid internship was changed to 20 hours in 2018, at the request of the Internship Support Laboratory (LAE/ FE). In 2018 and 2019, DEdIC was assigned by AEPLAN/DGA a value corresponding to 39 trainees. Moreover, it receives approximately 50 trainees annually in compulsory internship courses (management and practices in early childhood education), coming from FE and other Schools in the region.

### 2.1.3 Mechanisms for discussion and application of the results of the teaching-learning process evaluation

The systematized internal evaluation in DEdIC is not formalized. A study of results of evaluations and instruments for recording the learning and development process of babies and children supports the analysis of pedagogical practices and guides the projects.

Daily observance of babies and children has conducted the work of every team within DEdIC. Thus, the logs, portfolios, books of life; the various and different productions of babies

and children; the photos and other traces and clues gradually compose a set of records. Thus, the whole team is responsible for advancing toward systematizing and constituting a pedagogical documentation that enables reading the childhoods that have been provided in the Units as well as the conceptions of education and pedagogical practice.

There is formalized preparation of a roadmap so that teachers make what we call “Fact sheet with description of the teaching-learning process” and that the coordinations read and dialogue for possible corrections or modifications. Then, the corresponding fact sheet is shared with families in format of descriptive form, without the character of measurement or classification, but with description of the advances, activities and actions proposed, as well as the challenges and other aspects that the professionals consider important to register.

The meeting to present the work proposal with the families is held early in the first week for these families to know the teachers and the instructional intention planned for and with the class. In the first month this project is revisited, based on the activities and experiences conducted with the children, and then it is made available for consideration of the coordination and also of the management. Project meetings and practice sharing meetings, in their turn, take place during the year (cultural shows, integration activities, other activities involving the families). At the end of the third trimester, the form with a description of each child’s process is shared.

## 2.1.4 Provision of Early Childhood and Complementary Education

The Division of Early Childhood and Complementary Education consists of five Educational Units:

- Full-time Children Coexistence Center (CECI): Daycare/Nursery;
- Full-time Children Coexistence Center (CECI): Daycare/Nursery school – Preschool;
- Part-time Children Coexistence Center (CECI): Daycare/Nursery, Daycare/Nursery school – Preschool;
- Children Coexistence Center of the Piracicaba School of Dentistry (CECI FOP): Daycare/Nursery, Daycare/Nursery school – Preschool;
- PRODECAD: Child and Adolescent Development and Integration Program.

Coexistence Centers provide Early Childhood Education and PRODECAD provides Complementary Education in the “non-formal” mode from the perspective of comprehensive education. Children coexistence centers serve babies and children aged 6 months to 5 years and 11 months and PRODECAD serves children aged 6 to 14 years.

DEdIC provides today approximately 886 vacancies considering all its units. Table 2.1 shows the DEdIC Units, operating period and the distribution of its vacancies and Table 2.2 shows the overall demand for vacancies in DEdIC.

TABLE 2.1 – UNITS, SCHEDULES AND VACANCIES OF THE DEDIC UNITS

Unit	Time	Vacancies
Full-time CECI – Nursery	8:30 am to 5:30 pm	96
Full-time CECI – Nursery school and Preschool	7:00 am to 4:00 pm and 8:30 am to 5:30 pm	255
CECI Part-time	7:00 am to 1:00 pm and 1:00 pm to 7:00 pm Nursery from 7:00 am to 4:00 pm	180 10
CECI FOP	8:00 am to 5:30 pm	25
PRODECAD	8:30 am to 12:40 pm, 11:30 am to 1:15 pm, 11:30 am to 4:00 pm, and 5:00 pm to 7:00 pm	320

TABLE 2.2 – GENERAL DEMAND FOR VACANCIES IN DEDIC

Year	Number of enrollments and interviews with Social Worker
2014	203
2015	367
2016	271
2017	239
2018	244

Due to the annual demand being higher than the availability of vacancies, a socioeconomic analysis is made annually for the purpose of periodic classification of the capacity of service. At the end of 2017, the proposal for re-evaluation starting from age 4 years was approved, with the objective of expanding the vacancies/service of the nursery and continuing the service after that age group only for specific situations, since in Campinas and its region the deficit of vacancies is significant in the “daycare” period.

According to the socioeconomic classification, by the Social Worker of DEDIC, after analysis based on the requested documents and socioeconomic interview, which may be supplemented by home visit, the requested vacancies are granted to the guardian who has a biological or legally adopted child, a child under judicial guardianship, stepson under formal custody of spouse, considering the following conditions of proportionality for the various segments of the university:

- I. Unicamp staff (technical and administrative, researchers, faculty and attorneys): up to 60% or more of the vacancies;
- II. Funcamp staff: up to 25% of the vacancies;
- III. Undergraduate or graduate students – master’s and doctoral degrees: up to 15% of the vacancies.

Whenever demand exceeds the supply of vacancies, a waiting list is generated and vacancies are granted according to availability, respecting the period of publication of the lists (quarterly in the case of nurseries and semiannual in other segments). The following Table shows the profile of babies/children enrolled in DEDIC units and lists their parents or guardians’ ties with the University.

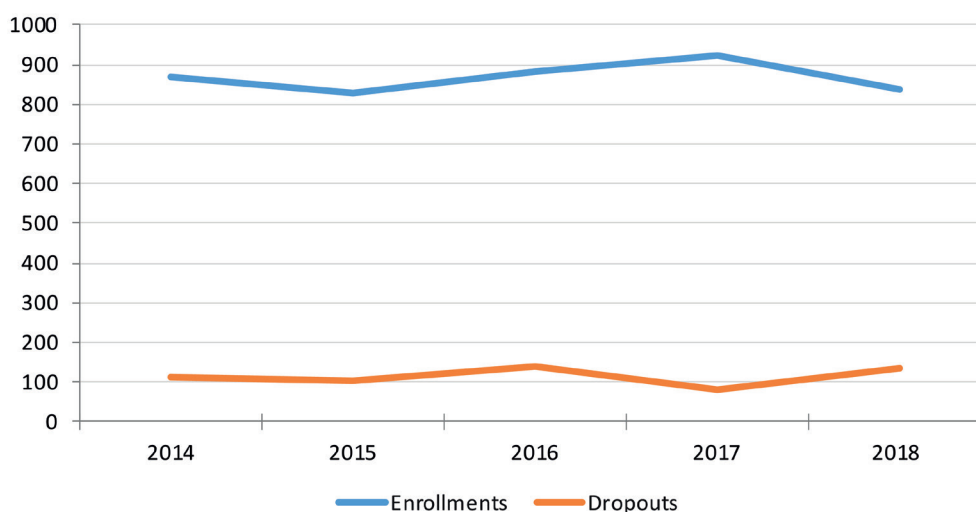
TABLE 2.3 – NUMBER OF ENROLLED CHILDREN ACCORDING TO THEIR FAMILIES’ TIES WITH THE UNIVERSITY, 2014–2018

Educational Unit	Tie of the parent or guardian with the University	2014	2015	2016	2017	2018
CECI (s)	Unicamp	285	234	266	297	245
	Funcamp	208	202	218	182	148
	Students	80	74	76	94	120
PRODECAD	Unicamp	150	155	156	166	161
	Funcamp	135	148	146	158	141
	Students	10	13	19	26	23

### 2.1.5 Dropout rates

Dropping out in DEdIC is characterized as giving up the vacancy and, therefore, the enrollment performed by the parent or guardian for the baby or child who attended one of the segments of DEdIC. In the period from 2014 to 2018, the mean dropout rate was 13%.

GRAPH 2.1 – ENROLLMENTS AND DROPOUTS IN DEDIC



Dropouts usually occur with higher incidence after the January holidays, as well as during strike periods, as in the case of 2018. According to data from the socio-educational service, approximately 90 children had their enrollment canceled until the end of the first semester of that year, totaling 135.

### 2.1.6 Organizational Structure

DEdIC’s current organizational structure had its certification approved in 2017 and is considered appropriate in order to enable the planning, development and coordination of the teaching process. And, considering the current changes, they have undergone reformulations for new certification.

Each of the five socio-educational units that compose DEdIC has Unit Coordinators (CoordU), public servant basic education professionals who, after approval in the selection process, carried out in 2017 and 2018, joined the DEdIC Management Team.

The corresponding coordinators are accountable to the DEdIC board, as well as to the DEEPU board and to the community for the work carried out. Therefore, for babies, children, male teachers and female teachers, as well as for the families and other employees, they are the ones who provide clarifications directly and can properly answer about the progress of daily pedagogical work, in addition to the male teachers and female teachers and other staff who constitute their work team.

The DEdIC Management Team has seven key sectors:

- a) Socio-educational Service;
- b) Administrative Services (Warehouse, HR, Finance, Purchasing, Informatics, Communication, Maintenance);
- c) Team of Nursing Professionals;
- d) Team of Nutrition Professionals;
- e) Team of Dental Professionals;
- d) Partnerships with faculty, trainees of the Institutes and Schools of the university; and
- e) Partnerships with external institutions (Fire Department, Sanasa, among others).

### 2.1.7 Management and Administrative Activities

As in the rest of the university, DEdIC also faced a deficit in the staff in all administrative sections, which generated an accumulation of tasks. This fact alerted us to the urgent need to expand and improve work processes through the improvement or creation of computerized systems.

Many administrative activities within DEdIC are still carried out manually, and with the use of computerized systems as a working instrument many errors and rework would be avoided. However, as part of a broader apparatus, DEdIC has partnerships with Aeplan, DGRH, DPD, municipal government, as well as effective mediation of the cabinet itself regarding unforeseen or emergency actions.

The team, although reduced, has been working effectively in the areas of human resources, purchasing, maintenance; and has contact with the support of the General Directorate of Human Resources for the area of dissemination and system (in relation to the network, for example, DGRH provides a responsible professional who dialogues directly with the respective board), among others.

### 2.1.8 Teaching Management

In the context of DEdIC, the Units serve the age group from 6 months to 14 years of age (daycare – nursery and nursery school; preschool; and counter-shift education called “non-formal education” – that provided in PRODECAD). Thus, DEdIC has a fertile field of

multiple possibilities for teaching-learning management. Because of the very condition of the age group – of the human condition of “learner”; of the organization and operation, as well as of integrating a University.

The central objective of the curriculum is experience/experimentation. That is, providing, by means of playing, toys and games, experiences that the babies and children live wholly and integrally. Learning focused on the arts, languages, diversity and sociocultural differences. Above all, learning primarily for solidarity, respect, for the joy of sharing and for the process of *omnization* and humanization.

In political-pedagogical terms, the following aspects are central:

- Continuing Training of Education Professionals: occurs as a priority in the Collective Pedagogical Meeting, which functions as time and space for dialogue, for sharing experiences, for strengthening collective work, for dialogue on the curriculum, on the conceptions of early childhood education, childhoods, etc. In addition, there is also the Double Meeting, “individual” Planning and training in isolated courses, in professional, academic graduate programs, etc.
- Different and Diverse Languages: in the context of each Unit, the Coordination Team and Teachers, together with all others, have the challenge of continuously mapping, analyzing, registering and systematizing actions, projects and workshops by the teachers with babies and children in different times and spaces. Moreover, they seek to provide dialogue on relevant topics and encourages the development of projects and actions that integrate the different languages (artistic-cultural, socio-environmental, linguistic, etc.).
- Inclusion, Food and Health: because it has a multidisciplinary team, this subject has been worked in partnership between DEDIC professionals and other partners at Unicamp.

## 2.1.9 Human Resources

Currently, DEDIC has 66 staff (PAEPE, Funcamp and outsourced ones) that are in charge of administrative activities, nutrition, nursing, social assistance, security and cleaning.

TABLE 2.4 – DEDIC STAFF AND TYPE OF EMPLOYMENT CONTRACT

Type of contract/Year	2014	2015	2016	2017	2018
Funcamp	–	–	–	–	39
Outsourced	26	28	28	28	27
Unicamp/PAEPE	165	160	154	142	141

Early childhood education professionals in the context of DEDIC have a peculiar career related to the institutionalization process that has been improved in the context of the Division. Most professionals have a Degree in Pedagogy and, some, a Degree in Physical Education or Music.



TABLE 2.5 – EDUCATIONAL LEVEL OF THE DEDIC TEACHERS – PAEPE CAREER

DEdIC	2014	2015	2016	2017	2018
Secondary Level Teachers	10	10	9	7	5
Tertiary Level Teachers	118	116	115	114	116

Regarding the number of teachers, there are currently a total of 130, of which 10 hold positions in management. The teacher-child relationship is quite satisfactory, when compared with other early childhood education institutions we see that there is a major difference, our proportion of teachers and babies and children has been favoring work, since the adult to child ratio is organized as follows:

- 1 teacher for every 6 children aged 6 months to 1 year and 11 months;
- 1 teacher for every 15 children aged 2 years to 3 years and 11 months;
- 1 teacher for every 20 children aged 4 years to 5 years and 11 months;
- 1 teacher for every 30 children aged 6 to 14 years.

(in: DEdIC school bylaw of August 30, 2017 and CAD A-004/2017)

It is important to inform that, from 2016, the proposal of 1/3 was implemented in the respective management for planning purposes, which implied that a teacher with a shift of 40, 30 and 20 works 2/3 directly with children.

### 2.1.10 Infrastructure

Next, there are considerations about physical infrastructure and accessibility in DEdIC units.

The CECI – FOP facilities have not undergone reforms for more than a decade and, although it has been made unfeasible at first, since 2017 the current rectory has not spared efforts to advance, with resources from the central agency, the project for reform and adaptation of the solarium, ventilation, replacement of doors and installation of windows, change of sockets, wiring, aiming to adapt the corresponding facilities to comply with ABNT (Brazilian Association of Technical Standards) standards.

The CECI full-time Nursery operates in a ground floor building near IB/FEA, but its accesses are narrow and there are many uneven surfaces on the floor that prevent access and locomotion. The restrooms are also noncompliant as to allow accessibility and there is no signage for people with vision deficit inside and around the unit.

CECI Full-time Nursery School and Preschool (next to the Teaching Hospital) has served for more than 30 years in a two-story building. The site, provided by the School of Medical Sciences (FCM), has been undergoing structural adaptations and physical organization, of internal and external areas, according to the needs of children, as per evaluation by the DEdIC management team, teachers of the corresponding unit, and competent agencies of Unicamp.

The building has ramps with railing to facilitate access. Currently there are restrooms adapted for people with special needs, for the use of both children and adults. There is specific signage in the external area for visually impaired people. The rooms and lounges

available for pedagogical activities are spacious. CECI Full-time is rich in outdoor area in terms of parks with green areas. These parks have been adapted over the years to provide conditions compatible with the infrastructure requirements defined by the standards of the Brazilian Association of Technical Standards (ABNT). There are some trees that have compromised the structure of the building (to those that are located next to the kitchen). Specific professionals have already been tasked for analysis considering the impact of their cutting and on the building, with the possibility of replacing them with medium or small trees.

One of the issues under discussion between management, coordination and teachers refers to the cafeteria of the unit. During meals the amount of children and adults causes a very hectic environment, with a lot of noise. It is in the process of adapting furniture (chairs), especially to Nursery School I children.

CECI Part-time operates next to *Gastrocentro* and has a major challenge in relation to accessibility, especially regarding the inclusion of children with physical disabilities and/or reduced mobility. There is no room for building an accessible restroom, neither for children nor for adults (which would also make it difficult to serve a parent or guardian with physical disabilities). Park furniture and toys are also not adapted for inclusion. Moreover, because it is a building that has already been awarded and does not have a foundation, it is not possible to carry out structural reforms. The color contrast between floor, wall and objects in several areas is subtle, hindering the mobility and orientation of the child with vision deficit, in addition to the lack of tactile floors throughout the space. Although no structural actions have been made, there are actions that have been carried out satisfactorily, such as: renovation of nursery and nursery school parks, with project to acquire rubberized floors; acquisition of sombrite (shading screen cover); implementation in partnership with CPROJ – FEC and Project architecture for preschool park renovation.

It is worth noting that, even considering the challenges presented, 6 children with special needs (Down Syndrome, Autism Spectrum Disorder, Kinsbourne Syndrome, Myelomeningocele) were included in this unit, within an inclusive proposal that respects and values differences and diversity.

PRODECAD consists of a set of 2 buildings that group the classrooms. These buildings are distributed on an uneven terrain, having no ramps and being interconnected by stairs that hinder the accessibility of some children. Although the project has already been carried out, the need for the park's renovation has been pointed out so the ramp and the court renovation can then be carried out. Similarly to the CECI Part-time preschool park, the PRODECAD park renovation project was carried out by CPROJ.

The main building has narrow corridors with uneven pavement, with exposed grates, hampering the circulation of wheelchair users. The paving of the pavements and sports court is irregular and with some holes. The lighting has been the object of attention and is in the process of improvement, since the unit operates until 07:30 pm. Moreover, for 2019, signage communication is expected to improve.

In summary, DEdIC's facilities are quite old, although adaptations have been carried out over the years, especially from 2013 in the building of CECI Full-time Nursery School and Preschool and in 2019 in CECI FOP.

The challenge of maintaining an effective and efficient routine in the maintenance of buildings, especially in the electrical and hydraulic part, furniture and equipment is constituted very much by the lack of professionals (in 2018 there were 2 retirements) and also by the excessive bureaucracy that permeates work processes.

Currently the work is focused on meeting demands for renovation of parks, toys and awnings. There were acquisitions of chairs for children and families; cafeteria table – FOP; sanding and painting of the chairs of the full-time nursery; planting in external green areas with by environmental professionals; stove replacement (3); acquisition of water fountains; microwave oven (one for experimental kitchen and one for full-time nursery cleaning staff); refrigerator for CECI part-time; rubber carpets for nurseries and nursery school I; poufs; purchase of fans; installation of security cameras; etc. in relation to building painting, the paints were acquired, and the painting was carried out by volunteers, combined with maintenance by professionals.

Pest control and cleaning protocol are properly carried out. The procedures with the fire department were carried out in 2017 and 2018 through the engineering/architecture team. This action, however, requires continuation as it is necessary to make the definitions for emergency situations and other procedures

In the nighttime, the reception and surveillance need to be in operation until the last employee leaves the unit and also the security of access in the units need to be improved. Electric lock has already been installed in the CECI Full-time Nursery School and Preschool, and proper implementation in the other units is expected.

### 2.1.11 Food consumption at DEdIC

Food consumption at DEdIC, although related to the Food Board, has specificities in the menu and preparation, because babies and children are the main subjects of this relation.

As of October 2019, DEdIC had a team of 3 nutritionists and from 2018 it began the retirement process. Two nutritionists have already retired, and one is on leave and has applied for retirement. Due to this conjuncture, we have an emergency contract and are in the process of hiring a temporary nutritionist – with a higher education degree.

The work of nutritionists involves: purchase, acquisition, preparation of menus, receipt; with technical guidance on the preparation, serving and presentation of the menu; etc. On another front, guidance was also provided to families and partnership was established with teachers in specific projects and actions.

TABLE 2.6 – NUMBER OF MEALS PROVIDED PER YEAR AT DEDIC

Year	2014	2015	2016	2017	2018
DEdIC	456,100	426,300	431,400	455,400	352,600

## 2.1.12 Budgetary and Extrabudgetary Resources

TABLE 2.7 – BUDGETARY AND EXTRABUDGETARY RESOURCES PER YEAR AT DEDIC  
DEDIC RESOURCES – LOCAL ACCOUNTS AND MONTHLY ADVANCE YEAR: 2016-2019

Ano	CO	CL	Qualification	Description	Value
2016/2017	01 Rectory	1310	Allocation	Monthly credits in the amount of R\$ 11,427.26	R\$ 137,127.12/year
		1311	Allocation	Monthly credits approx. of R\$ 2,705.00	R\$ 32,469.02/year
			Allocation	Monthly advance to meet the payment of minor and immediate-payment expenses for DEdIC, monthly credit of R\$ 7,000.00	R\$ 84,000.00/year
2018	DEdIC 4252 Budgetary Center	1310	Allocation	Monthly credits approx. in the value of R\$ 5.427,95	R\$ 89,132.63/year
		1311	Allocation	Monthly credits approx. R\$ 1.758,74	R\$ 21,104.86 /year
			Allocation	Monthly advance to meet the payment of minor and immediate-payment expenses for DEdIC, Monthly credit of R\$ 7,000.00	R\$ 84,000.00/year
2019	DEdIC 4252 Budgetary Center	1310	Allocation	Monthly credits approx. in the value of R\$ 5.427,95	R\$ 89,132.63 /year
		1311	Allocation	Monthly credits approx. R\$ 1.758,74	R\$ 21,104.86 /year
			Allocation	Monthly advance to meet the payment of minor and immediate-payment expenses for DEdIC, Monthly credit of R\$ 7,000.00	R\$ 84,000.00/year
			Allocation	Trainees/2019. Estimated amount to meet payment Of trainees and their financial support for transport of those assigned to co 4252 agencies – dedic, ref. To the 2019 financial year. Estimated value to meet the payment of trainees assigned to co 4252 agencies – dedic, ref. To the 2019 financial year.	R\$ 387,950.00/year

## 2.1.13 Strategic Planning and Institutional Evaluation Process

At the end of the previous management (2016/2017) the PLANES – DEdIC Strategic planning was carried out. In 2017, planning of management team and professional teams were carried out in each Unit with replanning and reassessment in mid-year. In addition to this planning, the School Council of the Division meets monthly to dialogue about the Political-Pedagogical Project, the plan and the experience. In the Units, a very important collegiate is the collective pedagogical meeting, at which time the practices are shared, the actions and conducts are reassessed, considering the conceptions of early childhood education in question.

In the period, working groups were set up on the following topics: sectoral human resources monitoring chambers; school board; progression; choice of classes; association of parents and teachers (under construction/analysis); DEdIC Action – GGBS; environment; among others.

It was pointed out by the team of professionals, especially coordination, the need to build an instrument for evaluating the pedagogical work of teachers, similar to what is done with the professors of institutes and colleges by student evaluation, in assembly and

by EA2. Building times, spaces, mechanisms and processes for dialogue and collective and democratic construction of the pedagogical project at/of DEdIC effectively committed to advances in the policy of early childhood education at/of Unicamp constitutes a challenge. This issue also appeared in the discussion about the PAEP Career Progression process.

## 2.2 Limeira Technical High School (COTIL)



Antoninho Perri/SEC – Unicamp.

The Limeira Technical High School of the State University of Campinas (COTIL) was created by State Law No. 7,655, of December 28, 1962, and authorized to be installed and to enter into operation by C.E.C. Resolution No. 46/66 and C.E.E. Resolution No. 12/70. The installation took place on April 24, 1967. Initially it was named as the Limeira Technical and Industrial School, having as its maintainer the State University of Campinas. It began operating in the facilities of the Trajano Camargo State Industrial School in Limeira and in 1973 moved to the new facilities on the current *campus* in Limeira. Providing general education and preparing for the exercise of specialized activities at secondary level, it initially provided programs on Machines and Engines, Buildings and Roads. The Nursing vocational program was created on September 17, 1974 and, on December 24, 1974, the name of the Machinery and Engines program was changed to Mechanics. In 1991, the Surveying vocational program was authorized, replacing the Roads program, beginning in 1992. In 1991, the Data Processing vocational program was also created, then it was renamed as Informatics in 2000. In 1994, the Quality and Productivity vocational program was created, the first in Latin America.

From 2005, adapting to Decree 5154/2004, CNE/CEB Opinion 39/2004, vocational programs concomitant with Secondary Education or subsequent started to be provided to those who have already completed Secondary Education or who are attending it (art. 1, art. 4th). From 2007, the nursing vocational program started to be provided, with duration of 2



years, for high school graduates or those who are attending it from 2nd grade. Currently, there is vocational training in Buildings, Nursing, Geodesy and Cartography, Informatics, Mechanics and Quality, whose graduates enter the labor market confidently. Secondary education is also provided, preparing students for the entrance exam, with the UNICAMP quality.

COTIL provides 600 vacancies annually, comprising modes with secondary education plus vocational program (for elementary school graduates) and only with vocational program (for those who attend or have already completed high school). Tables 1.8 and 1.9 show the COTIL programs and the distribution of their vacancies.

TABLE 2.8 – HIGH SCHOOL + VOCATIONAL PROGRAM

Program (Code)	Period	Vacancies	Duration (years)
Buildings (01)	daytime	40	3 + internship
Nursing* (02)	daytime	40	3 + internship
Geodesy and Cartography (03)	daytime	40	3 + internship
Informatics (04)	daytime	40	3 + internship
Mechanics (05)	daytime	40	3 + internship
Quality (06)	daytime	40	3 + internship
Informatics (14)	evening	40	3 + internship
Mechanics (15)	evening	40	4 + internship
Quality (16)	evening	40	3 + internship

Source: COTIL.

Note: \*Program 02 – Nursing: the internship will, necessarily, be concomitant.

TABLE 2.9 – VOCATIONAL PROGRAM

Program (Code)	Period	Vacancies	Duration (years)
Buildings VP (21)	evening	40	2 + internship
Nursing VP* (22)	afternoon	40	2 + internship*
Geodesy and Cartography VP (23)	evening	40	2 + internship
Informatics VP (24)	evening	40	2 + internship
Mechanics VP (25)	evening	40	2 + internship
Quality VP (26)	evening	40	2 + internship

Source: COTIL.

Note: \*Program 22 – Nursing VP: for those who are attending high school from 2nd grade in another period or have already completed it. In this program, internship will, mandatorily, be concomitant.

## 2.2.1 Entrant student profile per program

Collection of data on the student's socioeconomic profile is conducted by the Educational Guidance Service (SOE), using an internal questionnaire applied to all entrants, in the first days of class. The results indicate a huge diversity in profiles, such as students living on less than one minimum wage, parents with incomplete elementary education and children of professors with postdoctoral degrees, among other cases. In order to alleviate the financial problem of those most in need and keep them in high school, COTIL provides annual student support grants, which ensure the permanence of the most needy students



in the high school; side activities as a resource to recover lost content or address difficulties that arise during the semester, of utmost importance for creating an opportunity for the student to review the content and for leveling of knowledge among students in the initial grades; and making extra didactic materials available. Every year, we seek to improve the reception of new students, so they feel welcomed, safe and in a very high quality school. To that end, a parents' meeting is held at the beginning of the year to give the main guidelines that guide the school, bringing the family closer to the school and favoring a partnership in the students' educational process.

Table 2.10 lists the number of enrollees and the number of exemptions requested/granted in the Selection Exam, period from 2014 to 2018, by students from public schools. It is observed that within this period, in 2018, there was a decrease in the number of requests/grants of exemptions to needy students of the schools; although the number of enrolled candidates increased in the same year (2018). In Tables 2.11 to 2.25, this same list is presented in an particularized manner, by program provided by the School in this period.

TABLE 2.10 – NUMBER OF ENROLLED CANDIDATES AND NUMBER OF EXEMPTIONS IN THE SELECTION EXAM – GENERAL DATA

Year	Total	PAAIS	Exempt
2014	4529	–	619
2015	4343	–	570
2016	4375	–	680
2017	4462	–	607
2018	4588	–	503

Source: COTIL.

TABLE 2.11 – NUMBER OF ENROLLED CANDIDATES AND NUMBER OF EXEMPTIONS IN THE SELECTION EXAM – PROGRAM 01 – BUILDINGS DAYTIME

Year	Total	PAAIS	Exempt
2014	646	–	72
2015	600	–	61
2016	520	–	76
2017	491	–	64
2018	462	–	39

Source: COTIL.

TABLE 2.12 – NUMBER OF ENROLLED CANDIDATES AND NUMBER OF EXEMPTIONS IN THE SELECTION EXAM – PROGRAM 02 – NURSING DAYTIME

Year	Total	PAAIS	Exempt
2014	549	–	74
2015	584	–	94
2016	649	–	114
2017	817	–	111
2018	890	–	100

Source: COTIL.

TABLE 2.13 – NUMBER OF ENROLLED CANDIDATES AND NUMBER OF EXEMPTIONS IN THE SELECTION EXAM – PROGRAM 03 – GEODESY AND CARTOGRAPHY DAYTIME

Year	Total	PAAIS	Exempt
2014	196	–	24
2015	225	–	30
2016	214	–	42
2017	173	–	29
2018	253	–	31

Source: COTIL.

TABLE 2.14 – NUMBER OF ENROLLED CANDIDATES AND NUMBER OF EXEMPTIONS IN THE SELECTION EXAM – PROGRAM 04 – INFORMATICS DAYTIME

Year	Total	PAAIS	Exempt
2014	657	–	77
2015	636	–	57
2016	592	–	76
2017	606	–	83
2018	669	–	61

Source: COTIL.

TABLE 2.15 – NUMBER OF ENROLLED CANDIDATES AND NUMBER OF EXEMPTIONS IN THE SELECTION EXAM – PROGRAM 05 – MECHANICS DAYTIME

Year	Total	PAAIS	Exempt
2014	424	–	58
2015	443	–	40
2016	424	–	84
2017	424	–	49
2018	430	–	43

Source: COTIL.

TABLE 2.16 – NUMBER OF ENROLLED CANDIDATES AND NUMBER OF EXEMPTIONS IN THE SELECTION EXAM – PROGRAM 06 – QUALITY DAYTIME

Year	Total	PAAIS	Exempt
2014	429	–	83
2015	454	–	81
2016	469	–	93
2017	468	–	93
2018	507	–	77

Source: COTIL.

TABLE 2.17 – NUMBER OF ENROLLED CANDIDATES AND NUMBER OF EXEMPTIONS IN THE SELECTION EXAM – PROGRAM 14 – INFORMATICS NIGHTTIME

Year	Total	PAAIS	Exempt
2014	137	–	30
2015	131	–	35
2016	108	–	23
2017	91	–	21
2018	122	–	35

Source: COTIL.

TABLE 2.18 – NUMBER OF ENROLLED CANDIDATES AND NUMBER OF EXEMPTIONS IN THE SELECTION EXAM – PROGRAM 15 – MECHANICS NIGHTTIME

Year	Total	PAAIS	Exempt
2014	151	–	26
2015	123	–	36
2016	105	–	29
2017	101	–	29
2018	102	–	22

Source: COTIL.

TABLE 2.19 – NUMBER OF ENROLLED CANDIDATES AND NUMBER OF EXEMPTIONS IN THE SELECTION EXAM – PROGRAM 16 – QUALITY NIGHTTIME

Year	Total	PAAIS	Exempt
2014	149	–	31
2015	150	–	40
2016	148	–	36
2017	120	–	32
2018	113	–	31

Source: COTIL.

TABLE 2.20 – NUMBER OF ENROLLED CANDIDATES AND NUMBER OF EXEMPTIONS IN THE SELECTION EXAM – PROGRAM 21 – BUILDINGS VP

Year	Total	PAAIS	Exempt
2014	252	–	22
2015	207	–	19
2016	207	–	15
2017	156	–	15
2018	125	–	15

Source: COTIL.

TABLE 2.21 – NUMBER OF ENROLLED CANDIDATES AND NUMBER OF EXEMPTIONS IN THE SELECTION EXAM – PROGRAM 22 – NURSING VP

Year	Total	PAAIS	Exempt
2014	151	–	23
2015	140	–	8
2016	216	–	24
2017	270	–	24
2018	278	–	25

Source: COTIL.

TABLE 2.22 – NUMBER OF ENROLLED CANDIDATES AND NUMBER OF EXEMPTIONS IN THE SELECTION EXAM – PROGRAM 23 – GEODESY AND CARTOGRAPHY VP

Year	Total	PAAIS	Exempt
2014	58	–	7
2015	75	–	13
2016	52	–	3
2017	32	–	1
2018	39	–	2

Source: COTIL.

TABLE 2.23 – NUMBER OF ENROLLED CANDIDATES AND NUMBER OF EXEMPTIONS IN THE SELECTION EXAM – PROGRAM 24 – INFORMATICS VP

Year	Total	PAAIS	Exempt
2014	157	–	24
2015	139	–	12
2016	130	–	20
2017	168	–	23
2018	129	–	9

Source: COTIL.

TABLE 2.24 – NUMBER OF ENROLLED CANDIDATES AND NUMBER OF EXEMPTIONS IN THE SELECTION EXAM – PROGRAM 25 – MECHANICS VP

Year	Total	PAAIS	Exempt
2014	178	–	30
2015	143	–	15
2016	177	–	10
2017	163	–	19
2018	116	–	10

Source: COTIL.

TABLE 2.25 – NUMBER OF ENROLLED CANDIDATES AND NUMBER OF EXEMPTIONS IN THE SELECTION EXAM – PROGRAM 26 – QUALITY VP

Year	Total	PAAIS	Exempt
2014	236	–	37
2015	144	–	26
2016	200	–	30
2017	215	–	27
2018	154	–	14

Source: COTIL.

Table 2.26 presents the type of previous school of students entering High School in the period from 2014 to 2018. It is observed that from 2014 to 2016 the number of new students coming from public school was higher than 60%, and that in the last two years (2017 and 2018) there was a reduction in this percentage, while there was an increase in the number of new students coming from private schools and others (SESI, Romi Foundation, Bradesco Foundation, among others). In Tables 2.27 to 2.41, this same list is presented in an particularized manner, by program provided by the School in this period.

TABLE 2.26 – TYPE OF PREVIOUS SCHOOL OF ENTRANT STUDENTS – GENERAL DATA

Year	Public	Private	Other
2014	62.3%	34.2%	3.6%
2015	64.5%	33.3%	2.2%
2016	61.5%	36.8%	1.7%
2017	58%	40%	2%
2018	56%	37%	7%

Source: COTIL.

TABLE 2.27 – NUMBER OF ENROLLED CANDIDATES AND NUMBER OF EXEMPTIONS IN THE SELECTION EXAM – PROGRAM 01 – BUILDINGS DAYTIME

Year	Public	Private	Other
2014	32.5%	65.0%	2.5%
2015	37.5%	62.5%	0.0%
2016	30.0%	67.5%	2.5%
2017	39.5%	60.5%	0.0%
2018	22.5%	72.5%	5.0%

Source: COTIL.

TABLE 2.28 – TYPE OF PREVIOUS SCHOOL OF ENTRANT STUDENTS – PROGRAM 02 – NURSING DAYTIME

Year	Public	Private	Other
2014	40.5%	51.4%	8.1%
2015	35.0%	65.0%	0.0%
2016	30.8%	61.5%	7.7%
2017	92.1%	7.9%	0.0%
2018	30.0%	55.0%	15.0%

Source: COTIL.

TABLE 2.30 – TYPE OF PREVIOUS SCHOOL OF ENTRANT STUDENTS – PROGRAM 04 – INFORMATICS DAYTIME

Year	Public	Private	Other
2014	25.0%	70.0%	5.0%
2015	30.0%	57.5%	12.5%
2016	32.5%	65.0%	2.5%
2017	29.7%	67.6%	2.7%
2018	25.6%	71.8%	2.6%

Source: COTIL.

TABLE 2.32 – TYPE OF PREVIOUS SCHOOL OF ENTRANT STUDENTS – PROGRAM 06 – QUALITY DAYTIME

Year	Public	Private	Other
2014	40.0%	60.0%	0.0%
2015	50.0%	50.0%	0.0%
2016	35.0%	65.0%	0.0%
2017	36.8%	57.9%	5.3%
2018	17.5%	70.0%	12.5%

Source: COTIL.

TABLE 2.34 – TYPE OF PREVIOUS SCHOOL OF ENTRANT STUDENTS – PROGRAM 15 – MECHANICS NIGHTTIME

Year	Public	Private	Other
2014	72.5%	17.5%	10.0%
2015	73.0%	24.3%	2.7%
2016	70.0%	30.0%	0.0%
2017	62.5%	32.5%	5.0%
2018	63.2%	26.3%	10.5%

Source: COTIL.

TABLE 2.29 – TYPE OF PREVIOUS SCHOOL OF ENTRANT STUDENTS – PROGRAM 03 – GEODESY AND CARTOGRAPHY DAYTIME

Year	Public	Private	Other
2014	47.5%	50.0%	2.5%
2015	42.5%	57.5%	0.0%
2016	50.0%	47.5%	2.5%
2017	43.2%	54.1%	2.7%
2018	35.0%	60.0%	5.0%

Source: COTIL.

TABLE 2.31 – TYPE OF PREVIOUS SCHOOL OF ENTRANT STUDENTS – PROGRAM 05 – MECHANICS DAYTIME

Year	Public	Private	Other
2014	30.8%	56.4%	12.8%
2015	37.5%	62.5%	0.0%
2016	30.0%	67.5%	2.5%
2017	18.4%	81.6%	0.0%
2018	23.1%	61.5%	15.4%

Source: COTIL.

TABLE 2.33 – TYPE OF PREVIOUS SCHOOL OF ENTRANT STUDENTS – PROGRAM 14 – INFORMATICS NIGHTTIME

Year	Public	Private	Other
2014	64.1%	30.8%	5.1%
2015	75.7%	16.2%	8.1%
2016	56.8%	35.1%	8.1%
2017	57.9%	42.1%	0.0%
2018	51.4%	48.6%	0.0%

Source: COTIL.

TABLE 2.35 – TYPE OF PREVIOUS SCHOOL OF ENTRANT STUDENTS – PROGRAM 16 – QUALITY NIGHTTIME

Year	Public	Private	Other
2014	83.0%	14.6%	2.4%
2015	72.5%	27.5%	0.0%
2016	70.0%	30.0%	0.0%
2017	55.6%	38.8%	5.6%
2018	78.9%	13.2%	7.9%

Source: COTIL.

TABLE 2.36 – TYPE OF PREVIOUS SCHOOL OF ENTRANT STUDENTS – PROGRAM 21 – BUILDINGS VP

Year	Public	Private	Other
2014	86.8%	13.2%	0.0%
2015	85.0%	12.5%	2.5%
2016	75.0%	25.0%	0.0%
2017	80.0%	20.0%	0.0%
2018	95.0%	2.5%	2.5%

Source: COTIL.

TABLE 2.38 – TYPE OF PREVIOUS SCHOOL OF ENTRANT STUDENTS – PROGRAM 23 – GEODESY AND CARTOGRAPHY VP

Year	Public	Private	Other
2014	79.5%	20.5%	0.0%
2015	77.5%	20.0%	2.5%
2016	91.2%	8.8%	0.0%
2017	80.0%	20.0%	0.0%
2018	85.7%	10.7%	3.6%

Source: COTIL.

TABLE 2.40 – TYPE OF PREVIOUS SCHOOL OF ENTRANT STUDENTS – PROGRAM 25 – MECHANICS VP

Year	Public	Private	Other
2014	79.5%	20.5%	0.0%
2015	92.5%	7.5%	0.0%
2016	90.2%	9.8%	0.0%
2017	84.6%	12.8%	2.6%
2018	87.2%	7.7%	5.1%

Source: COTIL.

TABLE 2.37 – TYPE OF PREVIOUS SCHOOL OF ENTRANT STUDENTS – PROGRAM 22 – NURSING VP

Year	Public	Private	Other
2014	82.1%	17.9%	0.0%
2015	80.0%	17.5%	2.5%
2016	89.7%	10.3%	0.0%
2017	80.5%	14.6%	4.9%
2018	72.5%	12.5%	15.0%

Source: COTIL.

TABLE 2.39 – TYPE OF PREVIOUS SCHOOL OF ENTRANT STUDENTS – PROGRAM 24 – INFORMATICS VP

Year	Public	Private	Other
2014	82.5%	15.0%	2.5%
2015	87.5%	10.0%	2.5%
2016	91.9%	8.1%	0.0%
2017	81.6%	18.4%	0.0%
2018	70.0%	22.5%	7.5%

Source: COTIL.

TABLE 2.41 – TYPE OF PREVIOUS SCHOOL OF ENTRANT STUDENTS – PROGRAM 26 – QUALITY VP

Year	Public	Private	Other
2014	87.5%	10.0%	2.5%
2015	92.5%	7.5%	0.0%
2016	85.0%	15.0%	0.0%
2017	90.2%	9.8%	0.0%
2018	90.2%	9.8%	0.0%

Source: COTIL.

Table 2.42 presents the percentage of students entering the School in the period from 2014 to 2018 who attended preparatory courses for the Selection Exam. There was a decrease in the number of entrant students, in 2018, who attended preparatory courses for the Selection Exam. In Tables 2.43 to 2.57, this same list is presented in an particularized manner, by program provided by the School in this period.

TABLE 2.42 – PERCENTAGE OF ENTRANTS WHO ATTENDED PREPARATORY COURSE – GENERAL DATA

Year	No	Yes
2014	74.8%	25.2%
2015	77.4%	22.6%
2016	73.3%	26.7%
2017	75%	25%
2018	78%	22%

Source: COTIL.

TABLE 2.43 – PERCENTAGE OF ENTRANTS WHO ATTENDED PREPARATORY COURSE – PROGRAM 01 – BUILDINGS DAYTIME

Year	No	Yes
2014	45.0%	55.0%
2015	55.0%	45.0%
2016	47.5%	52.5%
2017	44.7%	55.3%
2018	65.0%	35.0%

Source: COTIL.

**TABLE 2.44 – PERCENTAGE OF ENTRANTS WHO ATTENDED PREPARATORY COURSE – PROGRAM 02 – NURSING DAYTIME**

Year	No	Yes
2014	62.2%	37.8%
2015	50.0%	50.0%
2016	51.3%	48.7%
2017	42.1%	57.9%
2018	52.5%	47.5%

Source: COTIL.

**TABLE 2.45 – PERCENTAGE OF ENTRANTS WHO ATTENDED PREPARATORY COURSE – PROGRAM 03 – GEODESY AND CARTOGRAPHY DAYTIME**

Year	No	Yes
2014	70.0%	30.0%
2015	75.0%	25.0%
2016	47.5%	52.5%
2017	62.2%	37.8%
2018	70.0%	30.0%

Source: COTIL.

**TABLE 2.46 – PERCENTAGE OF ENTRANTS WHO ATTENDED PREPARATORY COURSE – PROGRAM 04 – INFORMATICS DAYTIME**

Year	No	Yes
2014	37.5%	62.5%
2015	45.0%	55.0%
2016	52.5%	47.5%
2017	51.4%	48.6%
2018	53.8%	46.2%

Source: COTIL.

**TABLE 2.47 – PERCENTAGE OF ENTRANTS WHO ATTENDED PREPARATORY COURSE – PROGRAM 05 – MECHANICS DAYTIME**

Year	No	Yes
2014	59.0%	41.0%
2015	72.5%	27.5%
2016	52.5%	47.5%
2017	63.2%	36.8%
2018	59.0%	41.0%

Source: COTIL.

**TABLE 2.48 – PERCENTAGE OF ENTRANTS WHO ATTENDED PREPARATORY COURSE – PROGRAM 06 – QUALITY DAYTIME**

Year	No	Yes
2014	67.5%	32.5%
2015	67.5%	32.5%
2016	62.5%	37.5%
2017	57.9%	42.1%
2018	65.0%	35.0%

Source: COTIL.

**TABLE 2.49 – PERCENTAGE OF ENTRANTS WHO ATTENDED PREPARATORY COURSE – PROGRAM 14 – INFORMATICS NIGHTTIME**

Year	No	Yes
2014	74.4%	25.6%
2015	83.8%	16.2%
2016	75.7%	24.3%
2017	84.2%	15.8%
2018	86.5%	13.5%

Source: COTIL.

**TABLE 2.50 – PERCENTAGE OF ENTRANTS WHO ATTENDED PREPARATORY COURSE – PROGRAM 15 – MECHANICS NIGHTTIME**

Year	No	Yes
2014	87.5%	12.5%
2015	83.8%	16.2%
2016	72.5%	27.5%
2017	80.0%	20.0%
2018	71.1%	28.9%

Source: COTIL.

**TABLE 2.51 – PERCENTAGE OF ENTRANTS WHO ATTENDED PREPARATORY COURSE – PROGRAM 16 – QUALITY NIGHTTIME**

Year	No	Yes
2014	68.3%	31.7%
2015	90.0%	10.0%
2016	80.0%	20.0%
2017	75.0%	25.0%
2018	92.1%	7.9%

Source: COTIL.



**TABLE 2.52 – PERCENTAGE OF ENTRANTS WHO ATTENDED PREPARATORY COURSE – PROGRAM 21 – BUILDINGS VP**

Year	No	Yes
2014	86.8%	13.2%
2015	82.5%	17.5%
2016	90.0%	10.0%
2017	95.0%	5.0%
2018	97.5%	2.5%

Source: COTIL.

**TABLE 2.53 – PERCENTAGE OF ENTRANTS WHO ATTENDED PREPARATORY COURSE – PROGRAM 22 – NURSING VP**

Year	No	Yes
2014	97.4%	2.6%
2015	97.5%	2.5%
2016	97.4%	2.6%
2017	90.2%	9.8%
2018	97.5%	2.5%

Source: COTIL.

**TABLE 2.54 – PERCENTAGE OF ENTRANTS WHO ATTENDED PREPARATORY COURSE – PROGRAM 23 – GEODESY AND CARTOGRAPHY VP**

Year	No	Yes
2014	89.7%	10.3%
2015	95.0%	5.0%
2016	91.2%	8.8%
2017	100.0%	0.0%
2018	89.3%	10.7%

Source: COTIL.

**TABLE 2.55 – PERCENTAGE OF ENTRANTS WHO ATTENDED PREPARATORY COURSE – PROGRAM 24 – INFORMATICS VP**

Year	No	Yes
2014	92.5%	7.5%
2015	80.0%	20.0%
2016	89.2%	10.8%
2017	97.4%	2.6%
2018	92.5%	7.5%

Source: COTIL.

**TABLE 2.56 – PERCENTAGE OF ENTRANTS WHO ATTENDED PREPARATORY COURSE – PROGRAM 25 – MECHANICS VP**

Year	No	Yes
2014	94.9%	5.1%
2015	95.0%	5.0%
2016	95.1%	4.9%
2017	97.4%	2.6%
2018	92.3%	7.7%

Source: COTIL.

**TABLE 2.57 – PERCENTAGE OF ENTRANTS WHO ATTENDED PREPARATORY COURSE – PROGRAM 26 – QUALITY VP**

Year	No	Yes
2014	90.0%	10.0%
2015	90.0%	10.0%
2016	97.5%	2.5%
2017	92.7%	7.3%
2018	90.2%	9.8%

Source: COTIL.

Table 2.58 presents the reason for choosing a vocational program of students entering the School in the period from 2014 to 2018. It is observed that the great interest in the education provided by the School is, firstly, due to the vocational training and, secondly, to the introduction into the labor market.

TABLE 2.58 – REASON FOR CHOOSING A VOCATIONAL PROGRAM AMONG ENTRANTS – GENERAL DATA

Educational level	2014	2015	2016	2017	2018
Professional training	60.2%	63.3%	63.0%	60%	60%
Requalification training	1.9%	3.7%	1.0%	2%	2%
Aptitude	13.2%	12.6%	13.6%	16%	14%
Market	21.0%	17.2%	18.6%	18%	18%
Vocational Training	0.0%	0.7%	0.5%	1%	1%
Influence	3.7%	2.5%	3.2%	5%	5%

Source: COTIL.

Table 2.59 presents the educational level of the mothers of students entering the School, in the period from 2014 to 2018. It is observed that, in this period, the highlighted educational level is Complete Secondary Education, followed by Complete Tertiary Education.

TABLE 2.59 – EDUCATIONAL LEVEL OF THE MOTHERS OF ENTRANT STUDENTS – GENERAL DATA

Educational level	2014	2015	2016	2017	2018
No education	1.4%	1.7%	1.2%	2%	1%
Incomplete primary educ.	16.2%	16.2%	14.8%	11%	10%
Complete primary educ.	5.9%	6.6%	7.5%	7%	6%
Incomplete secondary educ.	5.6%	6.1%	6.3%	4%	6%
Complete secondary educ.	38.6%	36.9%	39.4%	40%	42%
Complete tertiary educ.	32.3%	32.7%	30.8%	36%	34%

Source: COTIL.

## 2.2.2 Pedagogical Project of the Programs

The School does not have a political-pedagogical project for each program, prepared with the participation of teachers. It has a single pedagogical project (Management Plan) that, every year, undergoes a revision focusing on the plans and syllabi of each course. Updates are made when necessary based on demands of the labor market of the Limeira macro-region and on external evaluations, such as the school's ranking in the Enem – National Secondary Education Exam and on the contents of the National Entrance Exams.

Based on the National Catalogue of Vocational Programs, it can be said that the curricular structure of the programs goes beyond the relevant curriculum guidelines, because it has a higher workload than required and considers the student's training in a comprehensive manner. Therefore, no complementary activities are included. The teacher inserts and develops activities and content in an interdisciplinary and extracurricular manner. Thus, students are encouraged to proactivity and protagonism in their academic life. In the school, there are activities such as: interprogram games, semi-annual simulated exams, simulated ENEM exams (SimEnem) and entrance exams (SimVest), UPA (*UNICAMP de Portas Abertas*), COPA (*COTIL de Portas Abertas*), Fair of Professions, lectures, technical visits to companies and fairs to supplement the theoretical part, vaccination campaigns, Knowledge Olympiads and *COTIL ARTE*. These activities provide the students with the

education and training necessary for the development of their potential and skills as an element of self-fulfillment, preparation for work and conscious exercise of citizenship.

### 2.2.3 Programs flow: dropout and completion rate

From 2014 to 2018, 90% of students in the daytime period graduated from secondary education in three years, while in the nighttime period this percentage was 93%. However, detailed data analysis shows that the completion rates in the vocational program, both in the daytime and nighttime, are low due to the lack of completion of the internship. This may be explained by the entry into higher education and dropout from the vocational program, but also because the school regulations allow obtaining the high school diploma even without completing the internship, since students have two enrollments (one for high school and another for the vocational program).

Table 2.60 presents general figures for enrolled students, dropouts and the number of graduates, each year, in the period from 2014 to 2018. Dropout rates in daytime period is lower compared with the nighttime, as shown in Tables 2.61 to 2.75. It is sought, whenever possible, with the help of financial resources from the Association of Parents and Teachers (A.P.M), to keep the student in the program. Often, dropouts occur due to family, mental health and financial problems, and sometimes it is not possible to intervene. Regarding dropout students in nighttime period, this occurs mainly due to socioeconomic reasons: the financial contribution of the nighttime student is fundamental to the family, and this student often must work overtime or undergo change of work shift in the companies; thus, studying ends up not being a priority at that time. COTIL strongly encourages its students to persist and insists on the importance of a vocational diploma for professional career. When the dropout is formalized, it is registered in the Academic Board. It is noteworthy that the vocational program student only has his or her training certified after completing the required internship. Students who have not yet completed this stage of training are not considered dropouts, as the time limit for completing the mandatory internship is not regulated in the School Rules of The School.

The number of failures in courses in the school is little significant. Content re-study is conducted continuously and concomitantly, making use of monitors' work and half-yearly and annual retakes as a last resort at the end of the cycle. Students are evaluated so the results help teachers to address specific problems regarding learning difficulties.

TABLE 2.60 – NUMBER OF ENROLLEES, DROPOUTS AND GRADUATES – GENERAL DATA

Year	Enrollees	Dropouts	Graduates
2014	987	69	181
2015	954	61	116
2016	984	88	133
2017	921	64	83
2018	951	17	106

Source: COTIL.

TABLE 2.61 – NUMBER OF ENROLLEES, DROPOUTS AND GRADUATES – PROGRAM 01 – BUILDINGS DAYTIME

Year	Enrollees	Dropouts	Graduates
2014	115	4	27
2015	113	5	20
2016	113	4	16
2017	110	10	18
2018	110	1	13

Source: COTIL.

TABLE 2.62 – NUMBER OF ENROLLEES,  
DROPOUTS AND GRADUATES –  
PROGRAM 02 – NURSING DAYTIME

Year	Enrollees	Dropouts	Graduates
2014	100	9	34
2015	95	6	23
2016	105	8	30
2017	100	12	21
2018	107	2	33

Source: COTIL.

TABLE 2.63 – NUMBER OF ENROLLEES,  
DROPOUTS AND GRADUATES –  
PROGRAM 03 – GEODESY AND  
CARTOGRAPHY DAYTIME

Year	Enrollees	Dropouts	Graduates
2014	98	7	14
2015	98	7	11
2016	110	13	11
2017	93	8	3
2018	107	0	6

Source: COTIL.

TABLE 2.64 – NUMBER OF ENROLLEES,  
DROPOUTS AND GRADUATES –  
PROGRAM 04 – INFORMATICS DAYTIME

Year	Enrollees	Dropouts	Graduates
2014	107	3	13
2015	109	2	4
2016	111	8	19
2017	102	4	10
2018	108	1	14

Source: COTIL.

TABLE 2.65 – NUMBER OF ENROLLEES,  
DROPOUTS AND GRADUATES –  
PROGRAM 05 – MECHANICS DAYTIME

Year	Enrollees	Dropouts	Graduates
2014	108	2	25
2015	110	6	9
2016	114	9	10
2017	108	3	8
2018	105	4	5

Source: COTIL.

TABLE 2.66 – NUMBER OF ENROLLEES,  
DROPOUTS AND GRADUATES –  
PROGRAM 06 – QUALITY DAYTIME

Year	Enrollees	Dropouts	Graduates
2014	117	5	17
2015	108	4	19
2016	115	9	15
2017	107	6	6
2018	106	2	12

Source: COTIL.

TABLE 2.67 – NUMBER OF ENROLLEES,  
DROPOUTS AND GRADUATES –  
PROGRAM 14 – INFORMATICS NIGHTTIME

Year	Enrollees	Dropouts	Graduates
2014	94	15	14
2015	85	3	5
2016	90	7	12
2017	95	6	4
2018	103	3	7

Source: COTIL.

TABLE 2.68 – NUMBER OF ENROLLEES,  
DROPOUTS AND GRADUATES –  
PROGRAM 15 – MECHANICS NIGHTTIME

Year	Enrollees	Dropouts	Graduates
2014	134	16	23
2015	128	17	14
2016	123	21	5
2017	113	11	7
2018	105	3	7

Source: COTIL.

TABLE 2.69 – NUMBER OF ENROLLEES,  
DROPOUTS AND GRADUATES –  
PROGRAM 16 – QUALITY NIGHTTIME

Year	Enrollees	Dropouts	Graduates
2014	114	8	14
2015	108	10	11
2016	103	9	15
2017	93	4	6
2018	100	1	9

Source: COTIL.

TABLE 2.70 – NUMBER OF ENROLLEES,  
DROPOUTS AND GRADUATES –  
PROGRAM 21 – BUILDINGS VP

Year	Enrollees	Dropouts	Graduates
2014	71	10	19
2015	70	6	23
2016	72	15	8
2017	70	11	15
2018	66	5	15

Source: COTIL.

TABLE 2.71 – NUMBER OF ENROLLEES,  
DROPOUTS AND GRADUATES –  
PROGRAM 22 – NURSING VP

Year	Enrollees	Dropouts	Graduates
2014	66	9	23
2015	73	8	31
2016	72	8	27
2017	77	7	35
2018	72	1	32

Source: COTIL.

TABLE 2.72 – NUMBER OF ENROLLEES,  
DROPOUTS AND GRADUATES – PROGRAM  
23 – GEODESY AND CARTOGRAPHY VP

Year	Enrollees	Dropouts	Graduates
2014	61	13	17
2015	61	6	15
2016	63	15	8
2017	40	7	6
2018	40	9	14

Source: COTIL.

TABLE 2.73 – NUMBER OF ENROLLEES,  
DROPOUTS AND GRADUATES –  
PROGRAM 24 – INFORMATICS VP

Year	Enrollees	Dropouts	Graduates
2014	66	13	3
2015	67	9	10
2016	65	4	7
2017	67	16	6
2018	66	7	3

Source: COTIL.

TABLE 2.74 – NUMBER OF ENROLLEES,  
DROPOUTS AND GRADUATES –  
PROGRAM 25 – MECHANICS VP

Year	Enrollees	Dropouts	Graduates
2014	72	10	19
2015	68	8	12
2016	71	13	18
2017	66	5	8
2018	73	8	8

Source: COTIL.

TABLE 2.75 – NUMBER OF ENROLLEES,  
DROPOUTS AND GRADUATES –  
PROGRAM 26 – QUALITY VP

Year	Enrollees	Dropouts	Graduates
2014	70	8	11
2015	68	0	10
2016	73	1	14
2017	83	13	4
2018	72	12	2

Source: COTIL.

The support scholarships granted by the University to underprivileged students are fundamental to enable permanence. Socioeconomic data of students entering between 2014 and 2018 showed that the highest percentage of these students have family income of 1 to 3 minimum wages. However, the number of scholarships provided by COTIL/UNICAMP (presented in Table 2.76) is low, since the school receives a very large number of low family income youth who register in the processes to obtain these scholarships. There are reports of students missing classes because they have no money to pay for transportation and others who cannot eat properly, which makes it difficult to remain motivated for learning.

TABLE 2.76 – NUMBER OF SUPPORT SCHOLARSHIPS – GENERAL DATA

Year	Number of Students			Total
	Social Support Scholarship	Transportation Scholarship	Food Scholarship	
2009	18	34	50	102
2010	18	34	50	102
2011	18	34	50	102
2012	18	34	50	102
2013	18	34	50	102
2014	18	34	50	102
2015	18	34	50	102
2016	18	34	50	102
2017	18	34	50	102
2018	18	34	50	102

Source: COTIL.

## 2.2.4 Mechanisms for discussion and application of the results of the teaching-learning process evaluation

In COTIL there is no systematized internal evaluation for courses or programs. There are analyses of results obtained in the Class Council and in external evaluations that students regularly undergo, such as entrance exams, Scientific Olympics, ENEM (Table 2.77). In the case of Vocational Programs, mandatory internship is used as a means of obtaining feedback as to the students' performance in the labor market, since reports are presented quarterly and analyzed and approved at the end of the internship by the teacher responsible for the program (Head of Department). In both cases (Secondary School and Vocational Program), the results enable studying the possible changes that each course requires. New technologies, despite being always welcome, need to be further explored by the faculty. Many of them still have great difficulty and resistance as to using them.

TABLE 2.77 – ENEM PERFORMANCE OF PARTICIPANTS FROM THE SCHOOL ACCORDING TO MEAN SCORES

Year	Humanities	Nature Sciences	Languages and Codes	Math	Writing
2014	625.7	583.7	584.8	654	645.3
2015	638	573.9	590.3	669.7	662
2016	623.5	579.9	599.3	657.3	690.8
2017	610.8	590.4	587.4	671.6	668

Source: COTIL.



## 2.2.5 Extracurricular Projects and Activities



Antonio Scarpinetti/SEC – Unicamp.

During the period from 2014 to 2018, the students participated with presentation of work in the UNICAMP Undergraduate Research Congress, in the IV Show of Technical Works of Cotuca and in the Econoteen (Contest of Essays in the area of Economics, promoted by FEA/USP). Such events enrich and update the students' knowledge, enable greater future professional qualification and promote the development of new ideas for other works. The students were also encouraged to participate in school games and in the COTIL Arte event, activities that have highlighted the name of the school and the work with pedagogical commitment to the education of full-fledged citizens considering their diversity and in order to value not only cognitive and technical skills and competencies, but to foster skills and expressions that surpass the cognitive aspect and impact the training of a complete professional. In the second half of each year, the "Science Show" is held, which is a preview of experiments to be presented at COPA – *COTIL de Portas Abertas*, an opportunity in which the school is presented to the whole community and students have the opportunity to exercise public oral presentation and practice teaching primary school students, parents, teachers and pedagogical coordinators.

Students participate in projects such as Science Show, Workshops on Physics, Chemistry, Mathematics, Cultural Lunches, Soirées, Workshops on Writing, Literature, Arts, technical and cultural visits, etc., in which they can develop skills, stimulate curiosity, prepare scientific experiments, live a very different social experience from their daily lives with students from other classrooms, from other programs or periods, in order to promote dynamism, entrepreneurship and more empathy among students. The Scientific Olympiads are held by students of all grades, for the pleasure of participation, in search of good results, and more recently for the possibility of entering universities.

COTIL students, in order to obtain the Vocational Program completion certificate, must fulfill the minimum workload of the mandatory internship conducted outside the

school. The exception is the Nursing program, whose supervised internship is conducted concomitantly with the program, according to Tables 2.78 and 2.79.

Regarding the validation of activities carried out in other institutions, the subject is still under discussed and is always re-included on the agenda in departmental meetings, without conclusion or closure of the subject so far.

TABLE 2.78 – NUMBER OF SUPERVISED  
INTERNSHIPS – PROGRAM 02 –  
NURSING DAYTIME

Ano	No. Internships
2014	91
2015	89
2016	97
2017	88
2018	105

Source: COTIL.

TABLE 2.79 – NUMBER OF SUPERVISED  
INTERNSHIPS – PROGRAM 22 –  
NURSING VP

Ano	No. Internships
2014	57
2015	65
2016	64
2017	70
2018	71

Source: COTIL.

The conduct of extracurricular projects and programs requires physical spaces at time slots that are often not available. The curricular schedule is extensive, and the rooms are always busy with regular classes. Thus, there is great difficulty because of the lack of rooms for specific purposes, such as monitoring, coexistence, study room, practical arts classes, among others, in addition to computer laboratories that are insufficient. The auditorium is small, with capacity for only 120 people. This implies resorting to spaces outside the School for events with many attendees, for example, parents' meeting, lectures and courses for students and teachers, etc. Currently, there is only one living room for monitors, the open area of the canteen and few tables and concrete benches for the accommodation of students in intervals and free periods. This last space is shared with the School of Technology, as well as with the Library, also used by students from both Units.

## 2.2.6 Access to Higher Education and Employability

There was no effective monitoring of the performance of graduates, both at the entrance to higher education and in the labor market. The School has a form made available on the institutional website for graduate students to complete their achievements in the entrance exams and admission to higher education and sends an e-mail annually to the graduates for them to fill out this information. However, there was no tabulation of the completed data nor the guarantee that everyone filled it. As for insertion in the labor market, except for evaluation of the compulsory professional internship report, there were no records.

The lack of political-pedagogical project for each program, prepared with participation of teachers, and the teachers' difficulty to access the management plan that deals with the structure of the programs provided by the School prevent an analysis of their contemporaneity, as already mentioned in item 1.2.2.

### 2.2.7 Internationalization

There was representation of the School on missions abroad. Students, teachers and staff participated in the processes published by DERI (formerly VRERI) to conduct technical visits to foreign universities, vocational upper secondary schools and organizations. In 2014, an employee went to the University of Porto in Portugal; in 2015, eight students and two teachers conducted technical visits to the university and secondary school in Madrid, Spain; in 2016, six students, one teacher and one employee conducted technical visits to universities and companies in the Salt Lake City region, in the United States; and, in 2017, one employee went to the Pontifical Catholic University of Chile. In addition, some students participated in exchanges on their own.

### 2.2.8 Outreach activities

The outreach programs that were provided in the period (CTL-0500 – Personnel Management and CTL-0100 – Quality Systems) were relevant and had excellent outreach in the external community, as they brought together students and professionals from Limeira and the entire region. The courses were taught by teachers of the COTIL teaching staff and by invited teachers, adding diverse experiences to the classroom. The programs met the expectations and demands of society (Table 2.80).

TABLE 2.80 – OUTREACH PROGRAMS AND COURSES

Year	Programs	Multi-program courses
2014	1	10
2015	2	24
2016	0	0
2017	0	0
2018	0	0

Source: PROEC/EXTECAMP.

The integration of outreach programs, projects, courses and events with teaching activities greatly contributed to the students' ethical and humanistic education, enhancing contact with the labor market and the social demands of the community. In addition, they added content and experiences to the curriculum of the programs provided by the School. Some programs and actions were developed entirely by the students, under the supervision of teachers.

The students were awarded medals or honorable mentions in all editions that they participated in the Brazilian Public Schools Math Olympiad (OBMEP), the Brazilian Public Schools Physics Olympiad (OBFEF), OBFEF Illustration Contests, Brazilian Astronomy and Astronautics Olympiad (OBA), Math Kangaroo, Brazilian Informatics Olympiad (OBI), Portuguese Language Olympiad, Brazilian Robotics Olympiad (OBR), and Gazeta Literature Award. The students were also medalists in the editions of the Municipal School Games and the School Games of the State of São Paulo (JEESP). The Fumagalli Trophy awarded

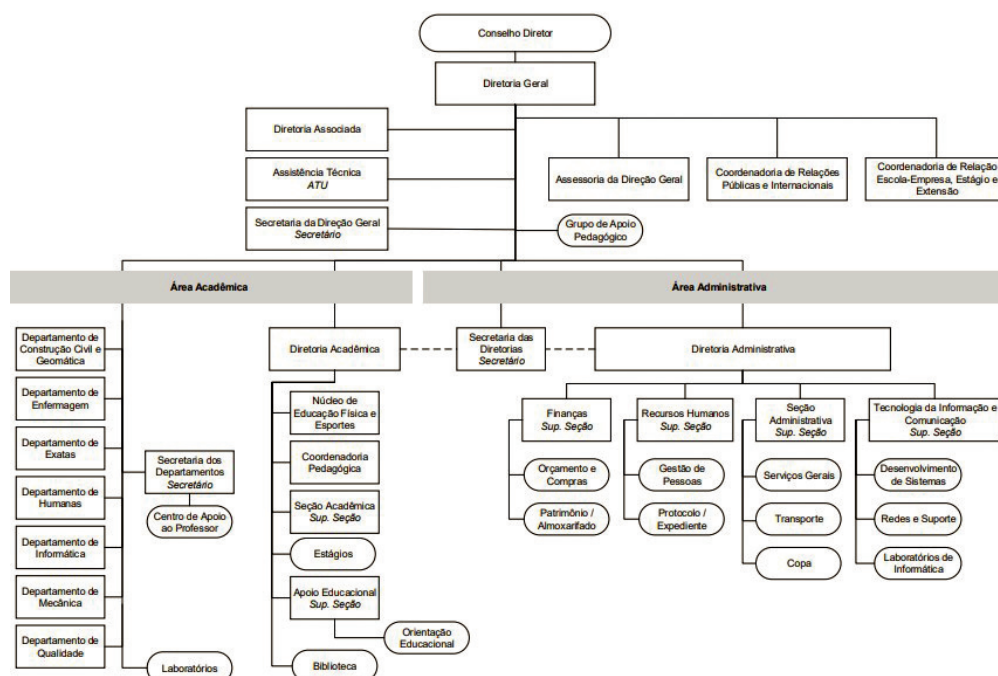
students from the school in the 2015 and 2016 editions. In 2017, COTIL received the “Regional Expression” award and the Applause Motion from Limeira’s City Council, both for the celebration of the 50th anniversary of the foundation of the School. In 2014, the School received the “*Sapientiae de Excelência Educativa y Diploma de Honor en Gestión de Calidad Educativa*”, from the Organización de las Americas para la Excelência Educativa (ODAEE).

Outreach activities (projects, programs, courses, events) fulfilled the role of leading the School to interdisciplinary, educational, cultural, scientific and political activities, promoting the interaction and transformation of all agents involved and, thus developing their essence towards society. COTIL’s participation in these activities was an important point of connection with the local and regional community and enabled the education of professionals and citizens that are aware of their social role and committed to building a better world. In the activities carried out, a closer relationship was established with the other public spheres and also with other private entities.

## 2.2.9 Organizational Structure

The organizational structure of the Limeira Technical High School – COTIL (Figure 2.1) had its certification approved in 2016 and was implemented in 2018. It is an adequate structure, which allows the planning, development and coordination of the teaching-learning process; however, due to insufficient staff and limited financial resources for new hires, the implementation has not yet been fully accomplished. Despite the high demand for service and low number of employees and teachers, the work of the sections and departments was carried out in order to meet all the needs of the School during this period.

FIGURE 2.1 – COTIL ORGANOGRAM



Source: PRDU.

### 2.2.10 Management and Administrative Activities

There was a deficit in the staff in all administrative sections: administrative support (mail room, reception and office), Information and Communication Technology support, financial support, specialized technical support and human resources, with transfer and death of employees and, as a result, overload of activities. The work was carried out as well as possible in order to quickly meet the School's academic support demands. The accumulation of work generated, sometimes, losses and rework. In addition, sectors such as financial support and human resources had only one employee responsible for all activities. Janitorial and maintenance services were not performed by school employees, but by campus administration employees, which generated difficulties in completing these activities. The maintenance area was the most impaired, delaying works and improvements in the School. There is no structured department to organize outreach activities in the School. However, course, training and cultural event were provided under coordination of the teacher responsible for each activity.

The main advances and improvements of the work Processes of the School were carried out in the academic area, with the implementation of the Class Record Book, daily lesson plan and release of grades and attendance online. Some administrative areas had their work systems updated by the University, and their employees participated in the courses and meetings provided by EDUCORP for professional training of the new tools.

### 2.2.11 Teaching Management

The courses planning process comprised a series of meetings with departments and the School Board at the beginning of each school year. The teachers prepared an annual Teaching Plan for each course taught, developed under supervision of the Academic Board. The School did not have a specific pedagogical project for each course. Instead, the School worked on a single management plan, which dealt with the structure of all programs.

The School did not have a specific process for evaluating teachers' activities. The activities conducted by the teachers were registered in the COTIL Activity Report, submitted annually to the University. In addition, teachers qualified for the career progression process during this period reported their activities in the progression forms, which were analyzed by deliberative boards of COTIL.

An increase in the number of candidates enrolled in the Selection Exam was observed annually. Some programs presented a higher candidate to vacancy ratio than the competition of undergraduate programs. However, due to the physical, personnel and budgetary restrictions, it was not possible to increase the number of vacancies and/or programs provided by the School. In 2016, the transfer of the Dental Prosthesis vocational program from FOP to COTIL was approved, which still awaits physical and budgetary resources for its full implementation.

The Selection Exam tests were prepared on the basis of the content proposed for elementary school, being adequate to the level of the enrolled candidates. The candidates' performance was considered satisfactory, but it was found that, in all years, not all of those

best ranked in the Selection Exam enrolled in the School. No analysis was performed on the relationship between performance in the selection process and during the course of the enrolled.

## 2.2.12 Human Resources

According to Tables 2.81 and 2.82, COTIL had a teacher to student ratio compatible with that of benchmark schools, such as the Federal Institute of Sergipe (IFS). The employee to student ratio of the benchmark school was not presented. However, these ratios decreased over the period, since the number of Cotil employees and teachers decreased over the period.

TABLE 2.81 – NUMBER OF STUDENTS, FACULTY AND STAFF

Year	Student	Faculty	PAEPE
2014	1459	91	28
2015	1405	86	26
2016	1415	88	26
2017	1364	87	25
2018	1335	81	25

Source: COTIL and DGRH.

TABLE 2.82 – FACULTY/STUDENTS/STAFF RELATIONSHIP

Year	Students/Faculty	PAEPE/Faculty	PAEPE/Students	Faculty/PAEPE
2014	16.03	0.3	0.0019	3.25
2015	16.33	0.3	0.018	3.3
2016	16.08	0.29	0.018	3.38
2017	15.67	0.28	0.018	3.48
2018	16.48	0.3	0.018	3.24

Source: COTIL.

The profiles of teachers to be hired were defined by the departments, pursuant to the current legislation and according to the courses of each selection process and approved by the School Board. There was no attempt to hire foreigners.

Didactic capacity was the most important criterion in the selection of teachers. The didactic test performed in public and temporary selection processes had as criteria mastery and in-depth knowledge of the subject addressed/theoretical basis; language/adequacy to Secondary Education and Vocational Training; creativity/posture; motivation/communication, and had the greatest weight considering all tests.

The public and temporary selection processes carried out in the period were highly competitive, with a growing number of registered candidates. There was also greater didactic and professional qualification of these candidates.

The criteria for distribution of faculty in didactic activities were defined by the Departments together with the Academic Board, considering the teacher's training, qualification and teaching and professional experience.



The criteria established in the MST career (Resolution CEPE-A-002/1997, of 068/03/1997) are updated and stimulate teacher development. However, in the period from 2015 to 2018, the restriction of resources earmarked for the teachers' career progression caused a queue of teachers waiting for resources for their progression, causing discontent among teachers (Table 2.83).

Departmental meetings were held according to the periodicity defined by each department, every year. The School's goals were prepared and published in the annual Activity Report, referring to the year immediately after that of the report; however, the School's internal community was not provided extensive information. There was no systematic evaluation of teaching practices.

To interested teachers, an extrabudgetary resource (mean of R\$ 700.00/year per teacher) was made available for them to attend courses and training related to the teacher's training and area of activity. There was low demand for the resource, perhaps because the money was not enough to take the courses of interest of teachers and/or because of the difficulty in obtaining authorization to participate in some training that conflicted with their working hours.

The School has no mechanism of its own for the recognition of excellence in teaching practice. A prominent teacher was nominated, per year, for the Fumagalli Trophy, but without receiving the award from the event organization.

In the period, there was a reduction in the replacement of teachers who left the School due to retirement (Table 2.84), further compromising the workload, in some cases above their assigned workload.

TABLE 2.83 – TEACHER PROGRESSION IN THE MST CAREER

Year	Progression by Merit	Progression by Graduation
2014	14	4
2015	1	2
2016	15	5
2017	0	1

Source: COTIL.

TABLE 2.84 – NUMBER OF FACULTY RETIREMENTS

Year	Retirements
2014	4
2015	5
2016	2
2017	3
2018	4

Source: DGRH.

With regard to the staff, all areas are in critical condition, considering that the unit has 40 (forty) certified vacancies and only 22 (twenty-two) filled vacancies, and of these 6 (six) employees are receiving bonus for permanence and may require retirement at any time.

Although the general conjuncture is critical, the areas with greatest deficiency are activities of academic support, finance support, technical advisory and public relations advisory. Regarding qualification, there was no investment in the training/qualification of the staff, on the part of the unit.

At the end of the period in question, the School's objective presented was to manage processes, but it is still necessary to properly train the current staff in this regard. In relation to the foreign language, there was no training for the employees of the School.

There was no concrete and defined policy for the institutional reception of newly hired employees. The new teachers were received by the Board, Human Resources (HR) and Head of Department, being provided the necessary guidance for the start of their activities. The new employees were also received by the Board and HR and were also provided guidance. In both cases, the new hires were presented in pedagogical and planning meetings.

### 2.2.13 Infrastructure

The School's facilities are old and, despite the adaptations made over the years, the environments intended for the teaching laboratories did not meet all the needs of the School. Some programs even lacked the minimum infrastructure required in the Vocational Program Catalogues. Regarding individual and group study spaces, students had only the campus library rooms available. The School's student association also did not have its own space for its activities. As for the living space, the campus has a large garden, without structures that enable holding artistic, cultural and entertainment activities, among others.

In the period, there were scarce financial resources for investment in the maintenance of the facilities (mean building maintenance budget of R\$ 152,976.00) and, in some cases, investments came from the resources of the Association of Parents and Teachers (APM) and from the School Direct Money Program of the National Fund for Educational Development (PDDE/FNDE).

The School requires investments for expanding and adapting the infrastructure of its teaching laboratories, in order to meet the programs' requirements, in relation to the National Vocational Programs Catalogue and to the labor market. In addition, the School needs an amphitheater that enables holding academic and administrative activities, as well as receiving the students' parents and guardians for meetings with the Board, among other activities. There is also a need for investments in the sports area, used for Physical Education classes, a mandatory curricular component in high school, for sports training and leisure practice. It needs improvements in sports facilities and equipment, cover on the courts, and changing rooms (male and female) for use of students, teachers and staff of the teaching units and administrative department of the campus. It also requires investments in expanding infrastructure, thus enabling increased provision of new vacancies for students and new programs for the community. Another important point is the investment for the construction of individual and group study areas.

With a reduced team of technical-administrative staff with scarce financial resources, it was not possible for the School to support its community for the modernization of its teaching methods and infrastructure. Wi-fi network and software licenses have been

provided for use in computer labs. Administrative support activities for the nighttime period were also further impaired than for the daytime period.

The lighting of the circulation area on campus is quite deficient. Regarding internal security and the existence of bus stops around the campus, there were no significant complaints in the period.

The School's infrastructure lacks the necessary structure for properly serving people with disabilities, because the facilities are old and have not yet undergone adaptations to current accessibility standards. In specific cases, as needs arose, classrooms were moved between floors of the building to meet the need of students with impaired mobility. There were also no accessibility actions regarding communication, methodological, instrumental, programmatic and attitudinal requirements. Students with cognitive or learning needs who took the Selection Exam were provided differentiated support adapted to the needs reported in the application.

The Campus' university restaurant met the demands of students, teachers and staff of the School.

There was no effective action related to energy efficiency and the economy and reuse of water. Except for the existence of the Environmental Management course in the curricular structure of the vocational programs in Quality, Buildings, and Geodesy and Cartography, provided by COTIL, there was no specific action for the dissemination of knowledge in the area of socioenvironmental education. The hazardous and non-hazardous waste management actions were carried out in the teaching laboratories, by the representatives of the unit in the Waste Management Group of the University and by the teachers responsible for the practical classes. During this period, the School replaced the roof of academic and administrative buildings, covered by asbestos tiles, and disposal was carried out in accordance with the rules of regulatory legislation by the company responsible for the services. In addition, COTIL did not use materials manufactured with asbestos or similar in its activities.

#### 2.2.14 Financial Resources – Budgetary and Extrabudgetary

The budgetary resources allocated to the School were sufficient for the maintenance of its activities but did not allow investments in the improvement of its work and study environments. During this period, there were no resources for renewal of equipment and furniture of teaching laboratories and classrooms. There were also no resources for renewal and adaptation to ergonomic standards of the furniture for use of technical-administrative staff. Regarding extrabudgetary resources, the only sources were those from the Selection Exam, voluntary contributions of students to the Association of Parents and Teachers (APM), used in support of the participation of students in technical-scientific events and in the conduct of extracurricular projects, and from the School Direct Money Program of the National Fund for Educational Development (PDDE/FNDE), used in building maintenance and also in the acquisition of teaching equipment. There were no other strategies for obtaining extrabudgetary funds, nor medium and long-term planning for this purpose.

The applications of budgetary and extrabudgetary resources (Table 2.85) were defined by the School Board. When there was investment in some department, it was on

demand submitted by the head of the department. The financial resources of the PADEMT scholarships, readjusted in the period by the University, Table 2.86, were allocated to the students (monitors) selected to participate in the program.

TABLE 2.85 – EVOLUTION OF BUDGET ALLOCATION AND EXTRABUDGETARY RESOURCES

Year	Extrabudgetary resources	Budget allocation
2014	R\$ 321,531.91	R\$ 29,448,571.00
2015	R\$ 409,291.69	R\$ 31,067,196.00
2016	R\$ 310,278.73	R\$ 33,127,725.00
2017	R\$ 306,452.83	R\$ 33,471,176.20
2018	R\$ 317,504.39	R\$ 31,110,,402.51

Source: AEPLAN.

TABLE 2.86 – PADEMT SCHOLARSHIPS (PROGRAM FOR DIDACTIC SUPPORT TO SECONDARY EDUCATION AND VOCATIONAL TRAINING)

Year	Nº Scholarships	Scholarship Value
2014	32	R\$ 432.57
2015	31	R\$ 478.58
2016	31	R\$ 522.05
2017	31	R\$ 522.05
2018	31	R\$ 522.05

Source: COTIL.

UNICAMP provided, during the period, through EDUCORP, several trainings and courses of interest of the School employees and meeting the needs of the unit. However, the staff complained that the School Board rarely authorized employees to participate in the trainings (Table 2.87). It was only in the final semester of the evaluation period that the COTIL Board authorized, provided conditions and promoted courses and trainings, in partnership with EDUCORP for the entire staff.

TABLE 2.87 – EDUCORP RESOURCES FOR TRAINING OF STAFF

Year	Number of staff	Total invested value
2014	10	R\$ 2,502.43
2015	9	R\$ 183.37
2016	9	R\$ 10.00
2017	18	R\$ 0.0
2018	16	R\$ 2,074.02

Source: EDUCORP.

## 2.2.15 Strategic Planning and Institutional Evaluation Process

The School Board carried out Strategic Planning with no participation of the community and did not disseminate it, during the period.

There was no management structure to implement the objectives of the programs; there is no political-pedagogical project for each program provided by the School; there was no integrated planning of curricular interdisciplinarity; there was no planning aimed at balancing ethical, humanistic, technical and citizenship education; there was no curricular integration between basic education and vocational training.

The School has specific laboratories for 5 of the 6 programs provided. However, new laboratories are necessary so as to meet the minimum infrastructure required in the National Vocational Programs Catalogue. The use of alternative resources in pedagogical practice occurred due to the initiative of each teacher, as well as the activities for interaction with society and the market (such as technical visits and field activities), when authorized by the Board.

The School participated in the National Textbook Program (PNLD), distributing secondary education textbooks to all students. There was also monitoring service for secondary education and vocational program students.

During the period, students were responsible for seeking an internship position in the labor market, conducting the mandatory internship under supervision of the head of department. There was no formal internship agreement with public and private agencies during the period.

The School organized, annually, internal games between classes/programs in order to integrate students of the School and foster the practice of sports. In addition, the students participated in the Municipal School Games and in the School Games of the State of São Paulo (JEEESP), achieving excellent results in all the modes played. As cultural activities, Arts Workshops, literary competition, and two editions of *COTIL ARTE* were held, officially integrated into the city's schedule of cultural and artistic activities, which promotes the students' reflection, critical sense, and creativity in various modes.

During the period, the Board contacted the family of students who had some occurrence and/or low school performance/attendance. At the beginning of the period, two meetings were held with parents of entrant students and the Board and Heads of Departments.

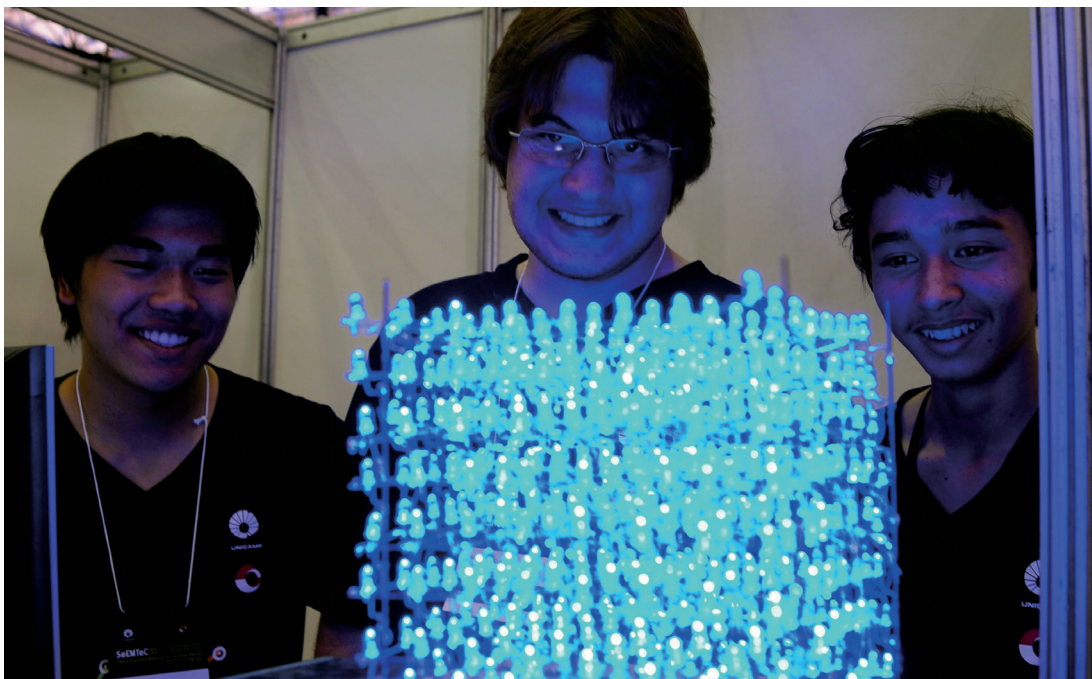
In the period, we had no students with special physical and educational needs. There was only support to the financial needs of a small portion of students, through social, food and transportation support scholarships provided by the University.

The School did not foster strategic projects that enhance and/or improve its teaching and management activities during this period. In the Institutional Evaluation of the 2009–2013 period, greater presence and participation of the general director on campus was recommended; adaptation of the campus for accessibility and mobilization; the coverage of a multi-sport court; campus signage; and expansion of the provision and dissemination of outreach courses. There was no implementation of the improvements recommended by the previous Institutional Evaluation.

Every year, the School's result in the ENEM exam was presented in pedagogical meetings attended only by teachers.

We understand that the institutional evaluation process is appropriate and meets the objectives. The difficulty encountered in filling out the form was the lack of historical record of the progress of the School.

## 2.3 Campinas Technical High School (COTUCA)



Antonio Scarpinetti/SEC – Unicamp.

The Campinas Technical High School (COTUCA), founded in 1967, was installed until February 2014 in a building listed by the Historical and Cultural Heritage in 1983. Designed by engineer and architect Francisco de Paula Ramos de Azevedo and built by the Bento Quirino Professional Association, the building was donated in will by Bento Quirino dos Santos for the purpose of having a technical and vocational school operate on this site. Until the date the building was transferred to the responsibility of Unicamp, with the installation of COTUCA, the Bento Quirino Technical High School operated on the site, belonging to the State Department of Education of the State of São Paulo.

Starting its activities with programs in Machinery and Engines, Electrotechnics, and Food, in the daytime period, in 1971, it began to provide the Vocational program in Nursing, initially, in the facilities of the Santa Casa de Misericórdia Hospital and in the Maternity of Campinas and, later, in the headquarters building of the Unit. In 1973, it created the Data Processing program. In 1978, aiming to serve a large segment of working youth and adults, with secondary education, it began to provide Vocational programs in the mode of level IV Professional Qualification, both in the nighttime period. The pioneering programs in this mode were the Mechanics and Electrotechnics vocational programs. In 1991, the Electrotechnics program underwent a thorough curricular revision, motivated by the rapid advance of the electronics industry in the Region of Campinas, training technicians in Electro-electronics.

With the development of the processing and telecommunications industry in the Metropolitan Region of Campinas, in 1993, programs for Plastics Technician, Telecommunications Technician and training in Medical-Hospital Equipment were created. From 1997, the data processing program, updated and called Informatics, was also provided



in the nighttime period. The Mechanics program underwent a thorough curricular revision, aiming to emphasize the area of automation and control, in line with the technological trends of modern production processes. In 2001, a new training was implemented – Occupational Safety Technician, immediately meeting Unicamp’s demand for technician-level professionals. In the same year, the technician-level specialization Management for Quality and Productivity was created, for holders of technician diploma. In 2002, the specialization in Computer-Assisted Mechanical Projects was implemented. In 2003, the Environmental Technician program began with emphasis on Management, in addition to the specialization in Metallic Materials.

At the beginning of the 2014-2018 four-year period, more precisely in February, after a report regarding the structural conditions of the historic building, classes were temporarily transferred to the Unicamp Basic Pavilion and since August 2014 the School was partially located in a rented building at 735 Jorge Figueiredo Corrêa street, Taquaral Parque, Campinas. During this period, part of its vocational courses were taught in teaching laboratories on the Unicamp Campus in Barão Geraldo and/or in Companies located in the Metropolitan Region of Campinas, maintaining this situation until the end of 2018.

COTUCA provides 820 annual vacancies distributed in programs in the modes of internal concomitance (high school with vocational program – for elementary school graduates), external concomitance (vocational program for those attending the second grade of high school or that have already graduated from high school) and technician-level specializations (for those who already have vocational education in a specific area). Tables 2.88 to 2.90 present programs, periods, number of vacancies and duration in years of the Programs provided by COTUCA.

TABLE 2.88 – COTUCA – INTERNAL CONCOMITANCE – HIGH SCHOOL + VOCATIONAL PROGRAM

Program (Code)	Period	Vacancies	Duration (years)
Mechatronics (24)	daytime	40	3 + internship
Food (25)	daytime	40	3 + internship
Electro-electronics (26)	daytime	40	3 + internship
Nursing (27)	daytime	40	3 years*
Informatics (28)	daytime	40	3 + internship
Electro-electronics (35)	evening	40	3 + internship
Mechatronics (37)	evening	40	3 + internship

Source: COTUCA.

Note: \*Nursing Program: the internship will, necessarily, be concomitant.

TABLE 2.89 – COTUCA – EXTERNAL CONCOMITANCE – VOCATIONAL PROGRAM

Program (Code)	Period	Vacancies	Duration (years)
Plastics VP (31)	morning	40	2+ internship
Environment VP (33)	evening	40	2+ internship*
Informatics for the Internet VP (34)	afternoon	40	2+ internship
Informatics for the Internet VP (38)	evening	40	2+ internship
Electro-electronics VP (40)	evening	40	2+ internship
Plastics VP (44)	evening	40	2+ internship
Telecommunications VP (45)	evening	40	2+ internship
Mechatronics VP (48)	evening	40	2+ internship
Nursing VP (49)	afternoon	40	2*
Occupational Safety VP (53)	evening	40	2+ internship

Source: COTUCA.

Note: \*Nursing Program: the internship will, necessarily, be concomitant.

TABLE 2.90 – COTUCA – TECHNICIAN-LEVEL SPECIALIZATION

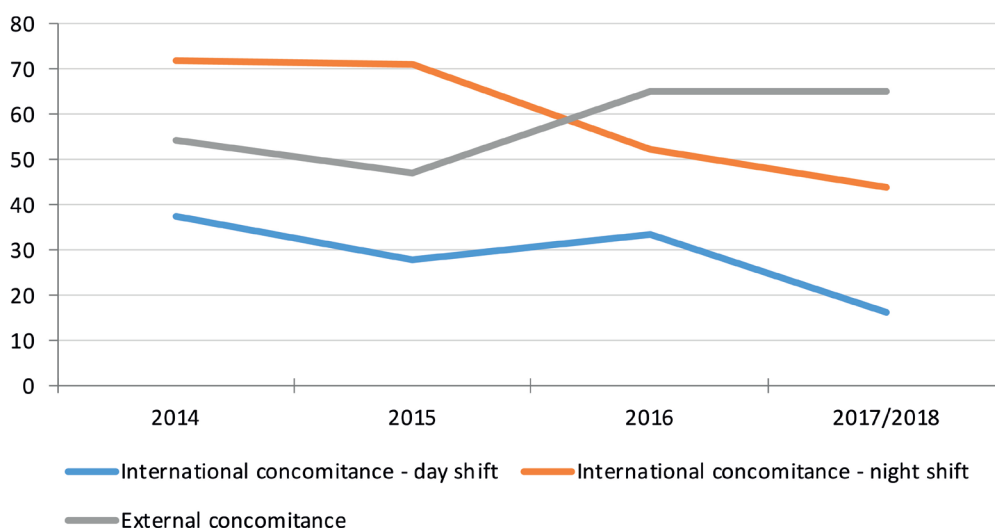
Program (Code)	Period	Vacancies	Duration (years)
Management for Quality and Productivity (52)	evening	40	1
Mechanical Projects (54)	evening	30	1
Biomedical Equipment (57)	evening	40	1
Industrial Automation (58)	evening	30	1

Source: COTUCA.

### 2.3.1 Entrant Student Profile

The School presents a diverse context regarding the profile of entrant students, as the provided programs have different educational prerequisites for admission. In the External Concomitance programs there is an increase in the entrance of students from public school from 54% in 2014 to 65% in 2018, and, in 2014, only 8% took preparatory courses to enter the School, with an increase of this number in 2018 to 19%. In the Internal Concomitance programs in daytime period, the opposite is observed as to public schools; decreased entrance of students from public school from 37% in 2014 to 16% in 2018, and an index of 42% in 2014 and 73% in 2018 of entrants who took preparatory courses. Among those who opted for nighttime internal concomitance programs, it is observed that in 2014 the entrants from public schools were 72%, with a drop in this figure from 2017. In 2018, for these programs, the number of entrants with this profile was around 43%, and, in this period, the percentage of entering students who took preparatory courses was 57%. While students seeking Technical Specialization programs are mostly students from public basic education schools. It is believed that the significant increase in the number of students from private schools in internal concomitance programs is the result of the financial crisis that occurred during the period with families looking for a public and quality School such as those of Unicamp. Graph 2.2 shows the percentages of entrants from public schools for the 2014–2018 period.

GRAPH 2.2 – PERCENTAGE OF ENTRANTS FROM PUBLIC SCHOOLS



Source: COTUCA.

To minimize the inequality of training of the entrants to internal and external concomitance programs, teachers seek to assess the level of basic knowledge on high school and primary school contents necessary for vocational program in the first week of class. Thus, it is possible to prepare a content plan for parallel study as well as guide the specific monitoring programs provided with veteran students. In 2018, the Mentoring Project was introduced, in which veteran students receive the entrants on the day of enrollment and, under the guidance of the Student Support Service, seeks to assist them through humanized reception. The reception for entrants is held one week before the start of classes with the objective of integrating them to the routine of the School. The family is also integrated during the meeting of parents/guardians by the Student Guidance Service and the teachers responsible for the departments. At the time, there are integration lectures with various sectors such as the Internship Sector, Informatics Sector and Student Board. For entrants in the technical specialization mode, because this student profile already requires a prerequisite for vocational training, there are no activities aimed at minimizing learning deficits. Reception for entrants is carried out with the same activities as the other programs.

### 2.3.2 Pedagogical Project of the Programs

The curricular structure of the programs provided by COTUCA meets the relevant curricular guidelines of MEC and of Professional Councils such as CRQ, COREN, Ministry of Labor (MTE and CREA), training students for the labor market.

COTUCA follows the CEE Resolution 105/2011, repealed by CEE Resolution 162/2018, which determines that all technical courses must have their Pedagogical Project revised every five years. This process aims at the adequacy of all contents of courses, workload revision and involves the Teaching Board, Pedagogical Coordination, external auditors and teachers of departments linked to the programs. All programs have undergone revision in the last five years and, from 2018, a new revision process was initiated. The School sends to accreditation agencies such as CREA and COREN the requested information about the

programs provided (annexes of the agency), and the programs are approved and compliant with the requirements of the agencies.

The Mechatronics Department revised its programs in 2013, changing the curriculum and incorporating courses with the most up-to-date content. The Data Processing department revised its programs in 2014. The Informatics for Internet Vocational Program was replaced by the Systems Development Vocational Program in 2018. The Electro-electronics Department revised its programs in 2014. The Food Department revised the curriculum of the Food Technician program in 2015. The new curriculum was implemented in 2016. The Nursing Department updated its curriculum in 2018 and from 2019 the new curriculum began to be implemented. The curricular structure of nursing programs is in accordance with the curricular guidelines of the corresponding agency, in this case, COREN. The Nursing Vocational Program's mandatory internship workload in both modes exceeds that required by the legislation in order to ensure the best possible practical training in all fields in which professionals may perform their activities. In this case, therefore, the complexity of the program and the quality of education and training are considered. Internships occur in an extremely serious and systematized manner, evaluations consider the student's training as a whole: technical skills, theoretical knowledge, relation between theory and practice, professional posture, interprofessional communication, and student to patient communication. The teacher seeks to develop in the internship the student's reflection as a professional in training, always focusing their actions on the responsibility and seriousness of the profession in the nursing area.

As for the technical specialization programs, as they are associated with at least one vocational training of the same technological axis and have at least 25% of the workload of the vocational program to which they are related, there is no requirement of revision, although they are also evaluated and updated internally. Table 2.91 shows information of publications of opinions on programs revised in the period.

TABLE 2.91 – PROGRAM AUTHORIZATION OPINIONS

Program	Authorization opinion
Food Technician	CEE Opinion 325/2016 DOE Oct 27, 2016
Environment Technician	CEE Opinion 274/2016 DOE Sep 15, 2016
Electro-electronics Technician	CEE Opinion 67/2015 DOE Feb 11, 2015
Nursing Technician	CEE Opinion 278/2013 DOE Aug 15, 2013
Informatics Technician	CEE Opinion 231/2015 DOE May 7, 2015
Systems Development Technician	CEMT Opinion 01/18 DOE Sep 7, 2018
Mechatronics Technician	CEE Opinion 45/2015 DOE Jan 30, 2015
Plastics Technician	CEE Opinion 266/2016 DOE Sep 1, 2016
Occupational Safety Technician	CEE Opinion 22/2015 DOE Jan 23, 2015
Specialization in Management for Quality and Productivity	CEE Opinion 149/2013 DOE Apr 25, 2013
Specialization in Industrial Automation	CEE Opinion 91/2014 DOE Mar 27, 2014
Specialization in Mechanical Projects	CEE Opinion 137/2013 DOE Apr 11, 2013
Specialization in Biomedical Equipment	CEE Opinion 125/2014 DOE Mar 27, 2014

Source: COTUCA.

### 2.3.3 Programs flow: dropout and completion rate

In COTUCA, in the 2014–2018 four-year period, there were significant differences between the external concomitance (EC) mode and internal concomitance (IC) mode programs with regard to dropout rates and number of graduates. On average, 30% of the students who entered the external concomitance mode vocational program completed it fully within the limit period for its completion; however, there were differences between the programs with more graduates and the programs with less graduates. In the Nursing vocational program (EC), 59% of the students completed the program, while in the Informatics for Internet vocational program (EC) the percentage of completion was 21.7%. For the programs provided in the internal concomitance mode (IC), 51% of the entrant students completed the program fully and about 30% did not complete it or dropped out. The Nursing vocational program is the only one whose curriculum includes internship, which is distributed over the semester because it is conducted in health clinics and hospitals where there are vacancies for internship, therefore, for all students. This is not the case in the other programs, whose internships depend on availability and selection processes. Tables 2.92 and 2.93 show the number of enrolled, dropout, graduate, active students, average training time, and dropout rate by entrant class between 2014 and 2018 for the External Concomitance (EC) and Internal Concomitance (IC) programs, respectively.

It is observed that in 2014 and 2015 there was a large number of dropouts regardless of program mode. In 2014 the School had its building interdicted and the programs were transferred to the Unicamp Campus and in 2015 to a rented building in the Taquaral neighborhood of Campinas. It is believed that the change of address was a determining factor in these results. Dropout rates began to decrease in 2016, but specialization and EC programs – to whose students public transport is fundamental – did not recover. The Taquaral region is not served by sufficient number of bus lines to meet demand.

TABLE 2.92 – NUMBER OF ENROLLED STUDENTS (E), % DROPOUT RATE (DR), GRADUATES (G), AVERAGE TRAINING TIME (TT) AND ACTIVE STUDENTS (A) FOR ENTRANT CLASSES BETWEEN 2014 AND 2018 – EXTERNAL CONCOMITANCE (EC) PROGRAMS

PROGRAM 31- Plastics Technician Morning					
Year	E	DR (%)	G	TT	A
2014	24	79	5	4	
2015	24	70	2	–	6
2016	25	24	–	–	19
2017	29	17	–	–	24
2018	23	4	–	–	22

PROGRAM 44- Plastics Technician Evening					
Year	E	DR (%)	G	TT	A
2014	40	70	12	4	
2015	40	57	5	–	12
2016	40	65	2	–	12
2017	40	20	–	–	32
2018	40	15	–	–	34

PROGRAM 34- Informatics for Internet Technician Afternoon					
Year*	E	DR (%)	G	TT	A
2014	40	62	14	4	1
2015	40	57	10	4	7
2016	40	40	7	–	17
2017	40	40	2	–	22

PROGRAM 38- Informatics for Internet Technician Evening					
Year*	E	DR (%)	G	TT	A
2014	40	90	4	4	
2015	40	75	6	4	4
2016	40	67	2	–	11
2017	40	50	–	–	20

Note: \*\* programs 34 and 38 were not provided in 2018.

PROGRAM 33- Environment Technician Evening					
Year	E	DR (%)	G	TT	A
2014	40	72	11	4	
2015	40	55	12	4	6
2016	40	40	7	3	17
2017	40	40	2	–	22
2018	40	12	–	–	35

PROGRAM 53- Occupational Safety Technician					
Year	E	DR (%)	G	TT	A
2014	40	42	22	4	1
2015	40	45	10	4	12
2016	40	40	16	3	8
2017	40	35	1	–	25
2018	40	15	–	–	34

PROGRAM 40- Electro-electronics Technician Evening					
Year	E	DR (%)	G	TT	A
2014	40	70	12	4	
2015	40	60	16	4	
2016	40	67	2	–	11
2017	40	32	2	–	25
2018	40	32	–	–	28

PROGRAM 45- Telecommunications Technician Evening					
Year	E	DR (%)	G	TT	A
2014	37	75	9	4	
2015	37	37	4	4	19
2016	37	56	6	–	10
2017	32	62	2	–	10
2018	33	24	–	–	25

PROGRAM 48- Mechatronics Technician Evening					
Year	E	DR (%)	G	TT	A
2014	40	52	18	4	1
2015	40	45	13	4	9
2016	40	22	9	–	22
2017	40	32	1	–	26
2018	40	10	–	–	36

PROGRAM 49- Nursing Technician Afternoon					
Year	E	DR (%)	G	TT	A
2014	35	54	16	2	
2015	35	68	11	2	
2016	35	68	11	2	
2017	35	37	9	–	13
2018	35	31	–	–	24

PROGRAM 39- Systems Development Technician Afternoon					
Year**	E	DR (%)	G	TT	A
2018	40	25			30

PROGRAM 59- Systems Development Technician Evening					
Year**	E	DR (%)	G	TT	A
2018	40	22			31

Source: COTUCA.

Note: \*\* Programs 39 and 59 started to be provided from 2018.

TABLE 2.93 – NUMBER OF ENROLLED STUDENTS (E), % DROPOUT RATE (DR), GRADUATES (G), AVERAGE TRAINING TIME (TT) AND ACTIVE STUDENTS (A) FOR ENTRANT CLASSES BETWEEN 2014 AND 2018 – INTERNAL CONCOMITANCE (IC) PROGRAMS

PROGRAM 25- Food Technician Daytime					
Year	E	DR (%)	G	TT	A
2014	40	42	23	5	1
2015	40	7.5	21	–	16
2016	40	15	–	–	34
2017	40	10	–	–	36
2018	40	15	–	–	34

PROGRAM 75- Food Technician Daytime – High School					
Year	E	DR (%)	G	TT	A
2014	40	10	36	3	
2015	40	15	34	3	
2016	40	10	27	–	9
2017	40	15	–	–	34
2018	40	10	–	–	36



PROGRAM 24- Mechatronics Technician Daytime					
Year	E	DR (%)	G	TT	A
2014	40	47	19	5	2
2015	40	10	4	–	32
2016	40	15	–	–	34
2017	40	10	–	–	36
2018	40	7.5	–	–	37

PROGRAM 74- Mechatronics Technician Daytime – High School					
Year	E	DR (%)	G	TT	A
2014	40	10	36	3	
2015	40	10	36	3	
2016	40	12.5	31	3	4
2017	40	10	–	–	36
2018	40	12.5	–	–	35

PROGRAM 26- Electro-electronics Technician Daytime					
Year	E	DR (%)	G	TT	A
2014	40	77	9	4	
2015	40	47	5	–	16
2016	40	27	–	–	29
2017	40	17.5	–	–	33
2018	40	7.5	–	–	37

PROGRAM 76- Electro-electronics Technician Daytime – High School					
Year	E	DR (%)	G	TT	A
2014	40	37	25	3	
2015	40	37	24	3	1
2016	40	32	18	3	9
2017	40	15	–	–	34
2018	40	2.5	–	–	39

PROGRAM 27- Nursing Technician Daytime					
Year	E	DR (%)	G	TT	A
2014	40	10	36	3	
2015	40	12.5	30	3	5
2016	40	12.5	23	–	12
2017	40	12.5	–	–	35
2018	40	10	–	–	36

PROGRAM 77- Nursing Technician Daytime – High School					
Year	E	DR (%)	G	TT	A
2014	40	27	29	3	
2015	40	35	24	3	2
2016	40	25	25	3	5
2017	40	17	–	–	33
2018	40	7.5	–	–	37

PROGRAM 28- Informatics Technician Daytime					
Year	E	DR (%)	G	TT	A
2014	40	42	23	4	
2015	40	32	16	–	11
2016	40	15	–	–	34
2017	40	12	–	–	35
2018	40	7.5	–	–	39

PROGRAM 78- Informatics Technician Daytime – High School					
Year	E	DR (%)	G	TT	A
2014	40	22	31	3	
2015	40	15	34	3	
2016	40	5	29	3	9
2017	40	5	–	–	38
2018	40	7.5	–	–	39

PROGRAM 35- Electro-electronics Technician Nighttime					
Year	E	DR (%)	G	TT	A
2014	40	77	5	–	4
2015	40	45	1	–	21
2016	40	37	–	–	25
2017	40	20	–	–	32
2018	40	10	–	–	36

PROGRAM 85- Electro-electronics Technician Nighttime – High School					
Year	E	DR (%)	G	TT	A
2014	40	62	15	3	
2015	40	55	17	3	1
2016	40	20	12	–	20
2017	40	17	–	–	33
2018	40	2.5	–	–	39

PROGRAM 37- Mechatronics Technician Nighttime					
Year	E	DR (%)	G	TT	A
2014	40	50	14	–	6
2015	40	45	1	–	21
2016	40	37	–	–	25
2017	40	22	–	–	31
2018	40	10	–	–	36

PROGRAM 87- Mechatronics Technician Nighttime – High School					
Year	E	DR (%)	G	TT	A
2014	40	55	18	3	
2015	40	42	19	–	4
2016	40	27	17	–	12
2017	40	25	–	–	30
2018	40	5	–	–	38

Source: COTUCA.

TABLE 2.94 – NUMBER OF ENROLLED STUDENTS (E), % DROPOUT RATE (DR), GRADUATES (G), AVERAGE TRAINING TIME (TT) AND ACTIVE STUDENTS (A) FOR THE ENTRANT CLASSES BETWEEN 2014 AND 2018 – TECHNICAL SPECIALIZATION

PROGRAM 52 – Technical Specialization in Management for Quality and Productivity					
Year	E	DR (%)	G	TT	A
2014	40	55	18	1	
2015	16	50	8	1	
2016	24	41	13	1	
2017	24	20	19	1	
2018	25	20	14	1	3

PROGRAM 54 – Technical Specialization in Mechanical Projects					
Year	E	DR (%)	G	TT	A
2014	29	58	12	1	
2015	18	33	12	1	
2016	22	63	8	1	
2017	28	57	12	1	
2018	13	15	7	1	4

PROGRAM 57 – Technical Specialization in Biomedical Equipment					
Year	E	DR (%)	G	TT	A
2014	12	41	7	1	
2015	11	36	8	1	
2016	14	57	6	1	
2017	17	64	6	1	
2018	16	25	8	1	4

PROGRAM 58 – Technical Specialization in Industrial Automation					
Year	E	DR (%)	G	TT	A
2014	15	100	0	1	
2015	17	70	5	1	
2016	18	61	7	1	
2017	22	68	7	1	
2018	16	62	5	1	1

Source: COTUCA.

The social support scholarships provided by Unicamp favor not only the students' permanence, but also their best performance in the studies. In conversation with some scholarship students, they all mentioned that, after assuming the role of scholarship student, they needed to better organize their study and even rest schedules, which has favored their performance in the school environment. It should be noted that scholarship holders cannot be seen as employee substitutes, and, as a result, all sectors of the School that receive them are instructed to comply with that. Gaps are observed in the support programs provided, because the number of grants available is much lower than the number of students in need. Accordingly, the School's Association of Parents and Teachers (APM) plays a fundamental role, as they provide monthly financial support to more than fifteen students.

Another support mode is the Program for Didactic Support to Secondary Education and Vocational Training (PADEMT Scholarships) provided by the Undergraduate Pro-Rector. In this case, the selection is not by socioeconomic criterion, but academic criterion,

because students are selected to support projects of departments or even to support colleagues under the supervision of teachers. From 2014 to 2018, a total of 43 PADEMT Scholarships were allocated for COTUCA and were fully occupied for the entire period.

TABLE 2.95 – SUPPORT SCHOLARSHIPS BY MODE AND PROGRAM – GENERAL DATA

Student Support				
Year	Number of Students			Total
	Social Support Scholarship	Transportation Scholarship	Food Scholarship	
2014	23	25	25	73
2015	23	25	25	73
2016	23	25	25	73
2017	23	25	25	73
2018	23	25	25	73

Source: COTUCA.

COTUCA has student support projects aiming to reduce school dropout. These include Monitoring, performed by the best students, which in this four-year period was computerized. Thus, the student support service can monitor the record of the student's attendance to the Monitoring and assist in organizing the studies. The Mentoring project was implemented in 2018 and seeks to facilitate the inclusion of entrant students and support them over the program and, also, the Permanence Commission, composed of representatives of students, teachers, employees and management. This commission analyzes and seeks to propose actions to reduce school dropout. School dropout is not only due to academic difficulties, but also socioeconomic difficulties. Social, transportation and food support grants are supported by Unicamp and the School's Association of Parents and Teachers (APM).

The School adopts the System of Dependencies, so students that failed some course have to take it compulsorily in the following period in which it is provided. For courses that are prerequisite for others and that have a significant number of failures, the following retake strategies were adopted: directed and special monitoring (with monitors or teachers); implementation of the individual assessment forms (FIAP) available in the student area with study recommendations for students and families; and parallel re-study and retake exams provided during the school year. It is important to highlight that it is believed that these actions effectively helped prevent students' from dropping out from mid-2016, a period in which the School began to establish at its current address. The transfer of its activities to the Campus in 2014 was one of the major factors for these results.

### 2.3.4 Mechanisms for Discussion and Application of the Results of the Teaching-Learning Process Evaluation

In this four-year period, we instituted direct evaluation of the courses and indirectly of the teachers who teach them, by students who, at each end of the semester, are invited to complete an evaluation questionnaire of each course in which they are enrolled. These data

are analyzed by the teacher of each course and by the pedagogical coordinator, constituting a self-assessment tool of the teacher. The application of this information to improve the quality of the courses and improve the curriculum of the program is at the discretion of each teacher. Some teachers conduct isolated actions for internal evaluation of the courses, through informal conversations with students or using their own questionnaires at the end of the course, as a way to evaluate the work.

### 2.3.5 Extracurricular Projects and Activities

From 2014 to 2018, incentive to improve teaching-learning by extracurricular projects and activities was institutionalized in COTUCA by means of the Institutional Projects Support Commission (CAPI). Internal projects such as the *Jovens Talentos* (Young Talents) project that encourages the development of interdisciplinary projects have had their results disseminated in scientific events held at Unicamp and other venues. From 2016, the School was included in the Institutional Program of Undergraduate Scientific Research Scholarship Program for High School Students (PIBIC-EM) of the National Council for Scientific and Technological Development (CNPq) concluding the third class in 2018. Each edition of the Program grants scholarships to 27 students associated with secondary education at COTUCA linked to five or six projects under guidance of vocational or high school teachers. Some of these projects were presented at National and International Congresses such as the Unicamp Undergraduate Research Congress, the Brazilian Congress of Nutrition (CONBRAN) in 2014 and 2018, and the Brazilian Congress of Chemical Engineering (COBEQ) in 2014. This work presented in 2014 at COBEQ resulted in the publication of a full article in 2017 in *LWT Food Science and Technology*, a journal with a high impact in the area of Food Science and the best rating (A1) in *Qualis Indexing* of the Coordination for the Improvement of Higher Level Personnel (CAPES). As for International Congresses, some projects were presented at the EuroFood Chem Conference in 2017.

The projects, developed throughout the year, curricular or extracurricular, address different objectives that generally involve the development of processes or products generally with some innovative aspect. In 2014, the *iNOVA Geração* Team composed of three students of the Food Technician program and one of the Electro-electronics program placed 1st in the *Inova Jovem Program*, linked to the Unicamp Innovation Agency, with the project "Double Opening Packaging – *iNOVA Geração Team*." In 2015, the project resulted in filing patent BR 10 2015 011186 0, entitled "Double opening packaging for better use of product waste." In this period, 2014–2018, several other projects were developed and presented, consolidating the inclusion of applied research experience as supplementation of vocational training. Students feel more motivated when they are involved in the project's propositions, as theoretical knowledge is applied concretely, in addition to awakening critical thinking within the industry, as well as developing skills for a future scientific career.

The teaching career of Schools does not involve research, even if technological and applied and, therefore, the development of extracurricular projects is individual to each teacher and results from the incentive plans of the latest directors of the Board. Despite the extensive workload and, often, also attending high school in another institution,

several students are dedicated to carrying out extracurricular projects mainly due to the encouragement of teachers in order to supplement the training beyond the classroom. The students' participation in fairs and Olympiads (Physics, Math, Biology, Robotics) may be highlighted. The following tables show the results of our students' participation in the evaluated period.

TABLE 2.96 – BRAZILIAN PUBLIC SCHOOLS MATH OLYMPIAD – OBMEP

Year	Gold medal	Silver medal	Bronze medal	Honorable Mentions	Trophy
2014	1	13	9	18	1
2015	*	9	8	26	
2016	2	11	6	16	1
2017	3	12	9	19	1

Source: COTUCA.

TABLE 2.97 – UNICAMP MATH OLYMPIAD – OMU

Year	Gold medal	Silver medal	Bronze medal	Honorable Mentions
2014	2	1	3	–
2015	–	2	–	–
2016	1	–	–	2
2017	1	1	1	2
2018	–	–	2	2

Source: COTUCA.

TABLE 2.98 – BRAZILIAN MATH KANGAROO

Year	Gold medal	Silver medal	Bronze medal	Honorable Mentions
2014	3	2	11	–
2015	1	14	13	–
2016	5	12	17	–
2017	13	24	20	–
2018	8	24	32	42

Source: COTUCA.

TABLE 2.99 – MATHÉMATIQUES SANS FRONTIÈRES – MSF

Year	Gold medal	Silver medal	Bronze medal
2015	2	–	–
2016	3	–	–
2017	3	–	–
2018	2	1	–

Source: COTUCA.

### 2.3.6 Access to Higher Education and Employability



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In this four-year period, COTUCA did not have a formal follow-up system for monitoring graduates. The follow-up is carried out informally due to the bond between students, the Student Guidance Service and the teacher. In general, students of programs associated with the daytime Internal Concomitance mode are interested in continuing their studies in higher education rather than the labor market. Students who opt for External Concomitance programs, especially in nighttime, have greater interest in immediate introduction into the labor market. In the case of graduates from the Nursing Vocational Program, the graduates' performance is assessed positively, considering that they are quickly introduced into the labor market and/or quality higher education. Most of them return to visit the School, reinforcing its importance for their success – but the data are informal. Tables 3.13 and 3.14 show the number of completed internships for internal and external concomitance programs, respectively. Data from the Nursing Vocational Program are not presented because all students are enrolled in internship that is conducted in health clinics and hospitals. The data from the other programs are based on the number of enrolled students per year, which is 40.

TABLE 2.100 – NUMBER OF SUPERVISED INTERNSHIPS – INTERNAL CONCOMITANCE

Program	nº Internships 2014	nº Internships 2015	nº Internships 2016	nº Internships 2017	nº Internships 2018
Program 24- Mechatronics Technician – Daytime	33	22	18	18	26
Program 25- Food Technician – Daytime	42	17	26	18	23
Program 26- Electro-electronics Technician – Daytime	26	22	15	11	19
*Program 27- Nursing Technician – Daytime	–	–	–	–	–
Program 28- Informatics Technician – Daytime	27	33	28	30	36
Program 35- Electro-electronics Technician – Nighttime	25	19	12	21	18
Program 37- Mechatronics Technician – Nighttime	10	21	24	26	26

Source: COTUCA.

Note: \*Program 27 – Internship at HC Unicamp.



TABLE 2.101 – NUMBER OF SUPERVISED INTERNSHIPS – EXTERNAL CONCOMITANCE

Program	nº Internships 2014	nº Internships 2015	nº Internships 2016	nº Internships 2017	nº Internships 2018
Program 31- Plastics Technician – Morning	2	2	2	1	3
Program 33- Environment Technician – Evening	5	9	9	5	13
Program 34- Informatics for Internet – Afternoon	10	20	17	14	10
Program 38- Informatics for Internet – Evening	18	7	18	13	18
Program 40- Electro-electronics Technician – Evening	9	7	10	22	22
Program 44- Plastics Technician – Evening	4	6	3	7	2
Program 45- Telecommunications Technician – Evening	5	3	5	10	9
Program 48- Mechatronics Technician – Evening	23	13	16	26	18
*Program 49- Nursing Technician – Afternoon	–	–	–	–	–
Program 53- Occupational Safety Technician – Evening	18	12	20	18	17

Source: COTUCA.

Note: \*Program 49 – Internship at HC Unicamp.

### 2.3.7 Internationalization

COTUCA participates in internationalization programs provided by Unicamp. Six teacher projects have been approved and carried out since the implementation of the programs and two of employees. Universities in the areas of information technology and industry were visited in countries such as Portugal, Spain, Canada and Chile in the case of teachers and students. In each edition of the program, one teacher and on average five students were involved. The employees' projects involved projects with Spain and Cuba, with the participation of one employee by project. The projects selected for the educational profile resulted in the exchange of technical and cultural knowledge and experiences mainly for low-income students and, for teachers, knowledge on how foreign universities or technological centers see training at this level of education. For example, it was possible to realize that in some areas such as IT, the training offered by COTUCA is much more comprehensive.

### 2.3.8 Outreach activities

The MST career comprises teaching and outreach; however, in this four-year period few Outreach Programs were provided by COTUCA. All programs were in the Technological Diffusion Mode in the industry area. It is believed that the teachers' high didactic workload, as well as the lack of infrastructure and of an outreach office located in the Unit, are some of the causes of low interest in providing programs to the external community. Table 2.102 shows the programs and courses provided by Cotuca teachers between 2014 and 2018.

TABLE 2.102 – ROGRAMS AND COURSES CARRIED OUT

Year		2014	2015	2016	2017	2018	Total
Outreach programs and Courses carried out	Programs	0	3	2	2	5	12
	Isolated courses	0	0	0	0	0	0
	Multi-program courses	0	0	0	1	0	1
	Total	0	3	2	3	5	13
Class Hours Taught		0	72	56	137	176	441
Enrollments	Simple programs	0	61	24	34	76	195
	Multiple programs	0	0	0	0	0	0
	Multi-program courses	0	0	0	13	0	13
	Isolated courses	0	0	0	0	0	0
	Total	0	61	24	47	76	208
	Total without multiple programs	0	61	24	47	76	208
Alunos	Simple programs	0	61	24	34	76	195
	Multiple programs	0	0	0	0	0	0
	Multi-program courses	0	0	0	13	0	13
	Isolated courses	0	0	0	0	0	0
	Unit Total (1)						

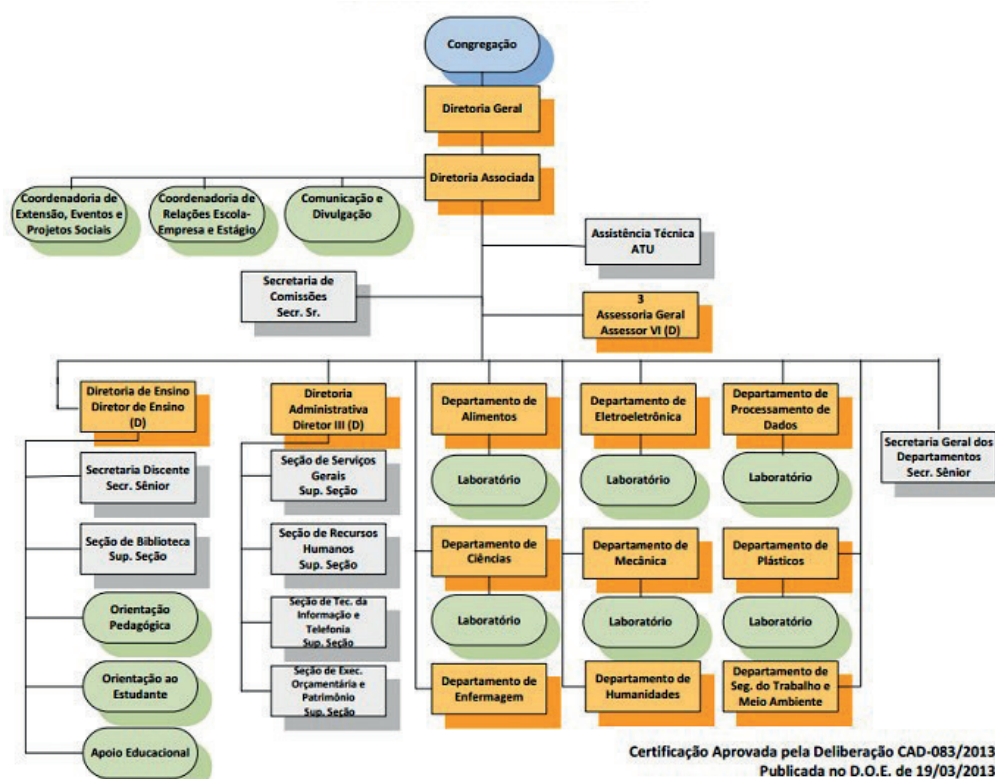
Source: PROEC/Extecamp.

The Presentation of Works of Vocational Programs, an event consolidated as an outreach activity, allows the integration of several vocational schools of the region and cities outside the State of São Paulo, such as Rio de Janeiro, Paraná and Minas Gerais. This integration and sharing of ideas stimulate the development of new projects and expansion of existing ones. On average, the events have the participation of 120 Vocational Schools with the presence of 80 teachers and 1,000 students.

### 2.3.9 Organizational Structure

Cotuca's organizational structure is governed by the Board, the highest department of the unit, and is distributed into four managerial sectors: general, associated, administrative and teaching. The organization chart below presents the organization chart institutionalized in 2013 and in force until 2018.

FIGURE 2.2 – COTUCA ORGANOGRAM



Source: PRDU.

### 2.3.10 Management and Administrative Activities

The administrative sector had major changes in this period. Once again, the lack of its own building impacted negatively as working conditions were adjusted depending on the available space. The period also had several retirements; sectors such as reception, janitorial service and maintenance service were practically extinguished. In 2014 the maintenance sector had four employees, in 2018 it had only one. Consequently, maintenance services were outsourced, which caused a major operational problem because emergency maintenance is not served in proper time. The School does not have an office to support outreach and culture programs. Computerization of some systems was important because the reduced staff due to retirements impaired support services in general. During this period in COTUCA, there was the effective implementation of the virtual Class Record Book, with adherence of most teachers, which allowed teachers and the student board to more completely manage the classroom routine, with electronic records of attendance and taught content. The same occurred for the release of grades and mean scores. The student area now had adequate systems aiming at the computerization of academic documents. In general, the increased computerization of systems has made work more efficient.

### 2.3.11 Teaching Management

The School has an annually revised Pedagogical Policy Plan and is in line with the program plans. Each course has a specific teaching plan, used by the teacher in planning the course, which describes the skills and competencies developed, technological bases worked, as well as methodological procedures and evaluation instruments used. Thus, the course's objectives can be fulfilled and followed, regardless of the teacher who will teach that course. The teaching plans are coordinated with the general and specific objectives described in the School's Political and Pedagogical Project. The evaluation of didactic activities allows self-assessment by teachers and implementation of changes in order to improve the quality of the programs in the next school semester. This evaluation leads the teacher to adapt the class format according to the course and to the program's profile, often with the use of projects. Departments meet at least twice during the semester. Demands are generated by departments. At least once a month, administrative meetings are held with career representatives, department heads and members of the School Board.

The internal concomitance programs provided during the daytime period have high demand, especially the Informatics, Nursing and Food programs. In the case of the first two, external concomitance programs were created, expanding the provision of vacancies. For the Food program, there is also the possibility of creating an external concomitance program on the subject, requiring, to that end, the hiring of more teachers and greater availability of laboratories for practical classes. It is a fact that the lack of physical space and human resources prevents the expansion.

### 2.3.12 Human Resources



Antonio Scarpinetti/SEC – Unicamp.

As for human resources, over these years the School has undergone the same problems of the University in general; employees are retiring and there is no replacement for the vacancies.

It is observed in COTUCA that the number of employees has been decreasing over the years due to retirements and lack of replacement. Vocational programs require a higher teacher to student ratio, due to the high workload of practical courses of the program. In these cases, students often have to be divided into classes (which doubles or triples the number of classes of the teacher) so the student can have due attention, favoring the development of their technical skills and avoiding accidents. There was an increase in the workload of the programs due to curricular readjustment, without increasing the number of teachers.

In Schools, the profiles of teachers to be hired are defined by the departments, pursuant to the current legislation and according to the courses of each selection process and approved by the Board. There was no attempt to hire foreigners during this period. The teaching career is accessed by public selection process, which comprises a qualifying stage with specific exam on the subjects, didactics exam, oral test and analysis of diplomas and certifications.

In COTUCA, the criteria for teacher progression follow the career regulation of the Vocational Secondary Education. Progressions are requested by teachers always after a two-year interval from the date of the last progression. Progressions by analysis of diplomas and certifications according to the career are automatic and those by merit follow a list of requests, being approved according to budgetary resources allocated annually. Due to the financial crisis of the four-year period and need for restricted allocation, progression by analysis of diplomas and certifications is no longer automatic. This situation causes stagnation of the teaching career and discourages the search for better training (taking courses, working in research and entry into graduate programs, for example).

The classes are assigned within each department according to the hiring of the teacher using the workload criteria for which the teacher is hired; teacher workload already assigned to classes and other didactic activities; agreement between the teachers of the department in the division of didactic activities according to the availability of schedules, as well as the teacher's specialization area. Tables 3.16 and 3.17 show the number of teachers linked to each department and the teacher replacement staff, respectively.

TABLE 2.103 – NUMBER OF TEACHERS – MST CAREER

Unit	Department	2014	2015	2016	2017	2018	2019
COTUCA	Food	5	5	5	5	5	5
	Sciences	13	13	11	13	11	11
	Electroelectronics	15	16	16	16	15	16
	Nursing	17	17	15	17	14	18
	Humanities	15	16	16	15	16	17
	Mechanics	8	8	9	9	7	8
	Plastics	8	8	8	8	8	6
	Data processing	8	8	8	8	8	9
	Work and environment safety	5	6	6	6	6	6
Total		94	97	94	97	90	96

Source: DGRH.

TABLE 2.104 – HIRING OF MST TEACHERS IN THE PERIOD PER DEPARTMENT

Unit	Departament	2014	2015	2016	2017	2018
COTUCA	Food		1			
	Sciences		3	1	3	
	Electroelectronics		1		1	
	Nursing	1	5	4	4	
	Humanities	2	3	2	1	1
	Mechanics			1		
	Plastics					
	Data processing					
	Work and environment safety		2			
Total		3	15	8	9	1

Source: DGRH.

With regard to the staff, all areas are in critical condition, considering that the unit has 40 (forty) certified vacancies and only 22 (twenty-two) filled vacancies, and of these 6 (six) employees are receiving bonus for permanence and may require retirement at any time. Although the general conjuncture is critical, the areas with greatest deficiency are activities of academic support, finance support, technical advisory and public relations advisory. Regarding qualification, there was no investment in the training/qualification of the staff, on the part of the unit.

TABLE 2.105 – NUMBER OF ACTIVE PAEPE STAFF

Unit	Age group	2014	2015	2016	2017	2018
COTUCA	20 to 29	5	5	3	1	1
	30 to 39	5	5	7	6	7
	40 to 49	12	11	9	9	7
	50 to 59	16	17	16	14	13
	60 to 69	5	4	2	6	5
Total		43	42	37	36	33

Source: DGRH.

At the end of the period in question, the School's objective presented was to manage by processes, but it is still necessary to properly train the current staff in this regard. In relation to the foreign language, there was no training for the employees of the School.

### 2.3.13 Infrastructure

With COTUCA moving to the Taquaral building, there was a loss of general physical space. There are fewer classrooms, and they are smaller. Several departments no longer have their own laboratories, needing to search for external spaces in other units on campus so that practical classes continued to be taught. With this, several adjustments were needed, such as reducing the number of classes for practical classes, since, with the circulation of students between Taquaral and the Barão Geraldo campus, the number of classes available



was reduced. There was a need to rent classroom spaces in the evening, so all classes were accommodated.

The interdiction of COTUCA's building in the 2014–2018 four-year period impaired the meeting of the College's infrastructure needs. The number of classrooms is insufficient, there is no space and structure for laboratories and the spaces for library and individual or group study are minimal. There is a need to seek assignment of classroom and laboratory space in other Unicamp Units and even renting space in private institutions in the vicinity for the conduct of academic activities. Space is also unavailable for archiving office material, HR material and for temporarily storing documents and assets. Due to renting space, currently the unit does not have specific budget for maintenance.

In COTUCA, civil adjustments were made to the rented building, but the School's infrastructure meets the needs of disabled persons only partially, because some characteristics of the building cannot be changed, which hinders or in some cases prevents disabled persons from accessing certain locations. During the period, studies for the construction of the School's building on campus were carried out, but due to restricted allocation were not executed.

### 2.3.14 Financial Resources – Budgetary and Extrabudgetary

In COTUCA, the occupation of a rented building, where the application of public resources for its maintenance would not be justified, as well as the period that began in 2017 of budgetary restraint, was the main reason budgetary resources remained at the same level. The demands were adjusted with the alteration or replacement of the materials used in practical classes; others that were conducted by the students began to be demonstrations by the teacher. These were some of the actions implemented to reduce the impact on the quality of the programs. Table 2.106 shows Cotuca's budgetary resources for the period between 2014 and 2018.

TABLE 2.106 – COTUCA BUDGETARY RESOURCES

Year	Initial allocation					Final allocation				
	Personnel	Defrayal (*)	Capital	Total	% on the total of Unicamp	Personnel	Defrayal (*)	Capital	Total	% on the total of Unicamp
2014	26,985,418	1,214,624	–	28,200,042	1.34%	30,349,308	3,298,888	11,410	33,659,606	1.46%
2015	27,767,312	2,980,306	–	30,747,618	1.38%	33,145,873	3,616,582	11,670	36,774,125	1.60%
2016	29,199,087	3,420,321	–	32,619,408	1.42%	35,430,870	3,544,305	31,179	39,006,354	1.60%
2017	30,113,494	3,217,210	–	33,330,704	1.41%	36,355,495	3,306,687	17,059	39,679,241	1.59%
2018	31,402,487	3,267,012	–	34,669,499	1.37%	33,864,392	3,328,446	1,622	37,194,460	1.47%

Source: AEPLAN.

Note: (\*) Includes the values referring to the Budgetary Qualification Program – PQO

1) Initial allocation: Values approved by CONSU in the initial Budgetary Distribution Proposal.

2) Final allocation: Values of the Unit's budgetary allocation at the end of the fiscal year.

Extrabudgetary resources come from outreach courses, and the value allocated to the Unit is the AIU and registrations of the annual selection process. Table 2.107 lists

the extrabudgetary resources in the period. The values referring to outreach courses are not part of the Unit's budget because they are intended to cover the costs of providing the courses. Extrabudgetary resources are administered by the Unicamp Development Foundation – Funcamp.

TABLE 2. 107 – COTUCA EXTRABUDGETARY RESOURCES

Nominal Values	Em R\$ 1.00				
Origin of resources	2014	2015	2016	2017	2018
Outreach courses	–	19,915.53	19,993.18	20,515.25	91,388.58
Entrance exams	320,684.25	391,402.80	399,563.25	422,400.00	370,350.50
AIU – other revenues	–	967.56	971.26	76.88	2,999.90
Total	320,684.25	412,285.89	420,527.69	443,892.13	464,738.98

Source: AEPLAN.

### 2.3.15 Strategic Planning and Institutional Evaluation Process

The School's Strategic Planning process is carried out in four-year periods following the methodology of Unicamp's General Administration. This is a process to review mission, principles and values aiming at the vision of the future. In 2017, during the annual pedagogical meeting, we carried out the last equivalent process for planning up to 2020. In this process, strengths and weaknesses were pointed out and strategic issues and strategic projects were defined. This document is validated by the School Board. COTUCA's educational management is primarily conducted through the departments linked to Vocational Training that are responsible for reviewing the program plans according to the labor market and current legislation and reviewing the secondary education according to the national curricular parameters. There is also support from pedagogical guidance, educational guidance and teaching direction always in line with the school's mission. Teachers seek to work with students according to their area of technical training, which can be linked to other related areas. Activities such as Soirée, Scavenger Hunt, Open School, SeEmTEC, Exhibition of works, projects focused on citizenship undoubtedly favor the interaction of teachers and students in the most diverse areas of knowledge, fostering the interdisciplinarity of the curriculum.

The School seeks to work education in an integrated manner. Internal Concomitance programs have the Philosophy and Sociology course, which fulfills much of the ethical training part also required in vocational programs. External concomitance programs have courses with content on the ethical instruction in the profession. In activities carried out throughout the School, such as the Scavenger Hunt and Exhibition of Technical Works, the subject is paramount in the activities. In Secondary Education the material used is mostly composed of textbooks indicated by the State Education Network, in addition to the materials used in laboratories. In Vocational Education and Training, due to the specificity of the courses of the programs and the need for constant update, the materials adopted by the teachers are mainly handouts, articles of reference journals, technical books, handbooks and exercises based on concrete experiences applied to programmatic content.

Out-of-classroom service occurs through monitoring at pre-established time slots and in consultation with teachers during intervals between classes. Students with special needs are served by the Educational Guidance Service (EGS) together with their family to better understand their needs, reorganize spaces/equipment/materials of the school, such as change of classroom if necessary, and contact for other guidance of professionals/specialists who already work in the service provided to students. The guidelines are presented to teachers working with the student and, if necessary, to classmates. As the EGS professionals are divided by program, the advisor responsible for the class in which the student with special needs studies conducts systematic and permanent follow-up.

COTUCA's faculty, staff and student community is informed about processes and results of external evaluation such as ENEM. These data are submitted to the departments and discussed in meetings of a pedagogical nature.

As for the negative and positive aspects of the current Institutional Evaluation process, the commission indicated as negative points the repetitive questions, and some of them do not apply to the reality of the Unit, as well as the difficulty as to having all data for a more productive discussion, because some of the data are not integrated with the University's management systems. The positive points presented refer to the process that allows reflection on the daily routine of the institution and the actions that can be discussed to improve the Unit within the Institution.

## 2.4 Final Considerations

Since its creation, DEEPU has had a prominent position in the central administration of the university. Its introduction has resulted in a process of administrative and pedagogical growth in the units that compose it.

In the beginning, there was difficulty on the part of the School's boards as to interacting with this board because, until then, the subjects were treated directly with the Rector, which ensured them greater autonomy. Over time and with the change of directors, there was a re-adaptation. Today, administrative and pedagogical issues are shared, and decisions are made in common agreement.

In relation to DEdIC, DEEPU is considered as a partner in all respects: administrative and pedagogical. The DEdIC coordination, directly responsible for administrative and pedagogical management, have worked intensively to strengthen and consolidate partnerships that have socio-educational actions and that contribute to child development. Actions that strengthen research are also being highly valued. In recent years, there has been institutional support for teachers to participate in internal and external academic events.

The great challenge encountered in DEdIC's work was the definitive implementation of the 1/3 (one third) of the workload of all teachers for planning and for training activities. The national legislation and DEdIC's Political and Pedagogical Project provides for 2/3 (two thirds) of hours worked in activities of interaction with children and 1/3 (one third) of these hours for extra-classroom activities. Despite difficulties with staff, lack of infrastructure and

financial resources, DEdIC has spared no effort to have quality work done in its segments. It is also worth highlighting the work with the families of babies and children, because the integration of families is a goal and begins in the DEdIC units before the child's beginning in the daycare center.

The Limeira Technical High School has old facilities and lacks space to accommodate and install some environments. In addition, the lack of financial resources prevented investments in maintenance, and this combined with the reduced team of technical-administrative staff prevented the School from providing support to the community to modernize its methods and education infrastructure. Despite these difficulties, COTIL has improved the reception of entrant students, holding meetings with their parents. Education remains with a high standard of quality. The number of failures, today, is not very significant; the work with the monitors and the implementation of parallel and continuous re-study and retake exams contributed to this context. There was also the introduction of the virtual class record book. Despite all the difficulties, there was an increase in the number of candidates enrolled in the Selection Exam.

The Campinas Technical High School, COTUCA, despite the lack of a dedicated building and the infrastructure difficulties, maintains its excellent standard of educational quality. The high dropout rates observed in the period are due to the sudden change of its facilities in 2014 to the Unicamp Campus in Barão Geraldo and, in 2015, to a building in the Taquaral neighborhood, a locality that is difficult to access using public transportation. The school maintains the goal of working education in an integrated manner. The teaching plans are coordinated with the general and specific objectives described in the Political and Pedagogical Planning.





3.

## UNDERGRADUATE STUDIES AND ProFIS







In 2018, the University of Campinas – Unicamp had 69 undergraduate programs, namely 17 teaching training degree programs and 52 bachelor's degree programs (full-time and part-time, evening), in addition to the Higher Education Interdisciplinary Program (ProFIS). These programs are conducted at the campi of Campinas – Barão Geraldo, Limeira – School of Applied Sciences (FCA), Limeira – School of Technology (FT) and Piracicaba – School of Dentistry (FOP). The coordination of each programs is under the responsibility of a coordinator and an associate coordinator, named by the director of the School and appointed by the Vice-Rector for Undergraduate Studies. The deliberative organ for undergraduate program is the Undergraduate Committee (CG), advisor to the unit's Board. Also, most units have an active Structuring Faculty Board (NDE), with the function of monitoring and updating the educational program, following Resolution of the National Committee for the Evaluation of Higher Education (Conaes-MEC, *Comissão Nacional de Avaliação da Educação Superior-Ministério da Educação*). Together, undergraduate program coordinators constitute the Central Undergraduate Committee (CCG), which meets monthly, and participate in their working groups, while the associated coordinators constitute the University Admission Exam Chamber.

At FCA, International Trade Management, Business Management, Public Policy Management and Agribusiness Management programs were replaced by Administration and Public Administration programs. In 2019, FT also had changes and places of the Higher Education Program in Civil Construction Technology (full-time) and Road Construction Technology were replaced by a new program in Transportation Engineering. These changes represent a critical view on the curricula and the relevance of their offering, replacing programs with low-performance in terms of conclusion rates, without reducing total places offered. Finally approved in 2019, the new teaching training degree program in Theater, nighttime, will begin in 2020.

Table 3.1 shows the programs by field, annual places, suggested completion time (time necessary to complete the set of disciplines suggested in the undergraduate catalogue) and maximum completion time as per the regulation (limit time allowed according to the Undergraduate Rules, corresponding to 1.5 times the suggested completion time). Direct entry teaching training degree programs (those in which the student chooses to seek the teaching training degree in the entrance exam) appear in the report separate from those that are considered qualifications, attended after completion of the bachelor's degree program, which is the option of entry. By year, in average, there were 18,880 total enrollments, 4,200 new enrollments and 2,650 students concluding their programs (Table 3.2).

TABLE 3.1. ANNUAL NUMBER OF PLACES IN THE ENTRANCE EXAM, SUGGESTED COMPLETION TIME AND MAXIMUM COMPLETION TIME FOR UNICAMP UNDERGRADUATE PROGRAMS

Fields	Programs	2014	2015	2016	2017	2018	Suggested time/ Maximum time
Arts	Performing Arts (Full-time) <sup>1</sup>	25	25	25	25	25	8/12
	Visual Arts (Full-time)*	30	30	30	30	30	8/12
	Social Communication – Midialogy (Full-time)	30	30	30	30	30	8/12
	Dance (Full-time)*	25	25	25	25	25	8/12
	Music – Composition (Full-time)	7	7	5	5	5	10/16
	Music – Direction (Full-time)	3	3	4	4	3	10/16
	Classical Music: Instruments (Full-time)	20	20	22	22	28	8/12
	Popular Music: Instruments (Full-time)	20	20	19	19	16	8/12
Biological and Health Sciences	Biological Sciences (Full-time)*	45	45	45	45	45	8/12
	Sports Sciences (Full-time)	60	60	60	60	60	8/12
	Physical Education (Full-time)*	50	50	50	50	50	8/12
	Physical Education (Evening) <sup>1, *</sup>	50	50	50	50	50	10/16
	Nursing – (Full-time) *	40	40	40	40	40	9/14
	Pharmacy (Full-time)	40	40	40	40	40	10/16
	Speech Therapy (Full-time)	30	30	30	30	30	8/12
	Medicine – (Full-time)	110	110	110	110	110	12/18
	Nutrition (Full-time)	60	60	60	60	60	9/16
	Dentistry (Full-time)	80	80	80	80	80	10/16
Exact and Earth Sciences	Computer Science (Evening)	50	50	50	50	50	10/16
	Program: Physics/Physical Engineering***/ Physics: Medical and Biomedical Physics/ Mathematics/ Applied and Computational Mathematics (Full-time)	155	155	155	155	155	Medical Physics and Physical Eng.: 10/16 Remaining: 8/12
	Statistics (Full-time)	70	70	70	70	70	8/12
	Geology (Full-time)	20	20	20	20	30	10/16
	Chemistry (Full-time) *	70	70	70	70	70	8/12
	Technological Chemistry (Evening)	40	40	40	40	40	10/16
	Architecture and Urbanism (Evening)	30	30	30	30	30	12/18
	Agricultural Engineering (Full-time)	70	70	70	70	70	10/16
Engineering	Environmental Engineering (Evening)	60	60	60	60	60	12/18
	Civil Engineering (Full-time)	80	80	80	80	80	10/16
	Food Engineering (Full-time)	80	80	80	80	80	10/16
	Food Engineering (Evening)	35	35	35	35	35	12/18
	Computer Engineering (Full-time)	90	90	90	90	90	10/16
	Control and Automation Engineering (Evening)	50	50	50	50	50	12/18
	Manufacturing Engineering (Full-time)	60	60	60	60	60	10/16
	Production Engineering (Full-time)	60	60	60	60	60	10/16
	Telecommunications Engineering (Full-time)	50	50	50	50	50	10/16
	Electrical Engineering (Full-time)	70	70	70	70	70	10/16
	Electrical Engineering (Evening)	30	30	30	30	30	14/22
	Mechanical Engineering (Full-time)	140	140	140	140	140	10/16
	Chemical Engineering (Full-time)	60	60	60	60	60	10/16
	Chemical Engineering (Evening)	40	40	40	40	40	12/18

TABLE 3.1. ANNUAL NUMBER OF PLACES IN THE ENTRANCE EXAM, SUGGESTED COMPLETION TIME AND MAXIMUM COMPLETION TIME FOR UNICAMP UNDERGRADUATE PROGRAMS

continued

Fields	Programs	2014	2015	2016	2017	2018	Suggested time/ Maximum time
Humanities	Business Administration (Evening)	180	180	180	180	180	8/12
	Public Administration (Evening)	60	60	60	60	60	8/12
	Economic Sciences (Full-time)	70	70	70	70	70	8/12
	Economic Sciences (Evening)	35	35	35	35	35	10/16
	Social Sciences (Full-time)*	55	55	55	55	55	8/16
	Social Sciences (Evening)	55	55	55	55	55	8/16
	Literary Studies (Full-time)	20	20	20	20	20	8/12
	Philosophy (Full-time)*	30	30	30	30	30	8/12
	Geography (Full-time)*	20	20	20	20	20	8/12
	Geography (Evening)*	30	30	30	30	30	10/16
	History (Full-time)*	40	40	40	40	40	8/12
	Linguistics (Full-time)	20	20	20	20	20	8/12
Technology	Information Systems (Full-time)	45	45	45	45	45	8/12
	Technology in Analysis and Development of Systems (Evening)	45	45	45	45	45	7/12
	Technology in Building Edifices (Evening)	50	50	50	50	50	7/12
	Technology in Environmental Control (Full-time)**	40	40	40			6/10
	Technology in Environmental Control (Evening)**	50	50	50			8/12
	Technology in Environmental Sanitation (Full-time)***				40	40	6/10
	Technology in Environmental Sanitation (Evening)***				50	50	6/10
Teaching training Degree Program (with exclusive admission in the entrance exam)	Music – Teaching training Degree (Full-time)	15	15	15	15	13	8/12
	Biological Sciences – Teaching training Degree (Evening)	45	45	45	45	45	10/16
	Physics – Teaching training Degree (Evening)	40	40	40	40	40	10/16
	Mathematics – Teaching training Degree (Evening)	60	60	60	70	70	9/14
	Language – Teaching training Degree (Full-time)	30	30	30	30	30	8/12 <sup>+</sup> and/or 10/16 <sup>#</sup>
	Language – Teaching training Degree (Evening)	30	30	30	30	30	10/16 <sup>+</sup> and/or 12/18 <sup>#</sup>
	Chemistry/Physics Teaching training Degree (Evening)	30	30	30	30	30	10/16
	Pedagogy – Teaching training Degree (Full-time)	45	45	45	45	45	8/12
	Pedagogy – Teaching training Degree (Evening)	45	45	45	45	45	10/16
Total	Total (Full-time)	2,180	2,180	2,180	2,180	2,190	-
	Total (Evening)	1,140	1,140	1,140	1,150	1,150	-
	Unicamp Total (day and evening)	3,320	3,320	3,330	3,330	3,340	

Notes: 1. Unicamp offers full-time programs (08:00 am to 06:00 pm) and evening programs (07:00 pm to 11:00 pm).

\* Bachelor's degree program/teaching training degree program.

\*\* Programs ended in 2017.

\*\*\* Programs created in 2017.

<sup>+</sup>Teaching training Degree in Language – Portuguese.

<sup>#</sup>Teaching training Degree in Language – Portuguese as Second Language/Foreign Language.

TABLE 2. TOTAL UNDERGRADUATE STUDENTS, BY YEAR – ENTRANTS (ENTRANCE EXAM OR OTHER ADMISSION METHODS, INCLUDING REMAINING PLACES), ENROLLEES, AND GRADUATES

Program Name	Period	Total Freshmen					Total Enrollees					Total Graduates				
		2014	2015	2016	2017	2018	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Business Administration	Evening <sup>1</sup>	243	261	286	326	301	243	469	663	864	1011	18	77	93	123	185
Public Administration	Evening	67	63	66	71	74	67	125	187	240	285	0	0	0	5	31
Architecture and Urbanism	Evening	36	34	33	35	36	211	203	209	213	223	39	26	25	17	34
Performing Arts	Full-time <sup>1</sup>	26	26	26	25	27	111	119	112	110	123	13	29	25	12	25
Visual Arts	Full-time	43	36	42	40	40	179	177	180	170	173	34	27	38	30	40
Computer Science	Evening	67	72	64	75	75	294	305	313	327	345	35	29	36	30	45
Biological Sciences	Full-time	68	76	80	78	82	217	237	255	261	263	46	54	63	66	70
Sports Sciences	Full-time	59	63	61	59	65	268	283	285	299	306	41	39	28	29	49
Economic Sciences	Full-time	76	75	75	76	76	369	353	363	372	374	73	51	47	54	48
	Evening	43	41	41	44	49	217	224	218	230	237	22	40	26	26	37
Social Sciences	Full-time	100	108	114	112	117	351	355	371	379	374	57	59	61	77	81
	Evening	95	108	110	106	117	383	363	375	370	390	62	60	57	44	65
Social Communication – Medialogy	Full-time	33	31	33	33	33	147	158	147	154	159	17	37	23	27	28
Tech Program. in A. D. of Systems	Evening	54	48	46	52	52	243	222	219	203	198	44	25	43	37	26
Tech Program in Building. Edifices	Evening	55	49	27	22	27	244	247	216	173	144	16	26	36	28	24
	Full-time	22	19	12	6	17	108	85	66	40	37	17	14	18	9	1
Tech. Program in Environmental S.	Evening	51	36	18	16	27	191	174	149	120	93	22	21	22	17	13
	Full-time	47	40	40	39	41	126	126	130	129	129	30	31	35	35	34
Dance	Daytime	74	68	81	79	62	283	288	302	302	300	43	59	70	51	44
Physical Education	Full-time	80	71	71	73	62	312	309	313	314	330	43	50	50	30	35
Nursing	Full-time	49	33	60	55	67	178	186	218	218	226	11	19	40	43	38
Agricultural Engineering	Full-time	93	79	83	75	81	446	413	430	437	435	50	37	39	45	40
Environmental Engineering	Evening	65	72	70	84	71	125	188	247	321	373	0	0	0	0	21
Civil Engineering	Full-time	93	90	96	105	111	491	486	520	535	552	82	56	74	69	91
	Full-time	84	82	82	82	83	469	471	467	488	490	56	56	38	54	68
Food Engineering	Evening	52	51	53	47	51	256	249	258	262	274	44	23	28	28	43

TABLE 2. TOTAL UNDERGRADUATE STUDENTS, BY YEAR – ENTRANTS (ENTRANCE EXAM OR OTHER ADMISSION METHODS, INCLUDING REMAINING PLACES), ENROLLEES, AND GRADUATES

continued

Program Name	Period	Total Freshmen				Total Enrollees				Total Graduates						
		2014	2015	2016	2017	2018	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Computer Engineering	Full-time	100	109	102	103	108	549	574	577	584	604	47	72	61	58	83
Control and Automation Engineering	Evening	55	53	52	59	57	350	358	347	348	355	28	45	35	29	28
Manufacturing Engineering	Full-time	60	66	62	64	63	312	347	363	358	366	20	31	43	35	48
Production Engineering	Full-time	65	69	71	69	70	340	364	368	380	380	39	60	52	60	64
Telecommunications Engineering	Full-time	58	53	53	52	54	106	152	200	240	268	0	0	0	3	9
Electrical Engineering	Full-time	80	75	77	79	74	413	426	432	449	439	52	54	41	64	57
	Evening	38	42	34	37	36	219	235	242	240	237	21	17	27	31	24
Physical Engineering	Full-time	12	16	13	15	17	30	46	58	72	85	0	0	0	4	8
Mechanical Engineering	Full-time	150	150	144	149	149	879	879	892	915	923	130	112	101	114	150
Chemical Engineering	Full-time	64	62	64	66	64	343	355	348	353	350	41	58	50	59	47
	Evening	44	46	46	44	51	260	269	286	282	301	31	24	38	25	61
Statistics	Full-time	79	79	80	84	91	299	315	317	328	336	32	33	21	30	54
Literary Studies	Full-time	25	29	27	32	27	106	112	119	126	111	16	16	19	25	16
Pharmacy	Full-time	41	45	44	46	45	220	223	228	252	255	37	31	17	38	35
Philosophy	Full-time	47	55	43	36	40	170	175	174	167	165	28	27	16	14	18
Physics	Full-time	98	88	87	94	92	380	391	412	405	410	43	41	48	46	44
Speech therapy	Full-time	34	35	33	30	33	120	131	132	137	131	20	24	21	34	30
Geography	Full-time	26	24	30	30	32	80	98	106	114	123	3	14	19	17	20
	Evening	46	56	48	50	63	212	207	196	201	217	41	40	19	35	32
Geology	Full-time	24	25	22	25	36	184	175	155	148	149	27	38	24	24	25
Management of Int. Trade	Evening	0	3	0	0	1	224	182	144	80	37	42	34	57	40	24
Business Management**	Evening	0	1	1	0	0	229	176	129	66	25	50	39	57	36	16



TABLE 2. TOTAL UNDERGRADUATE STUDENTS, BY YEAR – ENTRANTS (ENTRANCE EXAM OR OTHER ADMISSION METHODS, INCLUDING REMAINING PLACES), ENROLLEES, AND GRADUATES

Program Name	Period	Total Freshmen					Total Enrollees					Total Graduates				
		2014	2015	2016	2017	2018	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Public Policy Management**	Evening	1	0	1	1	1	206	166	125	79	26	28	27	38	43	14
Agribusiness Management*	Evening	1	1	1	1	0	192	157	127	79	40	23	21	41	32	24
History	Full-time	53	55	59	62	56	210	204	214	217	216	48	39	47	47	50
Teaching training Degree in Biological Sciences	Evening	50	49	48	50	50	242	250	245	249	253	35	41	42	35	28
Teaching training Degree in Physics	Evening	58	59	53	55	57	172	173	177	181	180	9	6	5	10	8
Teaching training Degree in Language – Portuguese	Full-time	40	39	39	39	41	155	162	167	165	173	23	28	33	23	23
	Evening	36	41	38	40	42	173	179	171	184	194	22	35	17	17	18
Teaching training Degree in Mathematics	Evening	81	76	82	82	96	270	264	286	285	301	35	23	28	21	20
Teaching training Degree in Chemistry/Physics	Evening	48	36	40	44	51	153	145	151	156	182	6	4	7	6	11
Linguistics	Full-time	23	26	23	28	26	101	105	108	109	105	11	13	11	14	15
Mathematics	Full-time	38	28	35	20	41	122	117	123	123	137	17	13	9	9	22
Mathematics /Physics/ Computational Math	Full-time	37	42	30	38	33	59	63	55	58	50	0	0	0	0	0
Applied and Computational Mathematics	Full-time	22	35	33	45	32	121	134	130	145	150	11	13	11	10	11
Medicine	Full-time	116	115	122	121	123	680	692	712	722	740	103	101	108	104	126
Music	Full-time	85	84	73	65	76	371	366	366	370	352	68	52	48	68	63
Nutrition	Full-time	62	62	65	62	67	242	256	259	298	319	44	53	16	34	59
Dentistry	Full-time	83	71	81	81	84	330	320	386	385	408	68	11	77	54	65
Pedagogy	Full-time	48	46	48	52	48	227	222	212	219	221	43	44	37	32	49
	Evening	56	53	49	50	45	247	250	259	263	249	31	30	40	38	47

continued

TABLE 2. TOTAL UNDERGRADUATE STUDENTS, BY YEAR – ENTRANTS (ENTRANCE EXAM OR OTHER ADMISSION METHODS, INCLUDING REMAINING PLACES), ENROLLEES, AND GRADUATES

continued

Program Name	Period	Total Freshmen					Total Enrollees					Total Graduates				
		2014	2015	2016	2017	2018	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Chemistry	Full-time	90	93	102	101	92	398	401	418	412	398	51	61	60	60	56
Technological Chemistry	Evening	49	48	50	49	47	256	254	258	262	251	23	30	24	32	30
Information Systems	Full-time	47	49	50	45	48	91	135	177	214	227	0	0	3	25	35
Tech. Civil Construction*	Evening	0	0	2	0	0	36	18	12	5	1	15	4	4	4	1
Tech. Environmental Control/Sanitation*	Full-time	0	0	0	0	0	33	11	1	0	0	12	6	1	0	0
Tech. Telecommunications Syst.	Full-time	1	0	0	0	0	67	26	13	2	0	10	12	11	2	0
Tech. Anal. Development of Systems*	Full-time	0	0	0	0	0	94	62	29	6	1	18	24	18	3	1
Tech. Construction of Roads*	Evening	2	0	0	0	0	39	24	14	3	2	5	4	9	1	2
Tech. Environmental Control/Sanitation	Evening	9	1	0	0	0	65	48	30	10	3	4	8	14	7	3
Overall Total		4,179	4,142	4,147	4,230	4,323	18,171	18,497	18,936	19,255	19,581	2,495	2,541	2,609	2,619	2,989

Source: DAC, 2019.

Notes: 1. Unicamp offers full-time programs (08:00 am to 12:00 am and 2:00 pm to 06:00 pm) and evening programs (07:00 pm to 11:00 pm), with different admissions to the diverse careers.

\* Programs ended in the period, but that had enrolled students, still without completion.

In May 2017, meetings for situational diagnosis and planning were held among the PRG divisions that resulted in Strategic Projects to be implemented from June/2017 to April/2021<sup>1</sup>. Together, these projects might support a qualified education process for innovative professionals, aiming at the best academic results, with the best possible educational experience. The projects have boosted collaborative actions between the PRG divisions, with other Pro-Rectories and University services, aligned with Unicamp's strategic vision. They also sought to offer greater support to the undergraduate coordinations and secretariats. The role of continuing training and educational advisory of the Teaching and Learning Supporting Space – [ea]2, associated with the Educational Technologies Management Group (GGTE) was intensified. These projects had important impact on the programs and will be mentioned numerous times in this chapter.

The proposed projects were:



**Access and Success** – Project to implement the new access policy aimed at promoting inclusion, ethnic-racial, social and regional diversity, with change in admission methods (ethnic-social quotas, National High School Exam (Enem), Indigenous Entrance Exam, Olympic places, new Affirmative Action and Social Inclusion Program, Affirmative Action and Social Inclusion Program (PAAIS), ProFIS).



**Support project for restructuring all undergraduate academic programs**, revising their educational program projects (PPC), towards flexibility, interdisciplinarity, with a student-centered, hybrid, project-based and collaborative learning design.



**Project for the development of indicators and provision of reports to support curricular renewal**, consistent with the indicators of federal and state regulatory bodies, also defining requirements for the implementation of standardized database that enables comparisons, analysis of student and program performance, and supports discussions on academic policies. Provide subsidies for academic flow management improvement and capacity-building, including academic flow predictability and action-taking.



**Project to revise management process of the scholarship policy**, qualification of aids that support student permanence and information systems to control flow and generate data on the granting of scholarships and aids.



**Project that aims to implement actions to promote well-being**, prevent difficulties in coping with the demands of university life and early identification and initial management in situations of psychological

1. [https://www.prg.Unicamp.br/?page\\_id=124101](https://www.prg.Unicamp.br/?page_id=124101)

suffering of students, with a relevant role to create and support effective communication channel among faculty, students, secretariats and coordinations with mental health professionals and services at Unicamp.



Educational development and support project focusing on enabling faculty of the first semesters of undergraduate programs to contribute to the new students' integration into the academic environment and to better academic results.



Training and consulting project on educational principles and practices for graduate students in teaching internship by the PED-PRPG/PRG program, aiming at their effective contribution as facilitators of the learning process for undergraduate students, together with the responsible professor.



The project aims to support the Undergraduate Secretariats, with optimization of processes and continuous training programs, promoting capacity building, optimization of human resources, and improvement of administrative procedures in order to offer a better support to faculty, students and program coordinators.



The project seeks to establish a partnership with alumni for the purpose of being informed by their perception of the training experience, and feedback on their professional career to orient curricular revisions. In addition, it intends to establish a connection between graduate students and the institution, allowing their voluntary contribution to the training of undergraduate students and maintenance of collegial ties.

This report summarizes data obtained from academic information systems, supplemented by the answers to the questions presented to the 24 schools for self-evaluation. The text's structure is organized into seven main subjects: (1) Profile and performance of students (2) Curriculum of programs, (3) Faculty and teaching assistants, (4) Academic management, resources and infrastructure, (5) Institutional Evaluation and awards, (6) ProFIS, and (7) Conclusion. Contents are described below:

- *Profile and Performance of Students* – geographic and socioeconomic profile, ethnic-racial profile, presence of disabilities, candidate/place ratio and bonuses, profile of enrollees and performance in programs, and academic flow of enrollees.
- *Curricular Schools program evaluation, renewal and supplementary activities* – Presenting aspects of curricular structures and their reformulations, elective and extracurricular subjects, internships, participation in extracurricular complimentary activities, among others. The schools were questioned about aspects related to curricular innovation initiatives, optimization of curricula, integration of projects, use of complimentary electronic resources, international

- exchanges, among others. This item is supplemented by the evaluations made by the students at the end of the subjects.
- *Faculty activities and Teaching Assistants* – Offering information on the workload represented by undergraduate teaching, the contribution of teaching assistants' support and on faculty members' participation in professional development initiatives, offered by the Teaching and Learning Support Space [ea]2, including the Welcome Program for New Faculty.
  - *Academic Management, Resources and Infrastructure* – Includes aspects about classrooms, equipment, laboratories, libraries and infrastructure for hybrid teaching, and initiatives to support Schools' undergraduate departments and laboratories. We discuss the alignment of the programs proposed by the PRG with the CGs, NDE and Congregation (the school board). In this item, the results of the application of budgetary and extrabudgetary resources in programs and processes also are analyzed, and data on the impact of international partnership, student exchange, and double diploma programs are presented.
  - *Institutional Evaluation and Awards* – this topic presents the actions carried out by the schools, based on the internal and external evaluations that followed the 2008–2013 Institutional Evaluation. The actions that were part of the Strategic Planning – PLANES – of the University. The Awards obtained by faculty and student projects in the different programs are also highlighted.
  - *ProFIS* – Refers to data on the Higher Education Interdisciplinary Training Program, sequential, with admission by ENEM performance, exclusive for students from public schools in Campinas.
  - *Conclusion* – Synthetizes advances, challenges and prospects (considering the 2014–2018 institutional evaluation and 2016–2020 strategic planning proposals)

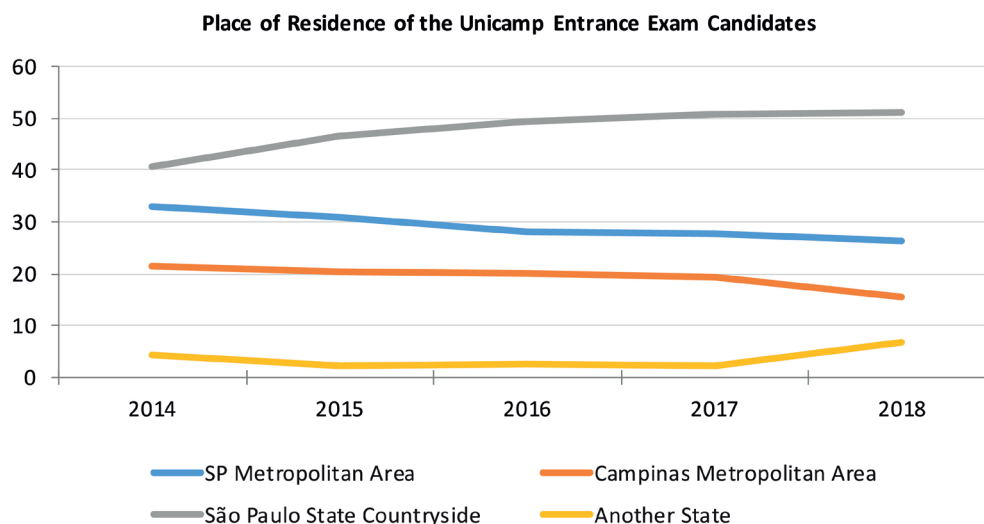
## 3.1 Profile and Performance of Students

### 3.1.1 Candidates for places at Unicamp

From 2014 to 2018, Unicamp received an annual average of 76,000 applications for the entrance exam for the places available in the 69 undergraduate programs. The Affirmative Action and Social Inclusion Program (PAAIS) has been operative since 2004, providing a bonus to students who attended secondary education (SE) in public schools (PS), with additional scores for black, brown and indigenous (BBI) people. In the 2014 and 2015, for the entrance exams, the bonus was applied by adding 60 points to the standardized option score (NPO) for public school students and 20 points for self-declared BBI students, but in this case, only in the 2nd phase of the exam. Between 2016 and 2018, the bonus for public school was increased, adding 60 points to the final score of the first phase of the exam (NFI) and another 90 points for each test in the second phase, if the candidate were qualified. Moreover, self-declared BBI students received additional 20 points in the NFI, and those qualified for the second phase received another 30 points. Other admission methods (quotas, indigenous entrance exam and Olympic places) were included in 2019.

There was growth in the number of students from the São Paulo state countryside (majority), with some reduction in students from the capital and Campinas metropolitan areas. The fraction corresponding to the state's countryside reached 50% of the candidates in 2018. However, the proportion of candidates from outside the state also increased (Graph 3.1).

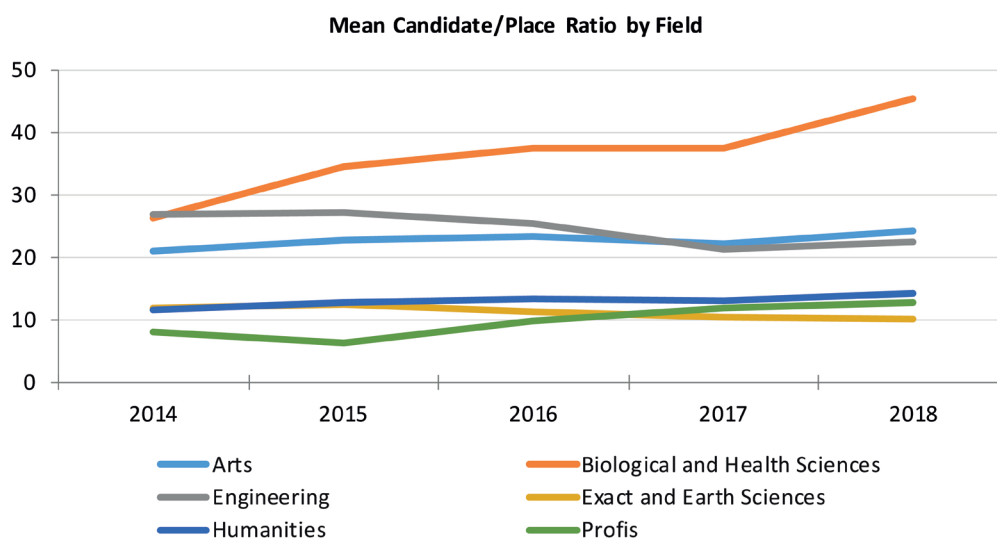
GRAPH 3.1. GEOGRAPHIC DISTRIBUTION OF THE UNICAMP ENTRANCE EXAM CANDIDATES BETWEEN 2014 AND 2018, ACCORDING TO PLACE OF RESIDENCE



Source: Comvest, 2019. Prepared by PRG.

Graph 3.2 presents the candidate/place ratios in the Entrance Exam for the different programs of Unicamp. Competition has increased in the fields of Biological and Health Sciences (mainly), Arts, and Humanities, with decreased demand for Engineering and Exact and Earth.

GRAPH 3.2. CANDIDATE/PLACE RATIO BY PROGRAM IN THE UNICAMP ENTRANCE EXAM AND GROUPED BY FIELD OF KNOWLEDGE IN THE 2014–2018 PERIOD



Source: Comvest, 2019. Prepared by PRG.

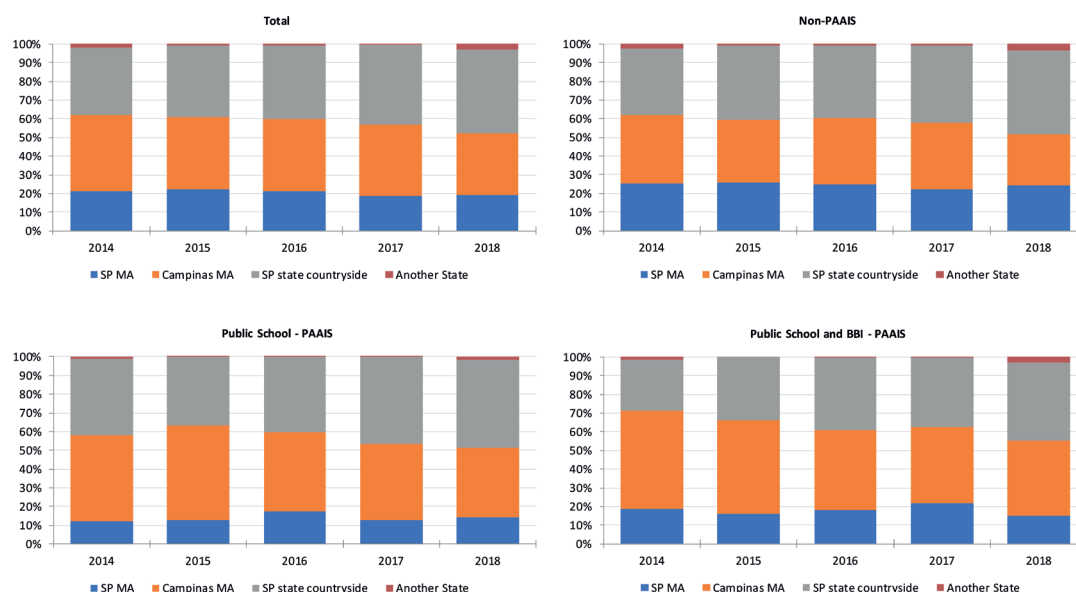


Program coordinations were asked whether the information on candidate profile and freshmen performance are disseminated and used by schools, in particular for faculty who work with freshmen. Most programs analyzed and disseminated information on student profile and on performance in the entrance exam. However, a smaller fraction used this information for academic planning. Comments are often made on the students' unpreparedness prior to higher education that prevents them from following academic proposals. In these cases, there are reiterated discussions on the relevance of support courses or creation of classes or differentiation in curricular development according to entrance exam performance, especially for basic subjects in Exact and Earth Sciences and Engineering and Technology programs, notably subjects on Calculus, Physics and Analytical Geometry. This has motivated new educational strategies with more hybrid characteristics, based on examples relevant to programs.

### 3.1.2 Profile of Unicamp entrants

Graph 3.3 presents the origin of the entrants enrolled in Unicamp for each admission category (non-PAAIS – Affirmative Action and Social Inclusion Program, Public School PS-PAAIS, Public School PAAIS and BBI – self-declared black, brown and indigenous people) between 2014 and 2018. The distribution by residence shows, in all groups, a progressive increase in entrants from the São Paulo state countryside and the emergence of entrants from other states.

GRAPH 3.3. DISTRIBUTION OF ENTRANTS BY TYPE OF ADMISSION  
ACCORDING TO PLACE OF RESIDENCE BY YEAR, BETWEEN 2014 AND 2018

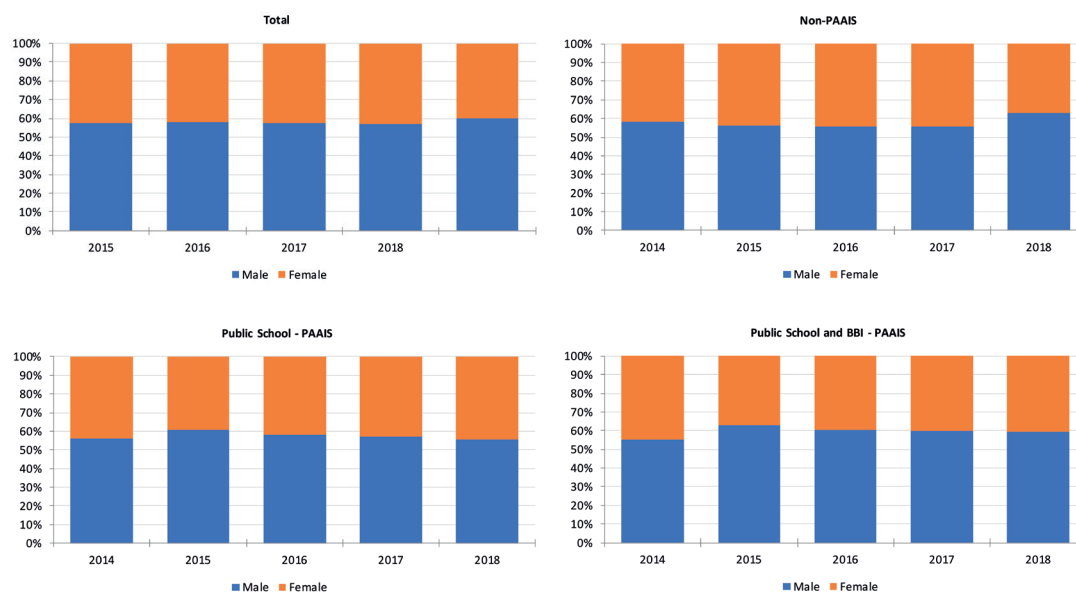


Source: Comvest, 2019. Prepared by PRG.

In Graphs 3.4, 3.5 and 3.6 the characteristics of students who entered in the period are analyzed considering sex, age and ethnicity, distributed into admission categories without

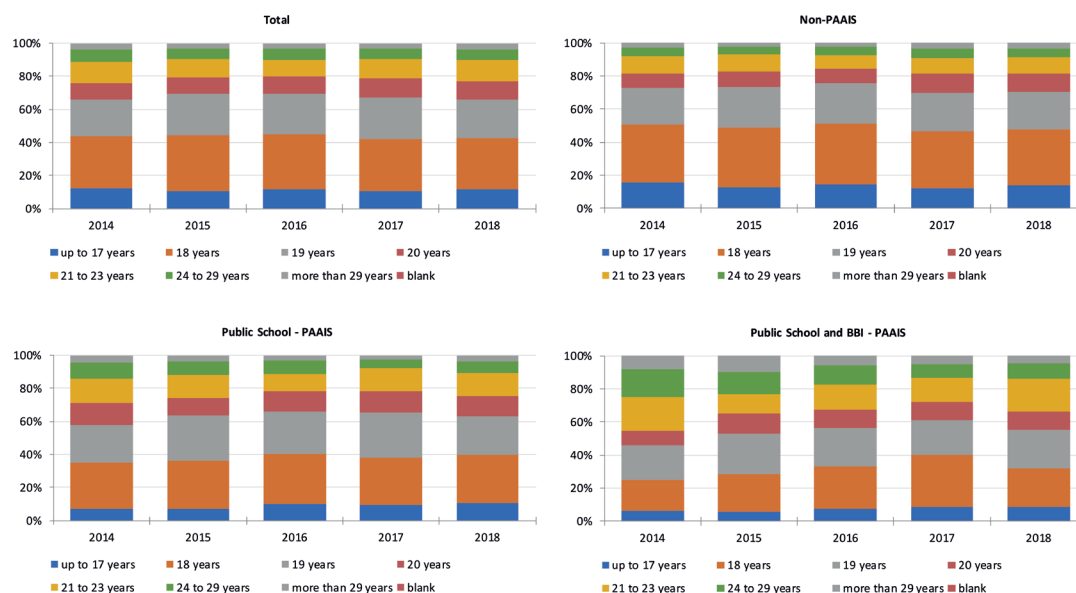
or with bonus (Public School PAAIS, Public School PAAIS and BBI). Regardless of the group, about 60% of the entrants were male and about 70% of non-PAAIS students were aged up to 19 years. The percentage of students aged up to 19 years decreases slightly (about 60%) in the PS-PAAIS, and about 50% in the BBI-PAAIS – Graph 5.

GRAPH 3.4. DISTRIBUTION BY YEAR OF THE ENTRANTS BY TYPE OF ADMISSION ACCORDING TO SEX, BETWEEN 2014 AND 2018 AND CORRELATION WITH THE ADMISSION METHOD



Source: Comvest, 2019. Prepared by PRG.

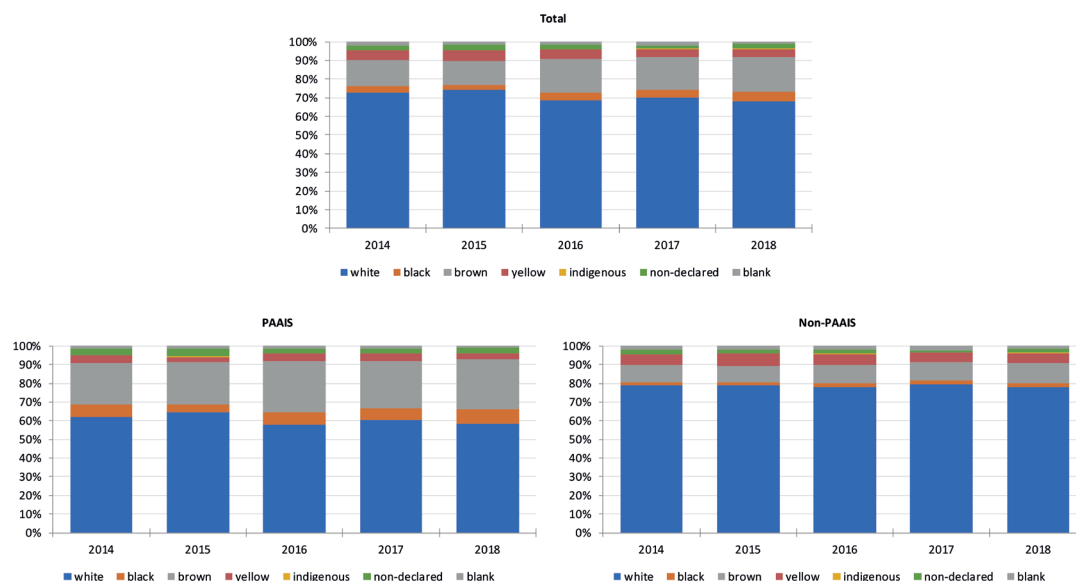
GRAPH 3.5. DISTRIBUTION OF THE ENTRANTS ACCORDING TO AGE AND CORRELATION WITH THE ADMISSION METHOD, BY YEAR, BETWEEN 2014 AND 2018



Source: Comvest, 2019. Prepared by PRG.

About 70% of Unicamp entrants between 2014 and 2018 self-declared as white. Among PAAIS students, there was a progressive increase in the proportion of blacks/browns, which was more than double that of the non-PAAIS group in 2018, reaching almost 33% versus 12% – Graph 3.6.

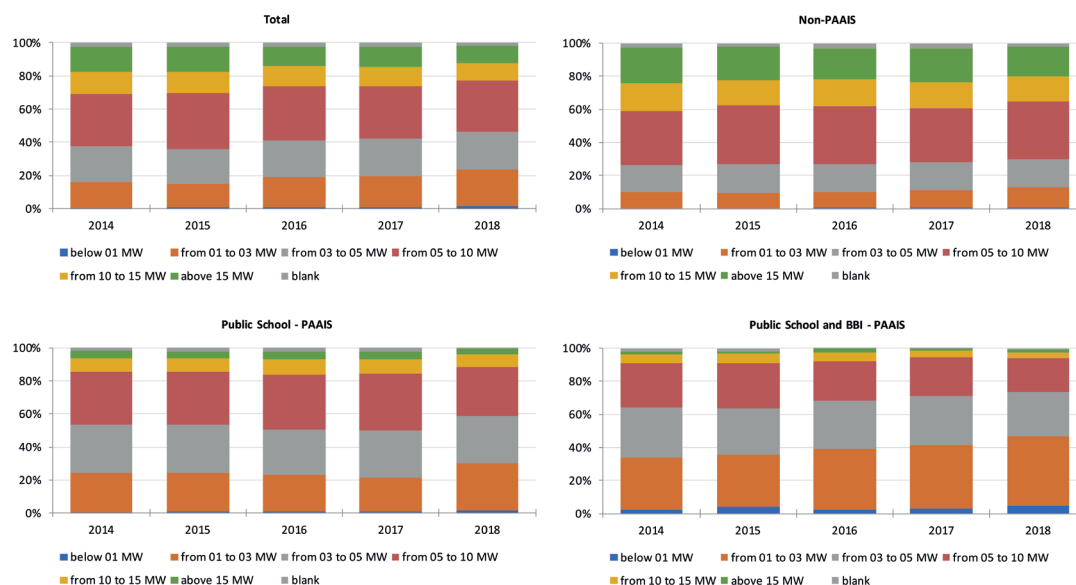
GRAPH 3.6. DISTRIBUTION OF THE ENTRANTS BY TYPE OF ADMISSION ACCORDING TO ETHNICITY, BETWEEN 2014 AND 2018 AND CORRELATION WITH THE ADMISSION METHOD



Source: Comvest, 2019. Prepared by PRG.

The fraction of students with total family income up to three minimum wages increased, ranging from 10% for non-PAAIS entrants to 30% and 45% for the PS-PAAIS and PS/BBI-PAAIS groups – Graph 3.7.

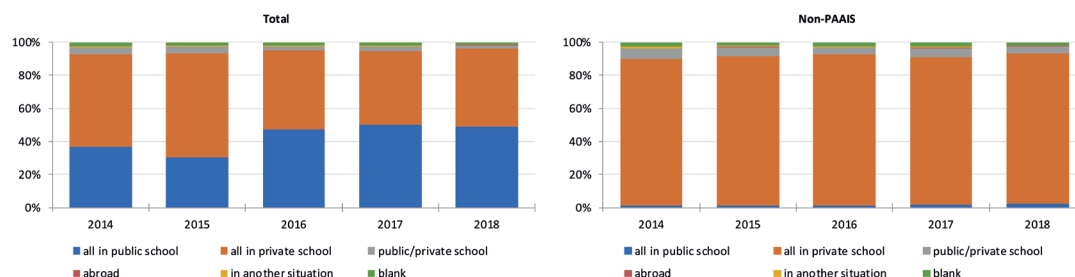
GRAPH 3.7. DISTRIBUTION OF THE ENTRANTS BETWEEN 2014 AND 2018, BY TYPE OF ADMISSION ACCORDING TO TOTAL MONTHLY FAMILY INCOME, AND CORRELATION WITH BONUS METHODS.



Source: Comvest, 2019. Prepared by PRG.

Graph 3.8 shows data on students approved in the entrance exams between 2014 and 2018, according to the schools where they had their previous education (secondary education). The first graph (total) shows an increase from about 35% in 2014–2015 to 50% of students from public schools in 2017 and 2018. In the non-PAAIS group, 95% studied in private schools.

GRAPH 3.8. DISTRIBUTION OF THE ENTRANTS IN THE UNICAMP UNDERGRADUATE PROGRAMS BETWEEN 2014 AND 2018, BY TYPE OF ADMISSION, AND ACCORDING TO SECONDARY EDUCATION

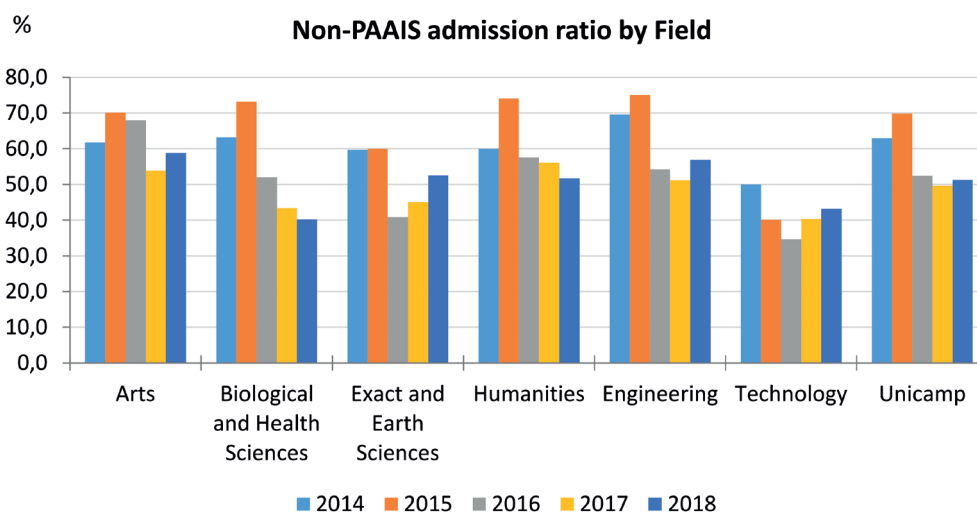


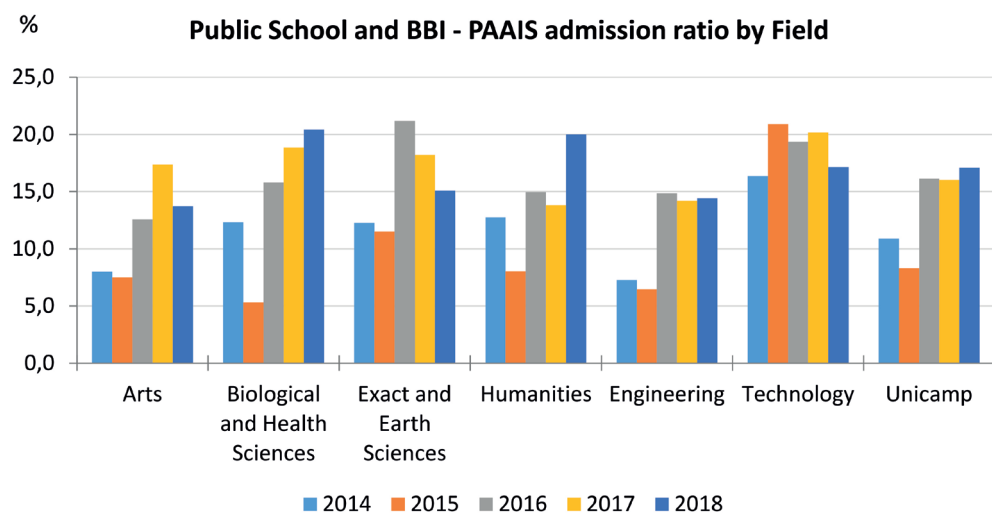
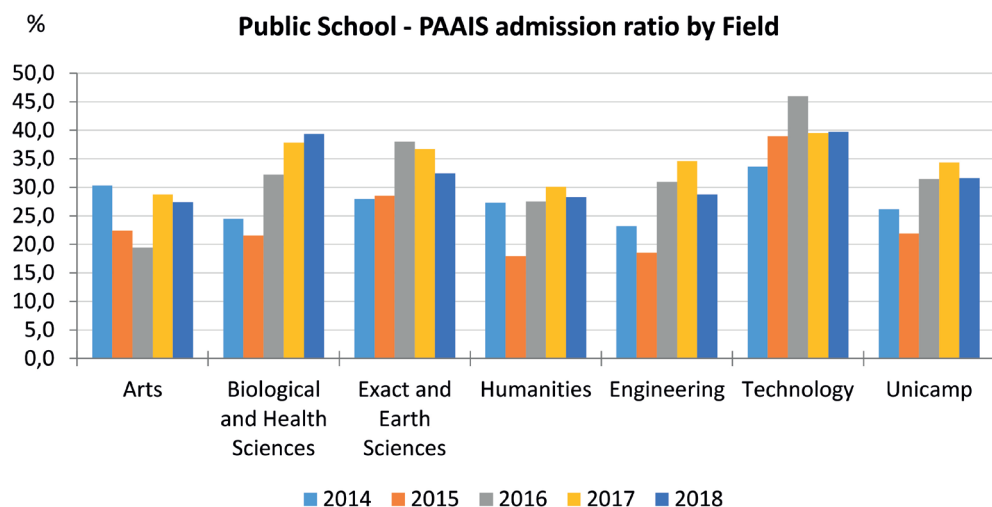
Source: Comvest, 2019. Prepared by PRG.

Graph 3.9 shows the distribution of the entrants by field of knowledge for the different bonus groups over the last five years. In general, there was a slight decrease in the proportion of students who entered Unicamp without receiving bonuses. Notably, between 2016 and 2018 there was a progressive increase in the fraction of students who received PAAIS bonus for all areas, with greater emphasis on the fields of Biological and Health Sciences and Humanities.

Most programs reported that they disseminate information about the socioeconomic profile of entrants in the programs and that they used this information to plan the programs and analyze the performance of the students.

GRAPH 3.9. DISTRIBUTION OF ENTRANTS IN UNICAMP'S UNDERGRADUATE PROGRAMS FROM 2014 TO 2018 BY FIELD OF KNOWLEDGE, ACCORDING TO BONUS GROUPS





Source: Comvest, 2019. Prepared by PRG.

Three special groups of students should be highlighted: indigenous people, foreigners, and self-declared disabled persons. We identified 49 indigenous persons in undergraduate programs between 2014 and 2018 (prior to the Unicamp indigenous entrance exam, started in 2019). About a third of these students were in programs in the field of Humanities, followed by Engineering and by Exact and Earth Sciences, with one student in Biological and Health Sciences (Table 3.3).

TABLE 3.3. DISTRIBUTION OF INDIGENOUS STUDENTS IN UNDERGRADUATE PROGRAMS AT UNICAMP, BY FIELD OF KNOWLEDGE, FROM 2014 TO 2018

Field of knowledge	Number of students
Arts	4
Biological and Health Sciences	1
Engineering	12
Exact and Earth Sciences	9
Humanities	16
Technology	7
Total	49

Source: DAC, 2019. Prepared by PRG.

Among the reduced number of self-identified disabled students, most presented visual impairment, followed by physical impairment and hearing impairment. The field of Humanities received 12 of these students, followed by the fields of Biological and Health Sciences and Exact and Earth Sciences – Table 3.4.

TABLE 3.4. DISTRIBUTION OF STUDENTS WITH DISABILITIES/SPECIAL NEED, ENTRANTS IN UNICAMP'S UNDERGRADUATE PROGRAMS IN THE PERIOD BETWEEN 2014 AND 2018

Field	Total Entrants Disability	Physical	Hearing	Visual
Arts	2	0	1	1
Biological and Health Sciences	8	4	1	3
Engineering	4	3	0	1
Exact and Earth Sciences	7	2	2	3
Humanities	12	4	1	7
Technology	1	0	0	1
Total	34	13	5	16

Source: DAC, 2019. Prepared by PRG.

Between 2014 and 2018, Unicamp received 153 foreign students, including 80 students admitted by the Undergraduate Students Exchange Program (PEC-G) – which serves countries with which Brazil maintains cultural agreement, added to nine refugees and other students admitted by supplementary admission methods (vacant places, other agreements, double diploma, ex-officio transfer and diplomatic courtesy). Most of these students came from South and Central America (59%), followed by students from Africa (28%), Europe (17%), and Asia (13%). Biological and Health Sciences programs received the highest percentage of students from Africa and the Americas. Humanities received students from South and Central America. In Engineering there was a relatively even distribution, including Europe, Africa and South America. The field of Exact and Earth Sciences received students from Asia, as well as from the other regions. Sixty percent of PEC-G students came to the Humanities and Engineering fields (Table 3.5).



TABLE 3.5. DISTRIBUTION OF FOREIGN STUDENTS ENROLLED IN UNICAMP'S UNDERGRADUATE PROGRAMS, BETWEEN 2014 AND 2018, ACCORDING TO THEIR COUNTRIES OF ORIGIN AND BY FIELD OF KNOWLEDGE

Field of knowledge	Country	Total	PEC-G	Refugees	Other admission methods
Arts	Colombia	3	3	0	0
	Ecuador	2	2	0	0
	Honduras	2	2	0	0
	Mozambique	1	1	0	0
	Paraguay	1	1	0	0
	Peru	2	1	0	1
	Uruguay	1	1	0	0
	Total	12	11	0	1
Biological and Health Sciences	Angola	1	1	0	0
	Benin	1	1	0	0
	Bolivia	1	1	0	0
	Cape Verde	4	4	0	0
	Colombia	1	0	0	1
	Congo	1	0	1	0
	South Korea	1	0	0	1
	Cuba	1	0	0	1
	Guinea-Bissau	1	1	0	0
	Haiti	1	1	0	0
	Jamaica	1	1	0	0
	Panama	1	1	0	0
	Peru	1	0	0	1
	Portugal	1	0	0	1
	Sao Tome and Principe	2	2	0	0
	Syria	2	0	2	0
	Total	21	13	3	5
Engineering	Argentina	3	0	0	3
	Benin	2	2	0	0
	Cape Verde	5	4	0	1
	Canada	1	0	0	1
	China	2	0	0	2
	Colombia	3	3	0	0
	South Korea	2	0	0	2
	France	16	0	0	16
	Honduras	4	4	0	0
	Italy	3	0	0	3
	Mozambique	1	1	0	0
	Paraguay	4	3	0	1
	Peru	6	6	0	0
	Sao Tome and Principe	2	2	0	0
	Sierra Leone	1	0	1	0
	Syria	1	0	1	0
	Taiwan (Formosa)	1	0	0	1
	Venezuela	1	0	0	1
	Total	58	25	2	31

TABLE 3.5. DISTRIBUTION OF FOREIGN STUDENTS ENROLLED IN UNICAMP'S UNDERGRADUATE PROGRAMS, BETWEEN 2014 AND 2018, ACCORDING TO THEIR COUNTRIES OF ORIGIN AND BY FIELD OF KNOWLEDGE

continued

Field of knowledge	Country	Total	PEC-G	Refugees	Other admission methods
Exact and Earth Sciences	Cape Verde	1	1	0	0
	China	2	0	0	2
	South Korea	1	0	0	1
	Haiti	4	4	0	0
	Italy	1	0	0	1
	Japan	1	0	0	1
	Nicaragua	1	0	0	1
	Peru	2	1	0	1
	Total	13	6	0	7
Humanities	Germany	1	0	0	1
	Angola	3	3	0	0
	Argentina	2	0	0	2
	Bolivia	1	0	0	1
	Cape Verde	2	2	0	0
	Chile	1	1	0	0
	China	2	0	0	2
	Colombia	2	2	0	0
	South Korea	1	0	0	1
	Ecuador	2	2	0	0
	Spain	1	0	0	1
	Ghana	2	0	2	0
	Guinea-Bissau	2	2	0	0
	Haiti	10	9	0	1
	Lebanon	1	0	0	1
	Paraguay	1	1	0	0
	Peru	1	0	0	1
	Portugal	1	0	0	1
	Dem. Rep. of the Congo	1	0	1	0
	Dominican Republic	1	1	0	0
	Romania	1	0	0	1
	Syria	1	0	1	0
	Taiwan (Formosa)	1	0	0	1
	East Timor	1	1	0	0
	Uruguay	3	0	0	3
	Venezuela	1	1	0	0
	Total	46	25	4	17
Technology	Chile	1	0	0	1
	Paraguay	1	0	0	1
	Senegal	1	0	0	1
	Total	3	0	0	3
TOTAL		153	80	9	64

Source: DAC, 2019.

In addition, Unicamp received 1,801 foreign students in regular programs as special students or activities as interns in research laboratories – Table 3.6.

TABLE 3.6. NUMBER OF SPECIAL STUDENTS ENROLLED IN REGULAR UNDERGRADUATE PROGRAMS OR PARTICIPATING IN SOME INTERNSHIP AT UNICAMP BETWEEN 2014 AND 2018

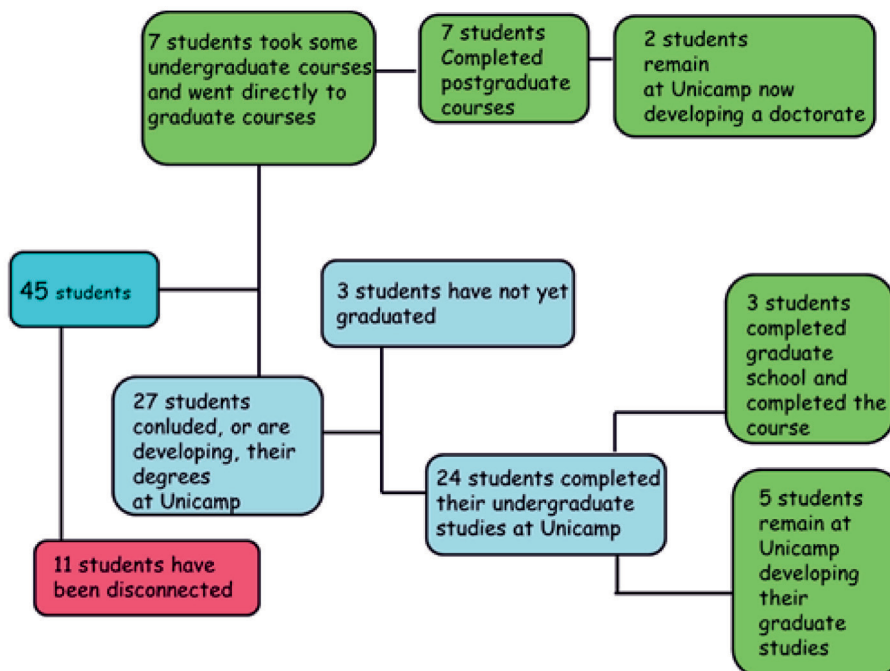
Country	Students	Country	Students
South Africa	2	England	15
Germany	79	Iran	17
West Germany	1	Ireland	1
Angola	8	Israel	1
Argentina	123	Italy	45
Australia	1	Japan	73
Austria	3	Lebanon	1
Bangladesh	1	Lithuania	1
Barbados	1	Morocco	1
Belgium	7	Mexico	87
Benin	3	Mozambique	4
Bolivia	18	Namibia	1
Botswana	1	Nigeria	4
Cape Verde	3	Norway	1
Cameroon	2	New Zealand	2
Canada	1	Panama	1
Chile	80	Pakistan	9
China	87	Paraguay	18
Colombia	491	Peru	150
South Korea	26	French Polynesia	1
Costa Rica	5	Poland	2
Croatia	1	Portugal	13
Cuba	10	Kenya	4
Denmark	4	Serbian Republic	2
Egypt	1	Czech Republic	3
Ecuador	29	Romania	2
Scotland	1	Russia	9
Slovakia	1	Syria	5
Spain	138	Sweden	2
United States of America	37	Switzerland	6
Finland	2	Tanzania	1
France	73	Tunisia	2
Ghana	3	Turkey	5
Guatemala	5	Ukraine	2
Guinea-Bissau	3	Uruguay	15
Haiti	3	Uzbekistan	1
Netherlands	6	Venezuela	16
Honduras	2	Zambia	2
India	12		
Indonesia	2	TOTAL	1,801

Source: DAC, 2019.

After a major earthquake occurred on January 12, 2010, in Haiti, severely compromising the population's future, CAPES launched the Pro-Haiti Higher Education Emergency

Program, aiming to help students to continue their studies at Brazilian universities. Unicamp was the institution that received the most Haitians in 2011, 45 students (36 men and 9 women), at different levels of graduation. A map of the trajectory of students welcomed at Unicamp from 2011 to 2019 is shown in Figure 3.1.

FIGURA 3.1. TRAJECTORY OF THE 45 STUDENTS FROM THE PRO-HAITI PROGRAM-CAPES RECEIVED AT UNICAMP IN 2011



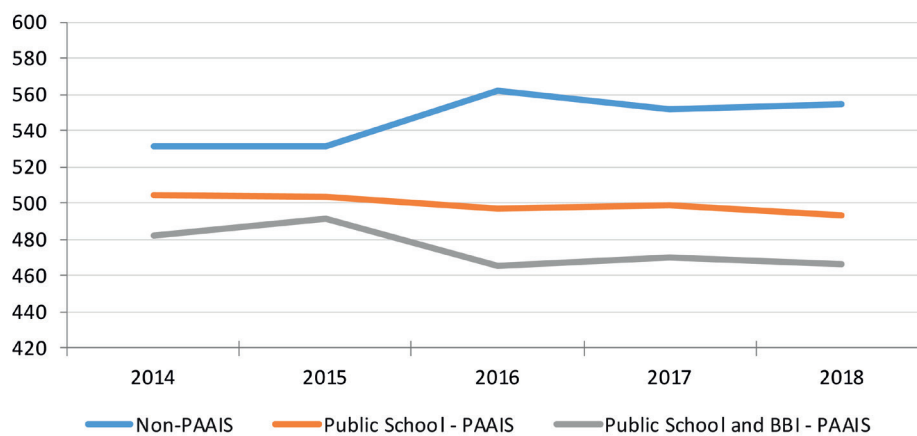
### 3.1.3 Entrance exam performance

The first graph in Graph 3.10 presents the means of those approved in the entrance exam in the period. The performance of students without bonus was 3% to 10% higher than that of students who received bonus (PS-PAAIS and BBI-PAAIS). The average performance of BBI students was lower than that of PS-PAAIS students and remained constant. Overall, the performance of the non-PAAIS group students improved. It is important to note that the change in the 2016 PAAIS, with a very significant increase in bonuses, contributes to increased discrepancies between scores of the PAAIS and Non-PAAIS groups.

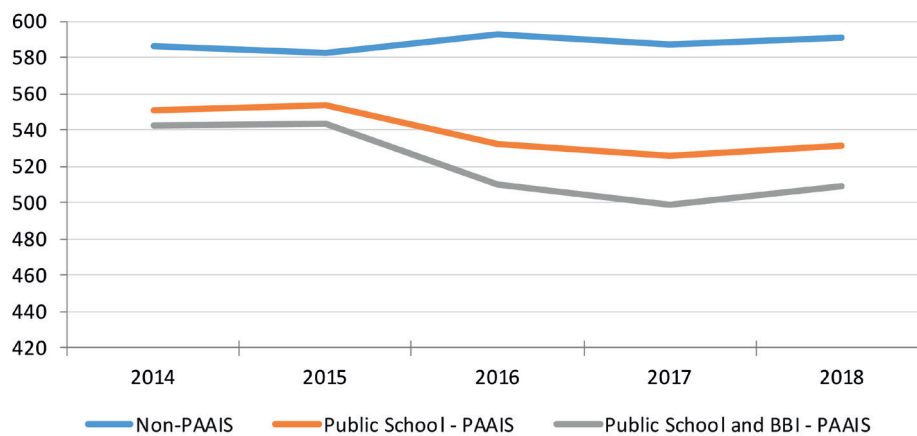
GRAPH 3.10. GENERAL MEAN SCORE AND SCORE BY FIELDS OF ENTRANTS  
IN UNICAMP'S UNDERGRADUATE PROGRAMS, BY TYPE OF ADMISSION,  
IN THE ENTRANCE EXAMS HELD BETWEEN 2014 AND 2018



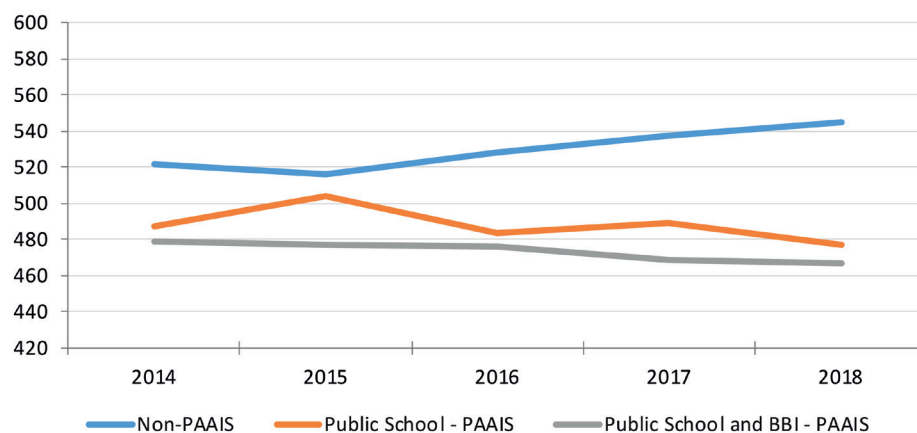
### Exact and Earth Sciences



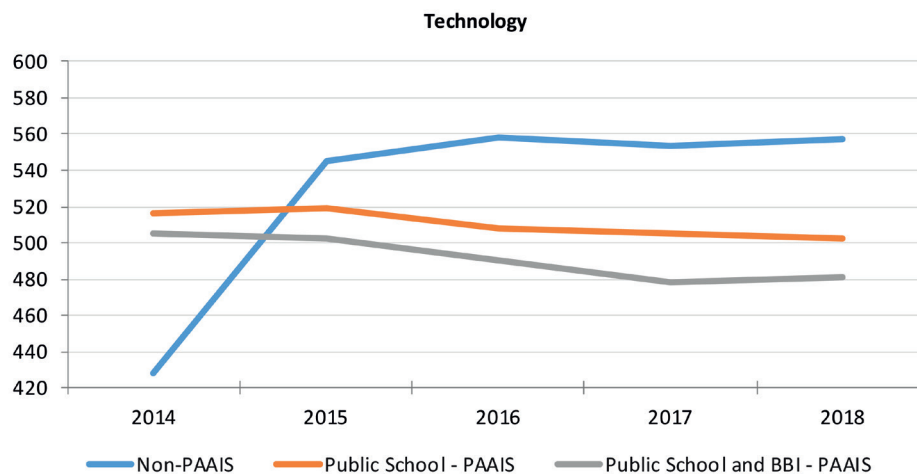
### Engineering



### Humanities







Source: Comvest, 2019. Prepared by PRG.

### 3.1.4 Student academic flow

In the period between 2014 and 2018, 4,437 disciplines were provided, which received 874,071 enrollments and had pass rate of 87%. A total of 72% of the enrollments (625,485) were made in mandatory disciplines with pass rates equal to or greater than 80%.

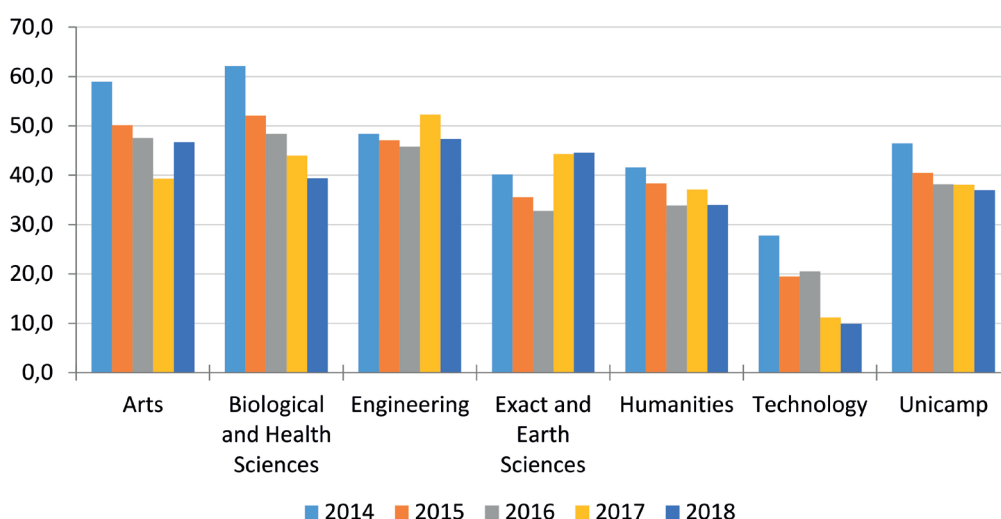
The coordinators were asked to report the strategies already adopted to reduce failure rates of students on first enrollment in mandatory subject that had greater than 20% reproval. About 35% of the programs report that they did not have failures at this level. For 45% of the programs that recognized this problem, the strategies adopted included guidance to students and faculty, curriculum restructuring, allocation of PAD and PED scholarship students. The following were pointed as causes of the high failure rates: unpreparedness of entrant students, excessive workload, difficulties with basic subjects. Approximately 16% of the programs reported having no strategies to reduce these rates.

As shown in Graph 3.11, based on official Office of the Registrar (DAC) data, about 40% of Unicamp students who completed their programs met the suggested completion time. For students enrolled in the fields of Biological Sciences, Humanities, Arts and Technology, over the five years, there was a decrease in this percentage. According to some program coordinators, the longer completion time is explained by different reasons, including: participation in the Science without Borders Program; the profile of the new generation of students, which are more prone to new experiences; difficulties to accommodate life and university demands; option to conduct multiple internships during the program. The fraction of students who completed their programs in the suggested completion time remained virtually constant in the fields of Exact and Earth Sciences and Engineering.

Heterogeneity is observed in the program completion rate in the same field and by school. The percentage of students who completed the Medicine and Dentistry programs

in the suggested time is virtually 100%, but in Sports Sciences, Physical Education, Nursing and Pharmacy the percentages are around 45%. In contrast, the percentage of students who graduated in the suggested time in the Technology field was 10% in 2017–2018, with an important reduction during the five-year period. About 70% of the Music students completed their programs in the suggested time, but only 20% of the Visual Arts students did so. In most Humanities programs, about 50% of the students completed the program in the suggested time, with a lower percentage for the Economic Sciences, Public Policy Management, and Agribusiness Management programs (the latter ones closed in the period). In the field of Exact and Earth Sciences, except for the Chemistry program, about 50% of the students, on average, completed their programs in the suggested completion time. In the Engineering field, the distribution was regular between the programs, except for Agricultural Engineering. In some Engineering programs, such as Food and Manufacturing Engineering, the percentage of students who completed the program in the suggested time decreased in the last five years.

GRAPH 3.11. DISTRIBUTION (%) OF STUDENTS WHO COMPLETED UNICAMP'S PROGRAMS WITHIN THE MINIMUM SUGGESTED COMPLETION TIME BETWEEN 2014 AND 2018

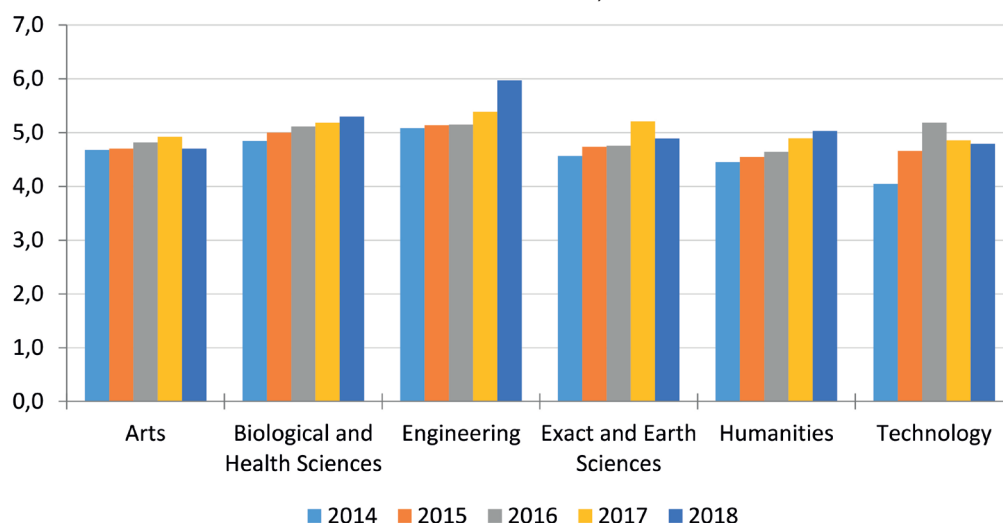


Source: DAC, 2019.

Unicamp undergraduate programs' average completion time between 2014 and 2018 is presented in Graph 3.12. The mean for the completion time was approximately 5 years. The mean completion time has increased in all cases (about 1 semester on average in the last 5 years). However, the differences in the minimum time suggested for the completion of each program have to be considered for such analysis (see Table 1).

The percentage distribution of students who completed the Teaching training degree programs within the suggested time and the mean completion time are presented in Table 3.7. Full-time Teaching training degree programs had increased percentages, while percentages decreased in evening Teaching training degree programs.

GRAPH 3.12. MEAN COMPLETION TIME OF UNICAMP STUDENTS  
IN THE VARIOUS FIELDS OF KNOWLEDGE, BETWEEN 2014 AND 2018



Source: DAC, 2019. Prepared by PRG.

TABLE 3.7. PERCENTAGE OF STUDENTS WHO COMPLETED TEACHING  
TRAINING DEGREE PROGRAMS WITH EXCLUSIVE ADMISSION BY ENTRANCE  
EXAM\* IN THE SUGGESTED TIME AND MEAN COMPLETION TIME.

Program	Completion	Year				
		2014	2015	2016	2017	2018
Pedagogy (Full-time)	Mean time	4.8	4.6	4.5	4.8	4.6
	% Minimum time	32.6	47.7	48.7	31.3	44.9
Pedagogy (Evening)	Mean time	4.9	5.7	5.4	5.2	5.3
	% Minimum time	67.7	46.7	55.0	52.6	59.6
Integrated Teaching Training Program Chemistry/Physics	Mean time	7.0	5.8	5.3	5.0	5.3
	% Minimum time	0.0	25.0	57.1	50.0	36.4
Mathematics Teaching Training Program	Mean time	5.0	4.9	5.1	5.3	5.1
	% Minimum time	37.1	39.1	42.9	42.9	25.0
Biological Sciences Teaching Training Program	Mean time	5.0	5.3	5.2	5.3	5.5
	% Minimum time	80.0	61.0	78.6	68.6	53.6
Language – Portuguese Teaching Training Program (Full-time)	Mean time	4.7	4.4	4.7	4.8	4.3
	% Minimum time	43.5	53.6	42.4	50.0	65.2
Language – Portuguese Teaching Training Program (Evening)	Mean time	5.3	5.2	5.1	4.8	5.4
	% Minimum time	63.6	60.0	58.8	88.2	50.0
Physics Teaching Training Program	Mean time	5.2	5.7	5.5	5.6	3.8
	% Minimum time	55.6	33.3	25.0	44.4	62.5

Source: DAC, 2019.

Note: \*Unicamp has 23 Teaching Training programs, of which 9 programs with exclusive and direct admission by entrance exam and 14 qualifications. This table excludes the 14 Teaching Training programs that are considered qualifications and follow the completion of the undergraduate program due to the impossibility of proper calculation of these times (see Table 1)

Table 3.8 shows data on the completion of students who did not receive bonus (PAAIS) and of those who received bonus. It can be observed that the mean program completion time in all fields is longer; the fraction of graduates is lower for PAAIS students, and the

proportion of students completing programs in the maximum time is higher among them. It is noted that the fields of Exact and Earth Sciences and Technology present the lowest fraction of graduates in both groups (around 50%).

TABLE 3.8. PERCENTAGE OF STUDENTS WHO COMPLETED UNDERGRADUATE PROGRAMS BY FIELD OF KNOWLEDGE IN THE SUGGESTED COMPLETION TIME AND REGULATORY MAXIMUM COMPLETION TIME AND MEAN COMPLETION TIME ACCORDING TO PAAIS BONUS

Field	Bonus	Completion Mean time (years)	% graduates Suggested time*	% graduates Maximum time
Arts	without	4	59	84.2
	PAAIS	5.2	47.7	77.3
Biological and Health Sciences	without	4.6	64.5	81.5
	PAAIS	5	52.6	83.3
Engineering	without	5.7	40.4	74.9
	PAAIS	5.8	47.1	74.7
Exact and Earth Sciences	without	4.7	21.5	45.6
	PAAIS	5.7	14.4	49.8
Humanities	without	4.3	30.9	68.6
	PAAIS	5.2	22.6	68.6
Technology	without	4.3	15.5	42.2
	PAAIS	5.1	10.1	51.7

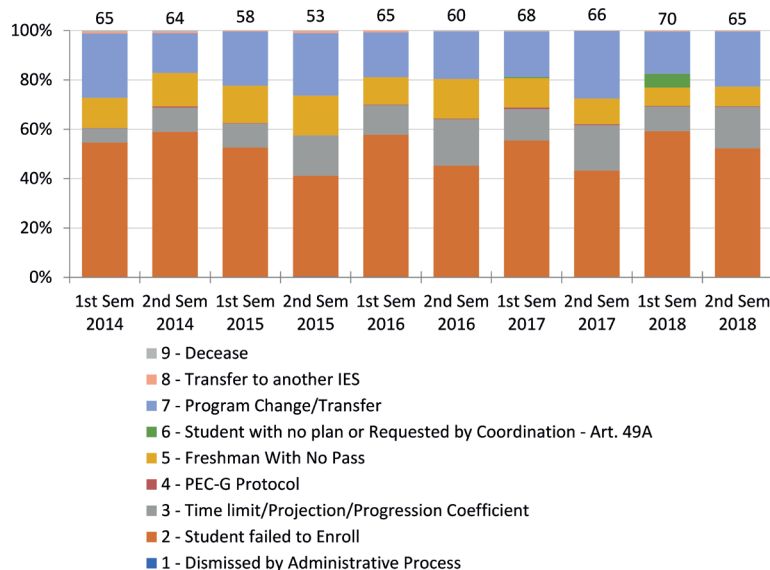
Source: DAC, 2019.

Note: \*considering the expected years for completion of each program individually

Schools were asked to reflect on the possible factors associated with the evolution of the mean completion time, the percentage of completion at the minimum time and the maximum time (150%) observed in the 2014–2018 period. About one third of the programs did not highlight variation over the five years analyzed and several interpretations were presented by the coordinators to explain the increase in the mean completion time: participation in exchange programs (mainly in the Science without Borders Program), participation in internships, permanence due to economic crisis, and academic difficulties for basic disciplines during initial cycle of the educational program.

Graph 3.13 shows the reasons for the dismissal of undergraduate students from Unicamp programs in each semester, between 2014 and 2018. The following categories are registered by DAC: I – administrative process; II – by time limit (above the maximum time), by projection (academic performance confirms impossibility of completing the program within the maximum time), by coefficient of progression (CP, index that measures the amount of credits fulfilled by the student, in relation to the total required in the curriculum of the program, qualification/emphasis, scored from zero (0) to one (1.0)); III – freshman reproof (failure in all disciplines during the 1st semester); IV – by change of program, internal relocation; V – death; VI- student failed to renew enrollment; VII – PEC-G protocol time exceeded; VIII – student not following requirements of the Academic Support Program (PAA); IX – transfer to other university – IES (*Instituição de Ensino Superior*). As can be observed, about 50% of the dismissals occur because the student did not enroll, 20% due to change of program/relocation, followed by difficulties related to completion time limit and not been approved in any discipline the first semester.

GRAPH 3.13. DISTRIBUTION OF CAUSES THAT RESULTED IN DISMISSAL OF UNDERGRADUATE STUDENTS FROM UNICAMP PROGRAMS IN THE PERIOD BETWEEN 2014 AND 2018

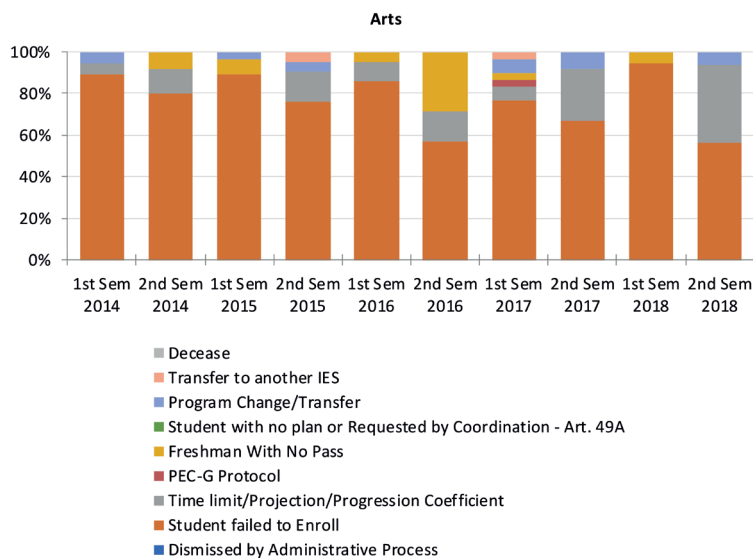


Source: DAC, 2019.

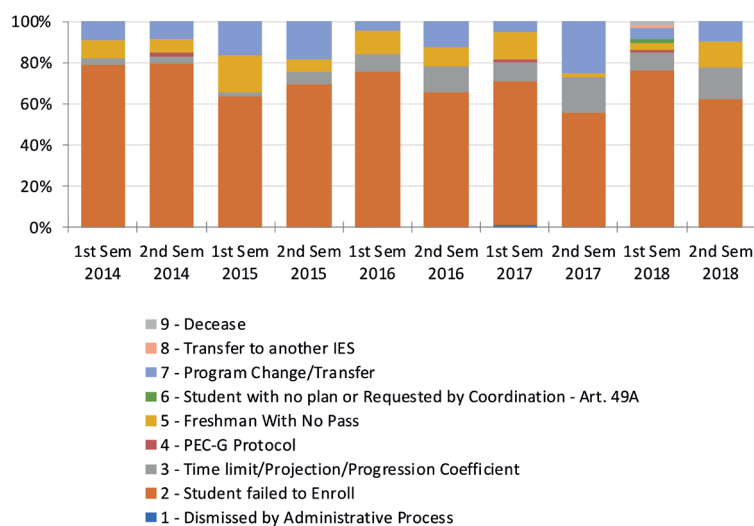
Note: The absolute number of dropout students is indicated at the top of each column.

The largest drop-out rates occur in programs of the Exact and Earth Sciences, Engineering and Humanities fields. The predominant justification, in all fields of knowledge, is the absence of enrollment by the student, which corresponds to 80% of the dropouts for Arts and 70% for the field of Biological and Health Sciences. The reasons for this decision may include dissatisfaction with program choice, initial difficulties in adapting to the university environment, or to the programs. Program change is especially significant in the Exact and Earth Sciences and Engineering (between 20% and 30%), followed by exceeded time limit in the projection for coefficient of progression, which is relevant in the fields of Humanities, Technology and Arts, especially in the last year (Graph 3.14).

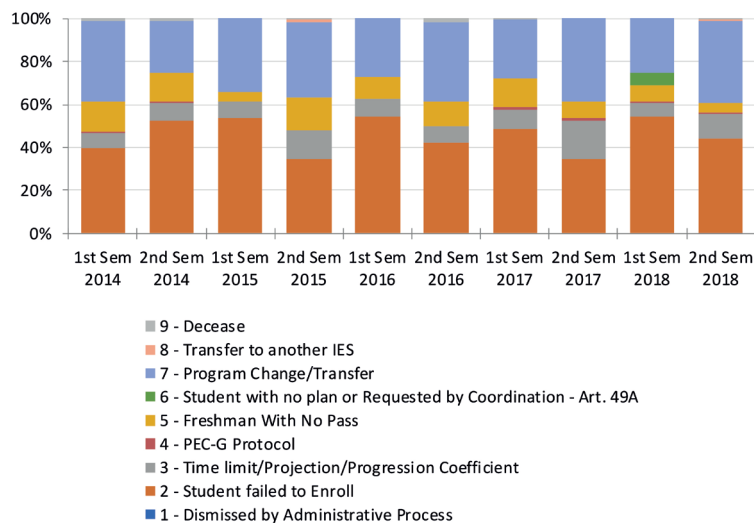
GRAPH 3.14. DISTRIBUTION OF THE CAUSES OF DROPOUTS OF UNDERGRADUATE STUDENTS FROM UNICAMP PROGRAMS BY FIELD OF KNOWLEDGE, IN THE 2014–2018 PERIOD



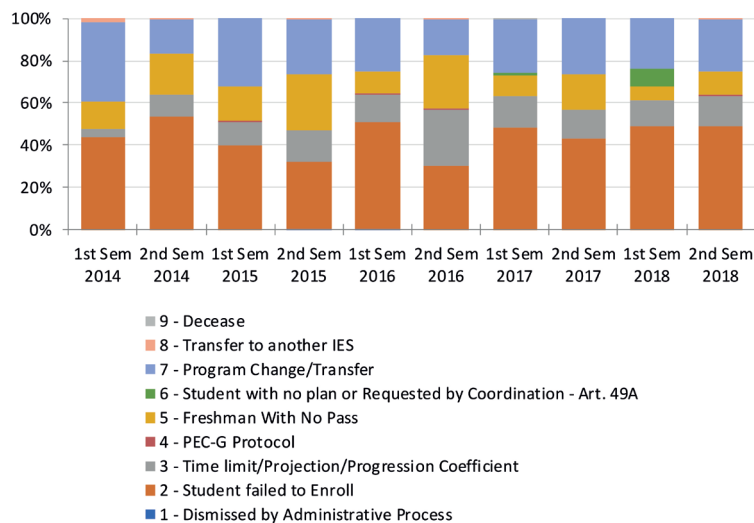
### Biological and Health Sciences



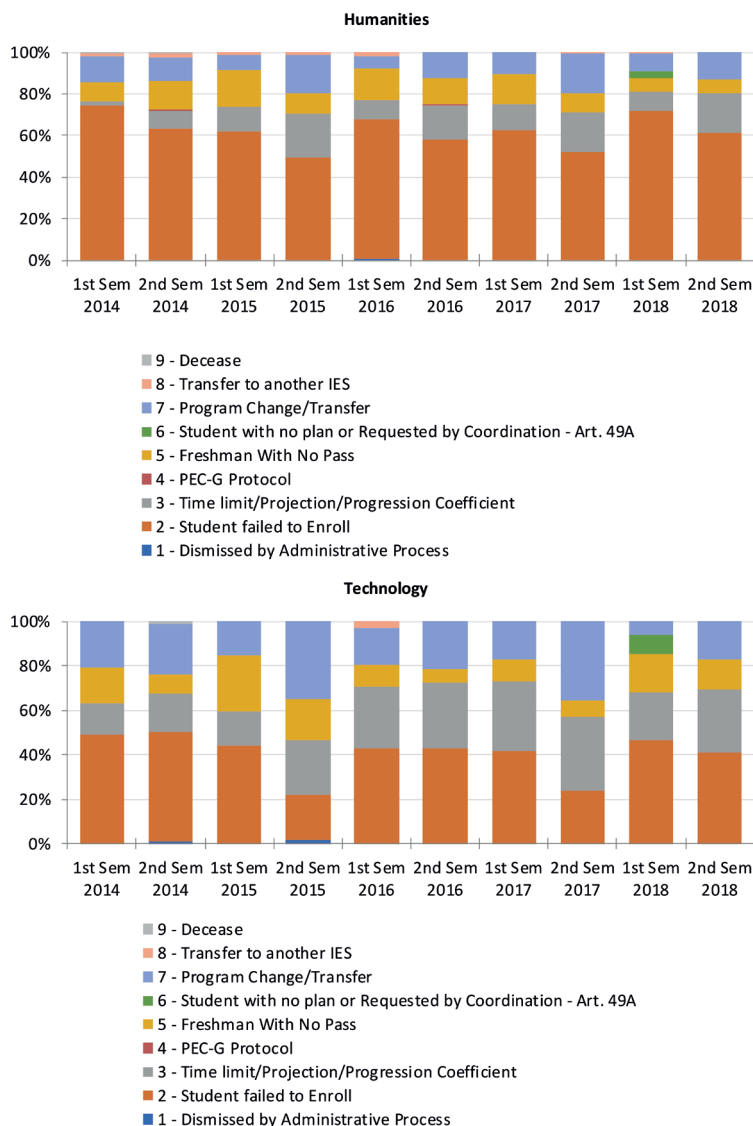
### Engineering



### Exact and Earth Sciences







Most programs recognized dropout due to non-enrollment by students as predominant. This could be associated with the students' little identification with the chosen programs, which would be reinforced by the observation that part of them changed program. It is also found that dismissals result from poor performance in initial subjects.

Routinely, in its Statistical Yearbook, Unicamp monitors the annual dropout rate, calculated as the number of dismissed students over the total number of enrolled students, which was 7.99% for students enrolled in 2018. Under this indicator, most programs understand that they have low dropout rates. However, some of them (Music, Sports Sciences, Agricultural Engineering, Mathematics Teaching Training program, Literary Studies, Geography) reported having implemented strategies to reduce dropout rates. They include: better dissemination of programs at the Open Doors University (UPA-*Universidade de Portas Abertas*), greater participation of Undergraduate Program Coordinators in the Academic Support Program – PAA (which identifies students with serious delay in academic

evolution and demands coordinator supervision to plan disciplines for completing the program), curricular renewal, and motivational earlier exposure of students to the demands of the labor market. The programs that implemented strategies to reduce dropout rates consider that they succeeded, while some have not applied any strategy.

The “Gleb Wataghin” Physics Institute (IFGW) stated that the aspects of dropout and retention rates are included in current strategic actions, but they recognize the need to make the process of developing these actions more participatory and inclusive, with contribution by its entire community. The field of Technology (FT) reported that it carried out some strategic actions to improve retention and dropout rates, including: (1) creation of a undergraduate committee by program for rigorous monitoring of the performance of the six undergraduate programs; (2) improvement and creation of learning laboratories, with 50 computers purchased, and creation of physics laboratory; (3) meetings and workshops with faculty on new teaching methodologies.

### 3.1.5 Student support

The granting of support scholarships to undergraduate students, under different names and specific uses, is managed by the PRG Student Support Service (SAE), as part of student permanence program. It also includes the 287 ProFIS undergraduate research scholarships. In addition, there are 464 Didactic Support Program (PAD) scholarships for undergraduate students act as teaching assistants, managed by the PRG itself.

In addition to these possibilities, undergraduate students have the undergraduate research scholarships from agencies such as CNPq and Fapesp. Also, these scholarship provision has expanded, considerably increasing the number of students served, responding to policies to diversify access to Unicamp in the period, initiated in 2004 with the Affirmative Action and Social Inclusion Program (PAAIS), expanded with the creation of ProFIS (in 2011), and more recently, quotas and ENEM (2019).

In addition to the scholarships, the SAE Social Service team analyzes the social profile for allocation of the 911 vacancies at the Student Housing, distributed in 226 houses shared by four students and 27 studios for families. As a result of the expansion and optimization of the resources of the different scholarships, in 2018 all students entitled to housing aid were granted a vacancy in student housing or Housing Aid Scholarship (BAM). It should be emphasized that the apparent reduction in the occupation of vacancies stems from the fact that several students have preferred the option of housing scholarship, whose figures almost doubled in the same period. Thus, there was an increase in request for support in the form of scholarships for BAM. The significant expansion in the provision of food and transportation aids, housing aids, and social support scholarships, funded with budget of the university itself, is shown in Table 3.9.

TABLE 3.9. BUDGETED AIDS AND STUDENTS GRANTED UNICAMP – SAE SCHOLARSHIPS, 2014–2018

Acronym	Scholarship Name	Purpose	Authorized 2018	Aided Students				
				2014	2015	2016	2017	2018
BAS	Social Support Scholarship	undergraduate students, by socioeconomic criterion, annual selection, with 10 hours of activity in projects	1,785	1,466	1,655	1,722	1,831	2,021
BAT	Transport Aid Grant	undergraduate and graduate students, by socioeconomic criterion	605	1,074	1,147	1,057	1,119	1,313
BAEF	Study Training Aid Scholarship	undergraduate students with 75% completed program, to participate in projects that are supplementary to education/training	50	30	78	69	77	67
BAM	Housing Aid Scholarship	undergraduate students from Limeira and Piracicaba or Campinas without a place in Student Housing	1,254	563	691	737	1,072	1,366
BAI	Installation Aid Scholarship	subsidy for the first expenses of freshmen in financial difficulties	200	193	112	201	200	199
ProFIS	ProFIS	for ProFIS students, scholarship associated with food and transportation aid	277	266	364	275	324	291
BE	Emergency Scholarship	students experiencing emergency economic difficulties	344	255	219	237	175	197
BAS-IC	BAS – Supplementary Incentive	undergraduate students with BAS are allowed Undergraduate Research, supplementing the value for UR scholarship	300	133	203	234	269	315
PAPI	Institutional Project Aid Program	support for institutional projects	600	365	477	431	447	577
BATO	Mandatory Internship Transportation Aid Program	transportation of students who are conducting mandatory teaching training internship	-	463	455	403	551	628
BAA	Artist-Student Scholarship	incentive for undergraduate students to present artistic-cultural projects.	40	41	30	35	30	40
BITA	Food Fee Exemption Aid	for students who prove per capita family income of up to 1.5 national minimum wage.	-	-	-	-	-	918

Source: Unicamp Statistical Yearbook, 2019.

As part of a student permanence qualification program, the Unicamp Undergraduate Student Permanence Support Projects Congress (PAPE-G) was initiated in 2018, providing the dissemination of scholarship holders' work in a scientific event, with publication of a supplement of abstracts<sup>2</sup>.

The SAE educational advisory area provides daily individual pedagogical advisory services, and assists faculty and program coordinators to plan activities (workshops, lectures) and refer students according to specific demands. Table 3.10 presents a temporal series of services provided to student. There are also collective and individual legal advisory and social support services on the different campi.

2. Information available at: <https://www.sae.Unicamp.br/portal/pt/congresso/congressos-anteriores>.

FIRST UNICAMP UNDERGRADUATE STUDENT  
PERMANENCE SUPPORT PROJECTS CONGRESS (PAPE-G)



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TABLE 3.10. HISTORY OF THE SERVICES PROVIDED TO STUDENTS BY SAE

Service / place offered	2014	2015	2016	2017	2018
Educational Advisory – Campinas	4,777	6,410	6,130	7,122	5,738
Individual Services (1)	112	575	485	492	412
Collective Services (2)	4,665	5,835	5,645	6,630	5,326
Educational Advisory – Limeira (3)	n/a	n/a	n/a	1,683	1,548
Individual Services				120	198
Collective Services				1,563	1,350
Legal Advisory (4)	967	1,068	726	960	746
Social Support Service – Barão Geraldo Campinas (5)	n/a	5,509	6,105	8,473	6,745
Individual Services (6)		5,367	5,665	8,043	6,423
Collective Services (7)		142	440	430	322
Social Support Services – FCA (8)	n/a	n/a	n/a	2,519	2,797
Individual Services				1,876	1,911
Collective Services				643	886
Social Support Service – FT (8)	n/a	n/a	n/a	1,817	2,102
Individual Services				1,330	1,531
Collective Services				487	571

Source: Unicamp Statistical Yearbook, 2019.

Notes: n/a = not applicable (1) Individual services provided by the Educational Advisor and by the Educational Psychologist. (2) Lectures, workshops and/or undergraduate programs provided by the educational advisory sector. (3) It started in April 2017. (4) From 2017, the pieces of information began to be identified as individual and collective services. (5) Data available from 2015. (6) On-call Services, selection process and BAE request interviews. (7) Services provided in the “Open Arms Program” lecture for freshmen. (8) Data available from 2017.

SAE's internship sector, which also coordinates the activities for establishment and regulation of the terms of internship, became part of SAE's academic section in 2018 (Table

3.11). In addition, there were more than 200 new agreements of the company research-scholarship, which allows students to conduct research in partnership with different institutions (public and private). In 2018, this activity reached more than 500 students. These data show the important connective work developed by the sector, which enables dialogue and opportunities in the labor market, essential for quality training of undergraduate students.

TABLE 3.11. SUMMARY OF THE NUMBER OF INTERNSHIPS IN SAE-UNICAMP AGREEMENTS, 2014–2018.

Itemization	2014	2015	2016	2015	2018
Agreement companies (1)	4,254	4,959	4,894	5,232	5,247
Agreement Companies by Year (2)	456	204	257	338	260
Number of Interns (3)	3,610	3,813	3,975	4,468	4,810

Source: Unicamp Statistical Yearbook, 2019.

Note: (1) only companies with active registrations are considered, including the ones registered in the year. (2) new companies that entered agreement in the year. (3) Unicamp students, in internship, according to the companies' demand.

The Student Psychological and Psychiatric Care Service (SAPPE), founded in 1987, provides care on the four *campi*: Campinas, Paulínia, Piracicaba and two in Limeira. It gradually structured a clinical practice suited to, and provides care to undergraduate and graduate students in the context of the institution. The responsible team also offers workshops and lectures during the receptions of freshmen, foreign undergraduate, and also graduate students meetings.

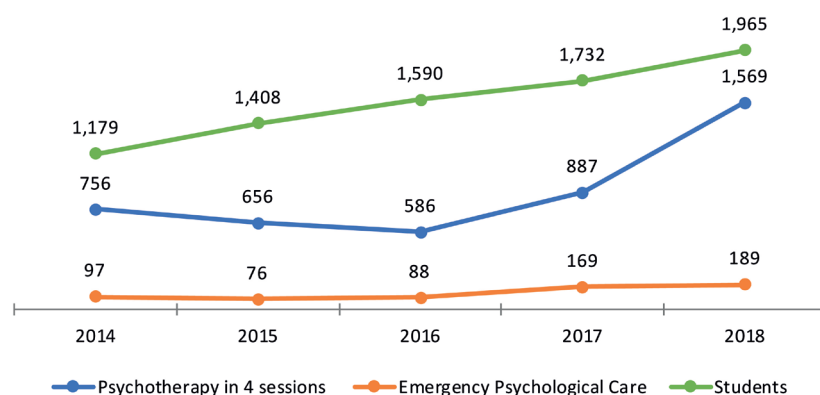
In 2018, 1,512 students registered in the Service, namely: 67% undergraduate students (30% entrants), 16% master's students (52% entrants), and 17% doctorate students (28% entrants). Since 1991, it has provided training internships, which have become specialization programs. With 24 places, it trains for the practice of Brief Psychoanalytic Psychotherapy and for Emergency Psychological Care, allowing expansion in the provision of care. From 2016, it became an internship area for the Department of Medical Psychology and Psychiatry (DPMP), of the School of Medical Sciences (FCM), in optional internship and, in 2018, it became a mandatory internship area under supervision of the team and faculty of the department. This partnership also expanded the capacity for psychiatric care. SAPPE – Due to high demand, the professionals have greatly emphasized shorter therapeutic modes (emergency psychological care (PA) and psychotherapy in 4 sessions (4S)) and in groups. Gradually, the Service has included a larger number of students.

During the period, SAPPE's services were expanded (Graph 3.15), providing the following modes of service – whose numbers are in Table 3.12:

- Reception group: lecture for presentation of the Service and clarification of doubts, in addition to enabling preliminary evaluations and referrals.
- Screening interview: individual interview for collection of personal data, complaints, assessment of severity, urgency and indication of the mode of service.
- Brief individual psychotherapy: individual care in psychotherapy, weekly sessions, estimated duration of 3 to 6 months.
- Psychotherapy in 4 sessions: individual care in psychotherapy, weekly sessions, duration limited to 4 sessions.

- Group psychotherapy: group care in psychotherapy, weekly sessions, estimated duration of 12 months
- Relational psychotherapy: couple or family care in psychotherapy, weekly sessions, estimated duration of 3 to 6 months.
- Ending follow-up interview: scheduled session 3 to 6 months after the ending date.
- Emergency Psychological Care: individual care, single session, to deal with stressful situations typical of the university environment or crises. In the most serious cases, the necessary referrals are provided.
- Psychiatric care: individual care in psychiatry, with scheduled consultations according to availability.

GRAPH 3.15. NUMBER OF CLINICAL CARE SERVICES PROVIDED IN THE MODES OF EMERGENCY PSYCHOLOGICAL CARE, PSYCHOTHERAPY IN 4 SESSIONS IN GROUP, AND NUMBER OF STUDENTS SCHEDULED FOR CLINICAL CARE IN PSYCHIATRY AT UNICAMP-SAPPE



Source: SAPPE, 2019.

TABLE 3.12. STATISTICAL DATA OF THE UNICAMP-SAPPE SERVICE

PROCEDURES	2014	2015	2016	2017	2018
Psychiatric Care	2,164	2,387	3,285	3,219	3,104
Diagnostic Interview	722	828	1,040	952	1,212
Reception Group (enrolled students)	572	1,083	1,139	1,250	1,104
Other services	1	17	154	19	47
Emergency Psychological Care	248	277	357	457	749
Psychotherapy in 4 Sessions	408	170	229	430	820
Brief Individual Psychotherapy	8,602	8,984	9,461	10,367	8,663
Relational psychotherapy	32	36	62	43	50
Group Psychotherapy	97	76	88	169	189
Total procedures	12,846	13,858	15,815	16,906	15,938
Number of Students who used the Service for the first time	520	735	728	788	893
Number of Students who had already used the Service	659	673	862	944	1,072
Total Students who used the Service	1,179	1,408	1,590	1,732	1,965

Source: Unicamp Statistical Yearbook, 2019.

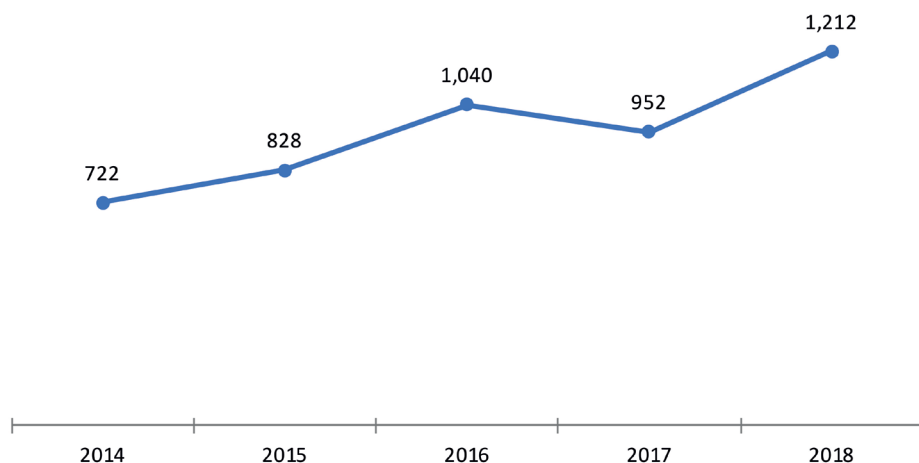


Since 2017, it has expanded its support and consulting action to directors, undergraduate coordinators and professors teaching staff in relation to mental health in the university environment. To this end, it has conducted visits to international benchmark services and participation in congresses with presentation of papers. This new front of action is synthesized in the so-called Strategic Well-being Project, developed in conjunction with SAE's Educational Advisory area. The project provides practical instructions to the community of professors, employees and students, aiming at the early identification and adequate referral of students with academic and/or emotional difficulties. The project produced a guide of Best Practices and training for the Promotion of Well-Being at the University, released in early 2020.

In 2018, the researches "Profile and demands in Mental Health of Unicamp students who underwent screening by SAPPE" and "Mental health demands of scholarship students from Unicamp" were the themes of the final Completion Works for two Psychiatry residents who conducted internship in SAPPE, enabling better analyzes of the data to advise the improvement of the actions offered. Since 2017, the team has also collaborated with another major thematic research of the Psychiatric Department, with a large number of undergraduate research scholarship students involved, to diagnose mental health conditions, addictions and habits of students from all Undergraduate programs. About 7,000 questionnaires answered is currently under analysis.

In 2018, SAPPE acted to reduce the time from the search for help to the screening interview, implementing diagnostic interview, which enables identifying and evaluating the severity and urgency of cases, reducing from two to one month or even two weeks later in the year except for emergency and urgency cases, which are to receive prompt care (Graph 3.16).

GRAPH 3.16. NUMBER OF TIME SLOTS PROVIDED FOR DIAGNOSTIC INTERVIEW.



Source: SAPPE, 2019.

In order to include an even larger number of students and after discussions of a Working Group, several actions should be implemented in 2020:

- Except for clinical criteria of severity and urgency, prioritize new cases with indication for brief individual psychotherapy;

- Provide, in case of return, psychotherapy in 4 sessions and in group for cases that have already undergone a previous therapeutic process of brief individual psychotherapy;
- Institute and provide group therapy for the most serious and chronic cases, which require a longer time of psychological follow-up;
- Institute a therapy group to address and work adaptation issues common to entrant students, corresponding to 30% of demand;
- Disseminate information on care provided by SAPPE in the context of graduate programs;
- Distribute Well-being Manual, with advisory visits to schools on services and their scope of action and initial prevention and support measures within the units;
- Advise the schools to institute interested groups, or a local team, for the prevention and immediate care action to start care locally in emergency situations.

### 3.2 Curriculum: evaluation, renewal and supplementary activities

The curricular structures of Unicamp Undergraduate programs respond to national regulations (National Curriculum Guidelines – DCN) and state regulations (State Board of Education – CEE). They are also inspired by international models of excellence in their fields of knowledge, valuing laboratory practices and interaction with society, including the productive industry, through internships. Being a university that values the connection between teaching, research, and outreach, added to academic management activities, it is understood that the participation of students in projects of these various areas, enhances the training process, providing the development of general skills necessary for subsequent professional and citizen exercise.

Projects providing scholarships allow professors to propose supplementary activities aimed at supporting education (PAD and BAS), or outreach (BAS and BE), or research (BAS or UR) or management (BAS). There are also special scholarship provided by governmental initiatives – Tutorial Education Program (PET), with projects in Physical Education and Chemical Engineering, as well as the Teaching Initiation Program (PIBID), by Capes, for teaching training students. It is also possible to participate in research projects with companies. In addition, numerous student initiatives constitute a wide range of available extracurricular activities, including junior companies, social entrepreneurship initiatives, prototype development groups for competitions, low-cost/free of charge courses that prepare for entrance exams, university sports teams, in addition to representation in collegiate bodies and management of student entities, among others. Finally, exchange and double-diploma also provide supplementary training opportunities.

In any case, generational changes, changes in the future prospect of professional work and activities point to the need to revise curricula, towards a more flexible proposal, that allow choices and favor the development of general skills (teamwork, communication and empathy, continuing professional development), while maintaining solid and scientific- based knowledge and skills training. The 2020 RenovaGrad strategic project has encouraged the programs to revise their curricula, providing support for the necessary

discussions and pedagogical training, conducted by [ea]2, with contributions of the Educational Technologies Management Group (GGTE).

## II WORKSHOP OF UNICAMP UNDERGRADUATE PROGRAMS EVALUATION



Antoninho Perri/SEC – Unicamp

### 3.2.1 Educational program evaluation

The answers presented ahead highlight the importance of half-yearly Program Evaluation Days in the official academic calendar, and the processes and instruments in use. Another peak moment for each program to self-evaluate is the cycle on institutional evaluation, every five years, preparing documentation due to CEE. The discussion on a unique instrument for evaluating programs and subjects, with a common core and another part that meets the needs of the different schools have been conducted by [ea]2. The failure of a previous attempt to reach a consensus instrument in 2014 (Undergraduate Evaluation Program) and the fear of losing specificity have prevented the advance of new joint core proposal.

In the self-evaluation by the Schools, all answered that they use their own evaluation forms and routines to monitor the progress of the programs, as well as semiannual evaluation seminars contained in the academic calendar (May and October). Some programs make clear the impact of these evaluations and the resulting revisions, with changes in curricular structures, responsible professor, methodologies, definition of prerequisites and others. Some programs stopped conducting program evaluations separately and began using the semiannual meetings of the official academic calendar (Physical Education, Sports Sciences, Speech Therapy and Pharmacy). Others maintain the evaluation of programs additionally, with their own system or forms, almost all online (Biological Sciences, Nursing and Dentistry) and some are already implementing an improved system (Medicine and Speech Therapy). The Nursing program developed an instrument applied at the end of the semester, with support from Permanent Entrance Exams Committee (Comvest). They also stress the importance of disseminating the results in reports to faculty, heads, teaching committees, NDEs or Congregations.

In the Arts, the evaluations have been used for pedagogical, bibliographic, and program catalog updates, as well as for the distribution of compulsory and elective classes, incorporation of new courses or activities, and to submitting requests for hiring professors, especially relevant for the dance program. Important reflection was highlighted by the Social Communication – Medialogy program on the need to create a culture for cohesion as to improving the teaching, research and learning process, with shared management between students and faculty.

The Biological and Health Sciences programs reported various forms of evaluating their programs, and faculty. The School of Medicine has a Center for Evaluation in Medical Education (NAPEM), whose tasks include improving and standardizing the student evaluation criteria. This center has a physical structure, a faculty coordinator and secretariat analyzing information related to the evaluation questionnaires completed by students, with focus on changes implemented previously.

The answers of Engineering programs are diverse. Most programs make evaluations, varying the effectiveness of the participation of students, faculty and the application of the needs surveyed and the ways of disseminating the results (reports to faculty, heads, teaching committees, NDEs or congregations) and periodicity. We highlight here the objectives for curricular improvement established on the basis of the evaluations in some units (FEA, FEC, IFGW-Physical Engineering, FCA-Engineering): to stimulate the professor-student relationship, have the student as the protagonist of the learning process, update teaching methodologies and incorporate active methodologies and digital platforms, make the academic career flexible to value different professional profiles, and improve contact with the productive industry to exchange practical experiences.

FCA's Control and Manufacturing Engineering programs highlight that the evaluations greatly impacted their curricular restructuring. The Automation Control Engineering program (FEM) highlights the lack of objective decision at higher Unicamp administrative level on the use of evaluation by students in the analysis of teaching activities, thus its impact depends on how each professor considers it in improving their didactic activities. They report that a significant portion of the faculty do not believe in the validity of the current evaluation, and that they are working to modify this perception. Agricultural Engineering and Telecommunications programs report that the evaluation has not had much adherence of students. FT's Technology programs report low adherence/participation of students and effectiveness of evaluations and some professors make an evaluation in their programs.

In the Exact and Earth Sciences, Statistics reports that it restructured the curriculum matrix, the composition and offering of elective subjects, projects and internships. Mathematics and Applied and Computational Mathematics report that evaluations and discussions generated improvements, with a full review of the program catalog in Applied and Computational Mathematics. The Physics program uses various forms of evaluations during the semester – subject, faculty, program – and there is a proposal that the results of faculty evaluations should be published in the Congregation. A group has been working with improvement in the evaluation of the basic area of admission of Program 51 (Mathematics/Physics/Applied and Computational Mathematics). The Geology program highlights that the discussion between students and professors about the pedagogical

issues of the program supported the curricular changes proposed to be implemented in 2020. The Chemistry programs highlight that the evaluations impacted the curricular changes already implemented (workload, students's assessment) and others under study.

Humanities programs, in general, carry out evaluations that impact the proposed changes. One example was the transformation of Management curricula into FCA Administration programs, to respond to the students' demand of better alignment with the labor market offerings. The coordinations of these programs report that the results of the evaluations routinely impact the changes implemented in the following semesters. IFCH, in its different programs, reports that there are always multiple dynamics of evaluations and that half-yearly evaluations have been guided by certain predefined themes or aspects of the program, for example: vocational training, technological resources and infrastructure, training for academic reading and writing, and others. This has ensured a better direction of both the discussions and any referrals by the Undergraduate Coordination. The History program reported that, in this evaluation process, it was possible to advance in the regulation of internal selection process for scholarships of the Didactic Support Program (PAD). The Economic Sciences program describes various evaluation activities and resulting reflections, especially those related to the didactics of classes.

In the Literary Studies program, in addition to the suggestions to improve the programs and subjects, undergraduate students suggest a list of elective subjects they wish to be offered, which guides the coordinator in the discussion of availability and specialties of the faculty. This demand also enabled being selected by the Visiting Specialist Professor Program, supported by the Undergraduate Pro-Rectorate. The Pedagogy program and the Integrated Chemistry and Physics Teaching Training program use online program evaluations, in a system of the School of Education. For teaching training programs, including Pedagogy, evaluations have also assisted in curricular reformulations. Among the improvements implemented or planned, we highlight the creation of mandatory subjects in teacher training: Education of Youth and Adults, African-Brazilian and African Stories and Cultures, Stories and cultures of Brazilian indigenous peoples.

### 3.2.2 Curricular renewal

The programs reported being updated in relation to the compatibility of the curricula with legal frameworks, pertinent literature, benchmark universities in the country and abroad. Most programs reported curricular updates meeting the regulations of the State Council of Education (CEE) and of the Ministry of Education (MEC), issued by the National Curricular Guidelines (DCN). The curricular proposals consider the demands and innovations as to education and labor market and seek to incorporate the suggestions of students and faculty, even if they recognize themselves as qualified, of national and international reputation.

It was observed that 56% of the programs have implemented new curricula in the last five years or are in the process of implementation 2019–2020 (20%). There have been more recent relevant updates in the fields of Technology (90% of programs), Humanities (85% of programs), Biological and Health Sciences (77%), and Engineering (63%). No updates were



reported in 12% of programs, especially in Engineering and in Exact and Earth Sciences. The changes originated from or are being planned in collective construction works carried out in the unit, with active participation of students and faculty and support from [ea]2. These reformulations mention the reflections on the DCNs and upgrade needs considering future professional activity. It is highlighted that 78% of the changes originated in the Structuring Teaching Centers (NDEs) of undergraduate programs. In the fields of Biological and Health Sciences, Engineering and Technology there is greater influence from and compatibility with international trends and benchmarks, in addition to reflection on professional training and activity. In the Arts, there is reference to national and international trends, but the program's projection and national and international awards are valued as evidence of adequacy of the curricular proposal.

FEEC informs that, by initiative of a group of young professors, the EAE – Teaching and Learning in Engineering group emerged in 2012, which organized itself to promote discussions on the subject and organize lectures. The Curricular Reform proposal has been extending since 2013, in the search for bold and consensual solutions. In 2016, the document entitled “Renewing Undergraduate Education: Invitation to FEEC” was released, which sought to establish a basis for the aspects that would be desirable in the preparation of a curriculum. In June 2017, the discussion on a second version of the reform began, seeking to transform some mandatory subjects into elective subjects. IFCH pointed out that in recent years there has been an important restructuring of teaching training programs.

Several of the recent changes have already responded to the demand of RenovaGrad 2020 or have been accelerated by this strategic project – Table 3.13.

TABLE 3.13. YEAR OF IMPLEMENTATION OF CURRICULAR RESTRUCTURINGS

Field	Unit	Program	Year update
Arts	IA	Performing Arts	2018
		Visual Arts	2016
		Social Communication – Medialogy	2016
		Dance	2018
		Music	2016
Biological and Health Sciences	IB	Biological Sciences	2015
		Biological Sciences Teaching Training Program	2017
	FCA	Sports Sciences	2016
		Nutrition	2018
	FEF	Physical Education (Full-time)	in process for 2021
		Physical Education (Evening)	in process for 2021
	FENF	Nursing	2017
	FCF	Pharmacy	2019
	FCM	Speech therapy	2016
		Medicine	2018
	FOP	Dentistry	2012
Engineering	FEC	Architecture and Urbanism	2017
		Civil Engineering	2006
	FEAGRI	Agricultural Engineering	in process for 2021
	FEA	Food Engineering	2020
		Food Engineering	2020



TABLE 3.13. YEAR OF IMPLEMENTATION OF CURRICULAR RESTRUCTURINGS

continued

Field	Unit	Program	Year update
Engineering	FEEC/IC	Computing Engineering	2017
		Electrical Engineering	2017
		Electrical Engineering	2017
	FEM	Control and Automation Engineering	2017
		Mechanical Engineering	2016
	FCA	Manufacturing Engineering	2013
		Production Engineering	2016
	FT	Environmental Engineering	2013
		Telecommunications Engineering	2016
	IFGW	Physical Engineering	2019
Exact and Earth Sciences	FEQ	Chemical Engineering	2009
		Chemical Engineering	2009
	IC	Computing Science	2012
	IMECC	Statistics	2018
		Mathematics Teaching Training Program	2015
		Mathematics	2016
		Applied and Computational Mathematics	2016
	IFGW	Physical	in process for 2021
		Physics Teaching Training Program	2018
	IFGW/IMECC	Mathematics/Physics/Applied and Computational Mathematics	2016/2018
Humanities	IG	Geology	2020
	IQ	Chemistry	2018
		Technological Chemistry	2018
	FCA	Business Administration	2019
		Public Administration	2019
		International Trade Management	ended 2014
		Business Management	ended 2014
		Public Policy Management	ended 2014
		Agribusiness Management	ended 2014
	IE	Economic Sciences (Full-time)	2010
		Economic Sciences (Evening)	2010
	IFCH	Social Sciences (Full-time)	2015
		Social Sciences (Evening)	2015
		Philosophy	2019
		History	2018
	IEL	Literary Studies	2007
		Language – Portuguese Teaching Training Program (Full-time)	2017
		Language – Portuguese Teaching Training Program (Evening)	2017
		Linguistics	2018
	IG	Geography (Full-time)	2019
		Geography (Evening)	2019
	FE	Integrated Chemistry/Physics Teaching Training Program	2012
Technology	FT	Higher Education Program in Civil Construction Technology	2019
		Higher Education Program in Civil Construction Technology	ended 2018
		Technology Higher Educ. Program in Systems Analysis and Development	2013
		Technology Higher Educ. Program in Systems Analysis and Development	2017

TABLE 3.13. YEAR OF IMPLEMENTATION OF CURRICULAR RESTRUCTURINGS

continued

Field	Unit	Program	Year update
Technology	FT	Technology Higher Educ. Program in Building of Edifices	ended 2018
		Technology Higher Educ. Program in Roads	ended 2018
		Technology Higher Educ. Program in Environmental Sanitation	2016
		Technology Higher Educ. Program in Environmental Sanitation	2016
		Technology Higher Educ. Program in Telecommunications Systems	ended
		Technology Higher Educ. Program in Environmental Sanitation (87)	2016
		Information Systems	2017

Source: Internal Evaluation Committees Reports, 2019. Prepared by PRG, 2019.

Regarding the specific demand for curricular flexibility, all Exact and Earth Sciences programs, 56.2% of Engineering programs, and 50% of Biological and Health Sciences programs reported that they have elective subjects in their curricula. However, the percentage reserved for elective subjects is very low on average (17.9%, with 4.4% of free elective subjects), ranging from 3% to 50% in the programs. They are almost always elective subjects offered in the unit itself. Several programs have extracurricular, non credited elective subjects. In the field of Humanities, as an exception, we have programs with 50% of elective subjects in IFCH. The Business Administration programs (FCA-Limeira) propose transverse elective subjects for various fields of knowledge, in addition to MA (Multidisciplinary Activities) subjects. This contrasts sharply with other programs, such as the Economic Sciences program, with 10% of elective credits, half of which in mandatory elective subjects of the Unit itself. Finally, in the field of Biological and Health Sciences, the Medicine, Speech Therapy, Dentistry, and Pharmacy programs have no elective subjects in the current curricular projects.

Table 3.14 summarizes the participation of these subjects in Unicamp's undergraduate programs.

TABLE 3.14. UNICAMP UNDERGRADUATE PROGRAMS WITH PRESENCE OR ABSENCE OF ELECTIVE SUBJECTS IN THE MATRICES, BY FIELD OF KNOWLEDGE

Fields	Present	Absent	Total	% Yes
Arts	4	1	5	80
Biological and Health Sciences	5	5	10	50
Engineering	9	7	16	56
Exact and Earth Sciences	10	0	10	100
Humanities	14	2	16	87
Technology	3	0	3	100
Total	45	15	60	75

Source: Internal Evaluation Committees Reports, 2019. Prepared by PRG, 2019

Note: Full-time and evening programs with similar curricula, with the same proportion of subjects, were not counted more than once.

Some programs increased flexibility in curricular renewals discussed in 2018–2019, improving the proportion between mandatory and elective subjects and reducing prerequisites. The Food Engineering and the Manufacturing and Production Engineering programs, which will implement new curricula in 2020, will offer interdisciplinary proposals with transverse projects. The Dance program is being restructured with the proposition

of elective subjects in transverse projects, including involving programs of other units. In addition to the specific initiatives in the programs, several MA subjects were created in 2018 and 2018 with promotion by the PRG, seeking to offer more elective interdisciplinary subjects, as part of RenovaGrad. Increasing flexibility, with student-based, hybrid and collaborative education are the guiding principles. When asked about the optimization of activity hours, reducing redundancies, integrating curriculum with projects, whether this has been carried out and what is the perception of students and faculty, the answers varied in the various fields of knowledge. The units report that they constantly have relevant actions to optimize and integrate the different activities into the education of undergraduate students, including adaptations to curricular guidelines, outreach activities and integrations between longitudinal and transverse projects in the program, between related fields or other fields of knowledge and progressive incorporation of technologies. The fields of Arts and Engineering stand out, with greater participation and changes already implemented.

In the Arts, the actions for integration between curricular activities and supplementary activities permeate several of the activities for education and training of professionals. The programs are supported by integrated projects, involving or not transverse or longitudinal subjects, other programs or supplementary training activities. An example is the Social Communication – Medialogy program, which has the conduct of projects as its strong, structuring point. To graduate, students need to complete four out of five project course options, in Photography, Cinema, TV and Video, Sound Production, and Digital Narratives. A considerable part of the courses' workloads are used in research, creation and development processes and activities outside the university. Furthermore, since 2014 students have held academic meetings called UNIMIDIA, for which they elect a theme, with participation of faculty and external guests. However, Music and Dance programs recognize the need to better integrate elective subjects and faculty projects into the curriculum. In Dance, students report that the amount of half-yearly credits does not match the reality of those who need to work, or that would like to actively participate in the activities that the university offers in addition the program itself. They suggest increasing the program completion time, since all subjects are seen as indispensable.

There are important analyses on content overlaps that have inspired changes in the structures of subjects and activities in Biological and Health Sciences. Integrated projects were implemented in Biological Sciences, with subjects that stimulate in-depth study of content, develop learning autonomy, incorporate other learning methodologies and improve the integration of acquired knowledge into other subjects. A similar process occurs in Medicine, Nutrition, Sports Sciences and Physical Education, Dentistry, Nursing, In Pharmacy, these reflections and numerous suggestions received guided a new curricular matrix that begins in 2020.

Sixty percent of Engineering programs reported using integrated and interdisciplinary projects in their current pedagogical projects. The Architecture and Urbanism, Food, Agricultural, Civil, Physical, Chemical, and Manufacturing and Production Engineering programs had recent reformulations and inclusions of project courses, occupying part of the percentage of credits in mandatory and/or elective subjects aligned for this purpose. Other Engineering programs (Computing, Control and Automation, Electrical, and Mechanical Engineering) reported that they are reviewing the curricula to avoid redundancies, with

proposal to introduce activities related to projects, reducing the workload of subjects and classroom.

In the field of Exact and Earth Sciences, half of the programs clarify that, in their recent curricular reformulations, they reflected on content redundancies and introduced activities related to integrated, curricular projects in interconnected subjects. Others are reformulating or with proposals for 2020. However, Chemistry and Technological Chemistry reported that few subjects integrate projects into their curricula. Most Technology programs reported having discussed the integrations of activities in projects into the new curricular proposals, not yet implemented.

In the Humanities, the integration seemed less evident. For some programs, there is need for integration with outreach activities, of social, professional, and educational character, others reported that there is already integration with research projects (Economic Sciences, Geography Undergraduate program, Management, Social Sciences, Linguistics, Literary Studies), or in the teaching training (programs in Language, Geography and Pedagogy).

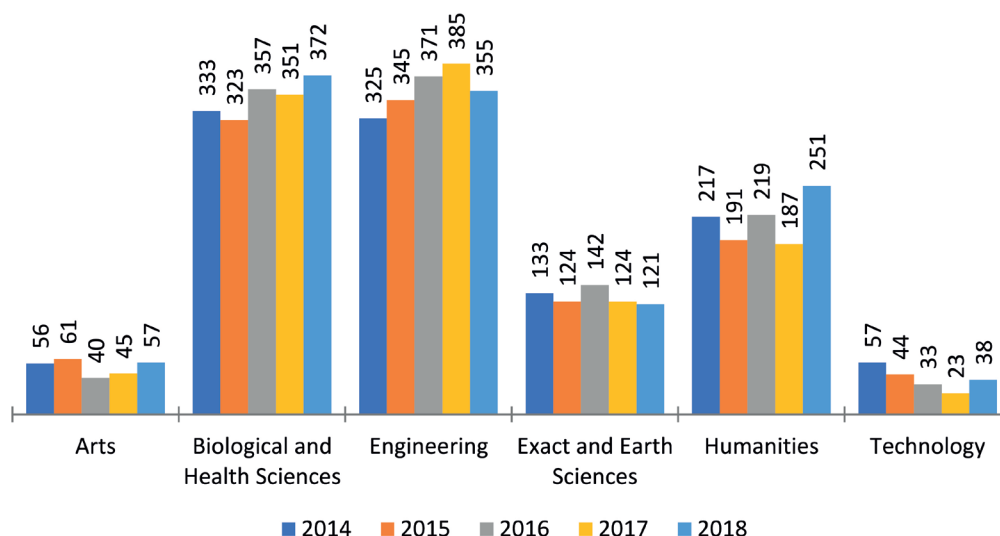
### 3.2.3 Participation in Undergraduate Research and Teaching Initiation

In all Undergraduate programs at Unicamp there is support and incentive to student participation in undergraduate research (UR) or technological initiation (TI) or teaching initiation activities, with scholarships from the federal government (Capes, CNPq) or state government (FAPESP), from companies, or even without scholarship support (volunteer). Thus, there is participation of undergraduate students in research projects, interacting with interdisciplinary teams. This practice is often stimulated by curricular subjects, in Sciences and Scientific Method, often culminating in program completion works. It is noted that URs have expanded the opportunity of being an advisor to new professors. Unicamp has the largest UR incentive program and has organized, since 1992, the annual PIBIC Congress with seminars and presentation of more than 1,200 works from projects. Subsequently, there is the Undergraduate Permanence Support Scholarship Congress, which includes works in research, teaching, outreach or administration projects. The programs recognize the importance of these activities as supplementary to student training, preparing them for graduate studies or contributing to their success in the labor market.

The fields of Biological and Health Sciences and Engineering, followed by Humanities, had the most students participating in undergraduate research or technological initiation projects, with an increase of 10–20% in these years of the report (Graph 3.17).

The Arts programs report an important and increasing participation of undergraduates in UR projects, fostered by scholarships offered in UR, BAS, or PIBID, scientific methodology courses, or integrated projects such as “Arts Training: visual arts, dance and music,” which aggregates the teaching training programs of the Arts Institute. It is noted that, from 2012 to 2018, PIBID Música participated in the program with up to 14 scholarship holders annually, developing projects in two state schools in Campinas. In August 2018, for the new Capes Selection Process, the Teaching Training Programs in Music, Dance and Visual Arts formed PIBID ARTE, with 24 scholarship holders, which has improved the training process of these students.

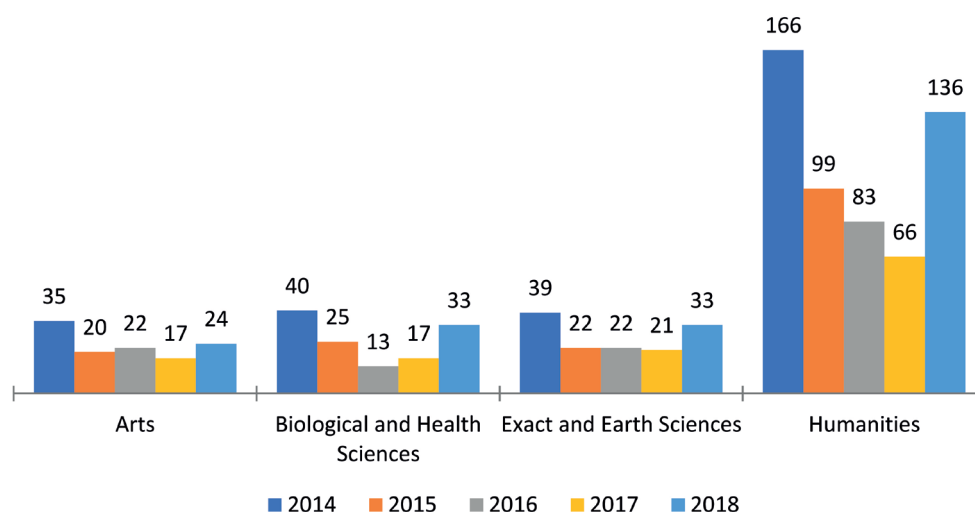
GRAPH 3.17. DISTRIBUTION OF STUDENTS WHO CONDUCTED UNDERGRADUATE RESEARCH OR PARTICIPATED IN TECHNOLOGICAL INITIATION ACTIVITIES (WITH SCHOLARSHIPS) BY FIELD OF KNOWLEDGE, BETWEEN 2014 AND 2018



Source: DAC, 2019. Prepared by PRG.

Graph 3.18 shows the distribution of students participating in Capes' Teaching Initiation Scholarships Institutional Program (PIBID). As expected, the field of Humanities, which includes most teaching training programs, received between 2014 and 2018 the largest number of scholarship students (about 60% of the 913 scholarships).

GRAPH 3.18. UNICAMP UNDERGRADUATE STUDENTS WHO PARTICIPATED IN PIBID BETWEEN 2014 AND 2018.



Source: DAC, 2019. Prepared by PRG.

In Biological and Health Sciences, between 10% and 25% of undergraduates participate in UR annually. In the Physical Education, Biological Sciences and Pharmacy

programs, students develop their URs in other Units or in other institutions (EMBRAPA, CNPEM, LNBio and LNLS). There is a differentiated proposal for medical students, through the Medical Practitioner-Researcher Program (MD/PhD). In this program, students may, at the end of the 4th year, migrate to the Research Program in Medicine, attend postgraduate programs as a special student and develop their research projects, returning to the Medicine program after four semesters. Thus, they obtain Bachelor's degrees and, later, Doctoral degrees. In contrast to UR, PIBID projects for the teaching training programs of this field (Physical Education and Biological Sciences) have undergone changes and the number of participants has fluctuated and decreased.

Most Engineering programs recognize the importance of student participation in URs by PIBIC, for vocational training, maturation for the market or preparation for graduate studies. However, participation in UR activities range from 3.5% to 30% of students, without considering other possible sources of scholarship promotion, such as companies. Practically all engineering programs have, in their curricular structure, courses and/or activities that compute credits related to undergraduate research activities, constituting supplementary activity. There is also a growing interest in CNPq's Institutional Program for Initiation Scholarships in Technological Development and Innovation (PIBITI) because they result in technology, future jobs and patents. They report that UR students have performance gains in other curricular activities.

The Exact and Earth Sciences programs reported participation of 15% of students in URs. There is a division of interest between conducting UR and participating in internships in the market, especially for Mathematics, Statistics, Chemistry and Physics programs. However, the UR experience is valued both for the market and for future graduate studies in Geology, Mathematics and Chemistry. PIBIT projects are also important, although they represent much lower percentages of scholarship holders. In Technology, there is small participation of students, but there are reports of search for other agencies to fund UR projects because it is understood that the projects can prepare them for the labor market and stimulate the continuation of research in graduate studies.

In general, the percentages of UR scholarship holders in Humanities are lower, but there is greater participation in PIBID. There are integrated projects between several programs (Sociology, Philosophy, Anthropology) with curricular activities involving UR and also program completion works. Students use this opportunity in order to obtain training experiences in the school routine, which makes PIBID extremely important for the future teachers' classroom inclusion and experience. FE highlights the relevance of PIBID, an important link between the university, public schools and their teaching systems (state and municipal), contributing to the experience in the everyday school routine, in the classroom, adding personal and professional values to the training of teaching training students in Geography, History, Integrated Chemistry and Physics Teaching Training Program, Pedagogy, Dance, Literature, and Portuguese Language. It should be noted that there is much demand for participation in PIBID, but the number of participants in the program is limited by the amount of scholarships determined by CAPES itself.

The School of Education highlights the Reference Center for the Training of Educators – CERFE, a project to develop a proposal for the training of educators, taking into account the national and international experience in the subject, aiming to coordinate the actions



between teacher-training bodies at Unicamp at undergraduate level for early childhood education, elementary education and secondary education, associated with continuing education and graduate studies. The effort aims to integrate the actions and infrastructure existing in the School of Education and Unicamp, enhancing teacher-training activities in a coordinated manner.

Older programs, with higher number of professors, have more URs than newer programs (in FCA and FT), perhaps due to the higher number of professors and advisors. Furthermore, the demand for UR is lower among evening students than among students of full-time programs. Demand is also lower in programs in which the interest in early introduction in the labor market surpasses the interest in inclusion in URs (Food, Chemical and Computing Engineering, as well as Mathematics, Statistics, and Physics).

### 3.2.4 Internships and other approaches to the professional environment

For the field of Arts, it is of paramount importance that students exercise it with external institutions and approach the needs of the professional environment. A large number of students carry out professional projects in their last years of university. In addition to scientific-cultural activities, supervised curricular internships and extracurricular internships are considered very important for training, especially in teaching training programs. They allow practical aspects of the teaching activity to be discussed in class, experiences to be built together with the professional world, and contribute to opening it to reevaluation of its practices.

All students in Health programs (Medicine, Nursing, Speech Therapy, Nutrition) carry out practical activities, curricular and extracurricular internships, most associated with mandatory subjects and as part of the clinical cycle of the program, which prepares for future professional performance. The Sports Sciences and Physical Education programs explore various internship and training activities with the provision of outreach activities to the community, in addition to recognizing the importance of extracurricular internships. Reports in program evaluations and Program Completion Works (TCCs) show the effective hiring of students and seniors for professional activities, with a very prominent role of internships, especially in Pharmacy.

All Engineering programs are categorical in reporting the importance of internships in student training and the ease they have to find mandatory curricular internship. These internships have received quite positive evaluations, being considered an important complement to the contents provided by the programs. They point out the effective participation in decision-making in works in execution, leadership position at sometimes of the execution, learning of new processes and use of knowledge learned in the program. Many students point to gaps in the program after the internships, which serves to add information to the program evaluations carried out throughout the semester. These factors contribute to professional training and great inclusion in the labor market soon after program completion.

In the Exact and Earth Sciences programs with teaching training and undergraduate programs, it was reported that the impact of internships is quite positive, providing

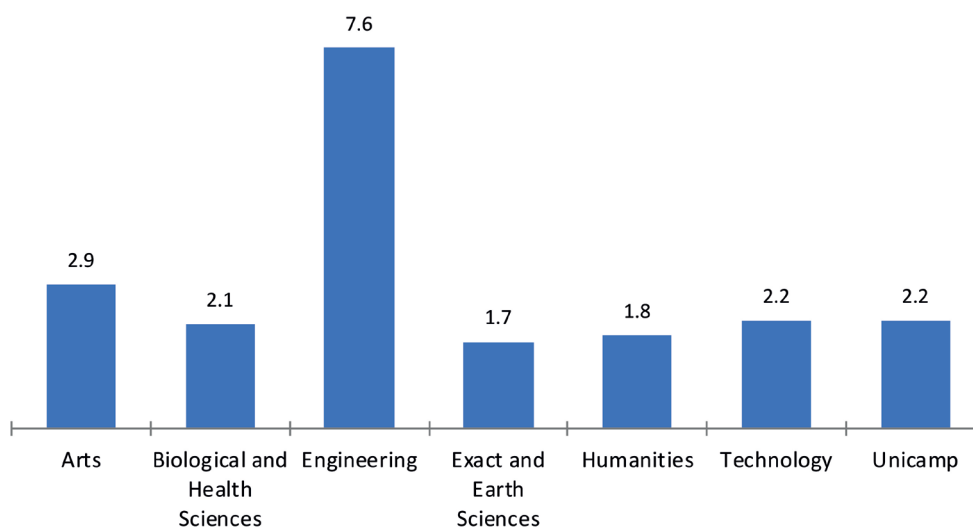
students with experience in the labor market. For teaching training programs, contact with the classroom environment, typically in high school, is a fundamental experience. In Geology, supervised internships may occur in all years of the program, in both public and private companies. Unicamp's mathematics undergraduate students are directed to advanced studies in graduate programs.

Similarly to students from other fields, Humanities students consider internships as extremely important, allowing reflection and improvement as to the extent to which they are able to mobilize knowledge for application in the world of work and how this, on the other hand, contributes to their training as a professional and education as a citizen. Several internships in this field are associated with teaching training programs, coordinated by the Unit and by FE in fields of work at the school or focused on education.

### 3.2.5 Participation in student mobility activities

Graph 3.19 shows the percentage distribution of students from various fields of knowledge who participated in official student mobility activities in the period. About 2/3 of these are students from Engineering programs, representing about 7–8% of the students in this field. Between 2% and 3% of the students from other fields participated in student mobility programs.

GRAPH 3.19. PERCENTAGE DISTRIBUTION OF UNDERGRADUATE STUDENTS FROM THE FIELDS OF KNOWLEDGE AND UNICAMP WHO PARTICIPATED IN STUDENT MOBILITY IN THE 2014–2018 PERIOD



Source: DAC, 2019. Prepared by PRG.

All programs agree on the importance of student mobility to enhance the training and expand the students' vision as to the globalized world and report the positive impacts both for Unicamp students who travel abroad and for the programs and students who come to Brazil. It is highlighted the importance of selection processes for students and faculty

and their impact on undergraduate education. Further detailed information is provided in the Internationalization chapter of this report.

Virtually all programs emphasize the importance of internationalization for the development and maturation of future professionals, as well as the impacts of reducing scholarship programs. They recognize how reports about the functioning of undergraduate programs abroad contribute to discussions for the modernization of the program. Many programs report the effective interchange of ideas of Brazilian students upon returning and also of foreigners who come to Unicamp. Technology programs have low participation in student exchanges, which is related to the socioeconomic profile of their students (low family income and need to work).

Almost all of Unicamp's undergraduate programs had students participating in international student mobility, but the perception is that the number of these students decreased significantly and they report the difficulties after the Science Without Borders program was interrupted. For some, this reduction had negative impact on the established internationalization goals, because they are part of the strategic planning of the units (FEAGRI, FEA, FEEC, Public Administration). Some units had the percentage of exchange students reduced from 20% to 5% in recent years. However, a recovery of the figures can be observed in 2018, resulting from efforts of the Executive Board of International Relations (DERI) to enter into new agreements.

In addition to selection processes, many schools reported having their own policies related to the expansion of international agreements, or by initiative of individual professors. Some programs have specific coordination or departments of internationalization to support these student exchanges (Biological Sciences, Medicine and Nursing). The Performing Arts and Medialogy programs used the University's selection processes – Deri, Santander, and Science without Borders. However, they point out the little feedforward of the experiences back at Unicamp.

In the field of Arts, they report that the technical refinement of programs abroad can contribute to the training of students and could be useful in discussions on restructuring the programs. In Biological and Health Sciences, they emphasize that the interactions are very rich and productive for both Unicamp students and foreigners at Unicamp. Health programs highlight the differences in the curricular structure and in the work in the health system, the creation of opportunities for supplementary training and interchanges. Engineering programs report excellent impact on students participating in student exchanges, contributing to their personal and academic maturation and increasing their competitiveness in the labor market. In addition, it allows comparative evaluation between the programs at Unicamp and at the institution being visited abroad. In Exact and Earth Sciences, student exchanges have a very positive impact on student training for teamwork, decision-making and initiative, and positively and indirectly impact colleagues. In Technology programs, the presence of foreigners is reduced. In the field of Humanities, the possibility of student internships at foreign universities and the presence of foreign students in the program are seen as quite positive.

Students of the Geography and Geology programs participate assiduously in the selection calls for student exchanges and emphasize that the experiences of exchange students in national and foreign institutions have fostered academic appreciation and

interchanges of knowledge that positively affect IG students in the classroom and in academic life in general.

DERI's selection processes have allowed many FEQ students to participate in international student exchanges, partly supplying the lack of the Science without Borders program. Students returning from student exchange have brought great personal experiences and are invited to talk to the Coordination about things of interest they saw in foreign universities.

The Business Administration and Management programs report important reflections on the programs with the practice of internationalization on the quality of training and on the program as a whole. Double-diploma agreements have been made and the establishment of new partnerships have been sought. In 2018, FCA's Undergraduate Committee launched a selection process to support the participation of students in national and international scientific and academic events, with increasing demand. Literary Studies students have the frequent opportunity to attend lectures and participate in short courses offered by professors from foreign universities in activities and events. For the International Trade Management, Business Management, Public Policy Management, and Agribusiness Management programs, DERI's mobility selection processes had an impact on the program.

The Integrated Physics and Chemistry Teaching Training Program students (program 56) have a profile that hinders student exchanges, especially international ones. Still, from 2014 to 2018, 22 students from the program participated in student exchange and FE received 8 students from Haiti. The Pedagogy program emphasizes the difficulty of exchanging experience with foreign institutions, because the models of the different existing programs differ greatly from free-of-charge state public universities. Still, the unit has sought to respond to demands for student exchanges abroad and recognizes the impact on their training.

The "Science without Borders" (CAPES/CNPq) selection processes increased the number of FEA undergraduate students who participated in student exchanges, which decreased sharply with its end. In 2017, it was selected in Capes' Brafagri Selection Process (25/2016), which enabled sending five students to partner French institutions. In 24 programs, students participated in international mobility programs and the special contribution of double-diploma agreements and other institutional initiatives to internationalize the Undergraduate Programs are recognized in improving the quality of students and programs of the Unit. The Mechanical Engineering program actively participated in DERI's selection processes for students and faculty and received foreign students. By the CAPES-Brafitec agreement, a significant number of students was sent to France. There was also significant participation in the Science without Borders program.

In the field of Engineering (Civil, Food, Electrical, Computing, Control and Automation, Manufacturing, Production, Electrical, and Mechanical Engineering) and in Chemistry, there is a vast tradition of student exchanges and double-diploma agreements. In other programs, double-diploma agreements are being discussed (Sports Science, Pharmacy and Nutrition).

IFGW (Physics) has set up a working group on the unit's general internationalization policy including stimulus so that elective subjects, reports and program completion works can be offered in English. Additionally, there is a collaboration agreement for mobility with

the Americampus Del Grupo 9 de Universidades Program, together with the Universidad de Zaragoza in Spain and the University Collaboration and Integration Program for Latin America and the Caribbean (PCIU-UDUAL), for diploma co-validation. IG reports that internationalization is also part of the Strategic Planning and students participate in the Student Chapters of international geoscience associations (IEEE-GRSS, associate with the Geoscience and Remote Sensing Society and AAPG, associated with the Advancing the World of Petroleum Geosciences. The exchange students, upon returning to the country, worked as PAD teaching assistants in undergraduate programs equivalent to those that were attended abroad, providing comparison and discussion of taught contents. IQ has implemented a logistics to support the establishment of partnerships for student exchange and double diploma with foreign universities. IQ has its programs accredited by the Royal Society of Chemistry since 2013, which qualifies these programs internationally, enhancing the professional inclusion of graduates.

Except in double-diploma situations, the use of studies is not automatic at Unicamp. Before leaving for student exchange, students indicate the courses of interest to request intended equivalences after returning and the Undergraduate coordination makes a pre-evaluation, following the rules of the Institution, which corresponds to 75% similarity between course programs. All programs in the field of Arts recognize the activities carried out abroad. The Sports Sciences and Nutrition programs reported that the activities carried out in student exchange programs are recognized in the curriculum, through the registration of the student exchange and the use of the courses studied. This recognition is less common in the Biological Sciences, Physical Education, Nursing, Pharmacy, Speech Therapy, Teaching Training in Biological Sciences, Dentistry and Medicine programs, as well as Chemistry and Technological Chemistry programs.

All Engineering programs recognize the activities carried out abroad based on syllabi and workload. A set of subjects abroad allows the validation of a set of mandatory and/or elective subjects at Unicamp. However, as recognition is based on subjects rather than credits, it is common that students return to Unicamp with several mandatory subjects lacking, but with numerous recognized elective credits, which postpones the program completion. In cases where Physical Engineering students attended subjects for which there are no equivalences at Unicamp, the credits are recognized by means of subjects on Special Topics of the Program, credited as elective subjects. Some Chemical Engineering students are in double-diploma programs, which provides them with the opportunity and time to attend a large portion of the program abroad, including program completion work, internship and EQ922 (project).

The Business Administration, Public Administration, Social Sciences, Philosophy, History, Geography, Public Policies Management programs from the field of Humanities reported having clear and efficient mechanisms for recognition of activities carried out abroad. Coordinators support students, either by seeking better academic use of the experience abroad or by utilizing the credits after they return to Brazil. The Social Sciences, Philosophy, and History programs reported that the subjects can be utilized for both mandatory and elective subjects, although the Coordination encourage students to take advantage of the experience abroad to diversify their training, seeking subjects not included in the common mandatory core of their curriculum.

The Economics Undergraduate Coordination validates mandatory subjects attended or by applying proficiency tests offered by Unicamp. However, subjects attended abroad are more difficult to be validated for the Language, Linguistics and Literary Studies programs, which establish elective subjects from a mandatory list of subjects of the schools. The Linguistics coordination aims to assign elective credits to subjects attended abroad. School of Education students can participate in student exchanges and receive validation of credits automatically, based on cooperation agreements and curriculum equivalence tables (as in the UNIBRAL program – 2013 to 2018, with Germany, for the Pedagogy program). Others may request the validation of credits to the Undergraduate Coordination by submitting documentation to DAC. In case of already established programs, the process is more streamlined, as there are indications of equivalence between ECTS (Bologna) and the credit system of Unicamp. In the specific case of the Integrated Chemistry and Physics Teaching Training Program, international mobility is low. The creation of a student exchange regulation in the CCG is suggested.

The Physical Education program highlights the gain obtained from the contact of our students with foreign students and the possibility of interchanging life experiences in another country. However, it states that the FEF needs to establish a more effective policy for receiving exchange students, as well as for monitoring our students abroad.

Only four programs reported having received more foreign students than having sent students abroad. The Coordinators consider that Unicamp receives a smaller number of students, relative to those who go abroad in student exchange, because the subjects are taught in Portuguese. The Manufacturing and Production Engineering program emphasized the lack of subjects taught in English in undergraduate programs, which restricts the participation of foreign students in these programs. In this regard, it is important to inform that, at the students' request, Undergraduate elective subjects taught in English were initiated in 2018 and 2019.

Programs in all fields consider it very important to provide subjects in English to facilitate the coming of exchange students. There are difficulties, however, since it is necessary that the same subject is provided concurrently in Portuguese. A recent initiative was the initiation of offering AM072 – Debates on Environmental Issues. In addition, the Physics, Teaching Training Program in Physics and Mathematics/Physics/Applied and Computational Mathematics program offered elective subjects: 2015 – F 015 – The Physics of the Rare Earth Element; 2017 – F 013 – Scientific Writing in English; 2018 – F 013 – Scientific Writing in English. The Social Sciences program also offered an elective subject in 2018 – HZ259 Sociology of Stratification and Inequality in the BRICS Countries. The Linguistics program offered the subject HL091 Academic Writing in English. In 2014, there was offer of one elective subject in French: HL092-A. Other programs did not offer subjects in English.

### 3.2.6 Outreach activities

There is a demand arising from the December 7, 2018 Resolution of the Higher Education Chamber of the National Council of Education for the incorporation of outreach activities into the curriculum of undergraduate programs in three years, with expectation



that they reach 10% of the workload. There is still no specific regulations from the state regulatory body, the CEE.

In any case, in the curricular renewal project, the PRGs and Office of Outreach and Culture (ProEC) have held discussion forums to stimulate programs to create outreach courses, utilize and credit existing courses or incorporate vectors in the outreach activity courses. These vectors, to be used, required a change in rules, approved in 2019 in the relevant institutional bodies.

In the Arts, there are subjects and course projects that incorporate cultural and artistic outreach activities into the community, with shows that are internal and external to the University, which have grown over the years (presentations, external projects, subjects, exhibitions, participation in events, festivals and competitions). The IA conducts a project called CEMANNECO, in partnership between the Municipal Department of Education of Campinas and the Undergraduate and Graduate Programs in Music. In order to offer classes on music theory and singing and instrument practices free of charge to children and adolescents aged 6 to 14 years this initiative coordinates faculty, students and Laboratories (of teaching training studies and metal instruments). The activities are carried out at the Manoel José Gomes Municipal Music School Center, with the provision of more than 500 places in music classes for the municipality of Campinas. In addition to the dialogue with society and Basic Education, the project contributes to student training by providing the opportunity to experience methodologies and practices for teaching with instruments and teaching of musical perception. Similar project with Dance should be started in 2020.

In Biological and Health Sciences, some programs report that their PPCs already include and credit some of these activities, especially those involving health projects in the community, in addition to pre-entrance exam courses and knowledge dissemination activities. The activities are part of the training, but it is unclear how they are credited. Several of the outreach, sports, cultural and artistic activities are associated with athletic and academic centers.

In most Engineering programs, especially on the Campinas campus, activities are traditionally encouraged and supported with infrastructure and funding. They comprise cultural activities, outreach activities, projects that integrate programs and the community and inclusion actions with sports, leisure, low/no cost preparatory courses for entrance exams, among others. These activities are especially valued in FCA programs. There are leagues (Engineering Labor Market, Financial Market), Integra (junior consulting company), BAJA (off road vehicle construction), Enactus (social entrepreneurship), among others that the students themselves propose.

Most Engineering programs do not credit these activities, even though they understand that they contribute to the student's training, which does not give them a character of supplementary activity. The coordinations began to study how to recognize them in the curriculum. Some of these activities are already credited (Environmental Engineering – integrated project, Computing Engineering – Programming Olympics, Telecommunications Engineering – Community Outreach Projects, and FEA – AM subject – Community Works).

Also in the Exact and Earth Sciences programs these activities are not credited, although they also recognize their importance, with very positive reports of students and graduates about these activities in training. The Physics and Mathematics programs conduct

courses with outreach projects, but the total number of credits is small. In the IFGW, from the second half of 2018, outreach and culture activities began to integrate the strategic actions. In the field of Technology there are actions and incentives, not always credited, although they are recognized for the training of the professional. It is pointed out that some already have a number of credits that can be obtained with outreach activities and other activities that are supplementary to student training, established in corresponding regulation (as occurs in the FT Informatics programs).

IFGW has a partnership with the Municipality of Santa Bárbara d'Oeste that consists in exposing students, from the beginning of their education, to critical thinking and scientific method to observe the natural phenomena of their everyday lives, enabling the conduct of tests and experiments to validate their ideas and draw conclusions and the methodology in the students' academic training will be evaluated frequently by the team at our Institute. IMECC highlighted its actions to strengthen outreach and culture activities in response to the previous Strategic Planning. In Regarding outreach activities there has been courses aimed at improvement in companies (through course at NEPO), public school excursions to IMECC, aiming to arouse students' interest in mathematics, regular lectures, program for elementary and secondary education teachers.

Most Humanities programs recognize the importance of these actions and that PPCs have not yet prepared to credit these activities. In IFCH programs there is great incentive and many activities carried out inside and outside the unit, and there has been an effort to recognize these extracurricular activities carried out by students. There are already scientific-cultural subjects that assign credits. IG and IEL programs are examples of activities already credited.

The Business Administration and Management programs were already created with this proposal and there are selection processes for students to engage in projects with the community. They understand that engagement with the community is a trend and regulatory need (outreach curricularization). Monographs were eliminated and the following were instituted: TCC COM (projects with the community), TCC OE (work carried out in student organizations), TCC IC (for those who carried out UR through PRP) and TCC RAE (in-depth internship report). The changes were inspired by initiatives and visits to international benchmark educational institutions.

For teaching training and FE programs, there are incentives for the engagement of all students in cultural, artistic and sports activities, whether institutionalized or outreach, non-outreach activities, associated with teaching and research. The courses called "Colloquiums" are highlighted in the initial four semesters.

### 3.2.7 Other extracurricular activities

The extracurricular activities in which students are involved are numerous, diverse, dispersed and insufficiently registered by Unicamp. Most of them result from their own initiatives. They include pre-entrance exam courses organized by Unicamp students, such as Zilda Arns (FCM), DCE pre-entrance exam course, Proceu Conhecimento (Student Housing), Joule (FEQ), Colméia Jovem (Limeira), PiraBixo (FOP), Exato (ProEC), among other popular

pre-entrance exam courses in the metropolitan region of Campinas with which Unicamp students collaborate such as Vila Soma (Sumaré), Flor de Maio (Hortolândia), Dandara dos Palmares, Cescom, Quilombo Urbano and Além da Escola. Table 3.15 presents some extracurricular activities, in addition to the several others that have already been described above (leagues, activities with vehicle prototypes, etc.).

TABLE 3.15. DESCRIPTION OF SOME EXAMPLES OF EXTRACURRICULAR ACTIVITIES RESULTING FROM STUDENT INITIATIVE.

Activity Type	Name	What is it?	Unit(s) Involved
Student Support	CONDECA	Control and Automation Engineering Student Council, which operates in conducting teaching, research and outreach in the field of Engineering, assisting students in problems related to undergraduate programs, promoting their integration.	FEM
Student Support	UnilInter	The Unicamp International group is a student organization that operates in conjunction with DERI (Executive Board of International Relations) to provide reception and assistance to international students before, during and after their stay.	Campinas and Limeira Campuses
Athletic	Unicamp Tritons	Unicamp eSports League.	Campinas Campus
Athletic	Unicamp Engineering League (LEU)	The LEU – Unicamp Engineering League is formed by the association of engineering athletics, and promotes sports practice among its students	Campinas Campus
Athletic	Unicamp Humanities League (LHU)	The Unicamp Humanities League (LHU) emerged in 2009 with the objective of making sports accessible and promoting the integration of students from IFCH, IEL and FE.	Campinas Campus
Athletic	UNICAMP Athletics League (LAU)	LAU is the league formed by all 20 athletics of Unicamp. It organizes championships, promotes events and prepares the university's teams.	Campinas and Limeira Campuses
Drums	Percussion Drums	LEU (Unicamp Engineering League) University Drums	Campinas Campus
Drums	BatuCogu Drums	FCM Drums	FCM
Career advisory	Unicamp Advisory Club – CCU	The Unicamp Advisory Club is an organization managed by undergraduate students that aims to disseminate the career in strategic and management advisory and prepare students for selection processes of these companies.	Campinas and Limeira Campuses
Internship advisory	Comestag	The Internship Comission, Comestag, is a student group of the Unicamp School of Food Engineering, engaged in the introduction of students into the labor market	FEA
Advisory/Incubator	AoCubo	AoCubo has the mission of fostering the management and execution of projects, sharing and building knowledge in the university context	FEEC, FEM
Social entrepreneurship	Núcleo Enactus UNICAMP	Part of an international non-profit organization that is present in 36 countries, inspiring university students to create community development projects with the support of academia and business leaders.	13 programs
Entrepreneurship	Núcleo de Empresas Juniores	Entity that brings together Junior Companies of all campi of the university	

Source: PRG and EA2, 2019.

According to the Schools, extracurricular activities are very present in the Arts, including the organization of FEIA, Unidança, the Student-Artist project, Visual Arts Bazaar,

Visual Arts Exhibition, Udigrudi Sessions, Kino Nights (Kinoforum Association), XIX Socine Meeting, among others. In Dance and Music programs, all students participated in on-campus and off-campus events. In Performing Arts and Medialogy, between 30% and 40% of the students participated in extracurricular activities, but in the Visual Arts program, the percentage is lower.

In the Pharmacy program, all students participated in activities. In Medicine and Speech Therapy, participation was around 40%. In Biological Sciences, Nursing and Nutrition, participation was about 10%.

In Engineering, the level of student participation in extracurricular activities was varied. In Mechanical Engineering, about 25% of the students participated in activities such as Mini Baja (engineering project for construction of off-road prototypes), Formula SAE (design and manufacture of formula-type prototypes), Aerodesign (functional design of aircrafts in reduced scale for competition), Ecocar (prototype project of ecological competition vehicle), GER (Robotics Study Group) and Phoenix (robot competitions in various categories). It is understood that such activities add value to the student's training regarding the practical application of their knowledge in the automotive, aeronautical and mechatronic areas, encouraging the search for knowledge already acquired and challenging to go beyond the content addressed in class. Still, about 4% of the students were involved with junior companies.

In Control and Automation Engineering, students participated in robotics teams, construction of cars, airplanes, rockets, etc. There was also a significant participation in the junior company, athletic and academic center. It is understood that these activities help students have more responsibility, better organization for studies and improved teamwork, in addition to providing protagonism in learning. They are challenged to contact some knowledge before classes or that are not yet included in the curriculum.

About 10% of Electric Engineering students participated in extracurricular activities and another 3–4% in the junior company. In Computing Engineering, almost all students had extracurricular activities that in 2014 was 85% and reached all students subsequently. They are diverse activities, including Academic Center, Athletic Center and Junior Company of the program, the latter with participation of 30% of the students.

In Physical Engineering, the percentage of students in extracurricular activities was between 13% and 25%. In Food Engineering, around 22%, associated with the Comestag leagues – for internships, Enactus – a worldwide student organization that proposes community development projects that focus on the capacity and talent of people, Gesto – social outreach group, responsible for social and community projects, in thematic areas related to training in food engineering, and 10% of the students participated in the Junior Company. A large set of extracurricular activities was carried out by about 13% of Chemical Engineering students, added to about 6% in activities of the junior company. In Environmental Engineering, participation was about 25% and 7%, respectively.

Between 15% and 20% of Civil Engineering students were involved in extracurricular activities such as: (i) internships in companies related to Civil Engineering; (ii) undergraduate research with or without support from promotion agencies; (iii) involvement with activities of the Academic Center and Civil Engineering Week; (iv) research and projects involving the

external community as an aid in non-profit courses and implementation of technologies in isolated communities; (v) junior company and (vi) organization and participation of the athletic association; (vii) technical visits. The program coordination understands that these activities are important in student training, due to the professional experience and academic improvement they provide. The Architecture and Urbanism program reported that 41 students from the program were involved in activities of the academic center, 244 in events of the Athletic Center, and about 190 students involved in the junior company, in 2018, among 250 students enrolled.

The Computing Science program had a significant number of students who participated in extracurricular activities (>90%) and, in the five-year period, between 9% and 40% participated in the junior company of the program. In the Statistics program, between 5% and 22% of the students participated in the junior company. In the Geology program, more than half of the students had extracurricular activities, and between 3% and 7% participated in the junior company. In Applied and Computational Mathematics, students' participation in extracurricular activities ranged from 42% to 99% and around 40% of the students were involved with the junior company. Students of the Information System, Technology in Systems Analysis and Development programs participate in activities such as Academic Center, Athletic Center and Junior Company.

In the Chemistry programs, students' participation in extracurricular activities was around 5% and between 2% and 5% worked in the junior company. IQ students were involved with all officially planned extracurricular activities, and had voice and vote in all committees and instances of the unit: Undergraduate Committee (CG), Interdepartmental Council (CID), Congregation and Departments. Representativeness is understood as important in the training of the future professional, in addition to contributing to the program. It was pointed out that student representation is very relevant, with increasing and mature participation.

Participation in extracurricular activities varied in Humanities programs: Business Administration (10%), Economic Sciences (25%), Social Sciences, Philosophy and History (3%), Literary Studies (between 15 and 31%), Full-time Geography (between 57 and 82%), Evening Geography (between 26 and 47%), International Trade Management (between 9 and 20%), Business Management (between 6 and 10%), Agribusiness Management (between 8 and 20%), Teaching Training Program in Language – Portuguese – Full-time (between 1 and 10%), Teaching Training Program in Language – Evening ( $\approx$  5%), Integrated Chemistry/Physics Teaching Training Program (between 61 and 72%), Linguistics (between 1 and 5%), Full-time Pedagogy (between 17 and 22%) and Evening Pedagogy (between 13 and 17%). Regarding junior companies, the percentage of student participation was between 1 and 20%, except for the Social Sciences (Full-time and Evening), Philosophy and History programs, which had no students involved.

### 3.3 Faculty and teaching assistants

Unicamp had 1,928 faculty in 2018, 95% of whom were in a regime of exclusive dedication to teaching and research. Their activity should include undergraduate and

graduate teaching, knowledge production, outreach activities for the community they serve, in addition to academic management, always in pursuit of excellence. The combination of these elements varies according to each professor's current career time, which is evaluated periodically by their school and, later, by the Internal Faculty Development Chamber (CIDD). The specific distribution of activities related to undergraduate education, as well as all aspects of teaching human resource management are the responsibility of the school, represented by its board, Congregation, Undergraduate Committee and departments.

In the conduct of undergraduate teaching activities, Unicamp has the Teaching Internship Program (PED) for graduate students, who work under supervision and guided by the professor responsible for the course in which they are participating in the internship. This program has specific scholarships managed by the Pro-Rectorate of Graduate Studies, but it is also possible to have volunteer PED students. PED is an institutional program that enables the improvement of graduate student training for internship in teaching experience or in support to teaching activities. Instituted in 1992, it meets the mandatory teaching experience for CAPES Social Demand scholarship holders regulated by CAPES Ordinance 76/2010. The internship is semiannual and can be paid or voluntary, having great adherence by graduate students, who interact with both faculty and undergraduate students enrolled in the course and also undergraduate students who participate in the Didactic Support Program (PAD), created as undergraduate teaching assistantship in 1997 and coordinated by PRG. The PADs are undergraduate students who work with scholarships or voluntarily, increasing efficiency in information interchange between faculty and students, contributing to the quality of didactic activity and serving as a link between the responsible professor and the students, maintaining a closer relationship, in addition to contributing to their own training.

In both programs, responsible professors register the courses and their needs for PED and/or PAD and then the registrations are opened for interested students. Finally, researchers in postdoctoral programs can also collaborate with undergraduate education, as well as volunteer professors-collaborators duly approved by university bodies.

### 3.3.1 Teaching activities in Undergraduate education

The teaching activity workload in Undergraduate education is distributed according to specific policies of each school. Decisions based on the professors' area of expertise predominate, within the limit of possibilities in relation to demand. This distribution also considers the activities relevant to the individual Teaching Activities Report (RAD), which undergoes periodic evaluation in university chambers.

An indicator called didactic load was defined in 1999 for decision on places for faculty selection. The indicator also composes the basis for calculating budgetary resources transferred to the Units by the Undergraduate Teaching Support Program (PAEG) through a formula that doubles the weight of nighttime workload in weighting. Thus, this index began to be understood as an indicator of teaching work in undergraduate education. In the calculation of workload dedicated to undergraduate education, the hours of some vectors of subjects registered in DAC – theoretical (T), practical (P) and laboratory (L) – are used,



excluding mentoring, preparation of material for classes, correction of tests, activities related to academic administration or representation of undergraduate education or development activities for teaching. This information is derived from the annual registration of subjects at DAC, in the year prior to their offering, with information from program coordinations, for the annual composition of the Undergraduate Catalog. The use of didactic load for budgetary calculations has been questioned, as well as the activities to be considered in the quantification of teaching work hours in Undergraduate education, and there is recognition as to inconsistencies and low reliability in the registration of teaching work hours in subjects. These considerations are relevant for reading the reports below, from the Schools.

For most programs in the field of Arts, workload is distributed according to competence in the field of the subject, with activities from 7 to 14 hours per week/professor/semester in the evaluated period. However, there are complaints about overload in recent years due mainly to retirements. There is a complaint that professors are taking on more administrative roles (WGs, committees, councils, outreach, graduate education), spending less time in the classroom and in research.

Workload in the area of Biological and Health Sciences is also distributed according to the professor's competence in the field of the subject, being defined by the departments, considering the responsibilities for teaching, research, outreach and administrative activities. As in the previous one, the perception is that management positions, retirements and leaves of absence are overloading some professors and have compromised the quality of work, as informed by the School of Dentistry (FOP) and Nursing programs, especially for field activities in the health system. In the FEF, with internal resolution for assignment of didactic load, this was 22 class hours per week/professor/semester, while, for the Speech Therapy program, this was 30 hours per week/professor/semester. IB informs that the didactic load is much higher in the full-time period.

In Engineering programs, undergraduate teaching workload is also distributed according to the professor's competence/mastery in the area of the subject, seeking to maintain balance between classes in undergraduate education, graduate education, research, outreach and administration. Professors teach classes within their research lines, aiming at greater mastery of content and at attracting Undergraduate Research students. In the case of FEA, since the first semester of 2016, the system aims to maintain the semester load of each professor close to the average workload of the unit, calculated on the basis of the last three years.

In FEEC, faculty reduction resulted in classes with more than 100 students, increased workload, requiring recent approval of new rules for assigning didactic load, increasing the requirements on faculty. The difficulties in the distribution of load are aggravated by the high percentage of stop-out and dropout in some subjects and because when students do not attend a subject in the expected semester this interferes with the expected demand for places and classes. This is particularly serious in laboratory courses, generating classes with few students, in contrast to other classes with excess demand. In FEM, the strategy to minimize problems with simultaneous absences of professors is the uniform distribution of didactic load. In Computing Science, there was an increase in the number of credits for program completion and expected increase in retirements, positions and jobs abroad will consequently increase the workload of faculty in the coming years.

In the field of Exact and Earth Sciences, the “Gleb Wataghin” Institute of Physics estimated that the time of dedication to teaching (undergraduate education) was at least 10 hours per week/professor/semester. In IQ, the distribution is based on several criteria: faculty send preferences for the subjects to the Coordination that distributes them, after opinion of the Department Board of the Unit, based on the professor’s previous evaluations or preference. The total load is proportionally divided between the departments, with criteria for the distribution of daytime and nighttime hours, seeking the balance between the other teaching activities. It is estimated that the time of dedication to teaching (undergraduate education) is 10 hours per week/professor/semester, excluding the hours used in preparation of classes and correction of tests and exercises or reports and increased workload is expected in the coming years due to retirements, positions and job abroad. However, the data provided for analysis show professors with zero didactic load in several semesters, which is inconsistent and shows a register with problems in the academic system. There has also been a great influx of postdoctoral students to work in the subjects, which is defined by the departments, progressively increasing the number of subjects with several classes with work of postdoctoral students and only one responsible professor. Student reports in program evaluation and discussion meetings indicate that, in subjects of the Chemistry and Technological Chemistry undergraduate programs in the evening, the presence of PED students is very high compared with daytime classes. This issue is very delicate and generates tensions for the Undergraduate Committee on every occasion time slots are to be assigned.

In the programs in the area of Technology, the Civil Construction program reported that professors of the MTS career (without research activities) have a higher workload than those of the MS career. However, since 2011 there has been selection process only for the MS career, which has led to an increase in the workload of professors. In the Systems Analysis and Development program, the needs are treated individually, while in Technology and Environmental Sanitation the competence in the area is considered for the distribution of workload.

In the area of Humanities, the Social Sciences program has daytime and nighttime activities, which generates an imbalance in the distribution of workload in relation to professors from other programs. In the Linguistics program, daytime and nighttime workload is distributed at department meetings, in common agreement between professors and aims not to overload professors. For the Literary Studies program, the average theoretical weekly workload increased in full-time and evening programs, as well as that of practical classes, especially due to the retirement of 15 professors in the five-year period, although compensated by 13 hirings. In Geography, workload distribution has remained balanced and has reduced the workload in the classroom, replacing with extra-class didactic activities, with greater adequacy and flexibilization of didactic-pedagogical strategies.

### 3.3.2 Hiring, Continuing Training and Teaching Support

Professors are selected by registration in open selection process for the corresponding defined areas, requiring minimum level of doctor for those who enter the career of Higher Professorship (MS). Didactic capacity is evaluated in the professor selection, together with

scientific production. About a third of the current faculty has been hired in recent years due to automatic replacement of vacancies resulting from retirements. Since 2017, when an effort has begun to balance revenues and expenses at the university, the opening of selection processes has undergone a rigorous evaluation of the Faculty Valorization Chamber (CVD), an agency linked to the General Coordination of the University (CGU). The demands are discussed together by a subcommittee of directors of different units and pro-rectors, authorizing immediate replacements due to death, but discussing replacement priorities after retirements and the opening of new selection processes.

An annual event has been held for the Reception of New Faculty, under the responsibility of [ea2] – PRG, within institutional policy, with presentation of pro-rectorates and their servants, pertinent to the new professor, advisory on rights and duties and opportunities and they are invited to start faculty training activity. Moreover, there are programs with FAEPEX resources for Career Initiation Aid (PAPDIC/PAPPIC) to set up their workspace and/or laboratory.

In addition to initiatives of the central administration, Schools also have their reception processes. The FCA provides a “Faculty Integration Manual,” with information on professional life, Higher Professorship career, diverse benefits, among others. FEAGRI has also developed an information manual. FCM has its “New Faculty Reception Program” by its Faculty Contract Chamber (CCD), when the structure of the unit is presented, clarifications are given regarding the probationary internship assessment, distribution of its didactic load and filling of the RAD, and explanation on the subsidies that Unicamp provides to faculty starting the career. IB has a seminar program for presentation of the research lines. Most Units have reception initiatives, with monitoring committee for new faculty, availability of physical space, resources and renovation of physical spaces, as well as advisory on the probationary period and incentive to participation in institutional activities such as those of [ea2]. However, several units (IA, IC, IFCH, IG, IMECC, IQ, FCF, FEF, FEM) reported that they have no established own policy for reception of newly hired faculty and that reception actions are carried out by the Departments and HR, or the head of Department.

There is a regular, annual activity for Reception of New Faculty, under the responsibility of PRG, with support from [ea2] and participation of all central management of the University and teaching and faculty support agencies (DAC, SAE, SAPPE, DGRH). It has also been offered in [ea2], more intensely from 2017, subjects, lectures and workshops with internal and external guests on curricular models and structures and new educational strategies (problem-based learning, project-based learning, flipped classroom, peer learning). GGTE has offered programs/training on subjects of use of technologies in education, such as the use of educational platforms, video production, podcasts, to support hybrid curriculum. These activities are geared toward coordinators, professors and also PEDs. There is a special teaching training program called PED+ for this specific group.

[ea2] has also promoted, since 2017, discussions on curricular restructuring and the RenovaGrad Forum by areas and programs, visits to the Units. In addition, [ea2] supports coordinators and professors in pedagogical aspects and organizes, with DAC and CCG, update activities for departments, within the AssessoraGrad project, with support, from 2019, from Educacorp. DAC has prepared instructional videos on different aspects of academic life, useful for students, but also for professors.

The Schools recognize Unicamp as an institution concerned with the improvement of teaching and learning activities, committed to the training of faculty, with a qualitative and quantitative advance in the provision of spaces for discussion. All these actions have involved most new faculty. They report that the faculty qualification initiatives promoted by the University and Units result, directly and indirectly, in positive impacts on the professors' performance in undergraduate education.

In the Arts, the importance of provided initiatives aimed at faculty qualification offered by [ea2] and DAC, including seminars, lectures on the work of invited professors and market colleagues, exhibitions, and workshops was stressed. There were very enthusiastic reports regarding the activities proposed by [ea2], not only with regard to the reception and training of professors, but also to curricular renewal, new forms of internal evaluation and the proposal of outreach curricularization. They also report that these support agencies facilitate communication between programs and provide pedagogical support to work.

The area of Biological and Health Sciences also highlighted as excellent the PRG's initiative of proposing RenovaGRAD and the support activities that have already produced positive results. Lectures and workshops with guests from outside Unicamp encouraged faculty to implement new ways of working with knowledge and its transmission. In Medicine, several subjects/events offered for faculty qualification, such as meetings, seminars, courses, lectures and other events were held additionally and by local action.

The contributions of [ea]2, GGTE and DAC were also mentioned by the Engineering programs, which report the participation of faculty and that the activities had influence on the decisions made. In FEAGRI, all newly hired professors participated in [ea2] class planning subjects, which were also widely used in Mechanical Engineering.

FEA highlighted the fact that there has been a significant renewal in its faculty since 2014, which contributed to the search for active teaching methodologies. Much was driven by the New Faculty Reception event, in addition to the teaching development activities with specialists promoted by FEA. The Undergraduate Committee points out that it has frequently participated in the activities in [ea]2 related to RenovaGrad, IngressaGrad (for professors of the initial semesters), biannual Curricular Innovations Seminar, among others. The Computing Science program reported that several professors, especially those hired in the last five years, took the course at [ea2] on course development plan and are in the phase of rethinking evaluation criteria. IG professors have also participated in RenovaGrad meetings.

In programs in the area of Humanities, it was reported that all IE professors already use the tools presented in [ea2] and GGTE. In the evaluation of IEL faculty, [ea2] has acted effectively in its function of supporting professors that have recently joined Unicamp, as well as GGTE by proposing courses and lectures strictly necessary for continuous training of professors in Technologies in Education.

In the understanding of the Social Sciences undergraduate coordination, the activities provided by the University address relevant topics for the improvement of teaching practice, with a great emphasis on issues of advances in teaching and related to the use of technologies in Undergraduate education. They understand that the main initiatives to qualify faculty come from the unit itself, involving all IFCH programs, as have occurred with the creation of the Laboratory of Teaching Training Programs, approved in December 2017, an initiative that

promoted the integration of actions of teacher training courses in the unit.

FE's Institutional Evaluation Committee reported that it lacks specific data to evaluate the relation that the unit and faculty had in activities promoted and conducted by the bodies concerned, given that it is also a unit with its specificities, whose faculty have also contributed to the construction of [ea2] itself. As for internal initiatives, there are no regular activities that resemble those conducted in the sphere of [ea2] and GGTE, and teaching is understood in coordination with the other essential dimensions of the university (research and outreach).

Some difficulties were also reported, however, especially for participation of faculty in the activities offered, due to the overload of academic activities rather than lack of interest. The Arts programs pointed out the difficulty in making better use of these activities due to schedules, as they overlap with other tasks of professors; the Biological Sciences program recognizes that, although there is provision of courses and workshops for faculty training/qualification, participation depends on the availability of time and on the relevance of the subject, with greater participation if it is specific. Some programs (Civil, Computing, Electrical, Physics and Chemistry Engineering), despite recognizing the importance of the activities, note that few professors participate because it is an individual initiative and it has not been assumed as a demand of the unit. For most programs in the area of Exact and Earth Sciences, although there were actions for reception of new faculty and discussion of new teaching and learning strategies, the faculty's adherence to the programs was small.

For the field of Biological and Health Sciences, there is a need to offer workshops on student's assessment as learning, flipped classroom, revision of the educational/pedagogical projects, among others. For IFCH programs, it is important the choice of these themes and the planning of activities by [ea2] and by GGTE through closer dialogue with the realities and demands of each teaching unit and each undergraduate program. For FE, internal actions, as well as those of general scope of Unicamp, should provide the faculty with more appropriate conditions, in order to enjoy leaves of absence, resources to participate in scientific events, fostering of outreach activities, etc., coordinating them to career valorization. Limeira campi consider that it would be extremely important and relevant to the implementation of faculty development programs *in loco*, which could involve FCA, FT and perhaps FOP, especially for educational strategies. They highlight that, in addition to the travel time, there is no ease of transport and, thus, to participate in training actions, faculty end up assuming the expenses. The Environmental Sanitation program reported that there have already been programs in FT taught by [ea2] and professors discussed undergraduate curriculum, which was very positively evaluated. It was suggested to have a greater recognition for the participation of faculty in these activities, as well as innovation and production of knowledge related to teaching at the time of the Teaching Activities Report evaluation, and in promotions, in order to stimulate dedication to teaching.

### 3.3.4 Teaching assistants: PEDs, PADs and Postdoctoral Students

Unicamp has teaching assistant programs (TA) providing scholarship for both undergraduate and graduate students, which contribute to their individual training and the

development of educational skills, while helping undergraduate students. These activities also aim to improve undergraduate teaching through assistantship, under the supervision of a professor responsible for the discipline. The Didactic Support Program (PAD), regulated by Resolution GR-54/2010, is a scholarship program as TA aimed exclusively at undergraduate students regularly enrolled at Unicamp. The program is under responsibility of the PRG, managed by the PAD Coordination Committee. During the period of this report, PAD scholarships has increased 13.3%, while the number of volunteers for the same role, as teaching assistants, increased by 100%. This support of both the growth of scholarship holders and volunteer students is directed toward the current objectives of supporting the success of undergraduate students. Table 3.16 shows data of scholarship holders and volunteer students of PAD.

TABLE 3.16. NUMBER OF STUDENTS PARTICIPATING IN THE TEACHING SUPPORT PROGRAM (PAD) – 2014 TO 2015

Unit	2014		2015		2016		2017		2018	
	Scholarship holders	Volunteers	Scholarship holders	Volunteers	Scholarship holders	Volunteers	Scholarship holders	Volunteers	Scholarship holders	Volunteers
CEL	13	4	11	4	14	3	14	2	10	9
FCA	35	27	34	44	36	85	37	101	41	103
FCF	(along with FCM)		7	6	8	6	8	6	8	3
FCM	25	68	17	42	16	46	14	57	14	66
FE	39	15	38	20	41	29	41	28	38	39
FEA	30	4	29	2	29	3	30	11	30	5
FEAGRI	21	4	25	2	22	19	22	9	22	9
FEC	21	6	21	6	21	4	21	6	20	1
FECC	40	7	42	2	42	3	44	0	36	3
FEF	41	3	39	22	41	37	40	39	41	35
FEM	30	3	24	1	30	3	29	0	28	2
FENF	7	5	9	11	10	30	10	28	10	33
FEQ	11	2	18	6	16	9	16	9	16	10
FOP	25	5	26	8	24	21	25	27	24	40
FT	43	32	41	32	43	51	44	56	44	72
IA	32	16	33	14	32	34	32	29	31	45
IB	35	69	44	58	40	94	40	129	41	84
IC	38	10	38	3	38	5	38	0	39	10
IE	25	3	25	6	24	6	24	0	23	8
IEL	34	16	34	12	34	12	34	15	35	17
IFCH	31	5	27	13	30	26	30	25	31	33
IFGW	43	2	40	0	41	2	40	1	39	6
IG	40	32	41	54	37	80	36	73	36	65
IMECC	70	7	66	6	63	24	66	17	64	23
IQ	20	1	20	3	20	8	26	17	31	13
ProFIS	31	0	32	4	36	0	36	4	36	0
PAA	it did not exist		it did not exist		62	1	59	2	71	1
Universidade Program	it did not exist	it did not exist	8	0	12	0	19	4	25	0
TOTAL	780	346	789	381	862	641	875	695	884	735

Source: Aeplan, 2019.



The students' adherence to the PAD program has been increasing in programs in the areas of Arts. For Performing Arts, the participation is important in practical classes. It is recognized a more mature participation, improving engagement and dedication of the PAD student. Social Communication – Midialogy reported that between 2014 and 2018, it had 40 scholarships in total, insufficient per semester (3 to 4). The Music program reported PAD students in 155 subjects.

IB reported that, between 2014 and 2018, there were 643 PAD scholarship holders. It stressed the importance of maintaining the program for the good progress of undergraduate teaching activities, and the need for increasing investment to improve the teaching-learning process. The work of PADs was especially important in practical and out-of-class activities in Biological and Health Sciences. In FEF, the teaching committee improved the criteria for granting scholarship and choosing students and subjects. For Medicine, the Program is important to improve the quality of teaching activities, considering the extensive workload and excess activities of the faculty. They observed, as well as the Nutrition and Dentistry programs, that there is a need for greater dissemination and increase the number of scholarships. The Speech Therapy program also reported that few subjects are included in PAD in each semester, and that there is demand for a greater number of scholarships.

For Engineering programs it was considered that the PAD students' contribution is positive. It was carried out especially by facilitating the students' understanding as to doubts, supporting subjects with higher demand and significant number of practical classes or high theoretical load, and assisting in the resolution of exercises. Regarding the number of participating students, there were 10 scholarships/semester in Chemical Engineering, 11 scholarships/semester in Agricultural Engineering, and 17 scholarships/semester in Food Engineering. The mean annual PADs in the Civil Engineering program decreased from 35% of the mandatory subjects to 10.5% in 2018, while in Mechanical Engineering there was an increase from 8 to 15 subjects in the first semester and 11 subjects in the second semester. In Electrical Engineering, the participation of PADs is recent (2018). The Physics Engineering program had 26 scholarship holders/semester and their assignments were modified over time in order to optimize their performance and improve the satisfaction of both PADs and students. They participate more actively in experimental subjects, being present during classes and being able to help in the practical part, always with the supervision of the responsible teacher. The PADs' performance, evaluated after each semester, serve as the basis for the selection of PAD students in the following semester.

The participation of PAD students was also positively assessed for all programs in the field of Exact and Earth Sciences. The scholarship holders contribute in disciplines that have part of the workload in laboratory or disciplines with high complexity and higher failure rate. For the Computing Science program, it is important to have recently approved a discipline in which one works as a teaching assistant. In addition to didactic experience, students receive a certificate and can enroll in two teaching assistantship subjects that provide credits, which has attracted a good number of candidates per semester, being a scholarship holder or not. The Statistics Program wanted a PAD allocated in each mandatory subject, but the quota is insufficient. IG reported that in 2019 it had 18 PAD scholarships, in addition to a large contingent of volunteer teaching assistants, totaling more than 50 PAD/semester.

PADs have been considered a valuable support for students of programs in the field of Humanities, participating in disciplines that require high loads of exercises, contributing efficiently to their training. Between 2014 and 2018, IE had an average of 14 PADs/semester, while the Social Sciences program had participation of 172 PADs in the 53 disciplines offered for the period. There was an evolution in the number of PAD-TA during the semester, which increased by 420% between the first semester of 2014 and the second semester of 2018. This increase was due to the Pedagogical Program reformulation offering credits for PAD-TA since 2013. IEL had a total of 238 PAD TA (scholarship holders and volunteers), in 93 different disciplines in the period, a substantial increase in relation to the previous five-year period (186 TAs in 88 disciplines). The increased number contrasts with the decreased of scholarships allocated to IEL, from 19 to 17/semester, supported by volunteer TAs in recent years. The History Program has been allocating, on average, five scholarship holders and equal or greater number of volunteer TAs.

The FE has been assigned approximately 20 PAD scholarships/semester. The professors highlight the scholarship holders' activity facilitates professor-student relationship. The FE Institutional Evaluation Committee evaluates that the program establishes a direct and rich relationship between professors and undergraduate students participating as TAs, who thus experience education in a new way, and may learn and enrich their training based on the experience of the responsible teacher and their practices over time. Equally important is the commitment of these students and responsible faculty to complete the evaluation in the PAD electronic system, so more data can be gathered for future evaluations. According to data provided, FE's PAD scholarship holders are distributed in a very balanced way in the set of disciplines for the Pedagogy Program, and considered a very positive aspect.

For programs in the Technology area, the participation of PAD students has mainly assisted in basic disciplines, practical laboratory classes and in the resolution of exercise lists. This contribution is very important because there is greater empathy between students and undergraduate TAs, with good academic progression of the participants. For the Technology in Analysis and Development of Systems and Information System Program, there were 172 PADs in the 53 disciplines offered. There was an evolution in the number of undergraduate TAs participation, increasing by 420% between the first semester of 2014 and the second semester of 2018, due to the new Pedagogical Curriculum started in 2013, when PAD teaching assistantship began to provide credits. In the Technology programs in Civil Construction and Building of Edifices, there was a reduction in PAD students in the last semesters. This fact can be explained by the reduction in the number of entrants in the program, which reduced the students' interest in participating in this type of program.

The other component of the Unicamp TA opportunity is the Teaching Internship Program (PED), an institutional program under responsibility of PRPG, that enables the improvement of educational competences of graduate students as an TA internship. This program, currently regulated by GR-048-2018, also meets the mandatory teaching experience for CAPES Social Demand scholarship holders (CAPES Ordinance 76/2010). The internship is semiannual and may be paid or voluntary. In the period of this report, PED scholarships were increased by 8.5%, while the number of volunteer graduate students increased by more than 50% – Table 3.17.

TABLE 3.17. NUMBER OF STUDENTS PARTICIPATING  
IN THE TEACHING INTERNSHIP PROGRAM (PED) – 2014 TO 2015

Units	2014		2015		2016		2017		2018	
	Scholarship holders	Volunteers	Scholarship holders	Volunteers	Scholarship holders	Volunteers	Scholarship holders	Volunteers	Scholarship holders	Volunteers
CEL	8	–	6	–	10	–	12	–	8	0
COTUCA	–	–	6	–	13	–	13	–	12	2
FCA	104	24	69	24	71	39	71	47	77	34
FCF	–	–	12	–	26	3	26	6	35	3
FCM	42	71	55	53	62	70	61	86	49	104
FE	52	29	50	41	52	63	56	71	64	73
FEA	68	51	74	29	73	37	74	42	62	57
FEAGRI	30	2	32	1	36	7	36	6	39	8
FEC	34	7	42	12	41	20	42	32	61	18
FEEC	63	1	65	1	65	5	63	3	65	13
FEF	49	7	58	3	50	7	56	12	56	18
FEM	58	12	51	12	54	24	54	40	58	46
FENF	16	21	22	23	26	31	27	32	37	11
FEQ	47	–	54	–	53	4	51	27	64	16
FOP	78	125	65	141	77	93	82	108	91	104
FT	61	7	64	11	61	9	64	8	52	2
IA	39	51	50	64	52	71	55	51	60	51
IB	63	34	69	41	67	30	64	64	71	42
IC	76	3	79	4	73	21	74	33	102	7
IE	37	4	35	2	38	5	38	8	36	10
IEL	65	16	74	10	73	9	73	12	53	34
IFCH	53	18	51	23	51	27	54	37	52	49
IFGW	85	1	77	1	81	–	76	2	74	1
IG	59	14	68	16	66	29	67	35	55	39
IMECC	123	–	100	6	105	5	102	7	104	6
IQ	94	4	83	6	86	6	84	17	86	12
INOVA	5	–	6	–	6	–	6	–	6	0
TOTAL	1,409	502	1,417	524	1,468	615	1,481	786	1,529	760

Source: Aeplan, 2019.

All Schools report that the participation of PED students was fundamental and of great importance both for graduate students, who have the opportunity of teaching classes under the supervision of a professor, and for undergraduate programs and students. It enabled the diversification of educational strategies and the provision of support to students in and out of the classroom, contributing to their own training, while improving the quality of educational activities in the disciplines.

Between 2014 and 2018, in some programs, there was significant participation of PED in subjects in the field of Arts at Unicamp, but not in others. The number of subjects with participation of PEDs ranged from 27 (Visual Arts) to 519 (Music) in total.

In the field of Biological and Health Sciences, virtually all requested disciplines offered PED places. The Institute of Biology received a higher number of PED students, an average of 59/semester, while the average for the Speech Therapy program was 45 PED students/semester.

Most Engineering programs at Unicamp evaluated the participation of PED students as essential, especially for disciplines with high failure rate and high demand of students in the classroom. It was reported that the number of disciplines that had PED increased when compared with previous years. Agricultural, Chemical, and Food Engineering reported, respectively, that the numbers were 18, 30, and 67/semester. There was a complain from several PED scholarship holders about supervision, which was flawed or non-existent, which needs to be reviewed.

Of the programs related to Exact and Earth Sciences, only Geology reported that in 2019 they had 39 PED scholarships. For Mathematics, except for calculus disciplines, there is no participation of PED students, including in teaching training programs, while for the Applied and Computational Mathematics program, PED students have provided fundamental contribution to the progress of undergraduate programs. Those responsible for programs in the Technology area recognized a major gain in subjects that had PED students when compared with previous years. It is emphasized the importance for the Technology in Environmental Sanitation program, which has disciplines with high failure rate and high demand of students in the classroom.

The programs in the field of Humanities also highlighted the support of PEDs for freshmen who may have difficulties in academic adaptation, their contribution by stimulating dialogue between faculty and students, as well as by the introduction of new educational practices. The support of PED students by means of academic support, out-of-class service, guidance in research activities and bibliographic survey is also essential. The importance of the participation of PED scholarship holders has accentuated in the context of the recent retirements, helping professors who become responsible for greater didactic load. IEL reports 410 PED students in the 2014–2018 period, among scholarship holders and volunteers.

Another group that collaborates in Undergraduate teaching is that of postdoctoral fellows, working as collaborating professors in disciplines and assuming formative activities in undergraduate and graduate programs, reported by 17 of the 24 units. It is understood that the post doctors have a very satisfactory performance in undergraduate teaching, which could be expanded.

The IQ has encouraged participation in didactic activities, where an average of 14 post-doctoral students/year have worked as professors in undergraduate disciplines between 2014 and 2018. At FEM, the work of post-doc fellows was more remarkable, since they officially assumed the didactic load in undergraduate education. A total of 19 post-doc fellows worked in undergraduate programs during the period, and 26 disciplines were taught by them. At FOP, participation has been more significant in clinical activities. At IFCH this is more significant in the offering of non-mandatory graduate disciplines, but they consider that it would be possible to expand the offer, improving the training of students. The IFGW considers that the contribution of post doctors is satisfactory, but the number of them participating in these activities is small in relation to the number of post doctors available, suggesting there is room to rethink ways to increase participation. However, a significant portion did not meet previous DAC requirements for registration as a TA (to be linked to the unit of original program, not discipline offered) throughout the school semester.

Post doctors have not worked or have worked little in units such as FEAGRI, IB, FCF and FEA and some of the supervisors do not authorize the participation of them, while some are available only for theoretical disciplines. However, with the new possibility of being registered by DAC, this work has been increasing. Additionally, it was pointed out by the IG that the participation of foreign postdoctoral students in teaching has enabled addressing relevant topics to the classroom, in fields of science not yet explored.

## 3.4 Academic Management, Resources and Infrastructure

### 3.4.1 Undergraduate support human resources

The program coordination reported that they have specialized human resources (HR) with much experience and initiative, ensuring safety to faculty, students and coordinators and streamlining processes. There are pedagogues in some programs, English-speaking employees, some with doctorates. The qualification of academic support is considered fundamental for the performance of the activities. Several employees take on multiple roles, which requires dedication and competence, and they often have higher qualification than that required by their contract. However, there is also lack of motivation due to career progression difficulties and reduced staff due to restriction to direct replacement of retirees has compromised some activities, especially in specialized functions. Programs with nighttime activities report difficulties with administrative and laboratory human resources. Some programs have the support of undergraduate student with BAS-SAE to meet administrative demands.

Most undergraduate program coordinators know that the University maintains an offer of courses and opportunities aimed at developing and improving employee skills and competences, which are very welcome. However, the programs located at Limeira and Piracicaba reported that although employees are interested, it is not always possible to participate due to difficult access.

In the Arts schools, technicians must have unique knowledge in the field and, although the staff is insufficient to meet the needs, the professionals are very competent and are able to minimize difficulties. In the Biological and Health Sciences, there are complex activities. Because the available personnel is insufficient for the needs, they need to take on multiple roles. FENF has two professionals at the Undergraduate Program Office, but, as a new unit, the structuring of work processes is under development and tasks, protocols and activities lack agility. The reduction in the number of employees in the FOP Undergraduate Program Office generated accumulation of work and compromised the service. In Engineering programs, the coordinations state that the professionals are experienced and very well trained, with academic titles (including PhD), who work mainly to support practical classes in the laboratory.

Some initiatives to circumvent this reduction in staff have been reported. At FEC/Architecture, a joint secretariat was created to serve the research, outreach and education activities, in addition to having standardized the services provided. At FEM there is a joint

secretariat of departments, facilitating the sharing of resources and service in the case of vacations and leaves, while the technical support staff meets the demands of laboratory/workshops, in a structure that has been considered effective. In the FEA programs, 468 and 243 students, respectively of full-time and evening programs, are served, in a secretariat composed of three employees, one in the evening shift. There were retirements, with no replacement. Support services are satisfactory for the IC, with a Technical Support Assistant and another employee for undergraduate education, but foreign language fluency is lacking. At IQ, a Technical Support Assistant manages all areas related to structure and secretariats, including the Undergraduate Program Office, and since 2016 he guides SAE scholarship holders. Currently, the number of employees is less than ideal, but the trend is optimizing the work processes so the current workforce can meet demand satisfactorily.

At IFGW, the Undergraduate Office currently has one person, with about 750 students enrolled/year, and her activities include all support actions for students and faculty members. She is also responsible for activities related to the service disciplines offered to other units, serving students from 24 other undergraduate programs, with an average of 10,000 enrollments/year. It also has three servants with secondary education, but it would need to have other higher education professionals to serve laboratories, apart from graduate education. Alternatively, the recent administrative modernization has increased the efficiency of the processes. The IMECC considers the support satisfactory, with less employees than necessary, resulting in overload for a school that deals with the largest number of enrollments at the Campinas campus.

At FEQ, a survey with the faculty community showed that 80% of them are satisfied with the academic support, recognizing that the employees are helpful. Nevertheless, with the increased retirements, employees are insufficient, and professors need to perform tasks that reduce the time available to dedicate to educational activities. They also pointed to the need of a supporting person working since 8:00 am, when classes start. They suggest that charter bus schedules should coincide with the working hours and highlight the need for training for undergraduate secretariats.

For the Exact and Earth Sciences, the undergraduate programs have good technical and administrative professionals and some have also support from the IT team for students. In general, the roles are adequate to their profile and competence, but the workload exceeds the possibilities and they need to assume multiple functions. The IG undergraduate department has five servants, but with profiles not fully suited to that certified.

At Humanities, professionals who perform administrative activities also provide operational support to undergraduate classes, which causes overloads and slowness. Although well qualified and dedicated to their functions, they consider that these employees are quantitatively insufficient for the demand, especially of those programs that have activities in the three periods. Work overload makes it difficult for these servants to enjoy the opportunities that the university offers for continuing training, updating and capacity-building. The IE, with an annual average of 701 active regular undergraduate students, had four employees covering three periods. At IEL, the number of employees is considered adequate, with one pedagogue and three technical-administrative servants with extensive experience, effectively fulfilling the tasks and demands. However, the need for more servants hinders their continuing training and part of this group is already in retirement



conditions. The IFCH Undergraduate Office serves three programs with two employees, one covering the evening demands. Even if they guarantee the primary functioning of the office, more servants are needed;

The Technology programs at FT and FCA reported that the officials hold undergraduate, but also hold a graduate degree (in some cases). At FT, the undergraduate office has two permanent and one temporary employee for six programs, which makes the staff limited. The employees have adequate training and perform their functions efficiently. Academic support at FCA is carried out by the Teaching Office, that comprises the undergraduate and graduate departments. The number of employees varied significantly in the period, with a minimum of 6 and a maximum of 10 servants, below the 15 proposed in the certification of the unit. The servants of the area have higher education, even if many are hired at the secondary education level. The adequacy to the roles is evaluated periodically by the school board and program coordinators and, in case of need, employees are reallocated to other activities/functions.

### 3.4.2 Infrastructure for ICT and hybrid teaching

The Educational Technologies Management Group (GGTE) supports initiatives to increase the adoption of supplementary educational resources using ICT, fostering hybrid, face-to-face and technology-mediated education. They provide staff and technical support for recording studio classes, production and training for podcasts, and use of Moodle or Google Classroom.

Several programs recognize the recent progress with the implementation of new technologies and improvements in computer laboratories with support from public procurement processes associated with undergraduate studies. Medialogy, Music, all programs in Engineering, Exact and Earth Sciences and Technology began to use digital platforms and to develop projects to implement technology-mediated learning. Biological Sciences, Sports Sciences, Nutrition, Medicine, and Speech Therapy have used e-books, digital databases of Unicamp or external collections, quizzes applications, online student assessments. Social networks, podcasts, with support from GGTE, have been adopted by programs in the fields of Humanities and in teaching training programs. At IB, some professors use flipped classrooms with virtual resources produced inside or outside Unicamp for specific disciplines (Transverse Themes and Media Construction for the Teaching of Sciences and Biology).

Undergraduate program coordinators see as a strong point the fact that Moodle is integrated to DAC systems, having the registration of each discipline, with the responsible professors and students. They emphasize that, with the agreement between Unicamp and Google, students and professors also have access to the Google Classroom tool and that access to the resources available in the Google Suite has contributed to the availability, discussion and dissemination of information and of different teaching strategies.

At IC, they point out that most academic activities are carried out with free software, while other pieces of software used have license acquired by the University. Thus, most programs considered the software licenses adequate (Architecture and Urbanism and

Agricultural, Environmental, Civil, Food, Telecommunications, Mechanical and Chemical Engineering, Exact and Earth Sciences, Business Administration, International Trade Management, Business Management, Agribusiness Management programs, Teaching Training Program in Language – Portuguese and Linguistics), with the exception of the Dance, Manufacturing, Production and Physical Engineering programs. The Visual Arts program reported that, with the hiring of two new photography and computer graphics professors, the demands for IT resources to both equipment and software increased, generally acquired by Unicamp.

The IE and FE also highlighted that the infrastructure is adequate for the provision of access points in classrooms, laboratories and libraries. The Wi-Fi network covers the entire area of the unit, it is widely used by students, and that there are computer labs and multimedia rooms. In addition, they highlighted the availability of networks, such as Eduroam, Unicamp and the sectoral ones. Eduroam enables the resources made available online to be accessed and supplemented dynamically and comprehensively. However, the Wi-Fi network has a weak signal in common use areas (such as Basic Cycles I and II, FCA), which prevents some activities. They point to the need for a Wi-Fi network project for these buildings and other common areas.

The Institute of Geosciences, in association with the School of Civil Engineering, Architecture and Urbanism, the School of Technology, the School of Agricultural Engineering, CEPETRO and NIED, is creating an interunit laboratory with resources from public offer by CGU-PRG 2019 and Fapesp technical reserve, to be installed in a physical space already available. It aims to bring actual problems to the classroom, allowing integration, immersive visualization and advanced analysis of scientific data, in order to promote active, flexible and motivating learning, with advanced Virtual Reality (VR) interface.

Many units consider adequate their conditions for providing hybrid teaching, with incorporation of mixed educational strategies, using information and communication technology resources. Computer labs do not seem to be a problem for most units and programs, but there are reports, especially at IA and FT, that they are partially adequate (Visual Arts, Biological Sciences, Manufacturing and Production Engineering and Physical Engineering, Economic Sciences, Technology in Analysis and Development of Systems and Information Systems) or inadequate (Performing Arts, Dance, Music, Nursing). For these, there is a need to invest in new computer labs and to update the existing equipment.

Several programs stated that they are satisfied with their websites (Visual Arts, Architecture and Urbanism, Engineering programs: Civil, Manufacturing, Production, Telecommunications and Mechanical Engineering, Exact and Earth Sciences programs). The Dance program created a 30-year anniversary (2015) celebration website with videos about PIBID, but it needs maintenance, update. With regard to blogs, the vast majority of Exact and Earth Sciences programs considered them appropriate. However, others are dissatisfied (Agricultural Engineering, Food Engineering, Exact and Earth Sciences and Pedagogy programs).

Regarding support from the ICT team, everyone recognizes the need for a trained and up-to-date team that provides fundamental support for different teaching, research and outreach activities. In units such as IB, FCF, FCM, there are several professionals: for systems development, with analysts and programmers, web designers, and network and

user support professionals. FEAGRI, FEA. FEQ consider the support of ICT professionals great or good, with very qualified professionals. At FEC/Architecture and Urbanism, the main contribution of the ICT team is the development of specific management and teaching systems, such as classroom reservations. Some units highlighted the existence of the Video Conferencing Service, such as FEA, which is widely used. At FEEC, the same team takes on the Communication area, including the Department of Events to support the organization of academic or professional activities, as well as at FEM).

At FOP, the number of employees in the area of systems development is adequate, but there is only one employee to support users, which has generated accumulated demands and delays. The IC, IMECC and IFCH reported the need for staff update and expansion: The FCA also reported that, with the growing demand for services, the ICT infrastructure is operating on the limit, and resources are needed for investment in the area. Due to the amount of systems awaiting development, the number of employees was inadequate and even the maintenance of computational resources in classrooms was a challenge because of lack of user support employees. Thus, the service was reduced and part of the processes were redistributed between the sectors linked to the Technical Support Board. IG's ICT support sector played an important role in moving the Institute to a new building and adapting the technology infrastructure. All servants have the necessary skills for the functions, but the staff is reduced and it was necessary to rely on interns. At IEL, the IT structure has not been adequate in relation to the number of employees, there are employees close to retirement and professionals do not have the desired qualification to ensure the full functioning of the sector, with its specificities.

### 3.4.3 Infrastructure of classrooms and laboratories

Laboratories and equipment are considered adequate in most programs (Biological Sciences, Physical Education, Pharmacy, Speech Therapy and Medicine, Architecture and Urbanism, Engineering: Agricultural, Environmental, Civil, Food, Electrical, Physics, Mechanical and Chemical Engineering, Higher Education in Technology in Building of Edifices and Technology in Roads and Technology in Environmental Sanitation; Exact and Earth Sciences programs). Civil Engineering reports that teaching laboratories have undergone some improvements, highlighting the renovation of teaching equipment for testing in laboratories, improvements in facilities aimed at safety, ergonomics and technological updating.

IA, FEAGRI, FT, FCA and IE consider that classroom conditions need to be improved (Performing Arts, Visual Arts, Dance, Medialogy, Music, Agricultural Engineering, Higher Education in Technology in Building of Edifices and Technology in Roads, Technology in Analysis, Development of Systems, Information Systems, Sports Sciences, Nutrition, Public Administration, Economic Sciences). For Medialogy, pieces of equipment such as multimedia projectors and screens were highlighted.

The Mechanical Engineering program currently has two classrooms with capacity for 90 students with comfort and didactic structure, but there is demand for six other similar classrooms. They currently use CB classrooms. The construction of the building for

allocation of didactic laboratories at Block O, with several experiment benches and that serve different areas of the program filled a gap, but the Dynamics and Vibrations laboratory is substantially delayed.

The Control and Automation Engineering program reported that the lack of equipment compromises the conduct of experiments by all groups, but a block was recently built for undergraduate laboratories (Block N) that facilitated the conduct of practical classes. Classrooms and computer lab are also considered appropriate and the students recognize that the classrooms and laboratories are functioning properly.

It was also noted the need for improvement in laboratories and technical support for IA (Dance, Medialogy, Music, Performing Arts and Visual Arts), FCA (Sports Sciences and Nutrition, Manufacturing Engineering) and FT programs (Production, Telecommunications, Technology in Telecommunications Systems). Dance and Performing Arts have special need for rehearsal and presentation spaces, due to the work on the theater having ceased. Renovations in the spaces currently used are scheduled and budgeted for 2020.

At IFCH, projects for the purchase of equipment were approved and more recently a project was designed for the construction of two laboratories for audiovisual activities. The History Olympiad, under the responsibility of IFCH, is one of its main outreach activities and now has an adequate space in the Institute's new Interdisciplinary Research Centers building.

#### 3.4.4 Academic system

It is a consensus that the academic information system is of fundamental importance to reduce face-to-face service in undergraduate departments and DAC, and that it provides agility in actions related to the registration of grades/scores and attendance, consultations to school history, during enrollment, consultation to grades/scores and issuance of documents. More than 90% of the programs considered the relevance of the enrollment system to be high or very high, although almost 30% classified its efficiency as moderate. Regarding SIGA (Academic Management System), which enables faculty to monitor academic life and enter grades/scores, the relevance was higher and the efficiency was lower, with 37% considering it low to moderate.

It is recognized that there has been a great improvement in the systems in recent period. school and their undergraduate program coordinatoions pointed that some modules are more effective than others, know that various procedures are still in implementation and request that the units are consulted when new modules are developed. They recognize that DAC is available for requested improvements, although not always in timely manner. They present a number of suggestions:

- The enrollment and academic monitoring systems (SIGA) should be unified;
- Integration with other systems is lacking (e.g. SAE, Comvest);
- The pieces of information should be accessed more directly, without many intermediate steps, with simplified menus, optimized graphic design, thus ensuring good browsing experience;

- The systems should allow the opening multiple screens/tabs at the same time for easy searching;
- The system lacks stability to avoid delay in delivering services or products;
- It needs greater agility on preparation of schedules, catalog and adjustment in enrollments;
- It lacks management reports in Excel format, capable of providing usable data (non-PDF) about the evolution of students and courses for monitoring;
- The didactic load report is issued only by a faculty member, and a report for the unit is necessary;
- The availability of didactic load by discipline, from previous semesters, would avoid the need to access the activity report of each participant;
- The catalog and PED system should be revised, so action can be taken in timely manner. Information about students should be grouped into a single access and, when consulting their records, there would be the option to access menus on various subjects of their academic life;
- The functions of consultations and issuance of student documents would need to be made available to the faculty, thus reducing consultations to academic departments;
- The reports should remain available after the period of action (e.g. course demand report, enrollment adequacy for analysis of applications for “out-of-time enrollment change”).

### 3.4.5 Evening programs

Undergraduate coordinators were asked to evaluate the conditions of operation, security and availability of supplementary activities for evening programs. Many do not offer programs in this period of the day, but students use the space and structure for other activities, in addition to attending subjects offered in the evening period.

Several programs considered the conditions adequate (Music, Physical Education, Architecture and Urbanism, and Food, Manufacturing, Production and Chemical Engineering, Visual Arts, Statistics, Teaching Training program in Mathematics, Mathematics, Applied and Computational Mathematics, Public Administration, and Technology programs). Inadequate conditions were highlighted in relation to support services in the unit and canteens (Biological Sciences, IG, Electrical Engineering, Technological Chemistry); lighting, bus stops, the presence of guards, chartered bus schedule (Sciences, Teaching Training Program in Physics, IG, Electrical Engineering, Teaching Training Program in Language – Portuguese, Environmental Engineering, FT Technology programs, Business Administration, Economic Sciences, Social Sciences, Teaching Training Program in Language – Portuguese, Geography). FT and FCA programs considered inadequate the bus service between campi (Limeira Campuses I and II). The Integrated Teaching Training Program in Chemistry/Physics and Pedagogy programs considered problematic the lack of monitoring cameras in parking areas and lighting in external areas of the School of Education.

The Technological Chemistry program also considered inadequate the schedules of internal and external support services and supplementary and extracurricular activities.

Libraries and undergraduate departments do not open at night or close before the end of classes and/or do not open on Saturdays and the Environmental Safety and Ethics Committee, which has employees with key activities to support teaching laboratories, is neither open at night nor on Saturdays when there are laboratory classes. It was also reported that, in general, evening programs are deprived of supplementary academic activities that take place during the class period: lectures, seminars and events. The Geology and Applied and Computational Mathematics programs positively highlighted the Preventive Health Program in the Units/Cecom.

### 3.4.6 Budgetary resources and calls focused on Undergraduate Education

The budgetary resources for undergraduate education allocated for each Schools compose the programs PAEG (Undergraduate Education Supporting Program), established by Ordinance GR-154/1997 and PAAEEC (Extracurricular Student Activities Supporting Program). The PAEG amount per each school is calculated using a formula that considers proportion of graduates in relation to entrants, enrolled students and teaching qualification, TA contribution and finally teaching workload, where the parameters corresponding to evening programs have double weight. The amount for PAAEEC is based on the number of undergraduate programs offered and the number of regular students enrolled in their programs.

In addition to these resources directly allocated to the Schools, there are the resources provided for in the general budget approved annually and under management of the PRG, as institutional calls: Visiting Specialist Undergraduate Professor Call – PPEVG, PRG Public Call to Support Extracurricular Activities of Students, in addition to recent call to Foster the Production of Video Classes. In addition to these, educational support resources, mainly used for infra-structure, are available at the Research Pro-Rectorate (FAEPEX-Ensino). There were also calls for professors to conduct international visits to programs of excellence to interchange experiences about undergraduate education through and Executive Board of International Relations (DERI), a Santander scholarship. A new call to Support Curricular Renewal Project – RenovaGrad by PRG will be launched early 2020.

Programs in the field of Arts consider that PAEG and PAAEEC budgetary resources are vital for the funding-execution of outreach activities and others activities related to the educacional process. The resources are used for the acquisition of permanent assets, Consumable supplies and materials and small-scale renovations. However, the limitation and difficulty in using the resources impose restrictions on the implementation of proposals by the program coordination, payment of guest speakers, or supporting students to participate in programs or congresses.



## WORK PRESENTATION OF THE STUDENT ARTIST PROJECT



Antonio Scarpinetti/SEC – Unicamp.

The Biological and Health Sciences programs consider that FAEPEX-Ensino and other specific calls are important for maintenance of and support to undergraduate activities. The resources allow the acquisition of inputs and services for laboratories and support external activities. However, the IB points out that the main source of resources (PAEG) has decreased significantly, from R\$ 194,805.00 in 2014 to R\$ 118,031.00 in 2019. The Sports Sciences program suggested that the calculation of PAEG resources should be revised to enable considering the needs of each program. At FCA, to circumvent their heterogeneous distribution, the PAEG resources are executed in conjunction, seeking to meet the different demands of each of the six undergraduate programs. The Sports Sciences program suggested that the calculation of PAEG resources should be reviewed to enable considering the needs of each program.

The Nursing program claims to understand the restrictions. However, the program expects gradual growth of the budget, so as to meet the specific needs of undergraduate education. The technical team is structured quantitatively and qualitatively to treat the resource in a targeted way. The Pharmacy program highlighted that it used most of the budgetary resource to purchase consumption materials for practical classes, lab improvement and equipment repair/acquisition. A significant amount was spent in transportation for visits to health centers, companies and institutions, a demand of the Curricular Guidelines.

The Medicine program considered the resources insufficient to meet the needs of improving the curriculum and teaching methodologies. There is need for expansion and replacement of parts of the Skills Laboratories, in which students train with low- and high-fidelity simulators for clinical routine, urgency and emergency situations. They also report that platforms such as Moodle have been used for academic activities and that the physical infrastructure available is insufficient for the class sizes (120 students/year). This requires that tests are taken in several rooms, demanding many responsible professors.

They consider their maintenance essential because it is understood that they improve the quality of the educational program.

For Engineering programs, the restriction on PAEG and PAAEEC amount has impacted the academic activities. They report that FAEPEX is an important complimentary source. However, they recognize the importance of these resources for the maintenance of laboratories, materials, as well as technical and field visits. The Food Engineering program reports that educational innovation requires creativity, non-traditional, interdisciplinary approaches, in a reality of scarce resources. FEA emphasizes the major effort of all faculty to maintain excellence in student training, but the restriction of budgetary resources limits and directly impacts the improvement of the educational system. The Electrical Engineering program reported that FAEPEX – Ensino public calls and PAEG resources have been essential for the proper functioning of collective study rooms and laboratories. For the Chemical Engineering program, PAEG's resources have been used in consumption expenses, and FAEPEX resources have been approved in a fraction lower than requested.

The programs in the Exact and Earth Sciences area report increasing difficulties in maintaining the undergraduate out-of-class activities, external to the Campus and that FAEPEX has been necessary to ensure quality and updating of materials and equipment. In particular, the Geology program reported that the 2009–2013 Committee of External Evaluators highlighted the recommendation of greater attention to the need for sufficient resources to meet the required 720 hours of field study. To remedy the problem, the IG Board has allocated other budgetary resources. They highlight that resources such as PAEG and PAAEEC are insufficient.

The IQ has peculiarity as to the execution of its expenses considering the special needs on reagents, materials and equipment, even subject to authorizations from the Army or Federal Police. It informs that the equipment park for undergraduate laboratories has not received minimum resources for renovation for more than 10 years. Many pieces of equipment no longer function, or are outdated, preventing students from having classes in satisfactory conditions. Nevertheless, these educational support public calls are insufficient for large acquisitions. The Technology in Civil Construction, Technology in Building of Edifices and Technology in Roads programs reported that the budgetary resources allocated to undergraduate education increased considerably in the period and that the funds were allocated to restructuring and creating laboratories. However, the same did not happen for the Technology in Environmental Sanitation program.

In general, Humanities programs report that the budgetary resources made available to undergraduate education have been decreasing, but that the need for them has increased. Actions to reorganize the application of PAAEEC and PAEG resources in addition to the use of other sources are in use with palliative effect. They criticize the parameters used in the calculation of the distributed values. The Social Sciences programs have endeavored to make the application of resources more transparent and systematic. They opted for the allocation of half-yearly funding quotas, whose proposals must be submitted in a public call at the beginning of each semester, evaluated by the Undergraduate Committee, which seeks to meet as many demands as possible. This strategy enabled better planning as to resources, without prejudice to the fulfillment of the demands coming from professors and students, activities planned by the Coordination.

For the Integrated Chemistry/Physics Teaching Training and Pedagogy (FE) programs, despite the insufficiency, the resources used have contributed positively to the process of training, learning and expansion of knowledge. They note that the application of these investments promotes the academic evolution of students and of their skills as a future professor. In general, the programs consider that the institutional public call/selection processes have contributed to improvements and that, despite specific contingencies, they were maintained regularly. Regarding Faepex-Ensino, they reported that it has been of great importance in providing supplementary resources for the acquisition of inputs to enable their programs with practical-laboratory content, but also important to maintain/renew equipment in laboratories, adjust the physical infrastructure of educational spaces and upgrade or exchange computers used by students.

Also, school highlight that the participation in the public call/selection processes allowed the collective discussion of projects and that, when they were not selected, the effort contributed to submission in other processes, development of the project with their own or alternative sources of resources. Although the impact of the above processes has been very positive, they see the need for improvements. They consider initiatives that seek to foster pedagogical practices in the program as important and welcome. The public call/selection processes had positive impact, allowing academic visits, student and professor exchanges, participation in scientific events with presentation of papers, teaching capacity. Also, they value the possibilities of interchange, providing a broader view of the training, both by the advances brought by professors who go abroad (Mobilidade Santander-DERI) and by the interchange with professors coming from abroad, or non-academic experiences as the Visiting-Expert Professor (PPEVG) call offers.

For the Arts, the public call/selection processes have impacted each particular program in a positive way. The coming of a Visiting Expert Professor by the PPEVG call/selection process benefited students and provided communication with various areas of the programs taught at the institute. It was extremely important for the supplementation of education, keeping in touch with the professional environment, with emerging themes and artists working in the contemporary scene. The public call/selection processes enabled fostering greater bond with artists and institutions that promoted access or sought together with Unicamp the development of national and international references of excellence. The Arts programs also participated in the DERI call/selection processes and several students benefit from attending part of the mandatory subjects in affiliated universities outside Brazil. They participated in Faepex-Ensino for the purchase of equipment for the studios. The SAE/PRG Aluno Artista selection process, which grants scholarship to students who propose artistic manifestations on campus, was recognized as one of the most important for this institute.

The Biological Sciences programs highlight a reduction in the values approved in the Faepex-Ensino to less than half of the amount received in the previous four years. Still, it enabled acquiring equipment and improving infrastructure (tablets, air conditioning, acoustics and sound of classrooms, multimedia projectors, videomicroscopy in practical class laboratories, Computer Center for Undergraduate Education Office). In a 2018 DERI Mobility process, the program coordinator visited the University of Bristol to learn about the virtual microscope being included in undergraduate programs.

The Sports Sciences program highlights that the institutional calls allowed academic visits, student and professor exchanges, participation in scientific events with presentation of papers and teaching capacity-building, among other activities. They also allowed the coming of important references for the program by two PPEVG – PRG, in addition to the DERI (AIUP) processes.

The Nursing program highlights the importance of the Professor that came by means of PPEVG from the USP-RP School of Nursing in the realistic simulation subject, which contributed to enhance teaching strategy. It also reported that in 2019 it was selected in the CGU process in the type 1 and 2, proposals for revitalization of teaching laboratories and acquisition of digital blackboards for all classrooms and laboratories, as well as payment of a realistic simulation course for the nurse responsible for the laboratories.

For the Pharmacy program, FAEPEX-Ensino has been of great importance in the provision of supplementary resources. Between 2014 and 2018, the Program obtained funding that enabled a major improvement in infrastructure. They also reported the benefits of the PPEVG visit. The Speech Therapy program received several PPEVG in the period. They report that the integration between professionals, students and professors has provided great contribution to specific knowledge, because they are specialized professionals in the areas of Language, Hospital Phonology (Neonatology), Voice, Worker Health, supplementary and/or alternative Communication and Audiology. In addition, all PPEVG Professors participated in the program evaluation activities, with lectures to the entire community of the School of Medical Sciences and open to the external public. The program has also benefited from several Faepex-Ensino calls, with acquisition of equipment and materials that assist in various theoretical and practical subjects. Three professors of the program benefited from DERI Calls.

The Medicine program informs that the resources of the FAEPEX Ensino are effectively allocated, although the values released are always lower than those requested and insufficient to meet the great demand. The new fields of practice, medical simulation laboratories, new technologies used in applied anatomy subjects (image room) and Telemedicine room, are areas that require a high and continuous investments. The resources obtained have been far below the needs, often preventing the improvement of curriculum and educational methodologies. They report that PPEVG has contributed by bringing the visiting experts' differentiated view that guided program improvement. The Dentistry program informs that it was selected in several of the PPEVG, which contributed to the activities of preclinical and clinical courses. The sum of resources obtained in educational public call/selection processes from 2015 to 2017 enabled adjusting physical area and purchasing materials and furniture for the new active methodologies room. The Nutrition program highlights that it has been difficult to take advantage of PPEVG because only one proposal can be submitted per unit and FCA has six undergraduate programs.

FEC reported that it was selected in 2018 in PPEVG, which contributed to the dissemination of knowledge related to the application and construction of structures with engineered wood, a subject that was not taught. In terms of additional resources for undergraduate education, the unit received aid from the FAEPEX-Ensino program, which was allocated for various activities, infrastructure and support in specific programs and academic infrastructure.

The Agricultural Engineering program informs that it was selected with the approval of a PPEVG call, which impacted the research group working in the field of the visiting professor, composed of three professors and several undergraduate and graduate students. It was also selected with partial approvals in FAEPEX-Ensino that, in general, allowed the updating of equipment and construction of didactic modules used in practical classes.

The Environmental Engineering program highlights the two PPEVG calls, which contributed to bringing professors for teaching courses with relevant subjects and supplementary to the disciplines of the program, and very important for the students.

The Food Engineering program was selected in Faepex-Ensino calls, which enabled: (i) improving the infrastructure of the building of the Undergraduate Teaching Laboratory (LEG); (ii) improving the infrastructure of undergraduate and graduate classrooms; (iii) Adjusting classroom with resources for hybrid teaching. The Computer Engineering program also highlights the importance of this call for the renewal of equipment in laboratories. For the Control and Automation Engineering program, the budgetary resources and those allocated to Faepex projects are greatly reduced, they allow the maintenance of equipment, but not the updating nor the preparation of new projects.

For the Electrical Engineering program, the Faepex call has been essential in the maintenance of laboratory equipment, which is particularly relevant considering the new curricular guidelines, which stimulate more integrative projects and activities led by the students themselves. They reported that the unit benefited particularly from PPEVG call, especially in one of the cases that had, working on the mentoring of joint undergraduate research work and changes in some laboratory disciplines, providing an interesting practical view on teaching.

For the Physical Engineering program, Faepex-Ensino and PPEVG calls are essential to maintain the proper functioning of undergraduate education. Between 2014 and 2018 there were approved calls that allowed the renewal of instruments and infrastructure of the laboratories. They also had a project approved in 2018 to make one of the classrooms more suitable for active learning methodologies. During the period from 2014 to 2018, they received three visiting professors in PPEVG. IFGW was also selected for a project in the recent call CGU-PRG 1/2019 – Planes 2019 to implement project courses in basic cycle programs, starting with those with greater failure rates. Chemical Engineering received resources from FAEPEX programs, which assisted in the renovation of classrooms and laboratories. PPEVG allowed three professionals with remarkable experience to teach undergraduate programs, bringing their in-the-job experience.

PPEVG's contribution allowed improved quality of undergraduate education in Manufacturing Engineering by interaction between professors, students and visiting professor by integrative projects. There was also alignment of content and teaching strategies with the professional qualification in Engineering required by the industry, promotion of a more constructive dialogue, consolidation of the relation between Limeira's local industry and the FCA community, and promotion of interdisciplinarity with other undergraduate programs of the school.

The Computer Science program highlights the importance of the Faepex-Ensino call for the renewal of equipment in laboratories. For the Geology and Geography program the PPEVG calls have also been very important and fruitful. Recently, IG/Unicamp has



made several investments via FAEPEX-Ensino, which were applied to the improvement of infrastructure (computers and other equipment, furniture, audiovisual material) for teaching laboratories and classrooms. In the second semester of 2014, IG made a large investment with FAPESP technical reserve resources acquiring 20 petrographic microscopes for the Microscopy Laboratory. IQ had two PPEVG projects approved. It also had projects approved in all FAEPEX –Ensino calls, with insufficient values for large acquisition. They are palliative contributions, which do not meet the demands, although their impact is positive.

For the IMECC, the Faepex-Ensino programs particularly benefited the teaching training program and the maintenance of the infrastructure of computer laboratories. In addition, a repository of teaching support materials (<https://cursos.ime.unicamp.br/>) was developed for the main mathematics subjects offered, benefiting approximately 6,000 enrollments/year, which has been accessed more than 711,000 times. The IMECC the visiting specialist professor, in addition to the subject offered, prepared didactic material for a future tutoring program, aiming to support entrant students with a prognosis of difficulties in the mathematics subjects of the first semester (Calculus 1 and Analytical Geometry). There was great satisfaction with the benefits of these calls.

#### IMECC'S COMPUTING LABORATORY



Antonio Scarpinetti/SEC – Unicamp.

Participation in PPEVG in the Public Administration program was very advantageous. The Economics Sciences program considers that the Faepex-Ensino program calls allowed the acquisition of computer equipment, renovation of the pavilion of restrooms and classrooms.

The available calls also contributed to improvements in the Social Sciences program, especially FAEPEX-Ensino and PRG calls. The program also highlights other calls recently used with direct impacts on undergraduate teaching: a) Prodocência/CAPES (2013-2017): enabled the constitution of L3 – Laboratory of Teaching Training Programs, project for integration of the Teaching Training programs in Social Sciences, Philosophy and History; b) Institutional



Call to Support the Production of Didactic Material/Unicamp/PRG (2016), for the book “Pensar com método”; c) PPEVG: IFCH programs have submitted proposals in most calls, and have been selected several times; they also report the acquisition of equipment and books and investments in infrastructure with resources from FAEPEX-Ensino and funding agencies.

The very positive impact of the calls on undergraduate programs offered at IEL, both by PPEVG and FAEPEX-Ensino, were recognized. The visiting professors selected conducted interesting activities with undergraduate students. Regarding the DERI calls, IEL points out that it is important to note their benefit to professors, staff and students, since they enable exchange between the community and the main universities abroad.

The School of Education has submitted projects in all public calls published by PRG and its programs have been greatly benefited by the approved PPEVG proposals, with subjects such as right to education in early childhood, Afro-Brazilian cultures, indigenous theme, which integrated the Pedagogy, Social Sciences and Arts programs at Unicamp, providing interchange between fields of knowledge. The same has occurred with projects for Faepex-Ensino, but the resources released have been insufficient to promote the necessary improvements.

The Technology in Environmental Sanitation Program reported that, in the period evaluated, they were awarded twice for PPEVG, which contributed to bringing professors responsible for teaching courses with subjects that are relevant and supplementary to the program, very important for the training of students. They were also selected in calls for professors to conduct international visits to programs of excellence to interchange experiences about undergraduate education. The existence of six programs at FCA requires distribution of resources, preventing all programs to apply individually for the calls.

### 3.4.7 Collaboration between units

Undergraduate education has been carried out with some collaborations between Schools. Usually, the so-called service disciplines, are offered by IFGW and IMECC to virtually all students of Exact and Earth Sciences and Technology programs, which corresponds to about half the entrants. Other collaborations depend on the nature of the program and specific subjects. The Pharmacy program, for example, originated from a collaboration between Medicine, Chemistry and Biology.

IA identified associations with Medicine, Electrical Engineering, Biology, and Physical Education. The collaborations and partnerships are carried out in undergraduate programs, in addition to graduate education and internships. The Institute of Biology coordinates and offers subjects for undergraduate students of FCM, FENF, FCF, FEA, IA, FEF and Engineering programs. The School of Pharmacy collaborates in undergraduate subjects of FCM, IB and IQ. The School of Physical Education has also received collaboration from FE and IB in offering subjects to its students, while FENF offers service subjects in conjunction with FCM.

In the Engineering area, FEAGRI maintains relation with the other units responsible for the basic core service subjects (IMECC and IFGW), but it considers that this interaction is partial and needs improvement with greater approach. The Undergraduate Civil Engineering program maintains partnership mainly with FEAGRI, but also with IMECC, IG,

IE and FEEC. The Architecture and Urbanism program comprises professors from IFCH and IA, with close collaboration in final undergraduate projects. FEEC receives support from the Center for Biomedical Engineering (CEB) for undergraduate education.

FEQ maintained good interaction between undergraduate coordinations in circumstances organized by the Undergraduate Pro-Rectorate, such as RenovaGrad events, in addition to meetings convened for certain purposes to discuss ideas for program improvements. A weak collaboration occurred between professors of FEA and of other units, what is considering a weakness to be overcome. FT, where Technology programs are concentrated, has no collaborative activities with other units.

At IFGW, collaboration with other units has been intense, especially with IMECC, which allows the admission of students of undergraduate and teaching training programs in Physics (with all qualifications), of Physical Engineering, of undergraduate program in Mathematics and Applied Mathematics. The undergraduate program in Physical Engineering has a partnership with FEEC and FCA and studies the expansion of partnerships with FEM. For the undergraduate program in Medical Physics, IFGW receives support from FCM and CEB, in addition to the partnership with FE. It also offers several disciplines to other Undergraduate programs in Exact Science and Engineering and Technology.

At IQ there was extensive collaboration with other Units in the period, by offering subjects to other programs. It served 1,500 full-time and evening students of programs of IG, IB, FCF, IFGW, FEQ, FEM, FEC, FEAGRI, FEA, FEEC. The Integrated Chemistry/Physics Teaching Training program is multidisciplinary and taught under the responsibility of FE, IQ and IFGW. There is PECIM (Programa de Pós-Graduação em Ensino de Ciências e Matemática), whose responsibility is shared between FE, IG, IF and IQ, and has professors from IMECC, IB, FCA, FT and NIED.

FCA professors taught disciplines for IE Undergraduate students, service disciplines for students of other programs, and also maintains reciprocal collaboration with FEC and IG professors. IEL conducted a partnership with the Speech Therapy program of FCM. It also had academic activities with IFCH, offering mandatory subjects to the undergraduate Philosophy program, in addition to holding events in conjunction.

The IFCH undergraduate programs received professors from Units such as PAGU, CESOP, CLE NEPO and NEPAM, all research centers at Unicamp, and IG, IEL, IA, Economics, Architecture and Urbanism and FE. On the other hand, IFCH participates in the training of FCM, FEM, FEC, FT, FEA and FCA students and it is required that students obtain credits in related areas such as Geography, History, Philosophy, Language, Linguistics, Education and Economics. Undergraduate students conduct their program completion work, monographs and undergraduate research with researchers and professors from other units. They pointed out that involvement and joint work with the other units are concentrated in educational and research activities.

### 3.4.8 Coordination of undergraduate education management bodies in the unit

The management of each program is under the responsibility of the coordinator, assisted by the associate coordinator. However, the propositions must be collegiate,

emanated in the Undergraduate Chambers (CG), having as a collaborative group the Structuring Faculty Nucleus (NDE), both understood as advisory bodies of the Congregation, the schoolschool board. The different bodies must cooperate in order for the curriculum to be developed within the normative frameworks of the national curricular guidelines, resolutions of the State Council of Education (CEE), the regulatory instance for Unicamp, and regulations of professional councils when relevant, considering the future world of work, using best educational practices, maintaining excellence in undergraduate training. Furthermore, the necessary changes and adjustments are submitted to and approved by the Congregations of the Schools and submitted to higher level bodies such as the Permanent Teacher Training Committee (CPFP) for the teaching training programs and Central Undergraduate Committee (CCG), both subordinate to PRG. The CCG is also advised by the Permanent Subcommittee on Laws and Standards (SPLN) and DAC for changes with implications in current regulations.

According to the IA, the CG is considered fundamental for the quality of the programs, as a privileged space for discussion. This format has also enabled fluency with the professor-student collective, with fulfillment of the artistic-pedagogical objectives proposed in the program projects, teaching plans and supplementary activities. As a point to be improved, they identify the need for greater student participation in internal bodies or in working groups. In Music, the NDE worked on the development of a new program catalog, more dynamic and compatible with the current needs of the area. In Performing Arts, the NDE is still starting its activity. The Visual Arts, Medialogy and Dance programs did not compose NDE due to their small number of professors.

The IB established the NDE in 2017 with the objective of working in the process of conception, consolidation and subsequent updating of the pedagogical project of Biological Sciences, successfully. At FEF, the CG and NDE allow a smooth flow between the different bodies of the School. At FOP, solutions that can be executed in the Unit are being carried out through coordination of these bodies. At FCA, the CG plays a central role in coordinating the multiple demands from its different programs and with the NDE. It was noted that the functions of the CG and its coordinator are broad, complex, requiring synergy to perform the activities that ensure the excellence of the programs offered, but they recognize that the bodies of the Unit (CG and NDE) contributed to the quality of the Nutrition program.

The Congregation of the School of Nursing and its Integrated Council have supported all CG actions related to the implementation of improvements in the program, support for student permanence and student mental health issues. Together with the CG, the NDE had a major role in the construction of the new pedagogical project that will be implemented in 2020. At FCF, the coordination between NDE, CG and Congregation allowed fulfilling the completion of the proposed new curriculum that will be initiated in 2020. In the Medicine and Speech Therapy programs, the coordinations carried out discussions between the CG and the NDE, which led to positive results on teaching actions.

The CGs of various Engineering programs have been crucial for approving matters such as catalog changes, schedule approval, operating standards, among others, as well as curricular restructurings. There is consistency and coherence in the understandings of CG and NDE, facilitating the decision-making process. They recognize that PRG has provided

much support, so the programs are modernized and apply new undergraduate teaching techniques, aiming to maintain the condition of excellence of Unicamp's programs.

For the Environmental Engineering program, all issues related to academic management are discussed in the NDE, CG and Congregation, bodies that have sought to operate in a coordinated manner, aiming at the excellence of education. Also in Civil Engineering, the CG has worked actively to maintain the program up-to-date and competitive; the NDE has provided support to direct the program and new trends to be followed for curricular restructuring. In the Architecture and Urbanism program, the CG has been essential for the discussion of strategic topics, especially in the definition of criteria for curricular changes, with contribution from the NDE in 2018.

In the field of Humanities, the CG, the Congregation of the unit and the Program Coordination constitute the academic structures that provide support and forward requests and problems to higher instances. The CG is the main body for decisions, and it plays an important role in planning periodic activities for evaluating programs and disciplines, in discussing their results and in conducting improvement actions.

For the Philosophy program, the decisions regarding undergraduate education taken in department meetings have had positive impact on the quality of the program and the CG operates with more organizational issues. The NDE was constituted with the aim of collaborating in the program reforms and in the process of self-evaluation, initiated with RenovaGrad. The NDE of the Teaching Training Program in Language – Portuguese has focused its discussions on the process of curricularization of outreach activities and on a proposal to reform the second qualification for entrant students of the Teaching Training Program in Language (Language – Portuguese as Second Language/Foreign Language). During the 2014–2018 period, the CG began to operate better as a space to discuss the policies of the programs. There was intensification in the relationship between coordination and faculty and CPFP, and discussions contributed to the restructuring of supervised internships and establishing the basis for cooperation with the Campinas Oeste Basic Education Office, composing a network of affiliated schools for internships. This good experience was even adopted for the other teaching training programs. The work coordinated with CPFP was also very important throughout the process of adjusting the curricula to CEE Resolution No. 154/2017, required for teaching training programs. It brought the demand for the inclusion of Practice activities as Curricular Component – PCC, and 400 hours of mandatory internship, in response to CNE/CP Resolution 02/2015, and National Curricular Guidelines for the Initial and Continuing Training of Teaching Professionals of Basic Education.

The CG of the Linguistics program is responsible for organizing events, awards and for discussions on preparing the curriculum. The NDE has actively contributed to the reflection on the improvement of the curriculum, the entrant students' desired profile, strategies to deal with the increased didactic workload of the faculty, and distribution of vectors that better characterize the subjects offered. These bodies and the Congregation are coordinated through Departments. In general, the bodies are well articulated, contributing to circulate information, and catalyze contributions from different areas.

In September 2018, CGs were created for each of the FT programs (previously there was a single one), aiming at greater independence and agility. The NDE was established

in 2013 and has participated in the main decision-making, such as the creation of the Transport Engineering program, which had its first offering in 2019. The decisions of the CG and NDE are submitted to the Congregation of the unit, thus ensuring that the decisions taken are well discussed with the whole community. For the Technology in Analysis and Development of Systems program, the coordination between CG, NDE and Congregation occurred effectively, contributing to problem identification, reformulation of courses and the Pedagogical Project.

At FEA, the CG's operation demands the professors' involvement and responsibility as to the training process and sought to also involve students, who have been increasing their participation. This strengthened the activities related to the PAA, modifying the criteria for the selection of PADs and PEDs, to motivate the involvement of undergraduate and graduate students in teaching activities, and the mentoring program for entrant students was created. The NDE was approved in late 2018 and is working for the proper implementation of the Pedagogical Project. FEAGRI has no NDE, and the Congregation acted as support for decisions of the CG, which was active in aspects related to the evaluation of the program and professors.

At FEQ, the CG is a very active and effective organ. The NDE began in March 2018, with the objective of defining the profile of the trained student, seeking to trace the training needs of the future chemical engineer. With this information, the group intends to analyze the current curricular structure, discuss it with the community and propose new teaching alternatives. The NDE acts as an advisory organ of the CG, whose proposals are approved in the CG. As informed, the CG has also contributed significantly to the quality of the Telecommunications Engineering program; however, the NDE is still starting activities. The FEEC has no NDE and has not departmentalize the undergraduate programs, that is, the structure and distribution of disciplines among faculty members are discussed by the CG, which operates consistently with the Congregation and other bodies related to the quality of the programs. The FEM has no NDE and decisions are discussed at CG and then are voted in the Congregation.

For most programs in the field of Exact and Earth Sciences, the CG is the most active body in relation to the control, coordination and solutions of program demands, ranging from simple topics to the most complex matters related to faculty and students. Some Committees fulfill the role of the NDE, because not all programs have implemented it. In the Statistics program, the consistency between the CG, the NDE and the Congregation enabled important actions to be carried out more quickly in the modernization of undergraduate education in 2018. Geology and the Teaching Training Program in Mathematics have no NDE and decisions are coordinated by the CG. The operation of the IFGW CG is quite broad, dealing with issues from the simplest to the most complex related to faculty and students. The NDE was created recently, been little requested.

The IE has no NDE, similarly to the IEL. The IEL considers that the present bodies are well coordinated. During the process of implementing the indigenous entrance exam, the CG's participation was intense as to discussing and proposing actions to support the permanence of the entrants. Also for the History program, the CG and the Departments are the two main bodies of discussion and decision. The program's representation in the Congregation has been fundamental for the definition of actions and projects that aim at

greater interests of the unit. At IG, the CG's relationship with the Congregation is satisfactory and the NDE has also not yet been created.

There is no NDE at the School of Education. In addition to the representations of Physics and Chemistry, the FE CG demands representations of other teaching training programs, because it serves more than 1,500 students from other programs. These representations are intended to remain only at the level of CPFP, whose chairman and vice-chairman are appointed by FE, even if it is an advisory committee of the PRG. FE has two program coordinations that compose the CG, with different functions, one for teaching training programs and one for the Pedagogy program. The CG's coordination with the other deliberative bodies is understood as fundamental for the quality of the programs, but it can be better constructed through its institutionalization and review of the representations of partner institutes and with the CPFP. The FE Institutional Evaluation Committee emphasizes that the Undergraduate Committee would need to review its relationship with the former teaching training committee – CL, requesting the abolishment of the deliberation that created it, as well as establish understandings with the current CPFP with regard to the representations of other units.

In the FCA's opinion, since the tasks of the CG and its coordinator are broad and complex, there is a need to create a synergy that guarantees the excellence of the programs offered. The IQ reported that the NDE has acted autonomously and, sometimes, in conflict with the CG. Thus, some academic procedures of the CG, such as accreditation of faculty and Teaching Development Plan, were treated as excessive bureaucracy and authority, which impairs the progress of activities. The IQ NDE, active since 2013, has restructured the undergraduate programs to meet the requirements of the Royal Society of Chemistry for accreditation, ensuring recognition of the diplomas in the UK. In this process, it was recommended that the programs should have less time in class and more time for autonomous action of students, in addition to recommending that technical quality control criteria are followed for student's assessment, focusing on validity, reliability and educational impact of the student's assessment system.

### 3.5 Institutional Evaluation and Awards

Unicamp Undergraduate programs are evaluated in several ways: a) day of semiannual evaluation in the academic calendar; b) evaluation of subjects carried out by the units; c) evaluations for recognition and renewal of recognition of undergraduate programs by the CEE; d) participation in the Sinaes, with Enade performed by students, coupled with the Higher Education Census and eMec data; e) Institutional Evaluation (every five-year period), a closed independent external evaluations by international faculty; f) national rankings (Ranking Universitário da Folha, Guia do Estudante) and international rankings (THE, QS, among others); g) international societies (such as in Chemistry and Food Engineering). In the process of renewing recognition by the CEE, regulatory body of Unicamp by current regulations, programs scoring 4 or 5 for Enade (range 1-5) do not require reviews from external evaluators (Unicamp voluntarily joined Sinaes in 2010). With the efforts to raise the students' awareness as to the importance of participating in Enade as an indicator of visibility



of the quality of education provided for society in general, there has been improvement in conscious participation, with students answering the exam questions appropriately. This improved the scores assigned to the programs and, with some exceptions, the renewal of recognition became automatic. Table 3.18 shows the last Enade scores and year and last renewal of CEE recognition by program.

TABLE 3.18. ENADE SCORES, CPC AND YEAR AND LAST RENEWAL OF CEE RECOGNITION

Programs	Enade year	Enade score	Enade CPC	CEE renewal*
Business Administration	2015	3	3	Sep 5, 2017
	2018	4	4	-
Public Administration	2018	4	4	Sep 18, 2017
Analysis and Development of Systems (active)	2014	4	4	Feb 17, 2016
	2017	3	3	Dec 5, 2018
Analysis and Development of Systems (ended)	2017	4	4	Feb 17, 2016
Architecture and Urbanism	2014	1	2	Mar 21, 2018
	2017	5	4	Dec 5, 2018
Performing Arts	na	-	-	July 16, 2018
Visual Arts – teaching training	2014	5	4	Jan 14, 2014
	2017	5	3	Aug 30, 2019
Computer Science	2014	4	4	Feb 17, 2016
	2017	5	4	Dec 5, 2018
Sports Science	2016	5	4	Dec 15, 2017
Biological Sciences	2014	5	4	Feb 17, 2016
	2017	4	4	Dec 5, 2018
Biological Sciences – teaching training (Full-time)	2014	4	4	Feb 17, 2016
	2017	5	4	Dec 5, 2018
Biological Sciences – teaching training (Evening)	2014	4	4	Feb 18, 2016
	2017	4	4	Sep 20, 2018
Economic Sciences (Full-time)	2015	4	3	May 10, 2017
	2018	4	4	-
Economic Sciences (Evening)	2015	4	4	May 10, 2017
	2018	4	3	-
Social Sciences (Full-time)	2014	1	3	May 17, 2016
	2017	3	3	-
Social Sciences (Evening)	2014	1	3	May 17, 2016
	2017	3	4	-
Social Sciences – teaching training (Full-time)	2014	2	3	May 17, 2016
	2017	3	3	-
Social Sciences – teaching training (Evening)	2014	2	3	May 17, 2016
	2017	3	4	-
Social Communication – Medialogy	na	-	-	Dec 13, 2016
Dance (Bachelor and teaching training Program)	na	-	-	Nov 9, 2018
Physical Education (Full-time)	2016	5	4	Jan 11, 2018
Physical Education (Evening)	2016	5	4	Jan 11, 2018
Physical Education- (teaching training (Full-time)	2014	4	3	Feb 18, 2016
	2017	3	3	Dec 6, 2018
Physical Education – teaching training (Evening)	2014	4	3	Feb 18, 2016
	2017	5	4	Dec 6, 2018

TABLE 3.18. ENADE SCORES, CPC AND YEAR AND LAST RENEWAL OF CEE RECOGNITION

continued

Programs	Enade year	Enade score	Enade CPC	CEE renewal*
Nursing	2016	5	4	Dec 15, 2017
Agricultural Engineering	na	-	-	Dec 19, 2017
Environmental Engineering	2017	5	3	Dec 5, 2018
Civil Engineering	2014	3	3	Apr 19, 2017
	2017	5	4	Dec 5, 2018
Full-time Food Engineering	2014	4	4	Feb 17, 2016
	2017	5	4	Dec 5, 2018
Evening Food Engineering	2014	4	4	Feb 17, 2016
	2017	4	4	Dec 5, 2018
Computer Engineering	2014	4	4	Feb 17, 2016
	2017	5	4	Dec 5, 2018
Control and Automation Engineering	2014	3	3	Dec 21, 2011
	2017	3	3	Mar 31, 2017
Manufacturing Engineering	2014	2	3	Mar 16, 2017
	2017	3	4	-
Production Engineering	2014	3	3	Feb 22, 2017
	2017	5	4	Dec 5, 2018
Transport Engineering	-	-	-	Start 2019
Telecommunications Engineering	2017	3	4	Sep 20, 2017
Electrical Engineering (Full-time)	2014	4	4	Feb 17, 2016
	2017	4	4	Dec 5, 2018
Electrical Engineering (Evening)	2014	4	4	Feb 17, 2016
	2017	4	4	Dec 5, 2018
Physical Engineering	2017	5	5	Dec 29, 2018
Mechanical Engineering	2014	4	4	Feb 17, 2016
	2017	4	4	Dec 5, 2018
Chemical Engineering (Full-time)	2014	4	4	Feb 17, 2016
	2017	5	4	Dec 5, 2018
Chemical Engineering (Evening)	2014	4	4	Feb 17, 2016
	2017	4	4	Dec 5, 2018
Statistics	na	-	-	Oct 30, 2017
Literary Studies	na	-	-	Mar 31, 2017
Pharmacy	2013	4	4	Feb 5, 2015
	2016	5	4	Dec 15, 2017
Philosophy	2014	3	3	Feb 17, 2016
	2017	4	4	Dec 5, 2018
Philosophy – teaching training	2014	4	4	Dec 14, 2015
	2017	4	4	Dec 5, 2018
Physics	2014	3	3	-
	2017	4	4	Dec 5, 2018
Physics – teaching training (Full-time)	2014	3	3	-
	2017	5	4	Dec 5, 2018
Physics – teaching training (Evening Program)	2014	3	3	-
	2017	3	3	Sep 19, 2018
Speech therapy	2013	5	5	Feb 5, 2015
	2016	4	4	Dec 15, 2017

TABLE 3.18. ENADE SCORES, CPC AND YEAR AND LAST RENEWAL OF CEE RECOGNITION

continued

Programs	Enade year	Enade score	Enade CPC	CEE renewal*
Geography (Full-time)	2014	2	3	Jul 5, 2017
	2017	4	3	Dec 5, 2018
Geography (Evening)	2014	2	3	Jul 5, 2017
	2017	3	4	Dec 5, 2018
Geography -( teaching training (Full-time)	2017	4	4	Dec 5, 2018
Geography – teaching training (Evening)	2014	3	4	Jul 5, 2017
	2017	5	4	Dec 5, 2018
Geology	na	-	-	Jun 11, 2019
Agribusiness Management (ended)	2015	3	-	Feb 23, 2016
	2018	3	3	Jul 22, 2019
International Trade Management (ended)	2015	4	-	-
	2018	4	3	-
Business Management (ended)	2015	3	-	-
	2018	4	3	-
Public Policy Management (ended)	2015	-	-	Jan 5, 2016
	2018	2	3	-
History	2014	5	4	Feb 17, 2016
	2017	5	3	Dec 5, 2018
History – teaching training	2014	5	4	Feb 17, 2016
	2017	5	4	Dec 5, 2018
Language – Portuguese – teaching training (Full-time)	2014	4	3	Feb 17, 2016
	2017	4	4	Dec 5, 2018
Language – Portuguese – teaching training (Evening)	2014	4	3	Feb 17, 2016
	2017	5	4	Dec 5, 2018
Integrated Chemistry/Physics – teaching training	na	-	-	Jul 1, 2019
Linguistics	na	-	-	Mar 5, 2018
Full-time Mathematics (Undergraduate Program)	2014	1	2	Jun 24, 2015
	2017	4	4	Dec 5, 2018
Mathematics – teaching training (Full-time)	2014	3	3	Jun 24, 2015
	2017	5	5	Dec 5, 2018
Mathematics – teaching training (Evening)	2014	3	3	Jun 24, 2015
	2017	4	4	Dec 5, 2018
Applied and Computational Mathematics	na	-	-	Dec 4, 2017
Medicine	2013	5	5	Feb 5, 2015
	2016	4	4	Dec 15, 2017
Music	na	-	-	Jan 14, 2014
Music – teaching training	2014	2	3	Dec 29, 2015
	2017	5	4	Dec 5, 2018
Nutrition	2013	4	4	Feb 5, 2015
	2016	4	4	Dec 15, 2017
Dentistry	2016	4	4	Dec 15, 2017
Pedagogy (full-time)	2014	1	2	Aug 17, 2016
	2017	2	3	Feb 5, 2019
Pedagogy (evening)	2014	1	2	Aug 17, 2016
	2017	1	3	Feb 5, 2019

TABLE 3.18. ENADE SCORES, CPC AND YEAR AND LAST RENEWAL OF CEE RECOGNITION

continued

Programs	Enade year	Enade score	Enade CPC	CEE renewal*
Chemistry	2014	5	4	Feb 17, 2016
	2017	5	4	Dec 5, 2018
Chemistry – teaching training	2014	2	3	Feb 17, 2016
	2017	5	5	Dec 5, 2018
Technological Chemistry	2014	5	4	Feb 17, 2016
	2017	4	4	Dec 5, 2018
Information Systems	2017	4	4	Dec 5, 2018
Technology in Informatics	na	-	-	Mar 8, 2016
Technology in Environmental Sanitation	na	-	-	Dec 27, 2016
Technology in Civil Construction	na	-	-	Apr 5, 2017
Technology in Telecommunications Systems	na	-	-	Sep 30, 2016

Source: Inep/Mec and CEE, 2019.

Note: na = not applicable; Enade scores 4 and 5: renewal of CEE without visit to program; scores 1, 2, and 3: renewal of CEE with visit to program. Excused: programs that are not included in the Enade evaluation cycle.

\*Blank cells mean that the previous recognition is still valid (ranging from 3 to 5 years).

### 3.5.1 Internal and external evaluation

In general, the coordinators reported that the self-evaluation process is a moment of reflection on curricular guidelines, with interchange of experiences and knowledge between professors, technicians and students. It is an opportunity for reflection, guiding changes, with discussions and implementation of actions in the Strategic Planning. They are carried out with the participation of the entire community (faculty and non-faculty), and reports are prepared to be later presented and disseminated widely (by email and meetings in: Congregation, Undergraduate Committee, Interdepartmental Council, and NDE). Pedagogical issues are discussed with the Undergraduate Committees of the programs and structural and professional issues are discussed with the Board. Visits with external evaluators are of great value to provide an external view as to the deficiencies that need to be remediated. The evaluations enable revisions of teaching plans, with updates of contents and learning methodologies, having a significant impact on the constant enhancement of projects in bachelor degree and teaching training programs.

The Communication – Medialogy program reported that it has conducted internal self-evaluation every semester and, in 2016, it had its last external evaluation for recognition of the CEE. In the Dance program, there was a meeting for institutional evaluation in 2014, where they analyzed aspects such as the flow of information about the profile of entrant students, excessive workload, reformulation of pedagogical project, dropout rates, interdisciplinarity, teaching training programs, physical space necessary for the activities, scholarship for assistants, outreach activities. It had its last recognition process in 2018, but there was no member of the dance or arts area among the external evaluators.

The Sports Sciences and Pharmacy programs evaluate all subjects every six months, conducting annual planning, which is shared. Physical Education reports that the last evaluation of recognition by the CEE had the effective participation of most faculty and staff.

The Sports Sciences program in the last evaluation (held in 2012) received criticism related to the reduced number of faculty and the lack of sports infrastructure, but subsequently it had automatic renewal based on the Enade score. In 2017, the Pharmacy and Speech Therapy programs had automatic renewal by Enade score.

The School of Food Engineering, in its meetings for feedback of evaluations, also presents the results of Enade. Students are informed of the importance of the external evaluation through face-to-face dissemination in all classrooms. In 2017, it was accredited by the International Union of Food Science and Technology (IUFoST), whose recognition fosters student exchange for double diploma. The Chemical Engineering program was visited by an MIT Professor, who was invited to report his impressions about the program and about the operation of the Unit and lecture to NDE faculty. The Electrical Engineering program did not need to renew the recognition by the CEE over the period, due to its performance in Enade. The Architecture and Urbanism program carried out the last external evaluation in 2017. Also, there are systematically performed evaluations for the Guia do Estudante ranking, in addition to Enade reports.

The Applied and Computational Mathematics program reported that it was recently evaluated by the CEE having received a fully favorable opinion. The Geology program reported that the evaluations were important to promote the necessary changes, including curricular reform (2020 Catalog). In the Chemistry and Chemistry -Technological programs, the CEE guidelines for renewing the teaching training program's accreditation and the curricularization of the outreach have already been addressed in meetings with faculty.

The Social Sciences program evaluates the program every six months at two occasions: general meeting on the date indicated in academic calendar of PRG-DAC, and application of forms for individualized evaluation of subjects by the set of enrolled students, closer to the end of the semester. The Geography program had, in the last four years, evaluation for the recognition of programs by the CEE. The Teaching Training program in Language received the visit of specialists appointed by the CEE in October 2018 for the renewal of recognition. The Economic Sciences and Philosophy programs were recognized through the Enade scores. The Technology programs report that the impact of the evaluations has been positive, with changes in the chaining of subjects, standards for Program Completion Work and review of syllabi. For instance, the Building of Edifices program was ended in 2018, being replaced by the Transport Engineering program (2019).

The Computer Engineering program reported that the internal and external evaluation processes do not necessarily generate an impact on undergraduate education because most changes occur in continuous process resulting from the interaction between coordinators, faculty and students. The IQ Undergraduate Committee considers the evaluation a very timely opportunity to strengthen faculty engagement in reflections on undergraduate programs, but adherence is low. The Mathematics program and the Mathematics Teaching Training program report that they have been well evaluated, but internal discussions on such results are also not conducted.

As for how programs perceive their external recognition, all programs in the Arts field consider themselves recognized nationally and internationally. The pieces of evidence that indicate this recognition include the demand for the programs in the entrance exam, both by Brazilian and foreign candidates, the MEC-INEP indicators such as Enade Score

(student performance assessment) and Preliminary Program Score (calculated on the basis of the Enade, the value added by the training process, and the inputs of offering conditions as faculty, infrastructure and didactic-pedagogical resources), grades/scores received (in general, 5 stars) from the Guia do Estudante student guide published by Editora Abril and from RUF (Ranking Universitário da Folha), participation of students in national and international festivals of great renown, agreements entered with institutions in the country and abroad (Music) and number of academic events that the area usually hosts (Music).

All programs in the field of Biological and Health Sciences were considered very well recognized externally. The same pieces of evidence above are reported, adding the increasing student exchange of foreign students and participation in calls such as Pró-Saúde and PET Saúde, of the Ministry of Health. The Biology, Nutrition and Pharmacy programs were considered the best programs in Brazil by the Prêmio Guia do Estudante award of Editora Abril and RUF. Unicamp's Medicine Program is considered as of excellence in Brazil and abroad, and presents the highest candidate/place ratio in the entrance exam. In interinstitutional evaluations, its performance is above the average of other national and international schools, having received – in addition to those above – awards from Exame magazine and Times Higher Education (THE).

Most programs in Unicamp's Engineering Area stood out nationally and internationally in the period in several rankings, and some are among the best programs in the world and among the most accepted by the labor market according to RUF. In the period, they received awards such as the 5-star Award in the Guia do Estudante evaluation, maximum score in the ENADE – MEC evaluation, in the THE (FEA, FEQ, Statistics), placing them in a prominent position in the national and international contexts (Top Universities). The FEA – Unicamp Program has been among the top seven in the world for at least 3 consecutive years, according to a 2019 global ranking of the Food Science and Technology area, prepared by Shanghai Ranking. The Agricultural Engineering program is among the top 50 in the world, and was ranked 43rd among the best educational institutions in the area of Agriculture and Forest Sciences, according to the 2017 ranking by field of Knowledge released by the international consultancy Quacquarelli Symonds (QS).

The Electric Engineering program ranks among the best in the world, having achieved the 47th position in the QS Ranking in 2015, with subsequent position drops, ranking in the group between the 101st and 150th positions in 2018. It is assumed that successive economic and political crises have impacted the country's image abroad, which may have influenced the indicators for "Academic Reputation" and "Reputation among Employers." The Mechanical Engineering program was considered the 2nd best program from the point of view of the labor market and according to faculty analyses, ranking 3rd in educational quality according to the 2018 RUF. They consider that the ENADE score (Score 4) resulted from the students' lack of interest in the exam.

The Undergraduate Chemical Engineering program has been recurrently awarded five stars by the Guia do Estudante guide published by Editora Abril. The Manufacturing Engineering Program offers more than 70 possibilities for international student exchange, as well as a double diploma agreement with a European university, which are seen as evidence of internationally recognized quality. Another indicator is the demand by foreign students, when agreements were entered with foreign universities and faculty.



Many factors prove the national and international recognition and prominence of the programs in the field of Exact and Earth Sciences: the grades/scores received (generally 5 stars) by the Guia do Estudante guide, by the RUF, by the MEC evaluation through ENADE, by the QS World Universities Ranking, by the Top Universities website, by the acceptance of students in the labor market, and by the successful experiences of student exchange in centers of excellence around the world.

Unicamp's Statistics program ranks among the 200 best institutions to study Statistics in the world, according to Top Universities. Physics also ranks among the 200 best similar programs in the world and among the top 5 in Latin America. According to the RUF evaluation, Unicamp's Chemistry program is the second best Chemistry program in Brazil in terms of evaluation by the market and educational quality and the undergraduate programs have recently had the recognition of excellence from the Royal Society of Chemistry (RSC) of the United Kingdom. Graduates from the Geology program are highly sought after by companies due to their high technical training.

For the programs in the field of Humanities, external recognition was due to factors such as high demand for the programs in the entrance exam, foreign students' demand for student exchange, evaluation of the Guia do Estudante guide, INEP/MEC Preliminary Program Score (CPC), Ranking Universitário Folha (RUF). The THE ranking places the IEL programs among the most important nationally and internationally. In the specific ranking by areas, it ranks in the second position in Brazil and between the 201<sup>st</sup> the 250th international positions in the last two editions (2018-2019) for the area of "languages, literature and linguistics." In QS, the programs in the area of "Linguistics" ranked, in 2016, from the 51<sup>st</sup>–100<sup>th</sup> positions at international level, the first among Brazilian universities and the second in Latin America. Since 2014, the Teaching Training program in Language has been evaluated among the top four in the country by the RUF.

The Philosophy program is recognized as one of the two best in the country. The History program is also highlighted, which since its institution in 1976 has become a national and international benchmark for academic excellence. In 2014, the QS Top Universities ranking placed it in the first position in Brazil and 34th in the world. In the 2018 Ranking Universitário Folha, the program ranks first in Brazil. The Economic Sciences program won the "Destaque Acadêmico" award in 2016, 2017, and 2018, promoted by the Federal Council of Economics.

Regarding the Information System program, it has gained recognition at the national level; it received Score 4 in the 2017 Enade and five stars in the evaluation conducted by Catho. The Analysis and Development of Systems program is among the best programs in the country and was ranked as the 18th best program on Technology in Analysis and Development of Systems (TADS) in the country and the 3rd best in the São Paulo state by Revista Exame magazine in 2015. However, in the 2017 Enade it received Score 3, which may reflect the attendance to the exam, in addition to its disregard by students, who did not answer the questions according to their knowledge.

The Environmental Sanitation program was well evaluated by Enade. The graduates have good acceptance in the labor market and have excelled both in the national and international contexts in several rankings. The issue of acceptance by the labor market was also highlighted by the Telecommunications System program.

Students of the Technology in Civil Construction and Technology in Construction of Edifices programs were well evaluated in the 2018 Enade; however, the low interest/demand for the programs resulted in their last offering in 2018. The main cause pointed out was the difficulty as to the low acceptance of construction technologists in the labor market, due to the restricted qualifications provided by its class council (CONFEA / CREA).

Undergraduate coordinators were asked to analyze the improvements implemented as a result of the quinquennial institutional evaluation. In the Arts, a recurring problem highlighted in the evaluations is the physical space for academic activities, but it is recognized that small improvements were obtained in the last period. It is mentioned that the pedagogical project of the Music program complies with international standards and few suggestions were offered by the evaluators. However, all programs are seeking to remodel their curricula, aiming to expand outreach activities. It is mentioned that the Visual Arts program expanded its teaching staff in deficient areas. The Performing Arts program developed a project for a new Teaching Training program in Performing Arts, as an evening program, which was absent in IA. The Teaching Training program in Dance had its recognition by the regulatory body (CEE).

The Biological and Health Sciences programs reviewed their curricula, following guidelines of the external commissions. The Biological Sciences program was very well evaluated and there were suggestions for convergence between the curricula of the full-time and evening programs. There were also changes in the sequence of subjects and to create greater coordination between theory and practice. The IB is instituting a task force to conduct follow-up with graduates from the program.

The Physical Education program reports the lack of infrastructure and that some improvements were obtained. The Nursing program reports the need to review the curriculum as an issue pointed out by the evaluation committees, in addition to infrastructure improvements.

In Medicine, the various projects resulting from the evaluations include the need to reevaluate the curriculum, infrastructure and teaching of the Medical Internship. The project involved holding frequent meetings, which addressed everything from administrative issues such as shift management, rules for distribution of students in internships to adjustments of teaching strategies. They also mention investments in improving infrastructure for academic activities. The Dentistry program informs that an online system of clinical images has been implemented, classified as one of the best in the country. A chronic problem is related to clinical facilities, which still do not comply with health surveillance standards.

The Nutrition program's pedagogical project has recently been reformulated. Several laboratories were expanded, with the purchase of various equipment and consumables. Many of the issues reported in the first and only evaluation of the FCA indicated potential and some deficiencies, but great evolution could be observed as to administrative organization, internationalization, research activities and outreach activities. Regarding undergraduate education, there was great improvement in the teaching staff and curricular structure.

In general, Engineering programs followed the guidelines of external commissions, regarding curricular and infrastructure demands. The Architecture program reports the issue of review of subjects in particular in the field of Urbanism, stating that new faculty have been hired. The Civil Engineering program highlights the implemented actions

resulting from external evaluations, such as improvements in infrastructure and in discipline evaluation mechanisms. The program informs that effective discussions on curricular flexibility were implemented in the NDE, resulting in a proposal that is proceeding in the unit for the elimination of training centered on emphasis, for the 2021 catalog. Another project is RenovaFEC, which aims to foster improvements in undergraduate education, through periodic evaluations of the curriculum and encourage the use of teaching-learning techniques; implementation of improvements in undergraduate curricula considering the institutions of excellence in Civil Engineering (EC) and Architecture and Urbanism (AU). The unit sought to develop the following initiatives: promotion of Structuring Teaching Centers – NDE; Improvement of the evaluation of programs and faculty; Curricular modifications and renewal of the recognition of undergraduate programs; Improvements in teaching infrastructure via FAEPEX calls; External evaluations of the programs; Unicamp entrance exam. – RetribuiFEC Project (integration of the FEC community in solidarity with those most in need). The unit has also invested in projects, such as ConviveFEC, which aims to improve the coexistence between students, professors and employees, with the allocation of spaces and promotion of the offering of creative workshops.

The Agricultural Engineering program highlighted the creation of a working group to analyze dropout rates and propose actions to reduce this problem. Opportunities and entrant student follow-up program were created as a way to motivate and inform them on aspects related to the program and academic life. The Food Engineering program lists a series of actions that were established through the analysis of external commissions and highlights: a) Incorporation of elective subjects; b) establishment of protocols for formal valorization of extracurricular activities carried out by undergraduate students; c) creation of strategies to minimize school dropout rates. The Computer Engineering program made changes in the curriculum, aiming at reducing credits in the classroom, as well as increasing credits in elective subjects. The Production Engineering program emphasizes the issue related to the lack of infrastructure indicated by the evaluation committee and that it accepted the NDE's suggestions regarding investments for program improvement. The Electrical Engineering program reported that one of the issues indicated by the evaluation committee was the high didactic load, but students and professors agree: despite the many hours in the classroom, the generalist aspect of the program is highly valued by the faculty, leaving little room for change. However, several initiatives to use electronic tools, such as *clikers*, mobile applications and educational support platforms such as Moodle, have gained momentum in the program. The Mechanical Engineering program highlights that some improvements suggested by the evaluation committees, such as catalog changes for workload optimization, have been implemented.

The Computer Science program restructured the curriculum in order to reduce the number of credits in classroom and expand credits in elective subjects. The Statistics program changed the curriculum, seeking to increase experiences focused on the demands of the labor market. The Physics program highlights some successful activities, such as the application of Moodle for special classes and application of new active teaching methods (F 008) that aim to work the mathematical bases of entrants. Considering the recommendations of the evaluation committees, the Geology program restructured the curriculum seeking to reduce the workload and reorganized the subjects over the 10 semesters of the program, enabling that the Program Completion Work course was exclusive of the last period, with

the Supervised Internship in the ninth semester. The Chemistry program reported that the pedagogical projects of all qualifications (Bachelor's degree in Chemistry and Technological Chemistry) underwent changes for the 2018 catalog to comply with the CEE resolution. It informs that interdisciplinarity continues to be a focus, seeking to stimulate its introduction into daily teaching practice. The changes valued the space of elective subjects to foster the improvement of student training.

In the Humanities, most coordinators were involved with curricular reforms, induced by the observations of external evaluations, to comply with CEE and by internal discussions with the communities. Specifically, the Social Sciences program informs that the curricular reform of the Teaching Training program generated substantive and productive internal discussions about greater engagement of each department in the training of future Sociology teachers for Secondary Education. The process resulted in the creation of four mandatory subjects, in which the areas of anthropology, political science, demographics and sociology can present and carry out specific contributions. Reports of the Philosophy program's external evaluations indicated no substantive change to be executed and the processes to evaluate the program and reformulate the CEE were promoted by the coordination. The History program received no indications for any substantive change by the evaluation committees, but its own mechanisms for monitoring and evaluation resulted in some changes, such as the broad discussion for the definition of criteria (academic and socioeconomic) for the granting of scholarships.

The IEL recognized the suggestions for improvement that were indicated by the external commission, especially in efforts to optimize curricula and improve infrastructure. Regarding the Language program, several adjustments and reforms were carried out to comply with CEE standards. The NDE and faculty focused on updating and revising syllabi and bibliographies of the subjects to avoid redundancies. Other improvements were made, such as accessibility works, renovation in the central space of outdoor coexistence ("Arcádia") and renovation in the block of educational departments, where a room for monograph presentation was created. The Literary Studies program carried out a curricular reform, expanding the minimum workload of Teaching Training programs and began to offer new subjects and renewed others, seeking to enhance specific training, didactic-pedagogical training, and practice as a curricular component, in addition to scientific research and the monographic production of students. The infrastructure of classrooms was expanded, allowing greater comfort for activities.

The evaluation reports of the Integrated Physics-Chemistry Teaching Training Program indicated the need for discussions and efforts as to the programs' curricular matrices, in order to enhance the students' self-learning. Another issue indicated relates to the failure rates in basic cycle subjects, especially Calculus. The program worked for the introduction of new subjects, the creation of specific teaching assistantships and the election, together with the IFGW, IQ and IMECC units, of PAD and PED scholarship students for assisting in such subjects. In addition, a working group was constituted with the aim of proposing a new curricular restructuring. The main recommendation from the evaluation committee to the Pedagogy program refers to grants of student exchange and undergraduate research scholarships, considered insufficient; the number of these scholarships grew in the period, as well as agreements with other institutions and new government programs.

The Geography program highlights the effect of moving to the new building, which allowed improvements in the following areas: a) classrooms, which became more spacious and better equipped for didactic support; b) the space for collective coexistence, with use of the lobby, which enabled strengthening the coexistence between students, professors and employees. In addition, it provided conditions for the implementation of collective and individual spaces for study and for holding exhibitions; c) better equipped laboratories for academic uses of students and didactic support to the subjects; d) the library, with a wider space which allowed to house under more favorable conditions the bibliographic collection and the conduct of the students' studies; e) computer labs adapted to the didactic needs to serve subjects and students.

Regarding the technology programs at FT, the coordinators of the Higher Education Technology in Environmental Sanitation and Construction of Edifices programs reported that they were ended, and that the Transport Engineering program was created in 2017. The higher education technology in Environmental Sanitation program highlighted that it has invested in improving the infrastructure and the teaching and learning conditions. Investments were made in laboratories, with improvements in structural conditions, maintenance of equipment, replacement of materials. Investments were also made in computer labs, with computer modernization, software purchase and Wi-Fi network expansion on campus.

### 3.5.2 Awards and/or distinctions

There are Unicamp faculty recognition awards for dedication to undergraduate education. All units have the right to indicate a name validated in the Congregation, who receives the award in an event that ends the year, granting the distinction for prominence in teaching, scientific production and, more recently, innovation and outreach. There was payment of pecuniary prize until 2016, suspended in 2017, 2018 and 2019, complying with Unicamp's spending rebalancing policy. FCM also has its own award in recognition for dedication to undergraduate education (Prêmio Miguel Tobar), annually. There are countless national and international awards for the contribution of professors in undergraduate education and of students, especially for scientific works.

They were asked to highlight institutional and non-institutional awards and/or distinctions received by the Unit, professors or students resulting from undergraduate activities. All programs in the six areas presented (Arts, Biological and Health Sciences, Engineering, Exact and Earth Sciences, Humanities and Technology) reported a considerable number of institutional awards and/or distinctions, notably related to research or contributions of program completion works. Examples of received awards:

- *Performing Arts:*  
PROAC – Secretaria Estadual de Cultura -SP
- *Visual Arts:*  
Award at the Primeira Bienal de Arte Print Brasil, Incubadora de Artistas. 2016  
Social Communication – Medialogy:

Prêmio Favoritos do Público – A Mulher da Casa do Arco-íris – 29 Festival Internacional de Curtas Metragens de São Paulo, KINOFORUM; Glasgow Short Film Festival 2019 (Scotland); Cal.ci.nha (2017)

Festival do Minuto (2017)

29º Festival Internacional de Curtas Metragens de São Paulo (2018);

■ *Dance:*

Prêmio Governador, Secretaria de Cultura do Estado de São Paulo, with the work “Suportar”;

Prêmio Governador do Estado De São Paulo, Dance category, 2015 Finalist

2015 Proac Call for the project “Tocando a Boiada”;

2016 Proac Call, São Paulo State Department of Culture for the Project: “O Corpo Como Relicário: Tudo É Divino”;

■ *Music:*

Arts & Literary Arts Fellow, Bellagio Center, Italy, Rockefeller Foundation, 2017.

Certification recognized in the Applied 1 Category, Sociedade Brasileira de Acústica – SOBRAC, 2014.

■ *Sports Sciences:*

Honorable Mentions in the “Report” category at the International Congress on Sport Pedagogy, for the study “Tênis De Mesa E Ping-Pong: Antagonistas ou Parceiros na Iniciação Tardia,” held on SESC Campinas in 2016.

■ *Pharmacy:*

Honorable mention at the X Brazilian Congress on Hospital Pharmacy, for the work “Adesão ao tratamento hormonioterápico de mulheres com neoplasia de mama; SBRAFH, 2015.

■ *Speech therapy:*

V Prêmio Vitor Vicente Valla – Congresso Rede Unida, Associação Rede Unida in 2018, with the title – Vulnerabilidade Comunicativa Do Usuário Da Atenção Básica: Promoção Da Saúde E Prevenção De Alterações Fonoaudiológicas (Projeto PET Gradua SUS Fonoaudiologia).

■ *Medicine:*

Gynecology and Obstetrics Professor obtained international recognition for dedication to medical education from the Foundation on Advancement for Medical Education and Research (FAIMER) – 2015.

Ophthalmology Professor obtained recognition for outstanding and dedicated work in favor of Ocular Health of the Population and of the Development of the Specialty, Brazilian Council of Ophthalmology – 2015/2017 biennium, 2018;

Hematology Professor awarded the Medalha Nacional do Mérito Científico – Classe Comendador for the relevant contribution to Science, Technology and Innovation, Ministry of Science, Technology, Innovations and Communications, 2018;

Collective Health Professor received Diploma de Mérito “Herbert de Souza – Betinho” for the Project “Cidadania, Saúde e Democracia” of Unicamp from the Campinas City Council, 2018 and Diploma de Mérito Médico “Dr. Roberto Maia Rocha Brito” from the Campinas City Council, 2018, with outreach project coupled with undergraduate program.



- *Nutrition:*  
Professor received Certificate of Global Educator from X-Culture 2018;
- *Dentistry:*  
Professor received Teaching Career Enhancement Award, from the American Physiological Society, for research projects in the field of education, 2016.
- *Architecture and Urbanism:*  
Prêmio Joaquim Guedes – 2018, 2017;  
Honorable mention and Awards in the Acoustic Student Contest;  
Prêmio de Concurso – Museu da Criatividade.
- *Civil Engineering:*  
CREA and Institute of Engineering grant award to the best graduate, annually
- *Chemistry:*  
Prêmio Lavoisier – CRQ 4ª Região for best performing senior student
- *Food Engineering:*  
CREA-SP for best performing seniors;
- *Physical Engineering:*  
Best poster work in experimental physics of high energies, Encontro Nacional de Física de Partículas e Campos;  
Shell Eco-Marathon, electric car category – ECOCAR Unicamp Team – 2017 – 6th position and 2018 – 3rd position.
- *Mechanical Engineering:*  
Prêmio da Associação Brasileira de Engenharia Automotiva;  
Prêmio Mahle;  
Prêmio SAE Brasil Estudantil de Educação de Engenharia.
- *Chemical Engineering:*  
Congresso Brasileiro de Engenharia Química: awards and distinctions for students
- *Physics:*  
Best poster work in the subject Materials and Sensors, XXII Congresso Brasileiro de Física Médica;  
Best poster work in experimental physics of high energies, Encontro Nacional de Física de Partículas e Campos;
- *Geology/Geography:*  
CREA-SP Awards granted to outstanding students at graduation (2014-2018).
- *Mathematics:*  
Gold and Bronze Medals, Olimpíada Brasileira de Matemática de nível superior.  
Honorable Mention, Olimpíada Ibero-americana de Matemática Universitária
- *Humanities:*  
International Trade Management: 2nd position in the event X Culture Global Virtual Team Coaching Program, Washington, in 2017.

### 3.6 ProFIS

In operation since 2011, the Higher Education Interdisciplinary Program (ProFIS) is aimed at students who attended Secondary Education in public schools in Campinas. The

goal of the program is to offer an integrated view of the contemporary world and develop general academic skills that prepare them to follow any field of knowledge in undergraduate programs at Unicamp. Students are selected through registration of interested parties, selecting from the school those with the best performance in the ENEM exam among those who register, ensuring at least one and at most two places for each school. The geographic quota is highlighted, which avoids the concentration of specific schools, usually the best schools located at high-income districts or schools with selection process. This report will present data regarding the profile and performance of students, curriculum of the program, faculty, academic management, and internal and external evaluations.

#### ProFIS STUDENTS' CLASS

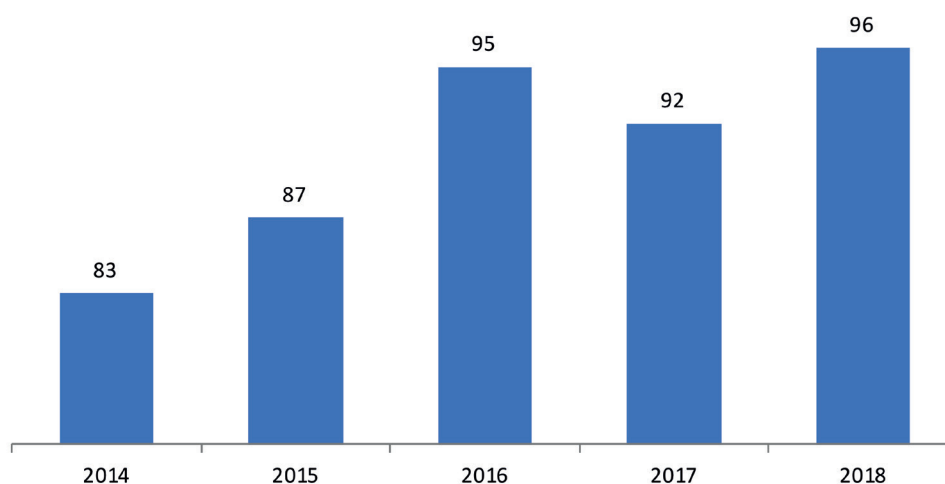


Antonio Scarpinetti/SEC – Unicamp.

ProFIS offers 120 places annually. In 2011, there were 99 high schools, two schools that offered only programs in the EJA (Youth and Adult Education) format and five schools in Units of the Casa Foundation and in penitentiaries, linked to the Teaching Directorates, Campinas Leste and Campinas Oeste of the Department of Education of the State of São Paulo. There were also three vocational schools – Cotuca, Bento Quirino and Etecap. The unit of the Federal Institute of Education, Science and Technology of São Paulo (IFSP), which had no completions until 2018.

Graph 3.20 shows the number of schools in Campinas that had students entering ProFIS each year, from the beginning, with a progressive increase in recent ones from 2014-2018, covering almost all schools in the municipality. It is also important to highlight that, in recent years, only one of the public schools of Campinas had no enrolled candidates.

GRAPH 3.20. NUMBER OF SCHOOLS WITH ENTRANT STUDENTS IN PROFIS



Source: 2019 ProFIS WG Report.

The ProFIS curriculum includes subjects in the areas of Humanities, Biological and Health Sciences, Exact and Earth Sciences, Technology and Undergraduate Research, with critical-reflective profile based on everyday problems. It has been under direct coordination of the Pro-Rectorate of Undergraduate Education of Unicamp, since its beginning in 2011 and faculty from various teaching and research units of Unicamp contribute, assisted by graduate students who are in the Didactic Internship program (PED), seeking the interprofessional approach. Subsequent admission to undergraduate programs, in previously reserved places, is based on the coefficient of production (CRO) of the mandatory subjects studied in ProFIS (Table 3.19).

TABLE 3.19. PROFIS STUDENTS AND THEIR ENROLLMENTS  
IN UNDERGRADUATE PROGRAMS AT UNICAMP

Field	Programs	ProFIS entrants					2014-2018
		2014	2015	2016	2017	2018	
Arts	Social Communication – Medialogy	3	0	3	3	2	11
	Performing Arts			1	0	0	1
	Visual Arts	0	0	0	0	1	1
	Total	3	0	4	3	3	13
Biological and Health Sciences	Medicine	5	5	10	10	10	40
	Nursing	2	2	4	3	7	18
	Pharmacy	1	2	2	5	5	15
	Biological Sciences	2	2	2	3	2	11
	Speech therapy	2	2	2	2	2	10
	Biological Sciences Teaching Training Program	2	2	2	1	2	9
	Dentistry	1	2	2	1	2	8
	Physical Education (Full-time)	0	1	1	1	1	4
	Nutrition	0	1	1	1	1	4
	Physical Education (Evening)	0	1	1	0	0	2
	Sports Sciences	1	0	0	0	0	1
	Total	16	20	27	27	32	122

TABLE 3.19. PROFIS STUDENTS AND THEIR ENROLLMENTS  
IN UNDERGRADUATE PROGRAMS AT UNICAMP

continued

Field	Programs	ProFIS entrants					2014-2018
		2014	2015	2016	2017	2018	
Engineering	Architecture and Urbanism	3	3	3	3	3	15
	Civil Engineering	3	3	3	3	3	15
	Agricultural Engineering	2	3	3	1	3	12
	Food Engineering (Full-time)	2	2	2	2	2	10
	Food Engineering (Evening)	2	2	2	2	2	10
	Chemical Engineering (Evening)	2	2	2	2	2	10
	Environmental Engineering	2	2	1	1	0	6
	Production Engineering	0	2	2	1	1	6
	Telecommunications Engineering	1	1	1	1	2	6
	Computer Engineering	1	1	1	1	1	5
	Control and Automation Engineering	1	1	1	1	1	5
	Electrical Engineering (Full-time)	1	1	1	1	1	5
	Electrical Engineering (Evening)	1	1	1	1	1	5
	Mechanical Engineering	1	1	1	1	1	5
	Chemical Engineering (Full-time)	1	1	1	1	1	5
	Manufacturing Engineering	0	2	2	0	0	4
	Total	23	28	27	22	24	124
Exact and Earth Sciences	Computer Science	1	2	2	2	2	9
	Geology	2	2	2	2	1	9
	Statistics	0	0	3	0	4	7
	Chemistry	1	2	3	0	0	6
	Mathematics / F. / A. M. Computational	0	1	0	3	1	5
	Physics	0	1	1	0	2	4
	Technological Chemistry	1	1	1	0	1	4
	Mathematics	0	1	0	0	1	2
	Applied and Computational Mathematics	0	1	0	1	0	2
	Mathematics Teaching Training Program	0	1	0	0	0	1
	Total	5	12	12	8	12	49
Humanities	Economic Sciences (Evening)	3	3	2	3	3	14
	Economic Sciences (Full-time)	2	2	2	2	2	10
	History	1	0	2	1	1	5
	Language – Portuguese Teaching Training Program (Full-time)	1	0	0	2	1	4
	Linguistics	0	2	0	0	2	4
	Business Administration	0	0	1	1	1	3
	Literary Studies	2	0	0	0	0	2
	Pedagogy (Evening)	1	1	0	0	0	2
	Public Administration	0	0	0	1	0	1
	Social Sciences (Evening)		0	0	0	1	1
	Philosophy	0	0	1	0	0	1
	Geography (Full-time)	1	0	0	0	0	1
	Language – Portuguese Teaching Training Program (Evening)	0	0	0	1	0	1
	Pedagogy (Full-time)	0	0	1	0	0	1
	Total	11	8	9	11	11	50

TABLE 3.19. PROFIS STUDENTS AND THEIR ENROLLMENTS  
IN UNDERGRADUATE PROGRAMS AT UNICAMP

continued

Field	Programs	ProFIS entrants					2014-2018
		2014	2015	2016	2017	2018	
Technology	Information Systems	0	1	1	0	2	4
	Higher Educ. Program Tech. in Build. Edifices	0	0	3	0	0	3
	Total	0	1	4	0	2	7
OVERALL TOTAL		58	69	83	71	84	365

At the end of this program, the student receives a certificate of completion, being able to enter the regular undergraduate programs of Unicamp or choose another trajectory if their ranking does not allow access to the place in the option program. The option manifestation follows CRO's descending order until all available places are filled. To ensure the permanence and feasibility of exclusive dedication to studies, students receive a monthly permanence grant (ProFIS Scholarship with a value similar to that of undergraduate research) of R\$ 400.00, food and transportation. More recently, in 2019, it was determined by CINE Brasil 2018 of the Ministry of Education as a basic area of entry (ABI) in Humanities, due to curricular predominance of this area. Because of the continuity of later studies, in any of the programs with place specially assigned to these students, selected by academic performance, it has been understood as a sequential program.

Four dimensions of the program are discussed: Student Profile and Performance; Curriculum and Graduates; Program Management and Evaluation, Faculty and Assistants; Future Prospects

### 3.6.1 Students

In this item are analyzed characteristics associated with geographic and socioeconomic profile, ethnic profile, on special needs, candidate/place ratio and the process of students enrolled for the selection of the 120 places of ProFIS Universidade. In addition, the text presents the evaluations and actions from the performance evaluation of the entrant students.

Between 2014 and 2018, ProFIS showed a gradual increase in the number of candidate registrations – Table 3.20. ProFIS received only one student with visual needs and two students who self-declared as indigenous in 2017 and 2018.

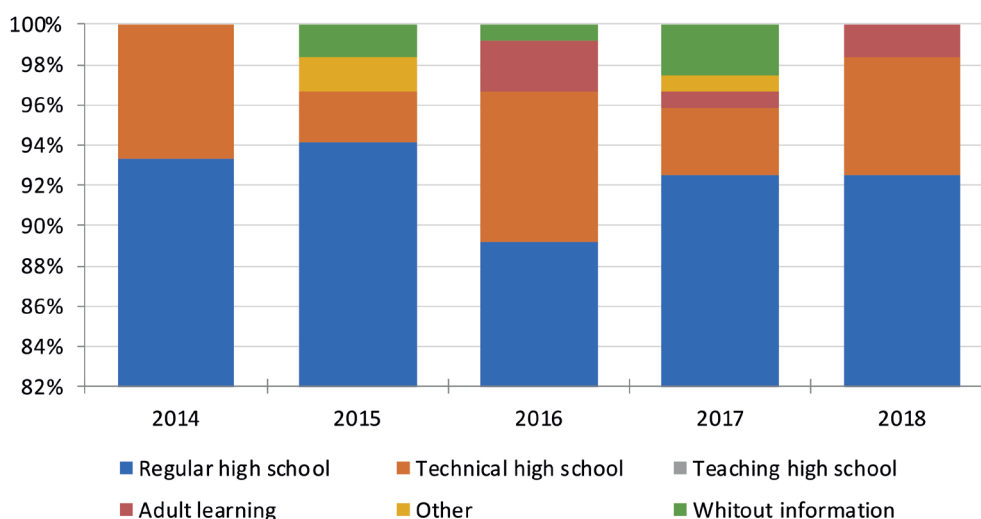
TABLE 3.20. NUMBER OF ENROLLEES AND CANDIDATE/PLACE RATIO

	2014	2015	2016	2017	2018
Number of Places	120	120	120	120	120
Number of Enrollees	965	743	1,192	1,416	1,512
Candidate/Place Ratio	8.0	6.2	9.9	11.8	12.6

Source: Comvest, 2019.

As expected, 90% of the entrants came from regular public school, with less than 10% coming from secondary education with vocational training (Graph 3.21).

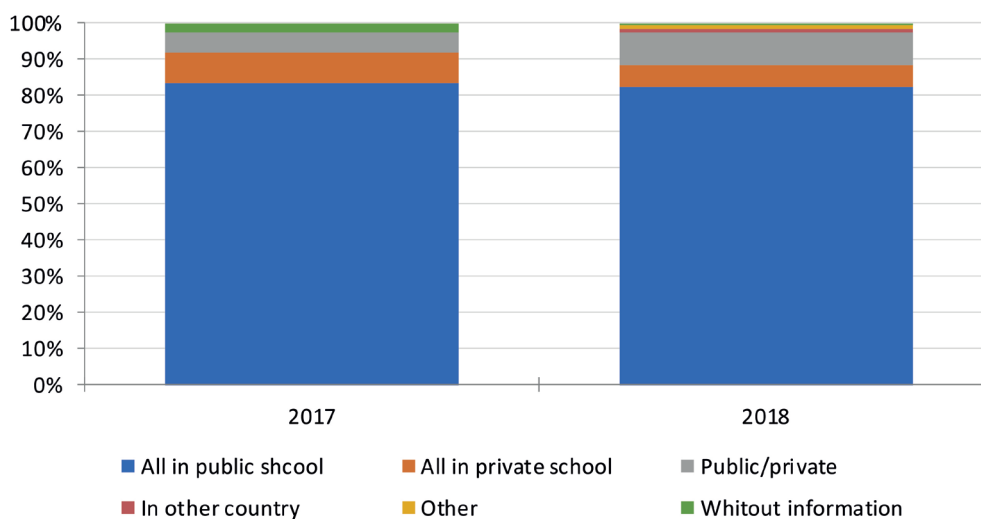
GRAPH 3.21. SECONDARY EDUCATION OF PROFIS ENTRANTS



Source: Comvest, 2019. Prepared by PRG.

Since 2017, entrants also inform the type of school that they attended elementary school 2, which corresponds to the last 4 years of elementary education. As observed in Graph 3.22, among all entrants in the last two years, most reported having studied in public school during this period of school life, so the program has met the purpose of bringing to Unicamp youth coming only from public education.

GRAPH 3.22. TYPE OF SCHOOL IN PRIMARY EDUCATION I AND II

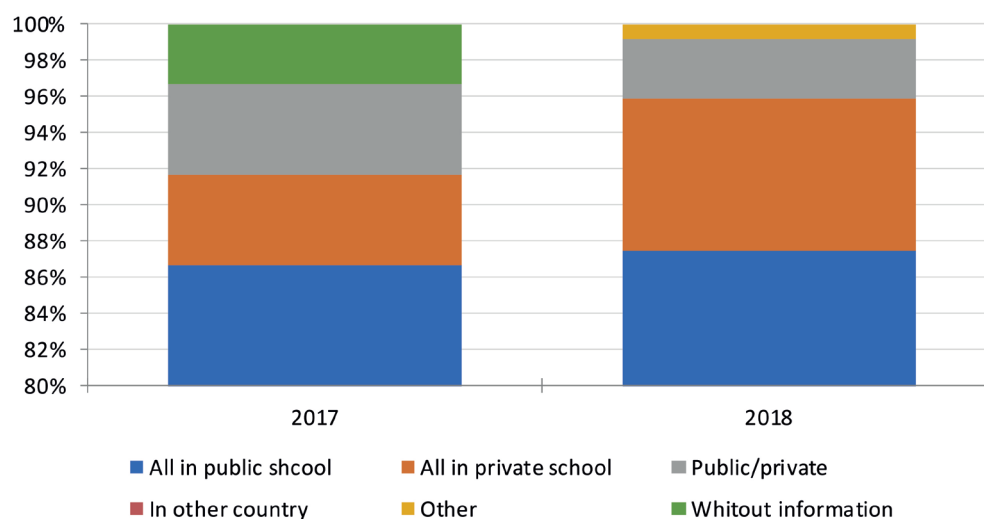


Source: Comvest, 2019. Prepared by PRG.

About 80% of the fathers and mothers have educational level up to high school, with 40% and 30%, respectively, with up to complete primary school (Graph 3.23).



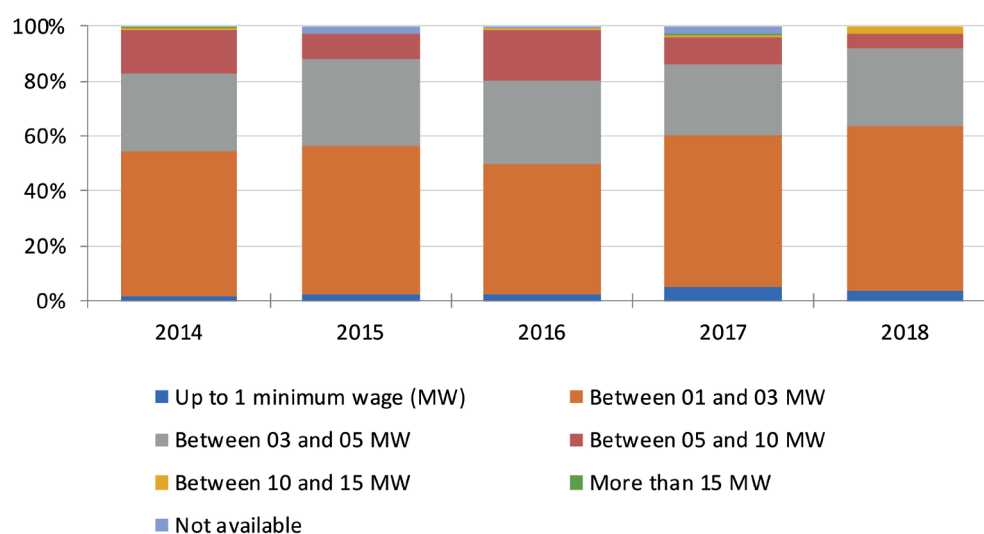
GRAPH 3.23. EDUCATIONAL LEVEL OF THE PARENTS OF PROFIS ENTRANTS



Source: Comvest, 2019. Prepared by PRG.

Between 2014 and 2018, most students (between 50% and 60%) had family income between 1 and 3 minimum wages, 30% to 40% had family income between 3 and 5 minimum wages, and less than 10% declared family income above 5 minimum wages (Graph 3.24).

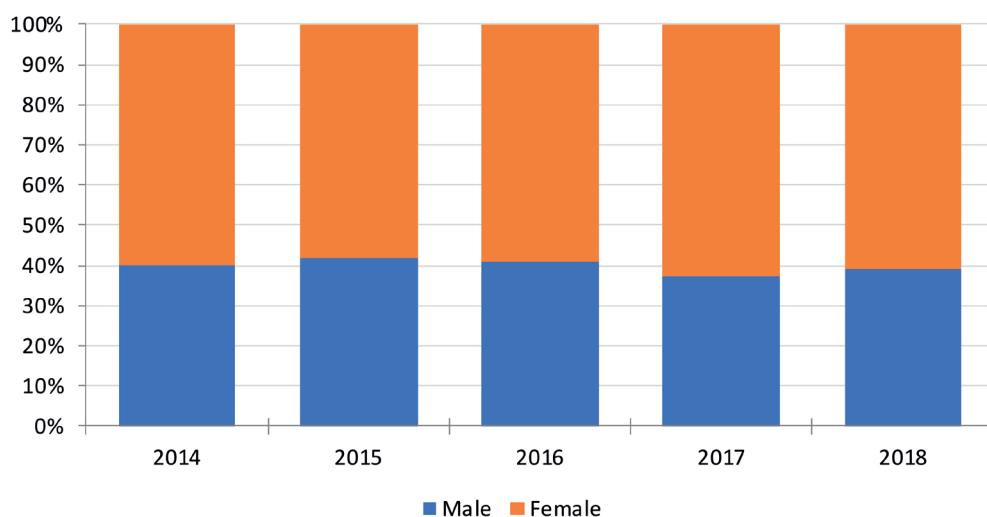
GRAPH 3.24. DISTRIBUTION OF PROFIS ENTRANTS ACCORDING TO MONTHLY FAMILY INCOME



Source: Comvest, 2019. Prepared by PRG.

It is noted that 60% of the students are female; with mean age of 17 years, which did not change in the period (Graph 3.25).

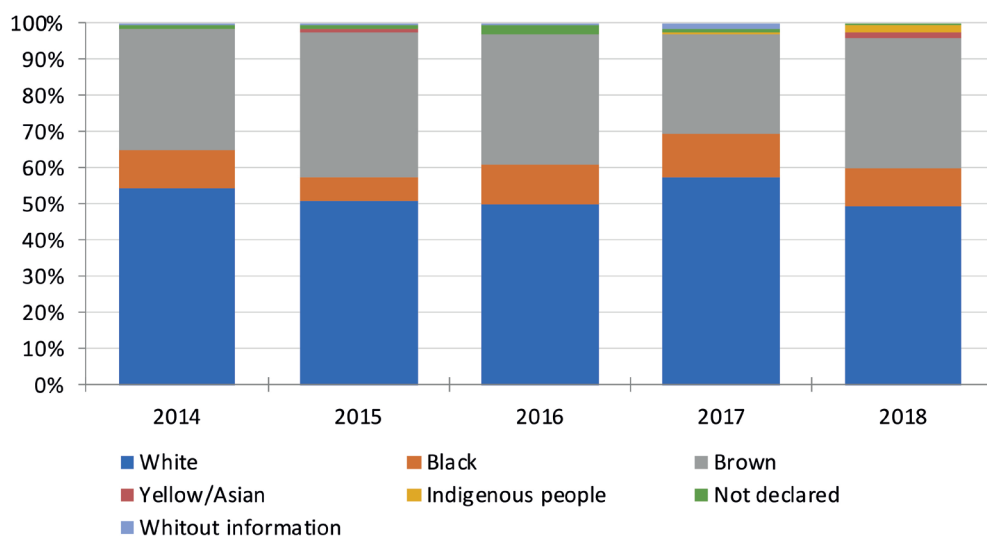
GRAPH 3.25. DISTRIBUTION OF THE ENTRANTS ACCORDING TO SEX BETWEEN 2014 AND 2018



Source: Comvest, 2019. Prepared by PRG.

From 2014 to 2018, about half of the entrants self-declared as white (Graph 3.26).

GRAPH 3.26. DISTRIBUTION OF THE ENTRANTS ACCORDING TO ETHNICITY BETWEEN 2014 AND 2018



Source: Comvest, 2019. Prepared by PRG.

Thus, there is no important change in the students' profile in these five years and its effectiveness in including students from different public high schools in Campinas is confirmed.

### 3.6.2 Curriculum

It is in the curricular dimension that the specificity of ProFIS stands out. The areas that integrate the program keep their curricula up to date and in dialogue with the main

renewals and discussions of their fields of activity, attentive to national and international issues and based on updated bibliographies. Still, it was understood that a reformulation was necessary, which occurred in the class of 2019. The main motivations were the reduction in the total number of class hours, in addition to greater standardization of the number of credits between fields of knowledge.

Between 2014 and 2018, the workload of the ProFIS curriculum was 1,755 hours, completed in a minimum of four semesters and a maximum of six semesters. For the coordination, faculty and students, this workload was considered excessive, hindering participation in elective subjects of interest and a more effective integration into the daily routine of the university. The importance of immersion, the need for hours outside the classroom for study and the time required for the transportation of most students from their homes in distant areas of the city of Campinas led to the decision of a curricular renewal. The changes included the elimination and reduction of subjects, including Descriptive Statistics in Mathematics, increasing the workload in Introduction to Economics and English language. There was a reduction to 1,485 hours in the areas of Exact and Earth Sciences, Biological and Health Sciences, and Humanities (Figure 3.2).

FIGURE 3.2. PROFIS CURRICULUM IMPLEMENTED IN 2019

1st semester 24 credits	2nd semester 25 credits	3rd semester 24 credits	4th semester 26 credits
Reading and writing 1 4 credits	Reading and writing 4 credits	English Language 1 4 credits	English Language 2 4 credits
Fundamental Literature Texts 2 credits	History 101 4 credits	Communication, art, culture and society 3 credits	Youth, psychology and citizenship 4 credits
Evolution 4 credits	Human Body 2 credits	Science, Technology and Society 3 credits	Environmental Engineering 2 credits
Basic Math 1 6 credits	Basic Math 2 6 credits	Ethics and bioethics 2 credits	Information Technology 4 credits
Earth Planet 2 credits	First aid 3 credits	Introduction to science and arts practice 1 8 credits	Introduction to science and arts practice 2 8 credits
Chemistry 101 6 credits	Physics 101 6 credits	Physical activity, health promotion and quality of life 2 credits	Economics 101 4 credits
		The professions 2 credits	

Source: 2019 ProFIS WG Report.

The ProFIS curriculum includes Undergraduate Research in the second year of the program. The inclusion of students in undergraduate research activities is covered in two

mandatory subjects (PF093 and PF094) that provide conditions so students start in critical thinking and develop skills related to the execution of an individual project. These subjects aim to supplement the training of students, developing the capacity of synthesis of theoretical concepts, creation, practical experimentation, scientific writing and presentation and defense of results in the Scientific Exhibition. The projects are supervised by a professor or researcher of Unicamp of their choice and, in addition to this mentoring, students have classes offered by the coordination, for methodological support in the production of partial and final reports. The ProFIS Scientific Exhibition, since 2016, has disseminated the research developed by students in their undergraduate research and awarded the best works in Arts and Humanities, Exact and Earth Sciences; Biomedical Sciences and Technology. The Scientific Exhibition is an event held at the end of the year. The last Exhibition was held on December 3, 2018<sup>3</sup>.

There are also reports of the publication of results of ProFIS student projects in international journals and presentations in national and international congresses, showing the scope of the undergraduate research carried out by them.

The participation of ProFIS students in university activities such as choirs, extracurricular projects and sports leagues has been of great prominence. Students are engaged in organizing activities such as saraus and dance workshops aimed at publics beyond the university, expanding the network of circulation and integration on campi. The curricular restructuring implemented in 2019 may boost the students' engagement in such activities.

The choice of undergraduate program and professional career is made in the subject "The Professions," taught with the assistance of professionals of the Educational Guidance Program of Unicamp's Student Support Service (SAE). In this subject students research and learn in depth about all programs offered by the University, including visits to other campi.

As a general training program, ProFIS is not professionalizing and its goal is to develop skills for academic life and contribute to the inclusion of public school students into the university. In order to provide students with a general multidisciplinary training, the curriculum includes subjects from different areas, capable of providing an integrated and critical view of the contemporary world, with broad culture and scientific spirit. It contributes so students have a better understanding of themselves, make a conscious choice of the Undergraduate program and identify themselves as members of a diverse, globalized and ever-changing society, preparing them for professional practice and citizenship.

### 3.6.3 Faculty and teaching assistants

The professors, PEDs and PADs involved with ProFIS come from various schools and institutes of Unicamp, by choice or designation of their CG. The absence of a physical reference of teaching integration has been overcome with the promotion of half-yearly meetings since April 2017, which has facilitated the integration of subjects, interchange of didactic strategies and cooperation to promote greater integration and collaborative

3. <https://www.Unicamp.br/Unicamp/noticias/2018/12/04/mostra-reune-pesquisas-de-iniciacao-cientifica-de-estudantes-do-profis>

learning and seek to remedy the training gaps of Secondary Education. These discussions, academic data, NEPP program monitoring reports and the half-yearly days of evaluation of the academic calendar guided the changes.

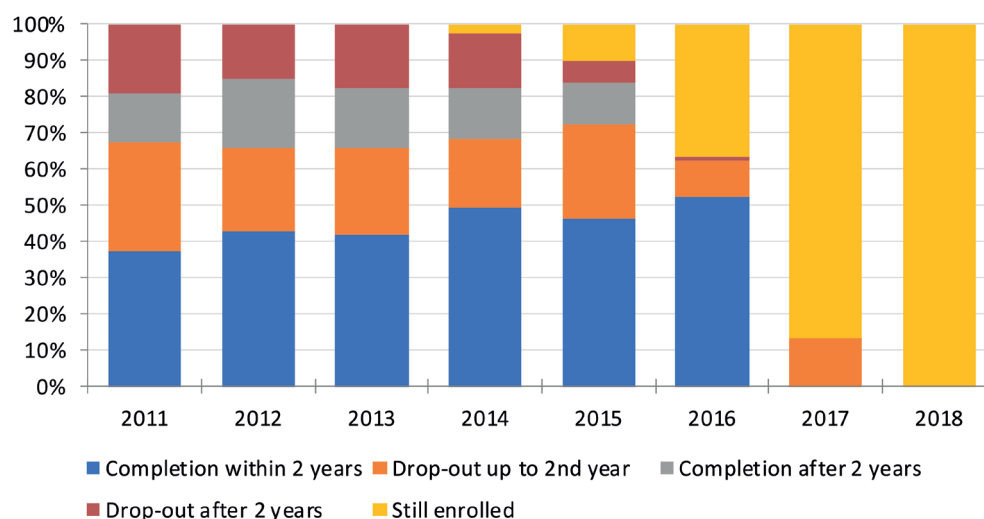
ProFIS has 18 PAD scholarships per semester, provided for in its pedagogical project, as well as volunteer PADs, especially former students. Similarly to PEDs, PAD scholarship holders have active participation in the practical activities of the subjects, as well as in the out-of-class service for students. PEDs and PADs are responsible for monitoring classes and academic development of students, in addition to contributing to teaching assistantships and academic support, closer to students. Moreover, they assist professors with indications of content that need to be reformulated or reinforced in the classroom. Coordination and faculty highlighted the large number of PADs, often graduates from the program and volunteers who, after attending the undergraduate education of their choice, return to support colleagues.

Professors have sought teaching qualification in training subjects promoted by [ea2] and participation in national and international congresses, updating the plans for the conduct of the subjects to improve the educational experiences of students.

### 3.5.4 Internal and External Evaluation and Management

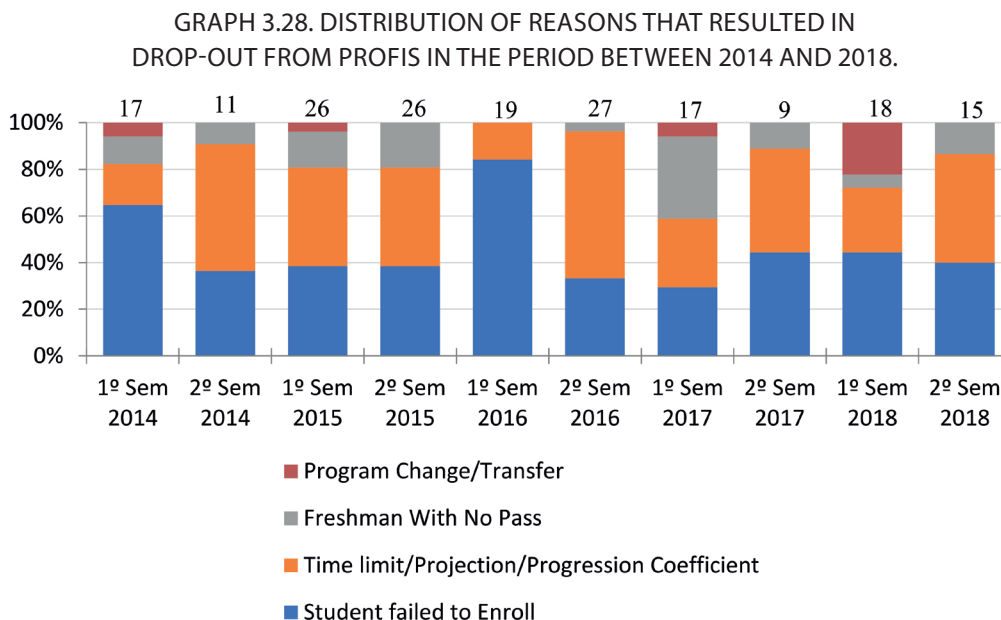
Graph 3.27 presents the students' status according to year of admission, for classes from 2011 to 2016. The graph indicates a trend of increase in the number of graduates in phase. The total of graduates in 2015 was 69%, similar to previous years.

GRAPH 3.27. ENROLLMENT STATUS BY CLASS ACCORDING TO YEAR OF ADMISSION



Source: 2019 ProFIS WG Report.

The reasons for dismissal from the program include, predominantly, non-renewal of enrollment and difficulties with academic performance, category in growth (Graph 3.28).



Source: DAC, 2019. Prepared by PRG.

Note: The number of dismissed students is indicated at the top of each column.

According to the coordination, the mechanisms adopted to reduce dropout rates include progressive adjustment of the subjects by faculty, increase in places in undergraduate programs at Unicamp for students from ProFIS, and a very close monitoring by the coordination of students who show a low level of production. The curricular restructuring that came into force from 2019 should also impact dropout rates.

In addition to the coordination, the faculty involved with ProFIS has also monitored the program indicators. A group of researchers of NEPP (Center for Public Policy Studies) conducted a longitudinal study for monitoring students from the first ProFIS classes during undergraduate program and after completion and professional inclusion. Program information is compiled and updated<sup>4</sup>. Among the graduates from the first class, of 2011, there are two doctoral students in Biology, two master's students in Linguistics and History, and three students, from Medicine and Speech Therapy, having medical residency.

According to the coordination, the ProFIS team has the help of one program secretary and one administrative technician. Activities include providing service to students and faculty, supporting the coordination, and executing general administrative routines of the department. This group includes: protocoling documents; writing letters, statements, preparing catalog and schedules; reserving classrooms; purchases; warehouse orders; organization of events (graduation and Scientific Exhibition); scheduling meetings and transportation for field visit; printing activities and texts worked in class, among others. The two employees monitor the program from the first classes. It is worth mentioning the previous experience of the employee who has worked for many years at DAC, who shares her experiences with the younger employee. The coordination points out that their pedagogical training is fundamental. They are able to meet different demands; understand

4. <https://www.nepp.Unicamp.br/biblioteca/periodicos/issue/view/127/CadPesqNepp85>



the structure and functioning of academic and pedagogical processes; understand and receive the needs and interests of students, faculty and coordination, which is necessary considering the relevance of the program, in the social and educational aspects. Both have also sought to improve their qualification with Educorp/Unicamp courses: Administrative Writing, Service Techniques and, more recently, Process Mapping Workshop – Value Chain.

The work of the Committee on Academic Administration has not been demanded, which would have similar function as that of a CG. Instead, the coordination has held, since 2017, half-yearly reassessment meetings, convening the entire faculty and student and administrative representatives, which have resulted in significant curricular changes. According to the coordination, there have been important improvements in the issues pointed out in the last Institutional Evaluation.

In addition to the above meetings, which enable identifying successes and correcting errors throughout the semester and promoting interdisciplinarity, the Program Evaluations provided for in the undergraduate calendar have been very productive. There was suggestion as to studying mechanisms to recognize extracurricular activities, which was carried out by means of two subjects, the Scientific Exhibition (within the scope of subjects PF093 and PF094 – Introduction to the Practice of Sciences and Arts I and II, respectively) and participation in the UPA (within the subject PF095 – The Professions). The participation and integration of ProFIS students in the various extracurricular projects and activities has been more significant, either through ProFIS Athletics, Sarau, or Dance Workshop “Dancing Chameleon.” However, the recommendation to replace certificate of studies with certificate of completion is not possible, due to rules of regulation of higher education for programs of this nature, non-terminal.

The innovative, unique profile, seeking inclusion with geographic quota related to public schools of Campinas, associated with its general interdisciplinary training curriculum contributed to winning the Péter Murányi award in 2013<sup>5</sup>. There is also an award at the Scientific Exhibition for works in each area. Some professors who also work at ProFIS received a teaching recognition award for their units of origin in the period.

Regarding infrastructure, between 2014 and 2018, the program had the help of a secretary and an administrative technician that take care of varied activities, including: service for students and faculty, support to coordination and routine administrative activities of the department, such as document protocoling, writing of letters and statements, preparation of catalogs and schedules, organization of events such as graduations and organization of the annual Scientific Exhibition. The program requires its own computer lab, especially because this is a program whose students have less access to personal or household computers.

### 3.6.5 Future prospects

It is recognized that the program has contributed to transforming the routine of the university and of the undergraduate programs that receive its former students. The research

5. <http://www.fundacaopetermuranyi.org.br/main.asp?pag=2013>

activities and support grants, associated with the academic and training experiences of ProFIS explain the success of the students. It is understood that these good results would be expanded with increase in ProFIS places, with greater administrative support, support staff, faculty and scholarships, in addition to a new governance model, with the program linked to a school. Its expansion beyond the schools of Campinas and greater offer of places are proposals aligned with the academic success of its former students during undergraduate programs. The expansion could enable the dissemination of general interdisciplinary training as a previous stage to undergraduate programs, which would contribute to reduce failures due to inadequate adaptation to the institution, program, or initial academic difficulties seen in undergraduate education.

In 2018, a working group (WG) was appointed to discuss proposals to expand ProFIS, with participation of professors of the program since its beginning, NEPP researcher who monitors the results, the coordination and other professors. The WG validated its relevance as a social inclusion strategy and as a qualifier of the academic experience prior to undergraduate programs and their good results. It was suggested its initial expansion from 120 to 180 places, aiming to serve the municipalities of Hortolândia, Jaguariúna, Paulínia, Sumaré, Valinhos and Vinhedo in a first stage and, later, the creation of another headquarters, on another campus, to serve other municipalities in the region, Limeira and Piracicaba. However, the financial crisis and the need for restrictions on spending prevented the implementation of the proposal. The allocation of responsibility for the program in one school, having been reclassified as an undergraduate program (ABI-Humanities) in 2019 by the Ministry of Education, is another aspect that will need to be rediscussed, from the perspective of sustainability and growth.

## 3.7 Conclusion

### 3.7.1 Advances

The priority projects in the 2016–2020 strategic planning, from the perspective of excellence in education, were curricular flexibility and the adoption of student-centered methodologies. Furthermore, the promotion of a wide review of undergraduate programs was proposed, seeking to meet social demands, ensuring indissociability between teaching, research and outreach, respecting the diversity of the fields of knowledge. The promotion of interdisciplinarity and transdisciplinarity was proposed, with the incorporation of new educational resources, online courses. In addition, it was planned to develop the evaluation of programs supported by a broad set of indicators, both of the efficiency of education and the achievement of training objectives. The continuing evaluation of students and routine evaluation of faculty and programs were suggested, in addition to evaluation by graduates. The expansion of programs and increase in places were proposed, optimizing the structure and human resources and reaffirming the leading role in higher education, creating new modes of programs. Regarding infrastructure, the improvement of educational spaces was proposed, including modifications to promote new educational strategies. At the

time, Unicamp reaffirmed its commitment to social inclusion, strengthening existing mechanisms and creating new mechanisms of entrance for groups with lower educational opportunities. This entrance should be associated with measures that ensured student permanence (scholarships, adaptation to the academic environment and culture and support to achieve the skills and knowledge necessary for their training). Furthermore, there should be promotion of interaction of our students with students from other countries, expansion of the national and international mobility of students, curriculum advisory more compatible with foreign universities, provision of the syllabi and schedule of the courses in English and Spanish, and increase in the offer of programs/subjects in these languages and Portuguese for foreigners.

The institutional evaluation of the undergraduate education in this 2013–2018 report, which includes the monitoring of the student and academic profile data series, the perception of the Schools in relation to different aspects of undergraduate education and the 2017–2021 project development actions, shows that almost all of the above proposals, contained in the 2016–2020 Planes, have been implemented or are in full development. Aware that student permanence and success in completing undergraduate training depends on financial conditions for dedication to training, an adequate and qualified academic environment and psychic comfort for good performance, these three dimensions have been worked on as a priority from 2017. This is also evidenced in this report and was recognized by the directors and coordinators of programs that answered our Institutional Evaluation questionnaire.

There was implementation of the new forms of entrance in 2019, after discussions in 2017 and 2018 (quotas, indigenous entrance exam, medalists, in addition to PAAIS and ProFIS). With change in the allocation of scholarship resources and application of academic criteria in the process of selecting candidates, it was possible to increase the number of students benefited and meet the entire housing demand for a place in Student Housing or Housing Scholarship, in addition to implementing the Food Rate Exemption Benefit to all students with per capita income of less than 1.5 minimum wage in 2018. In addition, new sources of scholarships were incorporated – Santander, several companies, INOVA – and budgetary resources were approved for outreach scholarships in 2020. In addition, there are PIBID and PET-Capes scholarships.

Changes in curriculum and educational strategies are at different stages between implementation and discussion in the school, in all programs, accelerated or induced by the 2020 RenovaGrad project. The [ea]2 has provided direct advice for this project, with support from GGTE, under coordination of PRG, having organized the RenovaGrad Forum for coordinators in 2017–2019. The changes follow legal frameworks (such as DCN) and principles such as curricular flexibility, student-centered learning, based on projects of interest to society, hybrid teaching with new technologies. Some programs (such as Food Engineering and Pharmacy) have already had relevant structural changes, while many others are changing educational strategies, incorporating more active methods and technology. In this process, community involvement has been evident, more broadly in the discussions on improvement of training, in the units and higher levels of the University.

In 2017–2019, all undergraduate programs underwent curricular readjustment required by a new resolution of the State Board of Education (CEE), of 2015. Interdisciplinarity

has been fostered with the creation of new MA (multidisciplinary activities) subjects, which can accept enrollment of students from any program and interdisciplinary in their origin, often associated with outreach or extracurricular activities and more focused on intervention projects. Subjects on entrepreneurship, sustainability, support for refugees, and environmental issues were created.

To boost the changes, there was great investment of resources in promoting events, workshops and lectures of professors both internal and external to Unicamp, national and international, addressing various aspects of teaching. Calls/selection processes were maintained (Visiting Specialist-Professor, PAD), criteria and regulation of PEDs were intensified and revised, the Faepex – Ensino Call (infrastructure) was maintained and, in 2019, additional resources were distributed for the Teaching Spaces Reformulation, Curricular Reform (CGU-PRG), and for Hybrid Teaching support (PRG-GGTE) Calls. In early 2020, new calls to support educational innovations will be launched. Considering the importance and scope of the PED program (graduate students) and its potential as a catalyst for changes in undergraduate education in conjunction with the PADs (undergraduate students), the strategic project for teaching training Ped+ was initiated.

Many aspects related to academic registration, in the DAC, have been improved since 2017. These included written, video instructions on electronic media about procedures, a very relevant change in the presentation of the so-called “completion test,” which simulates the evolution of the curriculum, counts credits and its prerequisites and informs, in color alert system, when the student is lagging behind in their program and when they have already exceeded time limits or this is expected to happen. Also, in the GestaGrad project, alert indicators were established for students and subjects, which, from the 2nd semester of 2019, will be sent via the academic management system SIGA directly to interested parties for more than three failures in the semester and subjects with more than 20% failure rate. Furthermore, quantitative indicators of program performance have been produced and discussed in the Congregations (in 2018 and 2019), including the percentage of students who complete the program in the minimum time (completion proposal officialized in the CEE) and maximum time allowed (150% of the completion time) and the corresponding evolution of the dismissal rate in the program, according to definitions of INEP-Ministry of Education. Finally, the two days of program evaluation, proposed by the academic calendar, became mandatory, with suspension of other didactic activities for professors and students, with each unit organizing their activities, which should serve as a contribution for curricular improvement.

Another aspect that has deserved attention in the period is the mental health of students, configuring the Well-Being Strategic Project. Visits to international benchmark services were made to improve the proposal. The SAE educational advisory team and the SAPPE team visited the Schools for advisory and proposal for identification of local crisis management personnel or team, for an earlier approach to cases. A booklet on relevant aspects for identifying risk and emergency situations, and contact numbers of support services, including SAE, SAPPE and Emergency Care of the Hospital das Clínicas, is being finalized and will be available in electronic format and in mobile phones. Mentoring programs with professors or senior students were initiated (IMECC, IFGW) and are components of the new academic support actions for Freshmen in 2020.

### 3.7.2 Challenges and prospects

The time of financial rebalancing of the university should be aligned with those that promote increasing needs of resources for supporting permanence, updating the pedagogical projects, and maintaining good conditions of offering, in terms of faculty, employees, equipment and physical structure. This will increasingly require better training in management of human and financial resources, both from central bodies of the University and Schools. The preparation of directors, teaching coordinators and faculty for basic aspects of management and leadership should be incorporated into the teaching development activities provided by [ea]2, in collaboration with Educorp. The pertinent literature shows that the faculty professional development programs that incorporate these elements are the most successful for promoting deeper reflection and repositioning on “university professorship,” appreciation of academic management activities. At the same time, it is necessary to intensify and offer basic and advanced training program in aspects of university training, which promote progress at the cognitive level and development of the skills expected for the future. In this regard, the mastery of educational strategies that promote reflection, collaboration and application of knowledge in real problems affecting communities, of digital technologies applied to these strategies, skills for teamwork and valuing the diversity of experiences and skills of the different team members become essential competences. In these faculty development initiatives [ea]2 and GGTE play a great role and need to be supported with resources and qualified staff, including webdesigner, multimedia communication applied to education professionals and higher education experts.

No less important is to review the calculation bases and rediscuss the scope and volume of specific resources for undergraduate education that are allocated to the Schools, PAEG and PAAEC. There are different demands with new curricular proposals and the outreach curricularization activities add possible transportation and material costs to support the activities with the communities served by the university. The parameters for calculations and the place of these resources in contrast with other ones from specific calls of the Planes or established programs (e.g. PPEVG, student call/selection processes for extracurricular activities) need to be widely discussed with unit directors and program coordinators. In particular, it is necessary that they consider the profile of the educational activities necessary for contemporary training. The same applies to resources for investment in updating laboratory equipment and the like and adjustment of physical spaces for a more welcoming and creative educational environment. The basis for decision on resources and prioritization of investments needs to be shared and validated by those involved, following principles of excellence in public administrative management.

In addition to the investments in the units themselves, PRG has sought to preserve its resources of investment in the calls, strategic projects and opportunity, with other pro-rectorates or agencies, to optimize resources that can improve undergraduate education. There have also been investments in improving common use learning spaces, in the rooms and external spaces of the Basic Cycle (CB) I, II, III (Basic Engineering building) and, in project, a set of classrooms for collaborative and technology-mediated learning is under developed in space to be made available in the future in CB I.

More comprehensive evaluation, aimed at confirming whether the undergraduate training goals have been achieved, was the subject of internal discussions in the scope of reflection of the RenovaGrad project in 2018. The use of indicators of student and program performance and temporal evolution of program dismissal rates, together with the half-yearly and other evaluations of each unit have created an environment of continuous reflection on the quality of the programs and educational environment, which represents a change in institutional culture. The in-depth determination of the reasons for non-renewal of enrollment, dropout or dismissal due to performance difficulties, or low rate of completion in the recommended and maximum completion time also require qualitative analyses per program in order to define strategies to seek appropriate completion rates.

There was planning to develop a proposal for online course evaluation that had common core and specific sections per program, seeking to enhance the old Undergraduate Education Evaluation Program (PAG). The working group, gathered in 2017 and 2018, did not reach consensus as to the multiplicity of course evaluation models in use by the different units and the consequent resistance to unification.

An already started project, which is expected to be developed in 2019, is that of the Graduates (*Alumni*), which aims to bring former Unicamp students together by using a specific platform. This project also aims to request feedback on the training and its relevance to the professional activities and career evolution, enabling greater approximation with the true evaluation of the impact of Unicamp Undergraduate programs. Other results of this project are the search for voluntary collaborations of these former students in the training during undergraduate education and their potential financial collaboration, supporting scholarships, research projects, possibly becoming true “Unicamp Partners.”

The student evaluation chapter in the Regulations is under review, in order to create general parameters on evaluation as part of the educational program under development and to define minimum quality criteria, which consider the validity, reliability, feasibility and educational impact of the evaluation process. Another regulatory aspect to be reviewed refers to the accreditation of supplementary activities with student protagonism, now called extracurricular, which may be outreach activities or other activities for supplementation of technical or scientific training or to foster citizenship, including participation in junior companies, social entrepreneurship activities, popular pre-entrance exam courses, among others.

There was also modification in the rules for inclusion of possible outreach vectors in the subjects to allow the curricularization of outreach activities, in the form of complete subject (e.g., MA subjects) or partial workload (EX vectors). This new model will be implemented in 2020, to be in the subject plans from 2021.

Recent retirements and consequent replacements in the undergraduate departments in the units, together with the renewal of the staff and faculty, requires greater support and training of these teams in academic aspects, of the systems involved, undergraduate regulation and support for students, faculty, program coordination, Undergraduate Chambers, Structuring Teaching Centers (NDE) and board. The AssessoraGrad project was started in 2018-9, but is expected to become comprehensive through the continuing education program that began to be offered in partnership with Educorp (corporate education). With the profound change in the world of work, in which computerization,



artificial intelligence, and electronic communication predominate and has been determinant for dialogue with and monitoring of students, there is need for strategic planning in relation to the support of professionals of the various areas of activity in ICT in the Schools and even in PRG.

The lower rate of replacement of faculty and the high rate of retirements lead to greater tension in the challenge of assigning responsibility for activities related to undergraduate education, including theoretical, practical and laboratory activities, but also outside the university space, as required by the new curricula. Once again, best practices in academic management require that this issue is adequately addressed and discussed at the local level, of Schools, that it is preceded by general lines of a university policy in relation to the essential activities and teaching career profiles and forms of balanced valuation of them. This discussion, in addition to the PRG, involves aspects that are evidenced in the Teaching Activity Reports (RAD), whose instrument is under discussion for updating. Similarly, the proposition of more actions and projects aimed at involving the faculty in the pursuit of excellence in undergraduate education is urgent, conferring it the status of knowledge production area, valuing it as a truly academic, reflective, and evidence-based activity.

Unicamp's budgetary difficulties, evidenced from 2017, required measures to contain expenses and restricted the expansion of differentiated and innovative curricular proposals. There was diversification of entrances to the university in addition to the entrance exam and PAAIS and the new entrances with indigenous entrance exam and Olympic places increased the extra places, which may or may not be filled in the selection process. However, it was not possible to expand ProFIS, with its model of broad support in scholarships, PED and faculty originating from the different Schools. Although some technology programs have become Engineering programs, there has been reutilization of credits rather than increase in places. The possibility of an initial common core, in the model of interdisciplinary undergraduate education of Exact and Earth Sciences, or similar, is under initial discussion by the Engineering programs. Similarly, discussion has begun on a common core also for the teaching training programs. Experiences of other institutions with these formats should be better known and discussed in 2020.

These challenges will continue to be tackled and should be considered in the future 2021–2025 Strategic Planning, derived from this Institutional Evaluation, in a collective construction of the academic community, urged to reflect on its difficulties and solution proposals in the current political and financial reality of Unicamp. Once again, the search for other experiences and the vast pertinent literature should guide these discussions, maintaining the academic spirit also in the management of Undergraduate Education.

4.

## GRADUATE STUDIES



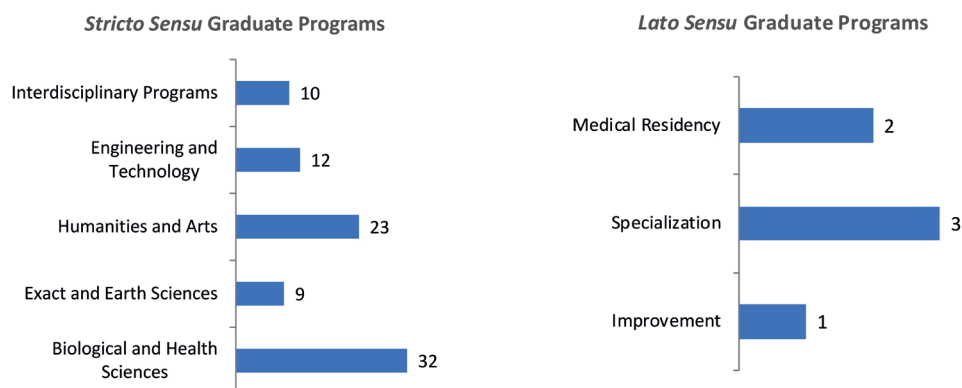


Unicamp's graduate education stands out for its excellence in training professionals with a high level of knowledge, and for carrying out research that contributes to the advancement of the knowledge frontier. One of its characteristics is the number of graduate students compared to the overall population of about 37,500 students at Unicamp. There were 17,625 graduate students in 2018 (47% of the total), 12,399 regularly enrolled and 5,226 special students. In its history, Unicamp's graduate programs have already graduated 70,320 students: to 21,007 in doctoral programs, 33,933 in academic master's programs, 953 in professional master's programs, and 14,427 in specialization programs.

In Brazil, graduate programs are divided into two categories: *Stricto Sensu* (academic and professional master's and doctoral programs) and *Lato Sensu* (Specialization, Improvement and Medical Residency).

Currently, Unicamp offers 86 *Stricto Sensu* Graduate Programs (PPGs), distributed as follows: 69 programs with master's and doctoral degree; three doctoral-only programs; three master's-only programs, and 11 professional master's programs in all areas of knowledge. This Institutional Evaluation (and many of the indicators and analysis in this) organizes these areas of knowledge as Interdisciplinary Studies, Engineering and Technology, Arts and Humanities, Exact and Earth Sciences and Biological and Health Sciences. In addition, there are six *Lato Sensu* courses divided into three categories: Medical Residency, Specialization and Improvement. Graph 4.1 shows the distribution of the graduate programs according to the areas of knowledge and type.

GRAPH 4.1 – UNICAMP'S *STRICTO* AND *LATO SENSU* GRADUATE PROGRAMS, 2018



Source: Office of Graduate Studies (PRPG) Statistical Yearbook (2019)

In 2018, there were 1,380 master's dissertation and 1,040 doctoral theses defenses<sup>1</sup>, a 14% increase compared to 2014. The graduate programs stand out for their excellence, given that 45% of them are rated 6 and 7 (maximum grade in the evaluation of Graduate Programs conducted by CAPES),<sup>2</sup> that is, they are comparable to the best graduate programs at international level. For this reason, they attract Brazilian students from all regions of the country, and students from abroad, especially Latin America, but also with countries on all continents.

1. In Brazil, a dissertation is required for a master's degree, and a thesis is required for a doctoral degree.

2. (Coordination for Improvement of Higher Education Personnel), federal government funding agency, body of the Ministry of Education (<http://www.capes.gov.br/capes/portal>)



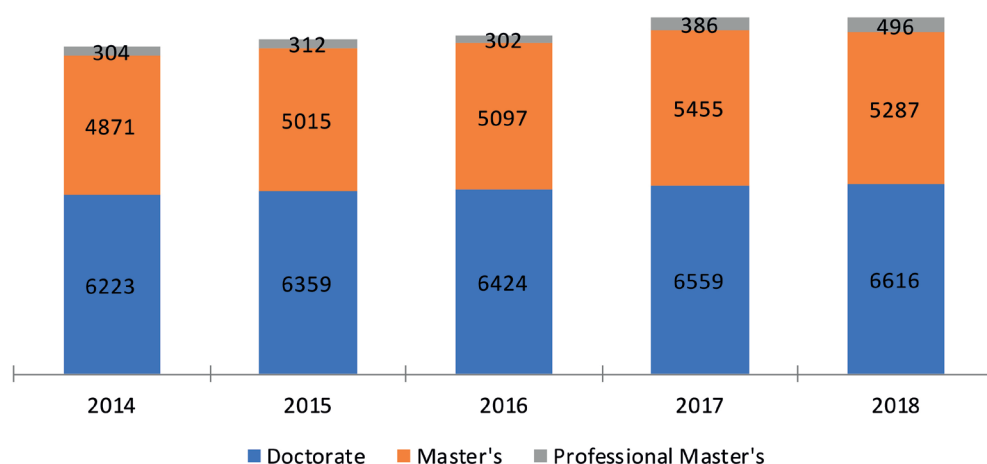
Graduate programs raise resources from different funding agencies nationwide – especially through scholarships –, for almost 40% of their graduate students, and annually receive and send an expressive number of students from and to foreign countries for academic internship. The CAPES awards won by students are another type of recognition: during the five-year period of the Institutional Evaluation (2014-2018), two Grand Prizes, 18 Awards and 26 Honorable Mentions were awarded for theses defended at the University.

In 2018, Unicamp was one of 36 Brazilian universities granted the PrInt Institutional Internationalization Program, with 117 projects in 60 different countries, distributed into 22 Priority Themes, within 5 Thematic Areas, covering 71 PPGs offered by 23 schools of the University. Moreover, there are other initiatives aimed at improving internationalization at graduate level, with a multiplier effect such as internships done abroad by Unicamp's students and professors, and reception of foreign students and researchers at the University, as well as the creation and strengthening of research networks that make it possible to update research topics and internalize new knowledge ('Internationalization' will be addressed in its own chapter).

Some of the key facts related to the Graduate Programs are presented below, and a detailed overview can be seen throughout this chapter.

Number of Regularly Enrolled Students between 2014 and 2018 – Unicamp has shown significant growth in this indicator, reaching a total of 12,399 students in its *Stricto Sensu* graduate programs last year (academic master's and doctoral degrees and professional master's degree), as presented in Graph 4.2. Between 2014 and 2018, there was an 8.8% variation in the number of regularly enrolled students, from 6,223 to 6,616 doctoral students (6.3% increase), from 4,871 to 5,287 master's students (8.5% increase), and from 304 to 496 professional master's students (63% increase).

GRAPH 4.2 – STUDENTS REGULARLY ENROLLED IN *STRICTO SENSU* GRADUATE PROGRAMS, 2014-2018

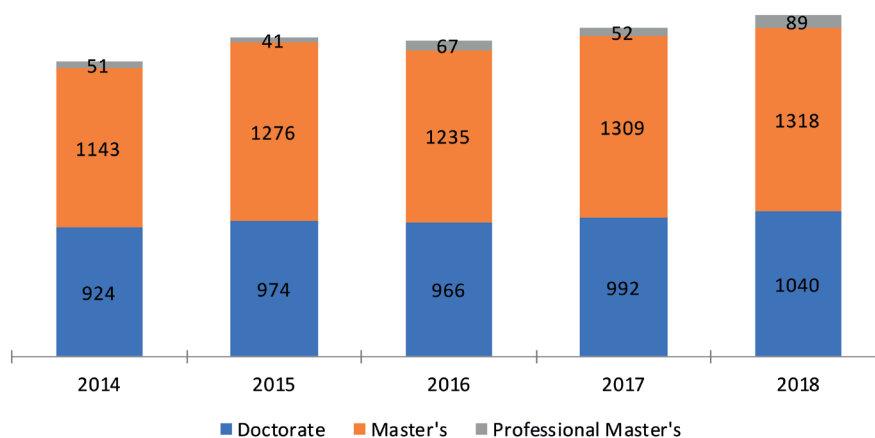


Source: PRPG Statistical Yearbook (2019)

Number of Graduating Students between 2014 and 2018 – The growth in the number of graduating students in the three *Stricto Sensu* graduate modalities can be seen in Graph

4.3 below. Throughout the five years covered by this Institutional Evaluation (2014-2018), the number of students obtaining academic master's degrees increased from 1,143 in 2014 to 1,318 in 2018; regarding professional master's degrees, the number increased from 51 to 89 in the same period, and regarding doctoral degrees, the number increased from 924 to 1,040 from 2014 to 2018. Growth rates were 15.3%, 74.5%, and 12.5%, respectively, and the overall variation was 15.5%.

GRAPH 4.3 – GRADUATING STUDENTS PER COURSE LEVEL, 2014-2018



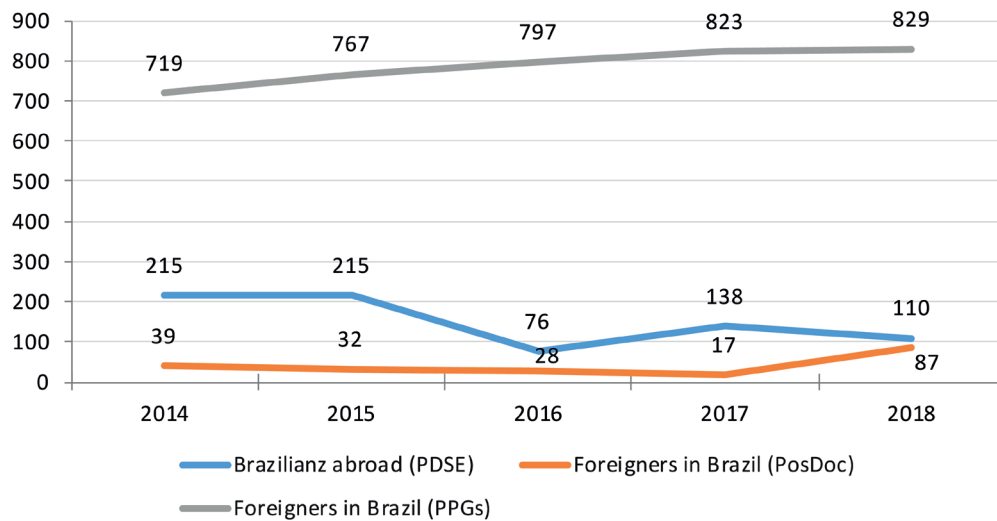
Source: PRPG Statistical Yearbook (2019)

Number of Internship Students Abroad and Foreign Students at Unicamp – Unicamp aims to internationalize its graduate programs by both sending students abroad and by receiving foreign students and postdocs. Between 2014 and 2018, regarding only the Sandwich PhD Program<sup>3</sup> (PDSE/CAPEs, the most important source of funding for internship abroad, remembering that there are also resources from CNPq, FAPESP, Fulbright, Santander, to mention other smaller-volume sources), the number of students abroad decreased – from 215 to 110 (strongly influenced by the instability of the federal government agencies' funding policy); on the other hand, there was an increase in the number of foreign students at Unicamp, from 719 to 829, and also of foreign postdocs who did internship at the university, from 39 to 87, as presented in Graph 4.4. Therefore, variations are as follows: 48.8% decrease in the number of PDSE/CAPEs students; 123% increase of foreign postdocs, and 15.3% increase of foreign students.

3. Interuniversity Exchange Doctorate.



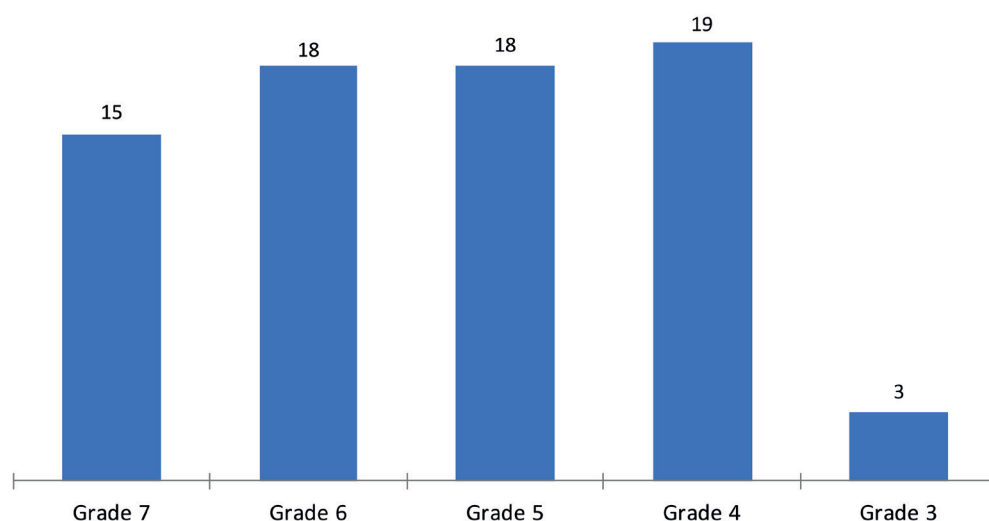
GRAPH 4.4 – INTERNATIONAL EXCHANGES –  
NUMBER OF STUDENTS AND POSTDOCTORAL STUDENTS, 2014-2018



Source: PRPG Statistical Yearbook (2019)

Performance of Graduate Programs in CAPES Evaluation – Unicamp's Graduate Programs are among the most highly rated in performance and quality in Brazil in the CAPES Evaluation. In the 2013-2016 period, regarding the University's 73 Graduate Academic Programs at the time (two others were created after 2017), 15 received the highest grade 7; 18 received grade 6; another 18 received grade 5; 19 received grade 4, and three received grade 3 (two of which are newly created), as shown in Graph 4.5. These are very significant indicators: 45% of PPGs have grades between 6 and 7 (excellence compared to the best international programs), and 70% of PPGs present grades above 5 (details on the evolution of PPGs grades in CAPES Evaluations are presented later; it is worth mentioning that professional master's programs – which are 11 at Unicamp – are evaluated separately).

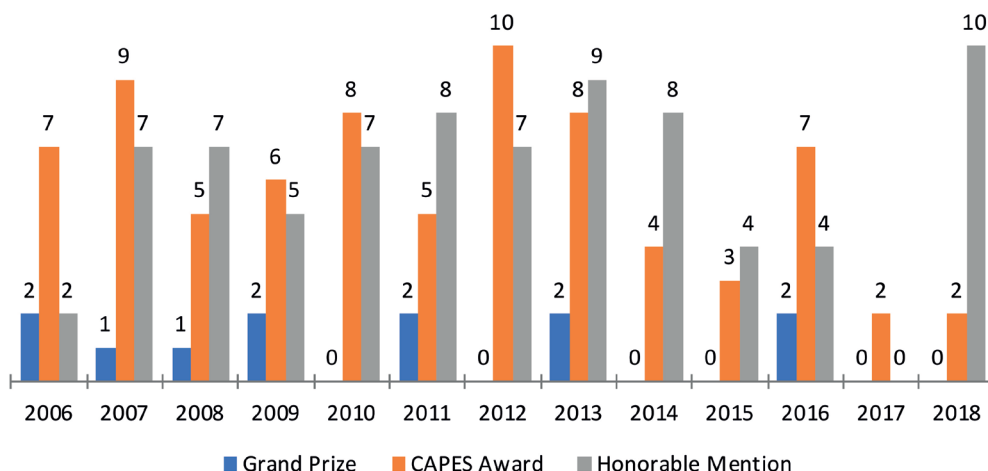
GRAPH 4.5 – PERFORMANCE OF UNICAMP'S PPGS IN CAPES 2013-2016 QUADRENNIAL EVALUATION



Source: PRPG Statistical Yearbook (2019)

**CAPES Awards** – Awards are also an important indicator of the performance of PPGs: in the five-year period of the Institutional Evaluation (2014-2018), two CAPES Grand Prizes, 18 CAPES Awards, and 26 Honorable Mentions awarded to theses defended at the University. Since 2006, Unicamp students from have won 12 CAPES Grand Prizes, 76 CAPES Awards, and 80 Honorable Mentions, as presented in Graph 4.6.

GRAPH 4.6 – NUMBER OF CAPES THESIS AWARDS, 2006 TO 2018



Source: PRPG Statistical Yearbook (2019)

The following pages feature a more detailed and in-depth analysis of the evolution, achievements and highlights of Unicamp's Graduate Programs. To this end, in addition to this Introduction, this report is structured as follows: 1.1 – Graduate Programs: Brief Description; 1.2 – Students and Faculty; 1.3 – Financial Resources; 1.4 – Teaching Internship Program (PED); 1.5 – PPGs Performance; 1.6 – Social Insertion; 1.7 – Analysis of Achievements and Challenges.

## 4.1 Graduate Programs

The Graduate Programs (PPGs) have specificities not only in the areas of knowledge to which they belong, but also in terms of organization, structures and procedures. The common aspect is excellence in teaching and research.

### BOX 4.1 – UNICAMP'S FIRST GRADUATE PROGRAMS

"Unicamp's first graduate program was the master's program in Orthodontics, which began in 1962 at the School of Dentistry of Piracicaba, when this unit was still an isolated school of Higher Education of the State of São Paulo. In June 1969, the School of Food Engineering started offering master's degree courses in Food Technology and Food Science, which were authorized to begin in December of that same year. These pioneering programs were followed by the master's and doctoral programs of the IFGW, which began in March 1970" (<http://www3.prpg.gr.unicamp.br/sites/site1/>).

The following sections present brief descriptions of the PPGs, made by the Graduate Programs themselves in their Internal Evaluation report, of the 86 *Stricto Sensu* PPGs – 69 programs with master's and doctoral degrees (M/D); three doctoral-only programs (D); three master's-only programs (M), and 11 professional master's programs (PM) subdivided into 5 areas of knowledge –, and of the six *Lato Sensu* courses, plus an analysis of the participation of the Interdisciplinary Research Centers in Unicamp's graduate education and training.

#### 4.1.1 *Stricto Sensu* Graduate Programs

Unicamp offers Academic Master's (M), Academic Doctorate (D), Professional Master (PM) degrees. Professional Doctorates are not offered.

##### 4.1.1.1 *Biological and Health Sciences*

- **Animal Biology – PPG-BA (Institute of Biology – IB), M/D**
  - CAPES Evaluation (2013-2016), grade 5

PPG-BA is well positioned in the national and international scenario for addressing issues related to animal/human health and animal biodiversity. It differs from others in the area for including the biodiversity/zoology subarea and parasitology area. Faculty members show high national and international insertion, contributing significantly to social insertion and involvement with basic education.
- **Biology Education- PROFBIO (Institute of Biology – IB), PM**
  - CAPES Evaluation (2013-2016), grade 4

PROFBIO is a unique program created from a CAPES public policy, aimed at improving the quality of Biology education at national level, targeting practicing teachers from the public school system. Unicamp joined the program since its beginning, attending the public notice, and it is the only Higher Education Institution in the state of São Paulo participating in PROFBIO. It is a networked program comprising 19 Higher Education Institutions and about 950 students. With regard to Unicamp, there are 39 students and 18 advisors participating in the program (16 from the Institute of Biology and 2 from School of Education).
- **Biosciences and Technology of Bioactive Products – PPG-BTPB (Institute of Biology – IB), M/D**
  - CAPES Evaluation (2013-2016), grade 4

PPG-BTPB was designed for the multidisciplinary training of graduate students and researchers of excellence in drugs, medicines and health supplies. It was implemented in 2011 with academic master's and doctoral programs and has three Lines of Research: 1 – Biomimetic systems, structural biology, molecular modeling and therapeutic targets; 2 – Gathering and evaluation of biological molecules and products of pharmaceutical interest, and 3 – Development, quality assessment and use of pharmaceutical ingredients and products. The desired graduate profile is a hybrid between a researcher of excellence and an

extremely qualified professor. It has an experienced faculty (currently 25 full-time professors and 5 part-time professors), high level of intellectual production (annual average of 198 full articles on journals, about 22% of this production with students), and human resources training (from 2014 to 2018, 28 doctoral and 48 master's students received their degree, with an annual average of 5.6 doctors and 9.6 masters), and its graduates have entered the job market and are either heading or taking part in research groups in different regions of the country and abroad. The faculty members collaborate with different national and international research groups, with contributions also regarding social inclusion and involvement with undergraduate and basic education. There is strong involvement and interaction with research institutes and companies in the region of Campinas that operate in the area of Biosciences and their applications, and in technological development in the area of bioactive products. The Program is strong in patent filing, with an annual average of over four patents, and many of these products have collaborative work from students.

■ Cellular and Structural Biology- PPG-BCE (Institute of Biology – IB), M/D

- CAPES Evaluation (2013-2016), grade 6

PPG-BCE aims to train professionals capable of developing activities directly related to research and teaching in Anatomy, Cell Biology and Tissue Biology areas. These areas are perfectly integrated and their Lines of Research, such as Apoptosis, Plant Cell Biology, Reproduction Biology, Chromatin, Chromosomes and Nucleoli, Cell Differentiation, Teaching, Extracellular Matrix, Cell Neurobiology, Cell Plasticity, Cell and Tissue Toxicology and Toxinology, reflect the diversity of biological phenomena. In the last four years, 64 master's and 78 doctoral students received achieving degree, with scientific excellence in terms of publication, with around 50% of their articles being published in high impact journals.

■ Child and Adolescent Health – PPG-SCA (School of Medical Sciences – FCM), M/D

- CAPES Evaluation (2013-2016), grade 5

The goal of PPG-SCA is to train human resources capable of conducting original research and transmitting knowledge in this area, based on principles of methodological rigor and ethical correctness. The research results are disclosed as dissertations, theses, congress papers, original scientific articles and media articles. The highlight is the growing role of the program in the Brazilian scenario of research on child and adolescent health, knowledge production with emphasis on the applicability of results, transdisciplinarity, organizational diversity, visibility, social reflexivity and the pursuit of quality, considering that the production of new knowledge is crucial in facing the new challenges of child and adolescent health. The epidemiological and demographic transition process, with increased life expectancy, establishes a new scenario in health within the first decades of life, requiring the understanding of new associations between early events and very late outcomes. At the same time, the nutritional transition, characterized by the rapid pattern change, has resulted in significant reduction in malnutrition and increased rate of overweight and obesity. All this requires the search for new models of health care for the growing and developing child

by integrating new knowledge produced through technological and scientific advance and the new demographics. Investing in the production of new knowledge in child and adolescent health may provide better health conditions for adults.

■ **Clinical Dentistry – PPG-CO (School of Dentistry of Piracicaba – FOP), M/D**

- CAPES Evaluation (2013-2016), grade 7

PPG-CO has maintained the quality and quantity of scientific activities/publications of the latest CAPES evaluations, and is recognized as a program of excellence, receiving CAPES grade 7.

■ **Collective Health (School of Medical Sciences – FCM), M/D**

- CAPES Evaluation (2013-2016), grade 5

The area of Collective Health in Brazil comprises 20 undergraduate programs, 36 professional master's programs and 52 academic master's and doctoral programs. The program at Unicamp is one of the oldest and has been offered for 27 years. It's social insertion is significant with recognized and influential professors in social sciences, health management and policy, and epidemiology areas.

■ **Dental Materials- PPG-MD (School of Dentistry of Piracicaba – FOP), M/D**

- CAPES Evaluation (2013-2016), grade 6

PPG-MD has shown commitment to maintaining the quality of the intellectual production and training of its students, since it has positively influenced a large number of professors/researchers in Brazil and abroad, with significant internationalization and participation of its graduates in new PPGs.

The faculty comprises doctors with expertise in the area covered by the program and their performance is compatible with the Areas of Concentration and Lines of Research. Most professors are highly experienced and enjoy national and international recognition. The infrastructure is very good, supporting training, research, teaching and administrative management activities.

■ **Dentistry – PPG-O (School of Dentistry of Piracicaba – FOP), M/D**

- CAPES Evaluation (2013-2016), grade 7

PPG-O is a consolidated program and has been rated 7 since the CAPES 2004-2006 triennial evaluation. It stands out for the following reasons: international recognition; performance on a par with to international centers of excellence in the area due to the quality and impact of intellectual production; creation and strengthening of other programs; excellence in teaching and research training; and recognized social inclusion in the country. The Program is acknowledged nationally and internationally for its research and high level training in teaching and research and several foreign students, mostly from Latin America, come to Piracicaba to develop their research and obtain their graduate degrees; in addition it maintains regular contact with foreign researchers and institutions.

■ **Ecology (Institute of Biology – IB), M/D**

- CAPES Evaluation (2013-2016), grade 7

It is a leader in the area, and until the 2013-2016 evaluation period it was the only program in the Biodiversity area with grade 7.

■ **Functional and Molecular Biology (Institute of Biology – IB), M/D**

- CAPES Evaluation (2013-2016), grade 6

The quality of the research developed in the program is documented in a significant number of international scientific publications with selective editorial policy. In 2018, 130 international articles were published, including in prominent journals, such as *Nature Communications*, *Biochimica et Biophysica Acta*, *Scientific Reports*, among others. Historically, it has contributed to the inception of other graduate programs, such as the Graduate Program in Nutrition, Food and Metabolism of the School of Nutrition of Universidade Federal do Mato Grosso (UFMT), created by former students, as well as the Graduate Program in Biosciences and Health (master's degree) of the Universidade Estadual do Oeste do Paraná (Unioeste), Cascavel Campus.

■ **Genetics and Molecular Biology (Institute of Biology – IB), M/D**

- CAPES Evaluation (2013-2016), grade 7

The program presents all the indexes evaluated in the top strata of the Biological Sciences I area at CAPES, a highly experienced faculty, and high level of intellectual production and human resources training. Its professors are recognized at national and international level with significant contributions regarding social insertion and involvement with basic education. The highlight is the interaction with research institutes and companies in the region of Campinas. Its graduates participate in research groups and graduate programs in different regions of Brazil.

■ **Hemotherapy (School of Medical Sciences – FCM), PM**

- CAPES Evaluation (2013-2016), grade 4

There are only two Professional Master's programs in Hemotherapy in Brazil, one of them at USP-Ribeirão Preto, linked to Ribeirão Preto Hemocenter and one at Unicamp, both with CAPES grade 4; however, the USP-Ribeirão Preto program was instituted earlier (in response to a demand from the Ministry of Health's General Coordination of Blood and Blood Products), while the program at the School of Medical Sciences has distinct characteristics: it is offered to the general public and without external funding. Demand is high and its faculty has great professional and scientific representation in the area.

■ **Human Genetics (School of Medical Sciences – FCM), PM**

- CAPES Evaluation (2013-2016), grade 4

This course meets a demand in Brazil for training professionals in genetic counseling, especially after the advent of newborn screening. In addition, with the discovery of more and more genes and mutations associated with human disease, the number of diseases that can be diagnosed has increased, as has the number of available genetic tests. Thus, there is also need to train qualified professionals for the development and execution of these tests, as well as for their analysis and interpretation. The first two students approved in the selection process started studying in 2017 and completed the course in early 2019.

■ **Internal Medicine – PPG-CM (School of Medical Sciences – FCM), M/D**

- CAPES Evaluation (2013-2016), grade 5



PPG-CM began in 1992 and has received CAPES grade 5 since 1998. It produced 472 master's dissertations and 362 doctoral theses by 2018. Recognized for its ability to train high level researchers, it is one of the most awarded FCM Graduate Programs at UNICAMP.

- Management and Collective Health (School of Dentistry of Piracicaba – FOP), PM
  - CAPES Evaluation (2013-2016), grade 5

The course began in 2003 (as Collective Health Dentistry), presenting itself as a link between the development of knowledge and technologies in academia and their practical application in public services. It is aimed at training professionals qualified to perform teaching, research and outreach activities practice focused on community action, and with outstanding skills to analyze, plan actions, execute and evaluate programs, thus qualifying the management of health services and systems.

- Medical Pathophysiology – PPG-FM (School of Medical Sciences – FCM), M/D
  - CAPES Evaluation (2013-2016), grade 7

PPG-FM has received Capes grade 7 in the first evaluation after its creation, when it received grade 6. It is considered one of the most consolidated and productive courses in the Medicine I area.

- Medical Sciences – PPG-CM (School of Medical Sciences – FCM), M/D
  - CAPES Evaluation (2013-2016), grade 4

According to CAPES, PPG-CM plays an active role in collaborating with other regional and national programs and institutions, with the development of research programs and insertion of graduates in various institutions. It participates in basic education through lectures and coordinated visits and has offered CAPES MINTER and DINTER Programs (interinstitutional master's and doctoral programs) with Universidade do Piauí, with students graduating in the period.

- Nursing – PPG-Enf (School of Nursing – FENF), M/D
  - CAPES Evaluation (2013-2016), grade 5

Among the 53 Nursing Graduate Programs in the country, the PPG-Enf is among the 16 programs with grade 5 in CAPES 2013-2016 Evaluation (30.2%). The program had about 22 full-time professors in the period. It received CAPES Thesis Award – Honorable Mention in 2014 and CAPES Thesis Award in 2017. It successfully completed, in 2018, DINTER with the Federal University of Juiz de Fora, graduating 10 students. Considering scientific production as one of the fundamental aspects of internationalization in the area, it is clear that Nursing in Brazil, as well as in PPG-Enf, is growing rapidly, gaining visibility in Brazilian science and at international level, which is the result of graduate program expansion.

- Nutrition, Sports and Metabolism Sciences – PPG-CNEM (School of Applied Sciences – FCA), M/D
  - CAPES Evaluation (2013-2016), grade 4

Since its inception, PPG-CNEM has offered multidisciplinary studies in Nutrition, aimed at training and improving professionals in different areas of knowledge related to Nutrition. The focus is on a few specific Nutrition Science areas, but it also covers the basic area and related ones, such as Sport. It has the characteristics

of an interdisciplinary program, which enables the training of students with greater skills and competencies, resulting in professional with a broad view of human beings and their health. The program emphasizes critical scientific training, content qualification, development of graduate studies and continuous improvement, as well as full-time community outreach activities and teaching activities integrated with research and outreach. It is still in consolidation since no doctoral theses have been concluded yet. Most of the publications of the program are published in high impact journals of the area, with the participation of students and graduates; besides, the faculty is very energetic, with recognized ability to raise funds from different funding agencies for both project development and scholarships.

■ Oncology Patient Assistance (School of Medical Sciences – FCM), PM

- CAPES Evaluation (2013-2016), grade 4

The Professional Master's Program in "Oncology Patient Assistance" was approved by CAPES in December 2015 with grade 4 and began its activities in August 2016. It is therefore considered a program under implementation. The program has a faculty of unquestionable professional and scientific importance in Oncology; it is one of the first, and most successful programs in the country, recognized in the area due to the expressive demand by master's students.

■ Oral Biology – PPG-BBD (School of Dentistry of Piracicaba – FOP), M/D

- CAPES Evaluation (2013-2016), grade 5

PPG-BBD stands out for the quality of its scientific production, which in 2014-2018 surpassed the quantitative average when compared to similar graduate programs in its area.

■ Oral Pathology and Oral Medicine (School of Dentistry of Piracicaba – FOP), M/D

- CAPES Evaluation (2013-2016), grade 6

The program has shown commitment to maintaining the quality of intellectual production and student education, considering its grade and the insertion of its graduates in the market, occupying positions in renowned educational and research institutions in Brazil. About 90% of professors have an h-index higher than 7. The faculty is composed of doctors with expertise in the area covered by the program and their performance is compatible with the Areas of Concentration and Lines of Research. The vast majority of professors is experienced and enjoys national and international recognition.

■ Oral Radiology – PPG-RO (School of Dentistry of Piracicaba – FOP), M/D

- CAPES Evaluation (2013-2016), grade 5

PPG-RO focuses on Radiology and subjects with theoretical and methodological frameworks geared towards didactic-pedagogical training. The program has adequate infrastructure to carry out teaching, research and outreach activities compatible with the development of the activities proposed by the program and aim direct graduate profile to teaching, research and clinical practice. The faculty is composed of doctors with expertise in the area covered by the program and their performance is compatible with the Area of Concentration and Lines of Research.

- **Pharmaceutical Sciences – PPG-CF (Faculty of Pharmaceutical Sciences – FCF), M/D**
  - CAPES Evaluation (2013-2016), grade 4

PPG-CF began its activities in August 2017 and is therefore quite new. The Program participates in Unicamp's PrInt project and obtained four six-month sandwich PhD scholarships for 2019-2023.

- **Pharmacology (School of Medical Sciences – FCM), M/D**
  - CAPES Evaluation (2013-2016), grade 4

Created in 1989, the Graduate Program in Pharmacology was a pioneer in recognizing Clinical Pharmacology as a tool for graduate training in an area previously unknown in Brazil. Bioavailability and bioequivalence studies were routinely performed in Brazil through the implementation of the Miguel Servet Clinical Pharmacology Unit in Unicamp's Department of Pharmacology. The pioneering role of Clinical Pharmacology in this department allowed training of masters and doctors in bioequivalence during this period, enabling both the application of the Generics Law in the mid-1990s and the creation of a large number of patents. In the "Cardiovascular Pharmacology and Genitourinary Tract" line of research, the Program is also one of the pioneers in Brazil in investigating the pathophysiology of erectile dysfunction, contributing significantly to the production of scientific articles, knowledge acquisition and training of graduate and postdoctoral students. The same occurs with the experience and competence in lower urinary tract diseases, and it is one of the few groups in Brazil, if not the only one, which evaluate the reactivity of lower urinary tract organs in experimental models of obesity, diabetes, hypertension, advanced age and in tissues from donors. The "Pharmacological Control of Metabolism and Endocrine System" line of research serves as the basis for the interaction of this program with Women's Hospital "Prof. Dr. Jose Aristodemo Pinotti" (Caism), where the projects assess in a basic and translational way the long and short term metabolic risks for women on antenatal corticosteroid therapy due to the risk of preterm birth; and with the Obesity and Comorbidities Research Center (CEPID-OCRC), where studies focus on the inflammatory profile of omental adipose tissue in Crohn's disease patients. It has five Lines of Research: 1) Toxinology and Toxicology; 2) Clinical Pharmacology and Drug Quality Control; 3) Cardiovascular Pharmacology and Pharmacology of the Genitourinary Tract; 4) Pharmacology of Inflammatory Processes and Immunology of Toxins; 5) Pharmacology of the Endocrine Control of Metabolism.

- **Physical Education – PPG-EF (School of Physical Education – FEF), M/D**
  - CAPES Evaluation (2013-2016), grade 4

PPG-EF, which became renowned and consolidated in the country, began its activities in 1988 with the master's degree, and in 1993 with the doctoral program. Consisting of three areas of concentration – Adapted Physical Activity; Biodynamics of Movement and Sport, and Physical Education and Society-, the program has stood out qualitatively in Brazil for to its plurality in training young researchers and its capacity for intellectual production in different areas, providing its students with an academic qualification to fully develop citizenship. Therefore, Physical Education, with its multidisciplinary characteristics and

as an area of knowledge production, should strengthen the links between research and intervention, thus enabling interaction with Humanities, Exact and Earth Sciences and Biological and Health Sciences through the qualification of professors/researchers to plan and transform in the fields of in health, education, sport and leisure, for instance. It has been responsible for graduating most PhDs in Physical Education in Brazil, acting in undergraduate and graduate programs. Until 2018, 650 master's and 316 doctoral students obtained their degree; besides, it has contributed to the consolidation and advance of Physical Education as a scientific research area.

■ Plant Biology – PPG-BV (Institute of Biology – IB), M/D

- CAPES Evaluation (2013-2016), grade 7

PPG-BV can be considered a course of excellence in Plant Biology in Brazil, and it is one of the courses rated 7 by CAPES. Its bibliographic production is expressive, both in quantitative and qualitative terms, and its graduates are currently employed in several national and international educational and research institutions, as well as in the private sector and the environmental consulting area.

■ Collective Health: Policies in Health Management (School of Medical Sciences – FCM), PM

- CAPES Evaluation (2013-2016), grade 4

The Professional Master in Collective Health: Policies in Health Management (FCM) has as its main goal the training of professionals in health policy and management, enabling them to develop research applied to services and health systems, in order to obtain new models, strategies and technologies. Their main target is professionals acting in public facilities, specially the ones in leading positions that can dictate state policies, the directors of health institutions, government employees, faculty members of public universities and professionals from different levels at Unified Health System (SUS). The themes of the dissertations usually are related to local realities and seek to promote social changes. Lined up with the intrinsic interdisciplinary nature of the collective health field, the program has the following lines of research: 1.– Epidemiological Methods In line with the interdisciplinary nature of the collective health field, the program includes the following lines of research: 1 – Epidemiological Methods applied to Health Systems and Services; 2 – Environmental Health; 3 – Politics, Social Sciences and Health; 4 – Organization of health care (health work process: ethics, models for care, planning and evaluation); 5 – Occupational Health; 6 – Health institutions, management and subjectivity.

■ Science Applied to Medical Qualification (School of Medical Sciences – FCM), PM

- CAPES Evaluation (2013-2016), grade 3

The professional master's degree program is aimed at residents of Unicamp's School of Medical Sciences, enabling them to produce scientific material and protocols for improved care, diagnosis and new technologies. It started three years ago, with great demand among the medical residents. Its faculty is composed of professors qualified in both health care and technical and scientific production.

■ **Surgical Sciences – PPG-CC (School of Medical Sciences – FCM), M/D**

- CAPES Evaluation (2013-2016), grade 4

PPG-CV was created in 1988 and by 2018 had concluded 647 projects – 243 doctoral theses and 404 master's dissertations – aimed at solving issues related to medical and social matters, such as the study on quality of life, social support and impact on the family before and after liver transplantation, providing a new perspective on the issue of cirrhotic patients waiting for a kidney transplant. It maintains a strong interface with university education, attracting professors from public and private higher education institutions to participate in the master's or doctoral program, in an important role of qualifying educators. The scientific-technological impact relates to its cooperation with engineering and biomedicine companies, besides scientific production stemming from partnerships within University (Institute of Biology, School of Chemical Engineering, and others) and also to formal agreements with international universities (University of Barcelona, and of the Netherlands). Ongoing research may assist in the following: rehabilitation of orthopedic diseases, development of biomarkers in inflammatory bowel diseases, and development of 3D technology that assists in skull surgery (see below), among others. In 2018, the Program's intellectual production consisted of 97 articles, and in 2013-2016 the technological production comprised 14 patents, four software registrations and two computer application registrations. In 2018, three patents were filed (two with international filing), in addition to one granted patent, which was developed through the work of five full-time professors (13.8%) and one doctoral student. In 2017, eight patents were filed, which involved eight full-time professors (22.2%) and five doctoral students. In 2018, there were 27 defenses. Regarding research funding, its increase over the years has been noticeable, especially in the present for-year period, considering ongoing projects and new ones. In 2018, there was an increase in the rate of full-time professors with funded projects from 38% (2017) to 44.4% (2018), with a gradual increase in the total amount of funding. Regarding solidarity among national institutions, it recently concluded MINTER and DINTER programs (interinstitutional master's and doctoral programs) with Universidade Federal de Jataí – Goiás.

■ **Gynecology and Obstetrics (School of Medical Sciences – FCM), M/D**

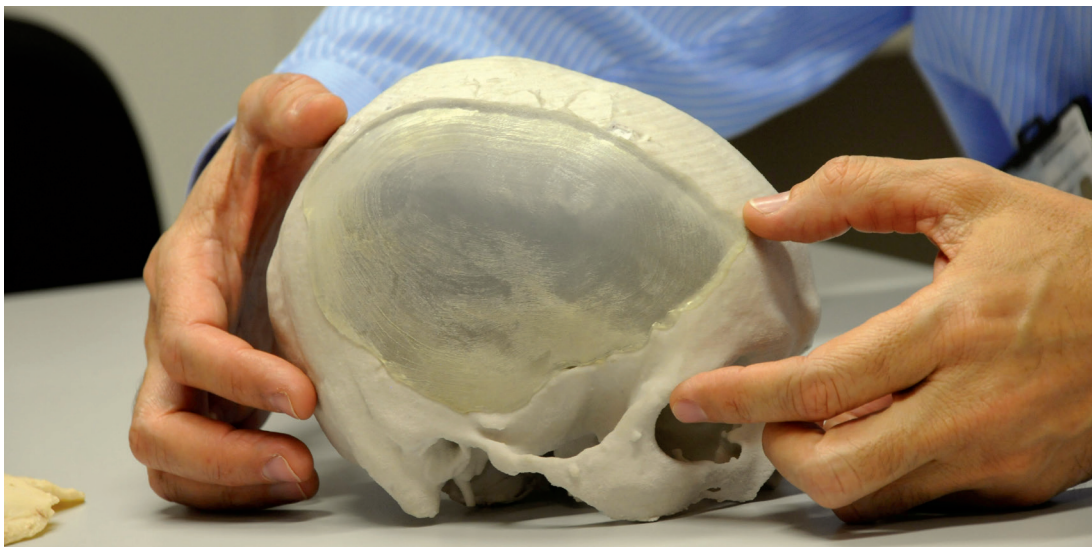
- CAPES Evaluation (2013-2016), grade 7

Nowadays, it is the only Brazilian PPG in the area of Medicine III with grade 7. It is considered an exemplary program in all items and subjects under evaluation. It has good scientific production in quality as well as quantity, evenly distributed among the full-time professors of the Program who belong to the different research groups. It routinely receives students from other states and professors from other universities to complement their academic education. Its quality is internationally recognized, which helps attract foreign students to participate in the program, especially more recently, when the World Health Organization's HRP-Alliance chose Cemicamp (Center for research in Reproductive Health of Campinas, a non-governmental and non-profit organization) to be its hub for Latin America and Portuguese-speaking African countries, promoting and funding scholarships for students from these countries to attend Unicamp's



master's and doctoral programs. I has several international exchanges programs with various research and health institutions. Today, the challenge is to increase internationalization in the program.

FIRST VERSIONS OF 3D PRINTED SKULL IMPLANT DEVELOPED BY INCT-BIOFABRIS AT UNICAMP. A 3D PRINTED TITANIUM SKULL WAS SUCCESSFULLY IMPLANTED IN 23-YEAR-OLD WOMAN AT UNICAMP'S UNIVERSITY HOSPITAL IN 2015



Antonio Scarpinetti/SEC – Unicamp.

Note: More information at <http://biofabris.com.br/en/medical-first-in-brazil-3d-printed-titanium-skull-successfully-implanted-in-23-year-old-woman/>

#### 4.1.1.2 Exact and Earth Sciences

- Applied and Computational Mathematics (Institute of Mathematics, Statistics and Computing Science – IMECC), PM

- CAPES Evaluation (2013-2016), grade 4

The Program started in 2006 as a pioneering initiative in Brazil to train masters in mathematics to work in higher education, primarily in regions of the country lacking masters and doctors. The course's structure, with on-site classes divided into modules, allows students to reconcile their master's studies with their professional activities.

- Applied Mathematics – PPG-MA (Institute of Mathematics, Statistics and Scientific Computing), M/D

- CAPES Evaluation (2013-2016), grade 6

PPG-MA is a consolidated program, the only reference center in Applied Mathematics in Brazil, with a strong multidisciplinary orientation. It stands out as the only program in the area of Mathematics and Statistics to have received the CAPES "Lobo Carneiro" Theses Award (for all major areas of Engineering and Exact and Earth Sciences) in 2007. The indicators of scientific production of the quadrennium are considered very good, with an average of 2.8 articles per full-time professor in the upper strata of high impact journals and an average of 6.6 published articles per



professor when considering all journals in the area. Nine books have been published during the quadrennium, four of them by international publishers (Oxford Press, Springer, and Society for Industrial and Applied Mathematics — SIAM). PPG-MA also filed a patent application with the National Institute of Industrial Property in 2014. In the 2013-2016 Quadrennial Evaluation Report in the area of Mathematics, Probability and Statistics, PPG-MA was ranked ninth among all evaluated programs and first in applied mathematics.

■ Computer Science (Institute of Computing – IC), M/D

- CAPES Evaluation (2013-2016), grade 7

The Computer Science program has a maximum grade 7 in CAPES evaluation, along with six other programs out of 85 in Computing in Brazil. The Program is one of the oldest in Brazil, standing out among the best in its area. Since its beginning, the Program has graduated 925 masters and 246 doctors.

■ Mathematics (Institute of Mathematics, Statistics and Computing Science – IMECC), M/D

- CAPES Evaluation (2013-2016), grade 7

The Program is fully consolidated, with a faculty whose profile and production compatible with national and international centers of excellence. It has a strong national influence in the development of national programs, and is an international reference in mathematics. It is one of the programs in Brazil in number of students enrolled and trained.

■ Mathematics Education – PROFMAT (Institute of Mathematics, Statistics and Computing Science – IMECC), PM

- CAPES Evaluation (2013-2016), grade 5

PROFMAT is a master's degree offered by the Brazilian Mathematical Society to train middle and high school teachers, especially from public schools. It is a networked program comprising 75 Higher Education Institutions. Unicamp has participated in the program since 2012 and it is the only program of this type in the area of Mathematics.

■ 'Gleb Wataghin' Institute of Physics – IFGW), M/D

- CAPES Evaluation (2013-2016), grade 7

According to CAPES evaluation, "this is an excellent graduate program with international visibility in various research areas, which has been classified as CAPES grade 7 in several past evaluations. There is a steady increase in its procedures related to the internationalization of its courses and in collaboration with major centers in the country and abroad. The program has a very high h-index in the triennium, are compatible with what is expected of a grade-seven course in the area. The program has served as a development hub for several research centers in all regions of the country and has strong ties with technology companies. The visibility of the program goes well beyond the national scenario."

■ Statistics (Institute of Mathematics, Statistics and Computing Science – IMECC), M/D

- CAPES Evaluation (2013-2016), grade 5

The program has a solid structure in Biostatistics, Inference and Statistical Methods, Probability and Stochastic Processes, with a coherent and well

formulated curriculum proposal to insert graduate students in the job market or research field, which can be measured by the number of students visiting other universities (as doctoral students or professors). In 2018, PPG-E had the largest number of PhDs in its history, a total of eight students, which is significantly larger than previous years. In the 2014-2018 period, 58 students received their degree – 38 masters and 20 doctors –, an increase of about 20% of master's and 70% of doctoral students. In addition, its structure is good and the professors are very productive (many with productivity grant).

#### 4.1.1.3 Arts and Humanities

##### ■ Administration – PPG-A (School of Applied Sciences – FCA), M/D

- CAPES Evaluation (2013-2016), grade 4

PPG-A, which began its activities in 2017, offers master's and doctoral degrees, training researchers, professors and other qualified professionals to be able to contribute at a high level to national and international scientific production and to the development of research and higher education. One of the distinctive features of this program is the quality of its faculty, with research connections and cooperation with different Brazilian and foreign institutions. The Area of Concentration is called "Management and Sustainability," linking the issues related to its Lines of Research: (a) Strategy and Management, and (b) Entrepreneurship and Sustainability. The Lines of Research aim at the production of frontier knowledge, in order to establish the academic dialogue at the level of excellence. This knowledge can and should be validated in the application environment, covering regional, national and international issues.

##### ■ Applied Linguistics – PPG-LA (Institute of Language Studies – IEL), M/D

- CAPES Evaluation (2013-2016), grade 5

The Program is prominent in Brazil for various reasons, among them the maturity of its faculty, with seven CNPq Productivity and Research grant holders, three of them at the highest level. This maturity is also demonstrated by the faculty's ability to regularly maintain good intellectual productivity throughout the quadrennia, and by its ability to advise a large number of students until their graduate degree projects are concluded within the average time recommended by CAPES, training and encouraging students under their guidance to produce qualified bibliographic productions. The faculty's quality is high, regardless of the time of experience, with 11 postdoctoral participants, eight of whom are full-time professors. An especially important item is its expressive integration with undergraduate programs. Contrary to what is observed in other Brazilian Graduate Programs, PPG –LA is not isolated from the initial training of future teachers or applied linguists, advising, every year, a significant number of students in scientific research and work, teaching internship and teaching initiation; in addition, it supports the organization of events in the area aimed at the dissemination of research and teaching projects developed at undergraduate level, guiding articles writing, occasional external presentations of work of students under its supervision and scientific initiation projects

(Institutional Scientific Initiation Scholarship Program – PIBIC). International insertion can be seen from the number and variety of cooperation agreements established; the significant number of professors and students who have already completed doctoral or postdoctoral internships abroad, and the good number of international publications. Finally, it is necessary to consider the ability of the Program to establish a dynamic interface with basic education, recognized by major official bodies such as MEC, thus generating a significant social impact when compared to similar programs. Over the past three quadrennia, PPG-LA's grade in CAPES evaluations has fluctuated between grade 6 and 5 (2013-2016 quadrennium), being the top national program in the area in that quadrennium;; currently, it is among those with the highest grades (grade 5).

- Architecture, Technology and City – PPG-ATC (School of Civil Engineering, Architecture and Urban Planning – FEC), M/D

- CAPES Evaluation (2013-2016), grade 5

PPG-ATC was created in 2012 (with grade 4) and underwent its first CAPES evaluation in 2016, obtaining grade 5, and is in the select group of five programs in the area of Architecture, Urbanism and Design area with grade 5 or higher. There is a need for improvement in the incorporation of goals aimed at social inclusion and a better balance of defenses and supervision among faculty. However, intellectual production is well recognized, relevant and well distributed among professors.

- Demography (Institute of Human Sciences and the Humanities – IFCH), M/D

- CAPES Evaluation (2013-2016), grade 6

The historical evolution of the Program shows a significant increase in the level of performance with regard to the graduation of doctors and intellectual production, comparable to international centers of excellence. Its distinctive feature compared to other programs in the area lies basically in the maturity shown throughout its existence and the achievement of a leading role in Demography. The Program presents important advances in internationalization and expansion of research networks, bringing together researchers from various areas of Brazil and from recognized international research centers, as well as in south-south cooperation, training students from Haiti, Colombia, Argentina and Mexico, and also from the Northern Hemisphere. Its faculty work in several research and occupy administrative and representation positions in civil, scientific and public management organizations. They also hold senior positions in the main population associations of the continent, such as the Brazilian Association of Population Studies (ABEP), and the Latin American Population Association (ALAP).

- Economic Development (Institute of Economics – IE), M/D

- CAPES Evaluation (2013-2016), grade 4

The master's degree in Economic Development is mainly directed at the academic education and specialization of the students in the actual area, and involves in-depth readings, reflection and discussion about topics relevant to economic development, often nonexistent or unusual in their previous backgrounds. Through the Program, besides being trained in economic development, master's

students address the development dimension in different perspectives: social, political, environmental, technological, institutional, historical, and spatial. In turn, the doctoral program in Economic Development aims to enable the full intellectual and theoretical-methodological development of researchers. Incoming students are faced with demanding special content of great theoretical, analytical and methodological rigor, which consolidates knowledge of Brazilian and international economics and economic development. In relation to other programs, PGP-DE is distinguished by its interdisciplinarity and the dialogue of economics and economic development with other areas of knowledge, such as history, sociology, urban planning, agrarian and environmental sciences. It is also characterized by being one of the largest programs in Brazil, with a total of 221 enrolled students in 2018, and also for having had a total of 138 master's dissertations and 67 doctoral theses defended between 2014 and 2018.

■ Economics – PPG-CE (Institute of Economics – IE), M/D

- CAPES Evaluation (2013-2016), grade 6

PPG-CE is characterized by a theoretical and methodological openness, addressing various approaches or schools of thought. Alternative approaches to mainstream economics play an important role in the master's and doctoral programs. In this sense, PGP-CE stands out among other programs for having a theoretical approach that benefits from dialogue with different aspects that deviate from the more traditional approach followed by the majority of graduate programs in economics in the country. In particular, the approaches to political economy, evolutionary theory, the post-Keynesian approach – including the Kaleckian approach –, and the institutionalist approach stand out. Thus, it intends to provide professors and researchers with a comprehensive theoretical background, making them capable of dealing with the relevant economic issues of reality, without resorting to simplifications and abstractions of the social environment typical of the traditional current. Between 2014 and 2018, the Program graduated 64 masters and 49 doctors, which is the average of other programs in Brazil.

■ Education – PPG-E (School of Education – FE), M/D

- CAPES Evaluation (2013-2016), grade 5

PPG-E has relevant role in the national scenario, contributing to the development of Brazilian and Latin American educational thought. In addition, it has assisted in the advance and consolidation of research in the educational field, proposing policies and courses with the participation of professors of various fields at regional, national and international levels. It is worth mentioning, among other important facts, the creation of the Brazilian Conference of Education (in the 1980's), a space for debate on the Law of Directives and Basis, the law that regulates education in Brazil. The institution is responsible for publishing one of the most important magazines in the area: *Educação & Sociedade* [Education & Society] (ranked in the first strata in the CAPES Qualification of journals), launched in November/1978, later published in partnership with the Center for Studies on Education and Society (CEDES), which also publishes *Cadernos CEDES* (ranked in the first strata of the CAPES Qualification of journals). In addition, it has other important publications, such as *Pró-Proposições*, since 1990 (indexed on various

databases and ranked in the first strata of the CAPES Qualification of journals); *Zetetiké* (ranked in the third strata of the CAPES Qualification of journals) published since 1993 and focused on works of Mathematics Education; ETD – *Educação Temática Digital* [Digital Thematic Education] online magazine (ranked in the first strata at CAPES Qualification of journals); and HISTEDBR online magazine, a journal of the History, Society and Education in Brazil Study and Research Group (HISTEDBR) (ranked in the third strata at CAPES Qualification of journals). It is also worth mentioning the Brazilian Reading Association strongly linked to the School of Education and PPG-E/Unicamp, which promotes the Reading Congress of Brazil (COLE), responsible for the publication of *Teoria & Prática* and *Linha Mestra* journals. PPG-E is Unicamp's largest Graduate Program, with 10 Lines of Research and is certainly (together with the graduate program in Education at University of São Paulo) also the largest in the Education Area of Brazil and Latin America. In 2018, PPG-E had 117 accredited professors – 104 full-time professors and 13 part-time professors –, and 594 students – 343 doctoral and 251 master's students. In Unicamp's Repository of Theses and Dissertations (<http://www.bibliotecadigital.unicamp.br/document/list.php%3Ftid=7>), of the 17,273 theses and dissertations available, 3,795 are from the School of Education (2,108 master's dissertations and 1,687 doctoral theses). The Program is a reference for interfaces, agreements, exchanges and joint research projects with groups, laboratories and institutions in Brazil, Latin America, Europe, and North America.

- Education (School of Education – FE), PM
  - CAPES Evaluation (2013-2016), grade 3

Created in 2016, the program had its first selection process in 2017, through which the 1st class of new students was formed, totaling 35 professionals from the public education system. FE/Unicamp PM is in the process of implementation, involving teaching and non-teaching staff, students and a number of people inside and outside the school, University, and city. The course aims to: 1) improve the qualification of teachers and managers of Basic Education, preferably from public schools; 2) favor academic production (applied research) directed at the organization of the didactic work, contents and pedagogical processes, management, and public policies to strengthen and transform knowledge and the school practices; 3) train professionals in their specific area of work, in theoretical and practical aspects of management, learning, teaching, school culture, inclusion in school, active and creative educational technologies, and so on, and 4) stimulate the training of qualified professional masters to develop activities and technical-scientific works in subjects of public interest for school education. PM consists of two Lines, namely: Line 1 "Policy, Planning, Management and Evaluation of Basic Education," and Line 2 "Pedagogical Practices in Basic Education," totaling 35 accredited full-time professors, involving more than 20 research groups in a set of collective actions with the public commitment of making PM a reference in the field of Professional Master's programs in Education and continuing education in the field of teacher training.

■ Geography (Institute of Geosciences – IG), M/D

- CAPES Evaluation (2013-2016), grade 6

With less than two decades of existence (since 2002), the Program seeks to internationalize its research through the implementation of new agreements and participation of foreign professors in subjects, lectures and also projects. During this period, the Program offered a DINTER (interinstitutional doctorate) in agreement with the Universidade do Estado da Bahia (UNEB). It is also worth mentioning that the Program in Geography has the highest relative number of CNPq Research Productivity grants. As for the grade obtained, compared to other PPGs in the area in the last four years, 25 had grade 3, 17 had grade 4, 13 had grade 5, seven had grade 6, and two had grade 7.

■ History – PPG-H (Institute of Human Sciences and the Humanities – IFCH), M/D

- CAPES Evaluation (2013-2016), grade 6

PPG-H is among the best ranked in the area in Brazil. This grade was achieved by only four programs, which account for 5.6% of the total programs evaluated. The Program is distinguished by its strong internationalization; high number of exchange programs with other national and foreign institutions; high-level intellectual production in high-impact publishing vehicles; student involvement in various interinstitutional projects and sandwich grants, and high capacity to develop programs, among other aspects. PPG-H is qualified in terms of excellence, comprehensiveness and dissemination of its competences in all research, teaching and outreach activities. This can be seen in the expansion of the number of opportunities for diffusion and exchange, research opportunities and support for professors and students in their academic routines. With regard to the excellence of its research, the Program has received increasing recognition, which is observed in the large amount of awards given to its members and academic production by other prestigious institutions.

■ History Teaching – PROFHISTÓRIA (Institute of Human Sciences and the Humanities – IFCH), PM

- CAPES Evaluation (2013-2016), grade 4

PROFHISTÓRIA – Professional Master's Degree in History Teaching is offered nationwide as a *Stricto Sensu* graduate program. There are 27 universities participating, and from 2020 there will be 39. Unicamp joined the project in 2016 and is currently in its third class. PROFHISTÓRIA is incomparable, since it is the only networked professional master's program in History in Brazil. UFRJ coordinates the course, aiming at the continuing education of history teachers focused on innovation in the classroom, while critically and responsibly encouraging teachers to reflect on relevant issues about different uses of historical information present in society today.

■ International Relations (Institute of Human Sciences and the Humanities – IFCH), M/D

- CAPES Evaluation (2013-2016), grade 4

PPG-RI is a pioneer in interinstitutional cooperation, especially because it involves a private catholic university (PUCSP). It was also the first in the area in the state of Sao Paulo. For these reasons, its international visibility is quite strong. Its faculty and students enjoy great mobility, with part of their research performed abroad, particularly in US universities.



■ **Linguistics (Institute of Language Studies – IEL), M/D**

- CAPES Evaluation (2013-2016), grade 7

In terms of quality, the Program grade reflects its excellence in several aspects: attraction of students from outside the state of São Paulo and development capacity (graduates active in other Brazilian universities); solidarity (agreements and multi-level cooperation) with programs of lower grade, often in less favored regions of Brazil; program consistency and coherence, and relation with undergraduate studies and infrastructure (library, database, files). Moreover, the Program is one of the largest in the country in terms of students and production, with five areas and 12 lines of research. With 43 professors in total (36 full-time professors), the program had, each year of the five years under consideration, about 200 students enrolled in the master's and doctoral programs, and 321 new students (126 master's and 195 doctoral students) enrolled in the period.

■ **Multimedia – PPG-MM (Arts Institute – IA), M/D**

- CAPES Evaluation (2013-2016), grade 3

Created in 1985, it has one Line of Research (History, Esthetics and Domains of Application of Cinema and Photography), and is one of the oldest programs in the area of Communication in Brazil. PPG-MM has proven to be an innovative and unifying center nucleus of teaching, research and reflections on media, especially the history, theory and poetics of cinema and audiovisual, photography and digital media, always addressing inter and multidisciplinary perspectives, addressing inter and multidisciplinary perspectives and the relations of such media with other domains of knowledge. Scientific, technical and artistic production is relevant and disseminated by different means, and artistic production is the result of research carried out by students and professors, mostly films, exhibited and awarded at Brazilian and international festivals.

■ **Music (Arts Institute – IA), M/D**

- CAPES Evaluation (2013-2016), grade 6

PPG-M is the second most highly regarded program in the area in Brazil and the first in the state of São Paulo, with its grade increasing from 5 to 6 in the last four years. It is an important hub for attracting researchers, students and professional musicians, sometimes with a consolidated career, from various regions of Brazil. It is believed that the introduction of the Qualis Artistic criteria (CAPES Qualification of artistic works) was relevant because the Program is strong not only with respect to bibliographic productions but also in artistic productions, many of them involving joint productions with graduate and undergraduate students.

■ **Performing Arts – PPG-ADC (Arts Institute – IA), M/D**

- CAPES Evaluation (2013-2016), grade 5

Consistency in bringing together theater, dance and performance – as well as related areas such as yoga, circus and martial arts, among other performing arts – led to the design of a PPG entitled 'Performing Arts' with a single Area of Concentration, favoring the exchange and production of knowledge in performing arts based on artists working outside their comfort zone. Many artists who graduated from Unicamp became graduate research artists – masters and doctors –, contributing to research in performing arts in Brazil and in different

higher education institutions. It is also worth mentioning the close relationship between theory and practice, a breeding ground for fertile questions and issues, widely discussed in artistic and academic levels of performing arts research in Brazil, and which is still in full development. If, on the one hand, the Program recognizes the importance of identifying the meanings generated by what is produced nowadays in the area, on the other, it cultivates an extemporaneous attitude, which does not intend to hierarchize current artistic production in relation to that which is part of the history of performing arts: both are prioritized and developed by the professors in their activities according to their needs. Therefore, the current production of knowledge in performing arts should also be investigated in the light of historical, regional and topological experiences, leading to the production of multiple perspectives that feed the production of a theoretical thought in tune with the basic and emerging questions of making art, thus stimulating the knowledge generated in processes of artistic creation, always in close connection with reflection, feeding each other, without hierarchy between theory and practice. PPG-ADC does not dissociate theory and practice. In this sense, creative processes are seen as means of interaction between recognition and invention, between experimentation and excavation of the already created; research is seen as a catalyst for interdisciplinary and intercultural knowledge. Such assumptions can be verified by the syllabus of the compulsory and optional subjects offered, which create a transversal rather than linear path of connections between practices and references, aspects that make PPG-ADC a unique program in its objectives and ways of elaboration.

■ Philosophy (Institute of Human Sciences and the Humanities – IFCH), M/D

- CAPES Evaluation (2013-2016), grade 6

Currently, there are 45 graduate programs in Philosophy in Brazil accredited by CAPES and associated with the Brazilian National Association of Graduate Studies in Philosophy (ANPOF), among which there is only one grade-seven program (USP) and three grade-six programs (Unicamp, UFMG and PUC Rio Grande do Sul). In 2018, 32 out of 40 master's students and 20 out of 90 doctoral students enrolled in the Program received their degrees. At least since 2001 the number of students enrolled in the doctoral program exceeds the number enrolled in the master's program. These data indicate the vocation of the program to receive master's students from different regions of the country. Regarding the 45 existing graduate programs, only 25 are doctoral programs, leading to the displacement of many master's students.

■ Political Science – PPG-CP (Institute of Human Sciences and the Humanities – IFCH), M/D

- CAPES Evaluation (2013-2016), grade 6

Recognition of the excellence of PPG-CP comes from its qualified production, since it is ranked second with regard to production of books and chapters, and ninth in relation to production of articles on periodicals; from its capacity for fostering development, which is shown by the participation of professors in coordination positions of funding agencies, scientific associations and research projects involving universities and national and international centers, and from the position of its graduates. Thirty-one of the 66 doctoral students that defended their theses between 2013 and 2018 are professors at public universities, and two

graduates are professors at universities abroad: one at the Université de Versailles Saint-Quentin-en-Yvelines (France) and the other at the University of St. Gallen (Switzerland). Regarding the internationalization of the program, 16% of projects coordinated by Unicamp's professors have international partners, besides a significant increase in faculty production in international journals.

■ Social Anthropology – PPG-AS (Institute of Human Sciences and the Humanities – IFCH), M/D

- CAPES Evaluation (2013-2016), grade 5

The history of PPG-AS follows the formation and consolidation of graduate studies in Anthropology in Brazil and represents effective integration of the various levels of education and training, originality of research subjects and interconnection between the lines of research. The projects link history of anthropology, gender, race relations, ethnography of knowledge and intellectual life, indigenous ethnology, and representations of the rural world, among others. The master's degree program was created in 1971 and the doctoral program in 2004. There were 356 dissertations defended between 1971 and 2018, and 76 theses defended between March 2009 and December 2018, an average of 8.4 theses per year since the beginning of the program. Recognition is expressed by the number of awards received: eight awards in recent years, including three Anpocs awards (National Association of Graduate Studies and Research in Social Sciences); four CAPES awards, including CAPES Grand Prize in 2016; and one international award in Social Sciences. Regarding thesis awards, six were awarded to doctoral theses. Compared to all 29 programs in the Anthropology/ Archeology area, one sees that PPG-AS has won almost half of the eight awards given by CAPES in the quadrennium (four Thesis Awards and four Grand Prizes). It is worth remembering that the 2012 CAPES Thesis Award, from the previous triennium, was also won by the program. Thus, in relation to the last five CAPES Thesis Awards, three were won by the program. These numbers are robust and expressive. In total, there were six awards in the quadrennium with six different advisors. Therefore, this is neither an isolated event nor the excellence of a specific advisor. On the contrary, these are quality indicators, given that the evaluation was performed by qualified peers.

■ Social Sciences – PPG-CS (Institute of Human Sciences and the Humanities – IFCH), D

- CAPES Evaluation (2013-2016), grade 4

PPG-CS was created in 1985, then Doctoral Course in Social Sciences (CDCS), as an innovative proposal, centered on the principle of synergy around thematic areas, an aspect ensured by both its curriculum, which establishes a set common subjects, and its organization into Lines of Research, which has allowed the realignment of professors according to emerging research interests. Currently, the Lines of Research are: 1) Social Processes, Identities and Representations of the Rural World, focused on study of the ongoing social processes in the rural world, their representations and agrarian roots in social thought; 2) Work, Politics and Society, which integrates a broad spectrum of theoretical interests and methodological approaches from the anthropology, political science and sociology, without neglecting up dialogue with other relevant subjects; 3) Gender Studies, which is

dedicated to understanding the various aspects of relationships involving gender in social life and seeks to provide tools for the theoretical and methodological refinement of research in this field, from an interdisciplinary perspective, aimed at student education and the constitution of research groups; 4) Modes of knowledge and their expressions, configured by different thematic core areas and aiming at teaching, research and theoretical and methodological invention, is based on the interface between science and the so-called humanities (art, music and literature), having as one of its axes the relation between experiences and trajectories; 5) Studies on China-Brazil Relations, an area created in 2012 with the purpose of developing an interdisciplinary approach to the study of relations between China and Brazil, is the result of the interaction of professors in the Brazil-China study group of Unicamp's Center for Advanced Studies, combining economics, sociology, international relations, environmental studies and innovation; 6) Studies on Cities, which investigates social life in contemporary urban environments, the city and its socio-demographic dynamics and reflection on the trajectory of the city in social science theories and its connection with the ethnographic method; 7) Heritage and Memory Studies, which aims at critical reflection on social, political and professional practices related to 'cultural heritage' and 'social memory,' themes that re-emerge nowadays as an issue of political controversy and innovative academic debate, enriched by contributions traditionally offered by history, architecture and urbanism, archeology, arts, museology, education and legal studies, which are also undergoing significant change.

- Sociology – PPG-S (Institute of Human Sciences and the Humanities – IFCH), M/D
  - CAPES Evaluation (2013-2016), grade 6

PPG-S has 45 years of existence. Currently, it is one of four programs that has grade 6 (along with USP, UFPE and UFSCar). Between 1974 and 2018, 410 master's students received their degree, and since 2005, 118 doctoral students have graduated. In 2018, there were 95 students enrolled in the program, 41 in the master's degree and 54 in the doctoral degree. Professors and students present high-quality production, nationally and internationally recognized, and awarded in Brazilian and foreign forums of the area, such as ANPOCS, CAPES, Arquivo Nacional Award, and Award for Young Portuguese-speaking Social Scientists (CES-Coimbra), among others.

- Literary Theory and History (Institute of Language Studies – IEL), M/D
  - CAPES Evaluation (2013-2016), grade 7

The CAPES evaluation merely confirmed a qualitative and quantitative superiority attested by the intense cooperation of the Program's faculty at national and international level. In this regard, the highlight is the high number of publications – which includes students of the Program – in Brazil and abroad, in the form of articles in journals, but also – which is characteristic of the area – books and book chapters. Nowadays, only six graduate programs in Linguistics and Languages have the highest grade, of which only one other (one of the two UFMG's programs) is also dedicated specifically to literature (the others either include linguistics and literature – UFRGS and PUCRS – or are dedicated solely to linguistics, which is

the case of the other program in the area at UFMG and the Graduate Program in Linguistics at Unicamp).

■ Visual Arts – PPG-AV (Arts Institute – IA), M/D

- CAPES Evaluation (2013-2016), grade 4

PPG-AV, which began in 2011, was responsible for graduating 103 masters and 46 doctors working in different fields, whether in public schools or universities, museums and cultural institutions. This is an ongoing effort to build excellence in Brazilian academic, artistic and cultural circles. The faculty members are leaders in research projects, with national and international recognition and diversified background, coming from different areas of knowledge (Arts, Communication, Architecture and Urbanism, History, etc.), with studies in centers of excellence in Brazil and abroad, besides various postdoctoral internships. The professors participate prominently in national (such as CBHA and ANPAP) and international associations such as CIHA – International Committee of Art History; REVLAT – Latin American Visual Studies Network, and GEAP – Latin American Public Art Studio Group. Unicamp's Gallery of the Arts Institute (GAIA) and Museum of Visual Arts (MAV) are focal points for discussions and research projects through the various events and exhibitions they promote. GAIA gives visibility to artistic research developed by the program, hosting PPG-AV student-artist exhibitions and promoting constant exchange with artist-researchers from other Institutions of Higher Education.

#### 4.1.1.4 Engineering and Technology

■ Agricultural Engineering – PPG-EA (School of Agricultural Engineering – FEAGRI), M/D

- CAPES Evaluation (2013-2016), grade 4

PPG-EA achieved CAPES grade 5 until the previous quadrennium, and received grade 4 in 2013-2016. Several professors of the Program are retiring, but new professors have been hired, which is very positive and beneficial for the Institution, although many of them are young, with little experience in procuring funds from funding agencies and supervising students. In other words, the Program's faculty is undergoing a renewal process with all the benefits it entails, but also with all the initial burdens expected to be temporary and overcome in a few years.

■ Chemical Engineering – PPG-FEQ (School of Chemical Engineering – FEQ), M/D

- CAPES Evaluation (2013-2016), grade 6

PPG-FEQ is well consolidated; the master's degree has been offered since 1980, and the doctoral degree since 1989. By the end of 2018, 1280 master's and 723 doctoral students obtained their degree, and many of them work in other teaching and research institutions, spreading knowledge acquired at Unicamp. It has about 330 regular graduate students, as well as some 70 special ones. PPG-FEQ is recognized as one of the leading courses in the area in Brazil and has already acquired excellent international insertion (according to QS World University Rankings, it occupies a worldwide position in the 51-100 range, ranking third in Latin America). Regarding the 81 PPGs of the CAPES Engineering II Area, eight are

classified with grade 7, and 11 with grade 6 (including PPG-FEQ), both categories considered of academic excellence (PROEX). The Program's strong points include faculty quality, updated curriculum proposal and excellent facilities (research and analytical laboratories, classrooms and multimedia resources), comparable to renowned international programs. Other strong points include its capacity for self-renewal and the goal of growing with quality and cohesion, training masters, doctors and postdocs capable to leading research groups throughout the country and abroad, with significant scientific and technical production (mainly as articles and patents) and outstanding internationalization. It is noteworthy that the Program's H2 index is the highest in the Engineering II area. The ability of PPG-FEQ to raise funds for research and outreach projects and agreements, both with funding institutions and the private sector, is also prominent. It is also important to appreciate the intense interaction between this graduate program and undergraduate programs and society, generally through the multiple outreach activities carried out by its faculty.

■ Civil Engineering – PPG-EC (School of Civil Engineering, Architecture and Urban Design – FEC), M/D

- CAPES Evaluation (2013-2016), grade 4

PPG-EC was implemented in 1986 with the master's degree, and in 2002 the doctoral course started being offered. Nowadays, PPG-EC has five Areas of Concentration and 13 Lines of Research. Areas of Concentration: Construction; Structures and Geotechnics; Water, Energy and Environmental Resources; Sanitation and Environment, and Transportation. From the Program inception until December 2018, 1021 master's and 242 doctoral students received their degree; in 2018 alone, 57 master's and 17 doctoral students graduated, and it is the second largest CAPES Engineering I Area Program. In the last CAPES evaluations, the Program received the grades 3, 4, 4, 5, 4, and again 4 in the last quadrennial evaluation. Brazil, among the 115 Engineering I Area programs evaluated, PPG-EC is among the 32% rated as grade 4 in the CAPES evaluation in the last four years.

■ Electrical Engineering – PPG-EE (School of Electrical and Computer Engineering – FEEC), M/D

- CAPES Evaluation (2013-2016), grade 6

PPG-EE was created in 1972 and has trained and qualified researchers, professors and other professionals in the field of Electrical Engineering to contribute positively to the advance of higher education, science and industry, mainly in Brazil, but also in other countries. FEEC trained approximately a quarter of the PhDs in Electrical Engineering in Brazil, meaning that practically every program in Electrical Engineering in the country has graduates from FEEC/Unicamp. By 2018, 1186 doctoral students obtained their degree. From 2000 to 2018, 778 doctoral students received their degree, with an average of 41 doctors per year, reflecting the performance of a mature and consolidated program. Regarding the master's program, the Program graduated 2545 masters. About 50% of FEEC professors have a CNPq research productivity scholarship (a percentage rated as 'very



good' by the CAPES Engineering IV area committee), and a significant number are classified as Level 1, in areas such as Electrical Engineering, Microelectronics, Computer Science and Production Engineering, besides grant holder in also Technological Development Productivity and Innovative Outreach.

■ Food and Nutrition (School of Food Engineering – FEA), M/D

- CAPES Evaluation (2013-2016), grade 5

PPG-AN has strong national and international insertion, with an annual average of 50 articles published in international journals, most of them in CAPES Qualis A1-A2 (first and second strata in of the CAPES qualification of journals) and B1-B2 (third and fourth strata of the CAPES qualification of journals) of the Food Science area, to which it belongs. Despite being a small program (with 11 full-time professors), there is great interest with respect to collaborations, promotion and participation in national and international scientific events, patents and innovation. In recent years, the following were filled with the National Institute of Industrial Property (INPI): 1. Utility Model. "Process of biotransformation of phenolic compounds from soybean extract into equol and bioactive isoflavones through fermentation and/or enzymatic application, composition obtained and use"; 2. Privilege of Innovation. "Method of controlled differential hydration of food grains with total soluble solids retention, hydration equipment and resulting products"; 3. Privilege of Innovation. "Composition comprising *jabuticaba* extract, and its uses," licensed in December 2018 and funded by FAPESP. The agreements are multiple, such as: Lund University, Sweden; University of Hannover, Germany, and University of Porto, Portugal. Many scientific events have also been held: IWBC – International Workshop Bioactive Compounds. 2016; São Paulo School of Advanced Sciences on Reverse Engineering of Processed Food, 2017; 12º Simpósio Latino Americano de Ciência de Alimentos, 2018.

■ Food Engineering (School of Food Engineering – FEA), M/D

- CAPES Evaluation (2013-2016), grade 7

The excellence of the program is observed through several indicators, such as: highly qualified faculty profile; high number of concluded project; outstanding scientific productivity, and performance of graduates in teaching and research in other institutions (which is due to the distinctive and unique characteristic of the program, contributing to meet the demand of the academic market). The highlight is the culture of dissemination of scientific work developed in both qualitative and quantitative terms, enabling the excellent scientific production of the program.

■ Food Science – PPG-CA (School of Food Engineering – FEA), M/D

- CAPES Evaluation (2013-2016), grade 7

PPG-CA has important production indicators, such as concluded projects, patents, and publications, among others. The impact of PPG-CA can be noticed through its scientific performance concluded projects international centers of excellence in the Food Science area; and its faculty scientific, technological and political leadership, performance in editing important world scientific journals, and active participation in the organization of national and international events

of great importance for the dissemination and consolidation of knowledge in the area. In addition, the program develops actions aimed at complementing its specialties in Food Science in the face of new demands and challenges of the modern world, considering that research can and should contemplate interinstitutional and interdisciplinary aspects, which involve collaborations at national and international levels

■ Food Technology (School of Food Engineering – FEA), M/D

- CAPES Evaluation (2013-2016), grade 5

The Program values the several ways of disseminating and transmitting knowledge generated and developed also in graduate studies, such as patents, technology transfer, creation of startups and social inclusion. In this respect, the Food Technology Program is among the most advanced, as it has two alumni companies in incubation and receives technology transfer royalties from research developed by researchers and students of the program. Over the years, the Program has received 53 awards distributed CAPES Thesis Awards (2), awards in events (32), innovation awards (7), and other awards (10); published 264 articles on indexed journals – most of them with CAPES Qualis A1 and A2 (first and second strata of the CAPES qualification of journals); filed 16 patents and published 54 national and international book chapters. These data, especially awards and filed patents, demonstrate the high quality of the Program in scientific relevance and innovative capacity.

■ Mechanical Engineering – PPG-EM (School of Mechanical Engineering – FEM), M/D

- CAPES Evaluation (2013-2016), grade 5

The master's program in Mechanical Engineering began in 1974, and the doctoral program in 1975; therefore, PPG-EM is a consolidated program, recognized throughout the country for its quality. A total of 1,581 master's and 837 doctoral students graduated until 2018, and the therefore Program helped spawn other graduate programs in Mechanical Engineering and even undergraduate and teacher training courses in the area. In the five-year period, 366 master's (average of 73 per year; average time to graduate of 20.4 months) and 147 doctoral (average of 29 per year; average time to graduate of 40.2 months) students received their degree. FEM undergraduate students can participate in Unicamp's Scientific Incentive Program (PICC), which has shortened the time to complete the undergraduate program since they attend part of the mandatory graduate subjects before graduating. In addition, special students are accepted to be trained in master's and doctoral programs – usually professionals that are PGG part-time students because they work in companies and industries in the region –, which may also reduce their time to graduate when they become regular students. The Program had an annual average of 67 full-time professors in this same five-year period. Since 2015, the Program has four areas of concentration: (a) Manufacturing Materials and Processes, (b) Solid Mechanics and Mechanical Design, (c) Thermal and Fluid Engineering, and (d) Mechatronics.

■ **Petroleum Sciences and Engineering – PPG-CEP (School of Mechanical Engineering – FEM), M/D**

- CAPES Evaluation (2013-2016), grade 5

PPG-CEP is evaluated by the Engineering Committee III, and is part of the Mechanical Engineering programs. It comprises one of the 56 master's courses and one of the 31 doctoral courses of this committee. These courses are distributed in 65 programs based in 15 Brazil's states, and PGP-CEP is one of 12 programs in the state of São Paulo. Thus, with regard to the 65 graduate programs in Brazil and endorsed by the Engineering Committee III/Mechanical Engineering, PGP-CEP is among the 12 best rated, besides being among the top five in the state of São Paulo.

■ **Production and Manufacturing Engineering – PPG-EPM (School of Applied Sciences – FCA), M**

- CAPES Evaluation (2013-2016), grade 3

The main objective of PPG-EPM is to contribute to the development of the Production and Manufacturing Engineering area, especially with regard to i) training of highly qualified human resources, and ii) development of cutting-edge scientific research in the area at world level. It has two Areas of Concentration: "Operational Research and Process Management" (POGP) and "Advanced Materials Manufacturing" (MMA). In addition to its closer proximity to the school's Engineering areas, PPG-EPM is linked to almost all other FCA areas. With regard to the students enrolled in the Program, there are graduates from practically all FCA courses. These characteristics demonstrate that the Program has fulfilled an important institutional role in FCA, which is precisely qualifying masters in an interdisciplinary environment, able to apply quantitative tools to the most diverse issues of current interest. As for geographical insertion, PPG-EPM attracted the attention of companies and public agencies in Limeira surrounding region whose activities range from the automotive industry to agribusiness. The program has students who are professionals in the research and development sectors of these bodies outside the institution and that seek improvement in Production and Manufacturing Engineering tools. In this sense, in addition to fulfilling a relevant role in conducting cutting-edge engineering research, the Program directly contributes to local external sectors by training masters capable of innovating. Until 2018, there were 58 master's defenses, with 20 defenses occurring in that year.

■ **Technology (School of Technology – FT), M/D**

- CAPES Evaluation (2013-2016), grade 4

The Graduate Program of Unicamp's School of Technology is relatively new – the master's program began in 2009, and the doctoral program in 2013. The first doctoral defense occurred in December 2017, followed by seven more in 2018. The program is linked to the CAPES Interdisciplinary Area. In 2014-2018, the Program went from CAPES grade 3 to 4, a grade received by most of the programs in the interdisciplinary area. Therefore, PGP-T is comparable to most programs in its area.

#### 4.1.1.5 Interdisciplinary Programs

- Bioenergy (School of Food Engineering – FEA, University of São Paulo – USP, São Paulo State University – UNESP), D

- CAPES Evaluation (2013-2016), grade 4

The Integrated Graduate Program in Bioenergy, at doctoral level, is an innovative proposal for being the first interinstitutional course held between the State Universities of São Paulo (Unicamp, USP and UNESP), which are leading teaching and research institutions in Brazil. The course is designed around a current question: how to create and develop new forms of energy that are more environmentally friendly? The main focus of the Program is a global discussion involving several countries such as Denmark and the Netherlands, seeking interaction not only with national organizations, but also with international institutions, resulting in seven co-supervisions. It is also important to note that the Program focuses on meeting the demands of the productive sector, which has been carried out through partnerships with private sector companies, enabling the funding of PhD scholarships linked to the industry. As this is a relatively new course (implemented in 2014), only five doctoral defenses have occurred to date, with the expectation that the other students will meet the course conclusion deadline.

- Energy Systems Planning (School of Mechanical Engineering – FEM), M/D

- CAPES Evaluation (2013-2016), grade 4

There are two other programs with the same characteristics as Unicamp's Energy Systems Planning Program: USP Energy Program and COPPE/UFRJ Energy Planning Program, but only the first two are in CAPES Interdisciplinary area, and Unicamp is a pioneer in interdisciplinary and integrated treatment of the energy sector. PPG-PSE broadly addresses technical/technological, economic/financial, socio-environmental, regulatory and political aspects through three Lines of Research: Analysis of Energy Supply and Demand; Energy policy, and Energy, Society and Environment. The master's course was created in 1987 and the doctoral course in 1993. Since the beginning, it has graduated masters and doctors who have influenced the development of the Brazilian energy sector by holding positions at boards of directors or advisory boards in various state or federal public agencies as well as energy concessionaires in the country, as such as the recent cases of two graduates who held the position of Director at the Brazilian Electricity Regulatory Agency (ANEEL). Moreover, research by its faculty's and student's often attracts the attention of the media in general, as well as in public debates on energy planning at the regional, state, national and international levels. Graduates also they act as consultants in regulatory and international agencies, contributing to the elaboration of public policies work as editors of international journals, and participate (including as coordinators) in working groups in international projects. Therefore, this diversity of activities is an important service that the Program renders to Brazilian society.

- Environment and Society (Institute of Human Sciences and the Humanities – IFCH, Center for Environmental Studies and Research – Nepam), D

- CAPES Evaluation (2013-2016), grade 6

The Doctoral Program in Environment and Society has two major Areas of Knowledge: (1) Biological Aspects of Sustainability and Conservation, and (2) Social Aspects of Sustainability and Conservation. It has 19 full-time professors (80%), one visiting professor (4%), and four part-time professors (16%). The internationalization of the Program is due to the profile of the faculty members – many with international background and collaboration – and also of the students' profile, who participate in the Sandwich PhD Program Scholarship abroad (CAPES, FAPESP and international institutions) and some foreigners (from Africa, Latin America and Caribbean). The Program develops projects under the São Paulo Excellence Chair/FAPESP. The pedagogical proposal is consolidated, as is curriculum, which includes compulsory subjects that guarantee theoretical, methodological and operational support for the students' thesis projects and training – Thesis Seminars, Social Theory and Environment, and Ecological Theory Fundamentals. The complementary subjects are selected jointly by student and advisors – all students have two advisors from different areas of knowledge, which has certainly contributed to the interdisciplinary perspective of Thesis projects. Thus, interdisciplinarity occurs in the scope of research, reinforcing the line adopted in the creation and implementation of the Program.

- Gerontology (School of Medical Sciences – FCM), M/D

- CAPES Evaluation (2013-2016), grade 5

There are 11 PPGs in gerontology and aging in Brazil in the CAPES interdisciplinary area. Unicamp's doctoral course is the only grade-five program, while PUC-RS has the highest evaluation, grade 7. Based on these indicators, it is clear that Unicamp's program is a leader among gerontology programs in Brazil. It receives professors and students with different backgrounds involved in research and teaching about old age, aging and the elderly, and practice in elderly care in different professional contexts. It is based on subjects that provide the theoretical-methodological foundations of Gerontology: Biology of Aging, Medicine, Psychology of Aging, and Social Sciences of Aging. The program has graduated more than 160 master's and doctoral students and enabled research that resulted in numerous publications on indexed journals, books, and book chapters. Its goal is to train professors and researchers capable of producing knowledge and making it accessible to the scientific community and the population, as well as working of healthy old age and frail old age care, from a multiprofessional and interdisciplinary approach.

- Health, Interdisciplinarity Practice and Rehabilitation (School of Medical Sciences – FCM), M/D

- CAPES Evaluation (2013-2016), grade 4

The Program started as a Professional Master's Program in 2007, and the first defenses took place in 2009. The academic profile was soon shown by the graduates' careers as many of them pursued doctoral studies, engaging in teaching and research activities. In 2011, it became an academic program, and the doctoral

course began in 2016. The Program provides qualified training and develops an interdisciplinary perspective, expanding partnerships and cooperation (in teaching and research) with researchers from Unicamp, the State of São Paulo, and Brazil in general. From the beginning, CAPES evaluations have recognized the points of excellence: innovative and genuinely interdisciplinary proposal built by full-time faculty, progressively maturing as the Program faces the challenges to grow (funding, national and international partnerships, hiring, retirement, scholarships, internationalization, publication, and others).

■ Interdisciplinary in Applied Human and Social Sciences – PPG-ICHSA (School of Applied Sciences – FCA), M

- CAPES Evaluation (2013-2016), grade 3

PPG-ICHSA was created in 2013 and consists of a single Area of Concentration, “Modernity and Public Policy,” which in turn unfolds into two Lines of Research, “Sustainability and Social Protection” and “Technological Changes and Human Condition.” The Area of Concentration “Modernity and Public Policy” indicates this effort of integration “modernity,” outlining the broad historical-cultural movement in which it is inserted, constituting the reasoning and materialities, origin and context of many contemporary issues; and “public policies,” denoting the social dimension of the Program’s interests, addressing issues pertinent to broad public interest and the constitution of specific and concrete social realities. The lines of research organize the arrangement and integration of the subjects as well as of the laboratories and research groups maintained by the faculty of the Program, which is highly original in concept, curriculum and methodology, even when compared to programs in Committee II of the Interdisciplinary area.

■ Multi-unit on Science and Mathematics Education – PECIM (IFGW, Institute of Geosciences – IG, School of Education – FE, Institute of Chemistry – IQ), M/D

- CAPES Evaluation (2013-2016), grade 4

PECIM is a relatively new Program, with only one quadrennium evaluation so far. It comprises four Unicamp schools: FE, IFGW, IG and IQ. It also has the participation of professors from the following schools: Institute of Mathematics, Statistics and Scientific Computing (IMECC), Institute of Biology (IB), School of Applied Sciences (FCA), School of Technology (FT), and Nucleus of Applied Informatics to Education (NIED). The structure and training of the faculty are of excellent quality when compared to other national programs, achieving good CAPES indicators. The format of the classes, in which professors from different backgrounds share the same class at the same time, is one of the highlights regarding interdisciplinarity. One proposal is to change the criteria for accreditation and disqualification of professors in the program, making the rules regarding academic production a little stricter.

■ Popularization of Science and Culture – PPG-DCC (Institute of Language Studies – IEL, Laboratory of Advanced Studies on Journalism – Labjor, Creativity Development Nucleus – Nudecri), M

- CAPES Evaluation (2013-2016), grade 4

PPG-DCC presents a vast field of research and creation in which interdisciplinarity stems from the complexity of the issues in the area. Therefore, students and



professors are required to invent new research topics and new methodological approaches that necessarily involve dialogue between different subjects and multiple ways of expression of knowledge, cultures, technologies, arts, and sciences. These are exciting challenges that drive classes, groups and research projects, events and publications, which have been developed since its inception in 2008. It also stands out for its pioneering and original proposal, setting an example and assisting the creation of other programs in the same area and format, as is the case of *Maestría en Ciencia, Tecnología e Innovación* and of *Especialización en Divulgación de la Ciencia, la Tecnología y la Innovación da Sede Andina*, of the Universidad Nacional de Río Negro (Argentina). In 10 years, it has trained 134 professionals, 70% (94) between 2014 and 2018, with an average time to graduate of 28 months, which is a reasonable figure, considering that many master's students engage in a profession in parallel to their studies for different reasons – they are already in the job market, the number of grants in the program is limited, and the grant money is low (some students have families). The course has been positively evaluated for the volume and quality of dissertations produced per year and has a strong impact due to workshops and productions that innovate in scientific dissemination, in addition to events and important bibliographic material arising from these components. Regarding the training of students for the academic environment, the graduates are well received in doctoral programs of important public universities and enjoy professional appreciation in their workplaces. The *Encontro de Divulgação de Ciência e Cultura – EDDIC* (Popularization of Science and Culture Science Meeting) is an initiative that has contributed to bringing students closer to each other and to the professors and the research environment in academy.

- Science and Technology Policy – PPG-PCT (Institute of Geosciences – IG), M/D
  - CAPES Evaluation (2013-2016), grade 6

PPG-PCT is the leading program directed at Science and Technology Policy and Science, Technology and Society in Latin America, and has some of the leading researchers in the Innovation Studies and Social Studies in Science and Technology (S&T). Being taught in an interdisciplinary department is one of its strengths. The program celebrated its 30<sup>th</sup> anniversary in 2018, has 27 professors, reached its 400-graduate record (249 masters and 151 doctors) and seeks to train three professional profiles: 1) those who pursue an academic career in universities and other educational and research institutions; 2) researchers and administrators of public S&T management and promotion institutions in Brazil and abroad, and 3) private managers who conduct research and innovation efforts in companies, including third sector institutions and individual entrepreneurs. The Program develops activities with less consolidated programs; and helps the formation of new research groups. It participates in different initiatives of CAPES, such as the Interinstitutional Doctoral Program – DINTER (with the Federal Institute of Minas Gerais), the Support Program for setting up Newly Graduate Doctors (PRODOC), the National Postdoctoral Program (PNPD, today with 5 scholars), the Academic Cooperation Program – PROCAD, for the strengthening of Graduate Programs (with PPGTE /UTFPR and the University of Buenos Aires, Argentina). There are

projects being developed under the São Paulo Excellence Chair Program – SPEC/FAPESP, two within the Increasing International Science, Technology and Innovation Cooperation between Brazil and the European Union – INCOBRA, and two projects with the National Institutes of Science and Technology Program – INCTs of CNPq. It also has a project within the scope of the Institutional Internationalization Program – PrInt/CAPES. Attraction of students from other states of the country and from other Latin American countries is significant, especially students from Colombia, Venezuela and Mexico, as well as of foreign postdocs (one Mexican and one French). Its Lines of Research are: History and theories of science and technology; Science and technology in the development process; Strategies for science and technology and social actors; Technological change, social transformations and the environment, and Management of science, technology and innovation.

- Teaching and History of Earth Sciences – PEHCT (Institute of Geosciences – IG), M/D
  - CAPES Evaluation (2013-2016), grade 4

The main goal of PEHCT is to enable professionals to develop research in fields related to the Program's Lines of Research: Methodology for the Teaching of Geosciences and History of Geosciences. In the knowledge production process, the historical, epistemological and methodological elements of science and education are considered indispensable. Pedagogical questions are focused on the dissemination of knowledge of Geosciences at various levels of education and non-formal education. PEHCT involves research related to multiple aspects of knowledge about Earth, being a pioneer in the area of Geosciences Education in Brazil, and also the only Brazilian PPG that connects Geosciences and Teaching areas. The research areas covered by professors and students in the Program are continually expanding due to multiple interests and diverse applications: curricula and programs of different levels of education; teacher training; History of Natural Sciences; scientific dissemination; teaching and learning; didactic material; innovation in educational technologies; environmental education; geological heritage; geoconservation; geotourism; legislation and environmental law. The Program is also a research center permanently dedicated to developing academic and political actions for the improvement of the Teaching of Earth Sciences and Environmental Sciences, from elementary school to higher education. Professors and students are directly involved with international entities such as the International Geoscience Education Organisation (IGEO), the International Commission on the History of Geological Sciences (INHIGEO), and Asociación Española para la Enseñanza de las Ciencias de la Tierra (AEPECT). At national level, PEHCT actively participates in the initiatives of the Brazilian Geological Society (SBG), Fórum Nacional de Cursos de Geologia [Brazilian Geology Courses Forum] and Fórum de Coordenadores de Cursos de Licenciaturas em Ciências [Sciences Degree Coordinators Forum].

### 4.1.2 *Lato Sensu* Graduate Programs

The modalities of *Lato Sensu* Graduate Program are Improvement, Specialization and Medical Residency.

#### ■ IMPROVEMENT

- Improvement (School of Medical Sciences – FCM)

The Improvement Courses are aimed at: 1) offering specialized training to non-medical professionals, complementary to university education, directed at serving the population in a certain area of activity; 2) encouraging the development of a critical and comprehensive view of the Health System, allowing professionals to act as agents of Unified Health System (SUS) implementation; 3) applying specific technical skills to a particular theme, with programs in various areas of knowledge; 4) encouraging training and continuing education of non-medical graduates in the health area; 5) training students to identify health problems and seek solutions through experimentation of innovative practices of promotion, diagnosis and rehabilitation and development of work processes, focused on intervention in health issues/situations related to individual, family and groups in an integrated manner, respecting popular knowledge and values, associated with technical competence, in a humanized manner. The Improvement Courses have low dropout rates 8% on average in recent years. The 50 courses are offered for 12 months and students receive a scholarship from the São Paulo State Health Department to work in their area of training for 40 hours per week.

#### ■ SPECIALIZATION

- Enhancement in Mathematics (Institute of Mathematics, Statistics and Computing Science – IMECC)

The accumulated experience in IMECC Graduate Studies in Mathematics in particular, and in other Brazilian institutions in general, has shown that many applicants to in master's degree programs in mathematics have deficiencies in their basic education. This finding led the IMECC Graduate Program in Mathematics to create the Enhancement Program, which enables the completion of a set of subjects aimed at leveling these students' education. The Enhancement Program is a way of expanding the target audience of the Master's Program in Mathematics, without changing the academic quality that it has maintained over the years.

- Labor Economics and Unionism (Institute of Economics – IE)

The course began in 1992 and is directed at professionals working in the labor area, such as managers, advisors and technicians of public institutions and trade organizations. The number of places has ranged from 20 to 25, depending on the candidates' quality. To circumvent issues of course dropout (as it is a course for people who are already inserted in the labor market and generally have no leave from work to study), it is necessary to be judicious in the selection process and offer support and discussion sessions on course subjects in order to ensure course quality. Before each class, there is opportunity for discussion of texts and concepts that will be used in the classroom. Writing the monograph is the

greatest difficult, since the reading load is very dense and classes take place every Friday during the two-year course.

- Science Journalism (Labjor/Nudecri and Institute of Geosciences – IG)

The course has been offered by Labjor since 1999, in partnership with the Department of Science and Technology Policy (DPCT) of the Institute of Geosciences, and with the Multimedia Department of the Arts Institute, both of Unicamp. The course lasts three semesters and is designed to train science journalists, science writers and communication advisors from universities and research centers. The course is directed at enabling professional journalists and scientists to disseminate science, publicly disclosing the debate on S&T and reducing the distance between scientific knowledge and people's daily lives. For scientists, it is an opportunity to be trained with a focus on the dissemination of research, which undergraduate programs do not include. For journalists, the course can contribute to a better understanding of the science production process, as well as of the Brazilian science policy. Since the first class in 1999, with 145 applicants and 30 slots, the course has held a selection process every two years, with an average of 200 applicants for 30 places, filled by students from different areas and with different levels of education, and presents a low dropout rate.

#### ■ MEDICAL RESIDENCY

- Medical Residency (School of Medical Sciences – FCM)

In addition to focusing on the training of its students, the FCM Medical Residency contributes to training physicians who are attending residency in other institutions. Due to the excellence of the hospital structure available for the training for the specialists, the FCM Medical Residency is increasingly sought by a large number of residents from all regions of the country to carry out observational stages complementary to their training. In 2014-2018, 451 residents were received for internship, a higher number compared to the 134 received in a previous similar period, especially in the areas of Obstetrics and Gynecology, Psychiatry and Hematology, and Hemotherapy. Based on the initiative of the Area of Dermatology of the FCM Department of Internal Medicine, with the support of the Brazilian Ministry of Health and through the Medical Residency Committee, a new residency project was implemented in 2016 with the Dermatology Medical Residency Program, with students' commitment to develop, after residency, a graduate research project at Federal University of Roraima; at Universidade Federal do Maranhão in 2017, and at Federal University of Rio Grande do Norte in 2018. The proposal is part of the National Program to Support the Training of Specialists in Strategic Areas (Pró-Residência) of the Ministry of Health and aims to serve regions of the country where these specialists are poorly provided by the Unified Health System. The FCM Medical Residency has also received nine resident physicians from foreign institutions over the past two years, who seek, in FCM prominent areas, opportunities to enhance and deepen their knowledge and skills. Sixty residents were also sent to the following countries: the Netherlands, Portugal, Canada, Italy, Argentina, Spain, France, the USA, Uruguay, and the United Kingdom.

- Multiprofessional Residency (FCM)

The multiprofessional or uniprofessional health residency programs are accredited by the National Committee for Multiprofessional Residency in Health – CNRMS, jointly coordinated by the Ministries of Health and Education. The first Program was approved in 2013, and nowadays FCM coordinates the following Programs: i) Health Multiprofessional, offered to speech therapists, nurses and pharmacists; ii) Mental Health Multiprofessional, offered to nurses, psychologists, occupational therapists, and speech therapists; iii) Medical Physics Uniprofessional, offered to physicists and medical physicists; and iv) Oral and Maxillofacial Uniprofessional, offered to dentists. These programs involve several Unicamp's schools and interdisciplinary research centers, namely: FCM, FENF, FCF, IFGW, FEEC, CEB and FOP. The group consists of 38 first-year residents (R1) and 38 second-year residents (R2) and all receive a monthly grant funded by the Ministry of Health. The activities developed by R1 and R2 residents are supervised by tutors and instructors and the theoretical activities are taught by professors from the various schools involved. In addition, residents are advised by Unicamp's faculty members in the development of the Course Completion Work. From 2014 to 2018, there were 182 residents enrolled in the program and 14 (7.4%) dropped out. Four out of these dropped out because they were approved in a civil service examination and were hired before completing the course, and three received scholarships in Germany and Canada. Thus, there were only seven residents (3.8%) that dropped out for not adapting to the programs or for personal reasons. The low dropout rate is due to the constant reformulation of activities and subjects on assessments made by professors and residents.

#### 4.1.3 Participation of Interdisciplinary Research Centers in the Graduate Programs

The participation of Interdisciplinary Research Centers in PPGs is one of the distinctive features of Unicamp's graduate studies, enriching the opportunities for research which result in students' dissertations and theses and involving professors from different University's schools.

The following is a summary of the participation Interdisciplinary Research Centers in graduate education.

CBMEG (Center of Molecular Biology and Genetic Engineering) – CBMEG's faculty and researchers have made it possible to establish interactions by strengthening research programs in the field of genetics, participating mainly in the PPG in Genetics and Molecular Biology and PPG in Plant Biology of the Institute of Biology, in the Integrated Graduate Program in Bioenergy, and in PPGs in Medical Sciences and Internal Medicine of the School of Medical Sciences. The activities of CBMEG's researchers in undergraduate programs are happen participation in subjects offered in teaching and research institutes, related to the Center's areas of activity.

CCSNANO (Center for Semiconductor Components and Nanotechnologies) – Undergraduate and graduate students, as well as postdoctoral researchers, participate directly in research carried out at the Center. Various FEEC undergraduate and graduate

subjects are taught at the Center's facilities, and practical lab activities are performed with the help of technicians and researchers.

CEB (Center for Biomedical Engineering) – As highlighted by the strategic planning, training human resources is one of CEB's pillars. Practically all research projects developed at the Center involve students from various levels, from scientific initiation to doctorate. Since most of CEB's researchers are members of the DEB/FEEC faculty, there is a intense involvement in undergraduate and graduate education, with teaching, guidance of course completion works and other activities typically relevant to undergraduate programs (preparation of labs, scripts, and teaching materials, for example.) Several of CEB's clinical engineers teach in the Clinical Engineering Specialization program (outreach course), which was created at CEB in 1993 and is headquartered at FEEC. In addition, CEB's medical physicists actively participate in teaching and supervising activities for undergraduate medical physics students at the 'Gleb Wataghin' Institute of Physics and medical physics residents, which is a joint program of CEB, FEEC, FCM and IFGW (see more detailed description in following items). These actions show that undergraduate and graduate students are also directly involved in the Center's service activities (outreach).

CEMIB (Multidisciplinary Center for Biological Investigation on Laboratory Animal Science) – The Center participated in training activities in various way. In formal training, in scientific initiation, master's and doctoral supervision with support from funding agencies. Regarding specific training, technicians and professionals from Brazil and abroad were trained in the period, and those from Brazil were trained in the Assisted Reproductive Technology, Genetics and Animal Health laboratories.

CEPAGRI (Center for Meteorological and Climatic Research Applied to Agriculture) – In addition to research and outreach activities, CEPAGRI's researchers have also contributed to training quality human resources through the participation of grant holders and interns from technical to postdoctoral level in research projects, lectures, classes and teaching undergraduate and graduate subjects (in schools such as School of Agricultural Engineering – FEAGRI; Institute of Biology – IB; Institute of Geosciences – IG, and IFCH), participation in defense boards and supervision of students' and professionals' research projects. It is worth mentioning the partnership established with the Campinas Dynamic Science Museum (which is jointly managed by Unicamp and Campinas Municipal Administration) for several years, which has enabled the development of activities related to scientific dissemination in meteorology and climatology.

CEPETRO (Center for Petroleum Studies) – CEPETRO took part indirectly in training activities carried out in the quinquennium by supporting the Graduate Program in Petroleum Sciences and Engineering (CEP), through administrative and financial assistance for research projects and offering of its laboratory facilities. The Center actively participates through research projects making financial and laboratory resources available so that graduate and undergraduate students can develop their research and base their work, and offers concise training in line with the current needs of the oil and gas industry both nationally and internationally. With regard to teaching, especially graduate studies, the Center's researchers have taught classes and courses in partnership with professors linked to CEPETRO, and participated in the co-supervision of undergraduate and graduate students.



CESOP (Center for Studies on Public Opinion) – With regard to graduate teaching, researchers linked to the Center taught 26 subjects in Political Science Program, with emphasis on research methodology, political parties, political regimes and legislative studies. In the Undergraduate Program, 26 subjects were taught on the same topics.

CLE (Center for Logic, Epistemology and the History of Science) – The highlight is training through participation in research projects, the Center's strong point, followed by classroom teaching.

CMU (Memory Center at Unicamp) – Basically, CMU's activities in university education were to support research in areas related to its activities and in accordance with the research projects developed at the institution. Through participation in the Graduate Program Seminars "Memory and Education of Sensitivities" and "Research Methodology in Education and History," of the School of Education, discussions about the methodology of the history of sensitivities were prominent. Co-supervision and participation in defense boards and qualification exams related to research on collections or archives and, in many of these cases, on themes related to the history of Campinas and surrounding region. Likewise, CMU's support for theses and dissertations defended between 2014 and 2018 related to, on the one hand, supporting the research in its collection and providing services of the researchers and, on the other, guiding them regarding the references available for reflection on the memory of the city, and local, social and cultural history, as well as on the history of sensitivities. Also during the period, a doctoral defense in History of Art and another in Economic History and a master's defense in Social History by CMU's researchers explored the potential of working with collections present in the institution. In this sense, they expressed the variety of the collection for the study of art, document conservation, and the coffee economy in the region.

CPQBA (Pluridisciplinary Research Center for Chemistry, Biology and Agriculture) – Activities include training master's, doctoral and postdoctoral students, as well as students of Scientific Initiation, Technical Training, Improvement and interns, totaling 91 supervised students, most of these in master's (27) and doctoral (41) programs. Most classroom teaching activities occurred in graduate subjects, totaling 31 subjects offered in the quinquennium in six different Graduate Programs. These figures show the significant contribution of CPQBA to training students and researchers in the Center's areas.

CIDDIC (Unicamp Center for Integration, Documentation and Cultural Dissemination) – The Center's researchers have worked in research, supervision and teaching in the Graduate Program in Music of the Arts Institute, where they are accredited as part-time professors. Four graduate subjects were taught by researchers during this period. Its production in terms of supervision is significant (three S.I. students, six master's students and one doctoral student). Together with the Unicamp's Symphony Orchestra, the CIDDIC Opera Studio Laboratory develops an important training work for students of singing and conducting of undergraduate and graduate programs in Music of the Arts Institute, with opera research and annual production of operas, in which students develop an interdisciplinary work of singing and performing, as well as production of sets and costumes. This work is a significant distinctive feature in training music students compared to music courses offered in other national HEIs. There were 13 operas staged between 2014 and 2018. Unicamp's Symphony Orchestra also contributes very

significantly to training undergraduate and graduate students in music: in the annual Performance project, master's and doctoral students can use the Orchestra as a laboratory for their research. In this project, students plan the research public presentation, and there were 16 concerts of this project in 2014-2018.

LUME (Interdisciplinary Centre for Theatrical Research) – It participates in the Graduate Program in Performing Arts – PPG-ADC (IA) in an effective way, and had a key role in its creation in 2010. This program has three accredited PQ researchers as professors, active in the Line of Research “Techniques and Processes in Training Performing Artists.” Another PAEPE actor-researcher has done a master's degree in this same program on the clown training methodologies developed in the center since 1985. That is, with regard to the seven actors-researchers linked to LUME, four have or had effective activities in the graduate program mentioned. In the scope of research conducted by LUME, there is a direct connection with PPG-ADC in the center's conceptual lines of research. In this perspective, LUME's Line of Research “Concepts on the body in art” dialogues directly with PPG-ADC's Line of Research “Techniques and Processes in Training Performing Artists.” Three LUME's researchers are accredited full-time professors in this program and in this Line, teaching subjects and supervising master's and doctoral students.

NEPA (Center for Food Studies and Research) – In terms of training offered to Unicamp students, NEPA supervised 10 undergraduate students in scientific initiation projects, five from the Nutrition, Sports and Metabolism Sciences course at the School of Applied Sciences (FCA); four students from the School of Food Engineering (FEA); one from the Institute of Mathematics, Statistics and Computing Science (IMECC); one technician with a technical training grant, and one Food Engineering student with a social assistance grant. In addition, one graduate student from the Department of Food Technology took part of member of the outreach project. Outside Unicamp, there was participation in a research project that was attended by two Scientific Initiation students from CEFET-RJ.

NEPAM (Center for Environmental Studies and Research) – In the case of researchers working at NEPAM, almost all of them work in disciplinary, interdisciplinary and even professional graduate programs. They also work in undergraduate programs at the University and are scientific initiation, master's and doctoral advisors and postdoctoral supervisors.

NEPO (“Elza Berquó” Population Studies Center) – NEPO is an important contributor to research, teaching and outreach activities of the Graduate Program in Demography of the IFCH. Since the beginning of the doctoral program in 1993 and the master's degree in 2003, the program faculty has been made up of doctors, linked to Unicamp not only as professors of the Department of Demography (IFCH), but also as PQ researchers, working at NEPO. Among the seven PQ researchers, four work in the Graduate Program in Demography. In the 2014-2018 quinquennium, NEPO's faculty and researchers taught in 115 graduate subjects in seven different graduate programs: master's and doctorate in Demography; master's and doctorate in Environment and Society; master's and doctorate in Sociology, and Interdisciplinary master's in Applied Human and Social Sciences. In the same period, they supervised of 71 doctoral, 46 master's, and 91 students in other categories (Scientific Initiation (IC), Technical Support (AT), Teacher Internship Program (PED), Teaching Support Program (PAD), and postdoctoral students), totaling 208 students supervised. It is noteworthy that the involvement of students in NEPO projects such as

ICs and ATs has been an important way of attracting candidates to the Graduate Program in Demography.

NEPP (Center for Public Policy Studies) – In NEPP, the participation of undergraduate and graduate students mostly occurs in specific activities within the scope of research and outreach projects and agreements, contributing to developing research and participating in theoretical and methodological discussions. Regarding graduate studies, NEPP contributes by supervising two master's dissertations and one doctoral thesis.

NICS (Interdisciplinary Nucleus of Sound Studies) – NICS' researchers have been active in teaching subjects in graduate programs, besides supervising students. Moreover, NICS has provided support infrastructure for courses taught by these and other members of the center.

NIED (Nucleus of Applied Informatics to Education) – The training activities were largely in extension courses. These activities consisted of initiatives in different lines of research of the centers in different niches of society involved with the use of educational teaching and learning technologies, especially in the educational area.

NIPE (Interdisciplinary Center on Energy Planning) – Holding events, seminars, congresses etc., has been one of the highlights of NIPE's activities. Some of these events took place in other Brazilian states and even abroad. NIPE has assisted other academic units in organizing and conducting these activities, compensating for Unicamp's lack of structure.

NUDECRI (Creativity Development Nucleus) – Regarding the *Lato Sensu* Specialization program in Science Journalism, two groups were formed in the period. All students develop course completion work, usually more practical projects, ranging from website analysis of educational and research institutions to video production or 360-degree reporting (multimedia). These are fairly varied projects. It has also enhanced the training of these students, with the possibility of developing journalistic research into various areas of knowledge, with help from FAPESP's Media Science Program, which provides grants for such research. The course subjects are varied, covering mainly concepts about journalism, science journalism, history of science, science and technology politics, ethics in science and journalism, practices of science journalism (through workshops in the three-semester course), and public policies. Regarding the Master's Program in Popularization of Science and Culture Science (with IEL), each student develops a research project, and many of them also participate in research groups, usually coordinated by researchers/advisors. Some have the opportunity to participate in larger projects that are developed at NUDECRI or in which NUDECRI participates. The subjects offered are more theoretical, in some cases with more practical activities, but always seeking to develop reflection on the themes, within the broader areas and contexts related to science, technology, and innovation policies and their relation with society, and the social role of the university, S&T and the scientific community.

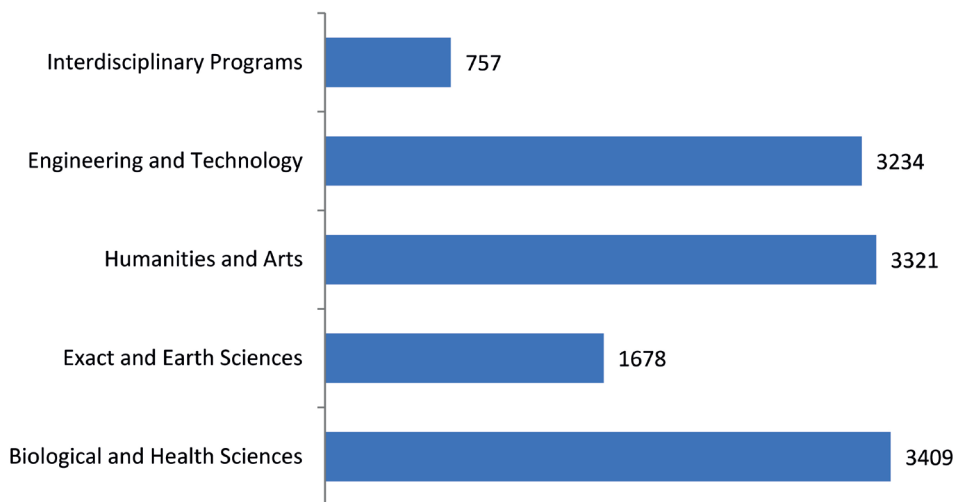
PAGU (Center for Gender Studies) – PAGU's group of researchers (including full-time researchers, collaborators, and postdocs) has significantly expanded its participation in undergraduate and graduate training activities. In the quinquennium, 145 graduate subjects were offered, 244 dissertations or theses (100 of which were completed) were supervised, 23 postdoctoral students were supervised and 10 graduate researchers

received for internships abroad. Participation in graduate programs has also increased, in addition to maintaining traditional and fundamental participation in graduate programs in Social Sciences and Social Anthropology, in which the totality of researchers involved in lines related to gender studies are linked to PAGU. In general, this growth is due to the incorporation of new associate and allocated researchers into the team, as well as the increase in the number of supervised postdocs working in training activities. Over the past five years, the most recently allocated researchers have been fully inserted in graduate programs, configuring a situation in which students of various levels, but especially graduate and postdoctoral students, are effectively members of research project teams and fully embedded and contributing significantly to enhance and consolidate of lines of research. Training activities do not end in the classroom or in the context of supervising research, ranging from the production of and attendance at events to the daily construction of study program spaces linked to lines of research, participation in outreach projects linked to these same lines and production or reading of publications produced by the Center, which are important references for didactic activities developed inside or outside Unicamp.

## 4.2 Students and Faculty

The numbers of students enrolled by knowledge area in 2018 are presented in Graph 4.7. Biological and Health Sciences concentrate the largest number of enrolled students, followed by Arts and Humanities and Engineering and Technology. Exact and Earth Sciences also concentrate an important number of students, and finally the Interdisciplinary Studies.

GRAPH 4.7 – STUDENTS ENROLLED IN THE GRADUATE PROGRAMS, BY AREA OF KNOWLEDGE, 2018

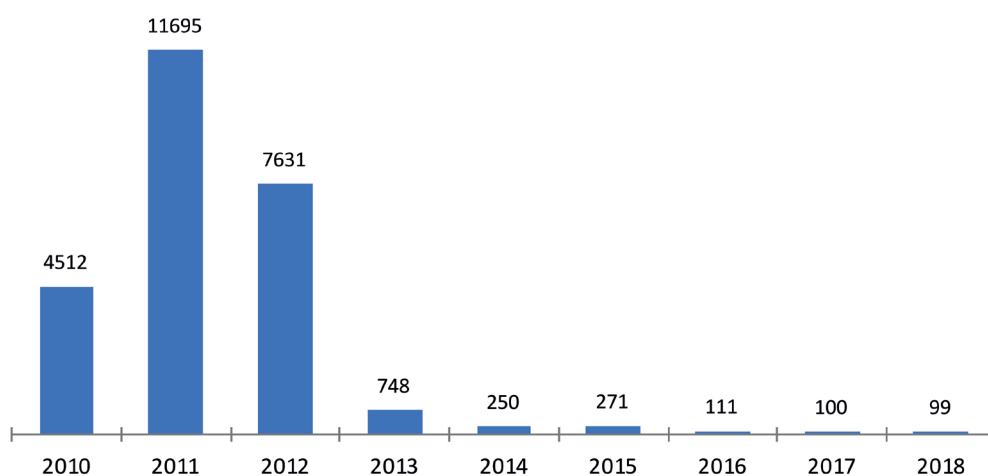


Source: PRPG Statistical Yearbook (2019)

As seen before, Unicamp offers six *Lato Sensu* courses – three *Specialization* programs: Enhancement in Mathematics (Institute of Mathematics, Statistics and Computing

Science – IMECC); Labor Economics and Unionism (Institute of Economics – IE), and Science Journalism (Labjor and DPCT/Institute of Geosciences); one *Improvement* course (School of Medical Sciences – FCM), and two *Residency* courses, namely: Medical Residency and Multiprofessional Residency (School of Medical Sciences). The evolution of the number of students are presented in Graph 4.8 below, with around 100 students in each of the last three years, presenting a decrease when compared to 2014 and 2015, when more than 250 students enrolled in these courses. The high enrollment between 2010 and 2013 relates to the Teacher Training Program (REDEFOR), jointly developed by UNICAMP and the State Department of Education, when Distance Learning Specialization places were made available for elementary and high school teachers in Mathematics, Physics, Physical Education, Portuguese, and History. The Program ended in June 2013.

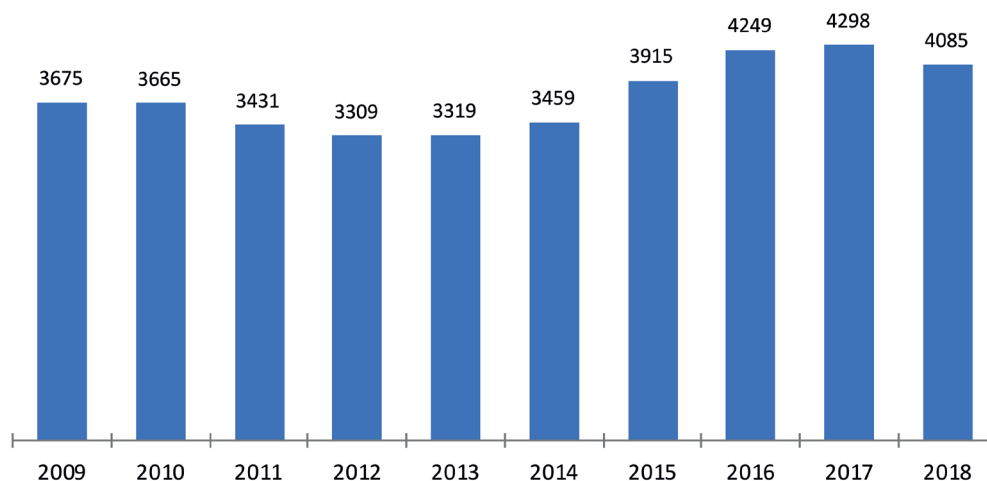
GRAPH 4.8 – STUDENTS ENROLLED IN *LATO SENSU*  
GRADUATE PROGRAMS, 2010 TO 2018



Source: PRPG Statistical Yearbook, 2019

The number of special students – those enrolled in graduate subjects but not regular UNICAMP students – between 2009 and 2018 varied as presented in Graph 4.9, reaching its peak in 2017 (almost 4,300 students), whereas in 2018 more than 4,000 students attended the programs. UNICAMP has adopted the policy of offering interested students the opportunity to take a single graduate subject, both for greater knowledge about the course and for the opportunity to prepare to attend graduate school; besides, it provides opportunities to those who are already in the labor market and cannot dedicate themselves exclusively to graduate studies.

GRAPH 4.9 – SPECIAL STUDENTS IN GRADUATE PROGRAMS, 2009 TO 2018



Source: PRPG Statistical Yearbook, 2019

Unicamp is an attraction hub for students who last graduated outside the state of São Paulo or abroad. These figures can be seen in Table 4.1 and Graph 4.10, with a considerable increase in the number of students whose prior education was in other Brazilian states, from 3,107 in 2014 to almost 5,000 in 2018, and a stable number of students educated abroad, from 560 in 2014 to 549 in 2018. Education in the state of São Paulo still predominates, but with a drop in the period – from 7,137 to 6,751 students.

TABLE 4.1 – ENROLLED STUDENTS BY LOCATION OF PRIOR EDUCATIONAL INSTITUTION, 2009-2018

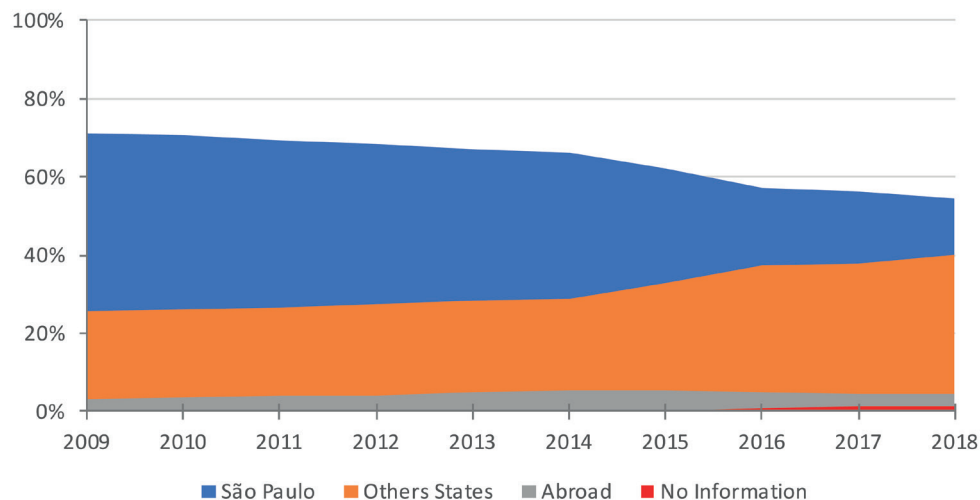
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
São Paulo	7,664	7,690	7,714	7,696	7,661	7,137	7,260	6,741	6,854	6,751
Other States	2,765	2,827	2,968	3,080	3,206	3,107	3,826	4,433	4,643	4,965
Abroad	349	389	424	457	537	560	600	568	550	549
No information								81	183	134
Total	10,778	10,906	11,106	11,233	11,404	10,804	11,686	11,823	12,230	12,399

Source: PRPG Statistical Yearbook (2019)

In the quinquennium of this Institutional Evaluation, the numbers varied as follows: 5.4% decrease in students from the state of São Paulo; 59.8% increase in students from other states, and 5.9% decrease in students from abroad.



GRAPH 4.10 – BREAKDOWN OF ENROLLED STUDENTS BY LOCATION OF PRIOR EDUCATIONAL INSTITUTION, 2009-2018



Source: PRPG Statistical Yearbook (2019)

Regarding breakdown by gender in Unicamp's schools, the most traditional and historical breakdown persists – in 2018, the most extreme cases were the Institute of Computing, in which 83% of the students were men, and the School of Nursing, in which more than 91% were women, as shown in Table 4.2.

TABLE 4.2 – STUDENTS ENROLLED IN GRADUATE PROGRAMS BY SCHOOL – TOTAL NUMBER AND PARTICIPATION PER GENDER

School	Number of Students	Women %	Men %
FCA	250	51.20	48.80
FCF	25	76.00	24.00
FCM	1,573	68.47	31.53
FE	630	67.46	32.54
FEA	521	71.40	28.60
FEAGRI	178	50.00	50.00
FEC	447	46.31	53.69
FEEC	777	21.36	78.64
FEF	220	42.73	57.27
FEM	808	24.01	75.99
FENF	129	91.47	8.53
FEQ	433	54.27	45.73
FOP	597	63.82	36.18
FT	243	42.39	57.61
IA	494	50.20	49.80
IB	925	61.19	38.81
IC	365	16.99	83.01
IE	360	38.06	61.94

TABLE 4.2 – STUDENTS ENROLLED IN GRADUATE PROGRAMS BY SCHOOL – TOTAL NUMBER AND PARTICIPATION PER GENDER

continued

School	Number of Students	Women %	Men %
IEL	624	66.19	33.81
IFCH	1,025	50.93	49.07
IFGW	341	33.72	66.28
IG	460	45.00	55.00
IMECC	535	28.04	71.96
IQ	439	43.74	56.26
Total	12,399	50.17	49.83

Source: PRPG Statistical Yearbook (2019)

Table 4.3 features the number of enrolled and incoming students, number of professors and the ratio of students to professors. In 2009-2013 (shown in the graduate report of the 2009-2013 Institutional Evaluation) both the enrolled student-professor and incoming student-professor ratios have a downward trend. The current scenario confirms such figures, even with 2014 and 2015 showing a slight increase compared to the end of the previous period. Between 2014 and 2018, the number of enrolled students grew 9.6%, the number of incoming students grew 8.7%, and the number of professors grew 4.3%. As a result, the enrolled student-professor ratio, which was 5.7, decreased to 4.4, and the incoming student-professor ratio decreased from 1.6 to 1.2 between 2014 and 2018. However, as will be seen later, PPGs have very different numbers and structures which should be analyzed in more detail. Graph 4.11 presents the evolution of the ratios cited for the entire period between 2004 and 2018.

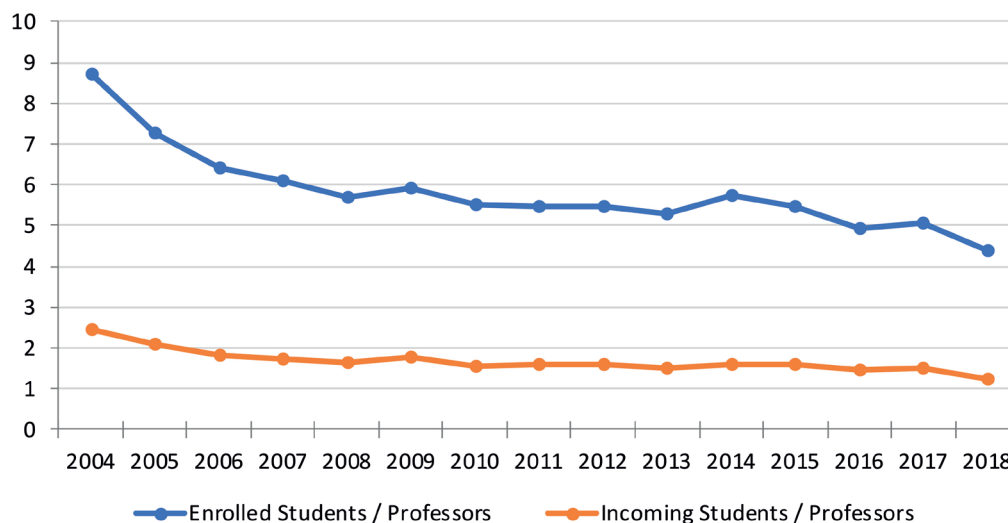
TABLE 4.3 – EVOLUTION OF THE NUMBER OF ENROLLED STUDENTS, INCOMING STUDENTS, AND PROFESSORS, 2004-2018

All Schools	Enrolled students	Incoming students	Professors	Enrolled students / Professors*	Incoming students / Professors*
2004	10289	2874	1181	8.71	2.43
2005	10191	2929	1401	7.27	2.09
2006	10080	2849	1569	6.42	1.82
2007	9984	2813	1643	6.08	1.71
2008	10170	2955	1791	5.68	1.65
2009	10767	3223	1823	5.91	1.77
2010	10904	3084	1974	5.52	1.56
2011	11100	3194	2030	5.47	1.57
2012	11243	3304	2061	5.46	1.60
2013	11404	3263	2157	5.29	1.51
2014	11882	3327	2075	5.73	1.60
2015	12219	3561	2232	5.47	1.60
2016	12397	3640	2515	4.93	1.45
2017	12829	3843	2524	5.08	1.52
2018	13028	3619	2977	4.38	1.22

Source: Unicamp Institutional Evaluation Report 2009-2013 and PRPG Statistical Yearbook (2019).

Note: \* "Professors" are all accredited doctors in Unicamp's *Stricto Sensu* graduate programs who have supervised or co-supervised regular students of these programs. If the professor is accredited in two programs, he/she has been counted twice.

GRAPH 4.11 – OVERALL EVOLUTION OF THE RATIO OF STUDENTS TO ACCREDITED PROFESSORS IN THE GRADUATE PROGRAMS, 2014-2018



Source: DAC.

The most prevalent assumption for the drop in enrollment rate is based on the increased offer of undergraduate and graduate programs in Brazil, coupled with a government student financing policy that was practically nonexistent in previous decades. Moreover, the labor market, when heated (as in the late 2000s and early 2010s), attracts people who might be studying; when sluggish, it discourages those who can't find a job and do not have financial and/or emotional conditions to study.

In any case, a more detailed analysis per PPG is necessary, as these are heterogeneous in size, pedagogical dynamics, strategies and policies for student attraction and professor accreditation; some are structured with direct and close orientation between advisor and tutored student, in others practical and theoretical training overlap. For this purpose, an analysis was performed of the Internal Evaluation answers on the student-professor ratio and what measures were taken to deal with possible deficiencies. The next pages feature information and answers regarding the ratio of enrolled and incoming students to full-time professors (and the respective numbers), from the five areas of knowledge into which the data of this Institutional Evaluation were organized. All comments were made by those responsible for preparing the Internal Evaluation of each school. For all cases, the source is DAC via S-Integra. It is worth noting, however, that in several instances there are discrepancies between the numbers mentioned in the answers and the numbers presented in the tables. The reason may be both the sources used for the comments and data (problem that has to be reviewed at the university) and the fact that these numbers vary during the year and thus represent the time of their compilation. In addition, the person responsible for the information may be referring to data from 2019 rather 2014-2018.

The following sections refer to figures and comments regarding the Internal Evaluation question: "Was the ratio of students to accredited full-time professors in the program adequate and what measures were taken to address possible deficiencies?" It is worth noting that some of the comments refer to the supervised student-professor ratio

and others refer to the enrolled or incoming student-professor ratio (in both cases, CAPES recommendations on these ratios vary by Evaluation area).

## 4.2.1 Biological and Health Sciences

### ■ Animal Biology (IB)

The student-professor ratio is adequate and tends to improve with the insertion of new professors in the Program.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Animal Biology	2014	86	20	18	04.77	01.11
	2015	84	24	19	04.42	01.26
	2016	79	21	21	03.76	01.00
	2017	92	34	25	03.68	01.36
	2018	98	29	28	03.50	01.03

### ■ Biology Education (IB)

There is an adequate student-professor ratio, and in each incoming period each advisor receives one student. The average of two students per advisor from the second incoming period should be maintained.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Biology Education	2017	20	20	20	01.00	01.00
	2018	40	20	22	01.81	00.90

### ■ Biosciences and Technology of Bioactive Products (IB)

The program has 25 full-time professors and five part-time professors to supervise about 65 students (22 master's and 43 doctoral students). The number of students per professor is approximately three, and the number of incoming students per professor is one. Very few professors have large numbers of students to supervise. Some full-time faculty members have larger research groups than the part-time professors and this can also have a positive impact on other aspects, such as funding and production, which can be considered a favorable point since full-time professors are more committed to procuring financial resources and producing high quality publications. The program's faculty has professors from IB-UNICAMP and other Unicamp's schools, such as FCF, IQ, CPQBA, and also from LNBIO/CTBE/LNLS-Campinas-SP, who work in the Pharmacy area. In addition, the Program has sought the participation of prestigious foreign professors in program subjects, such as Special Topics in Bioscience and Bioactive Product Technology and General Seminars on Bioscience and Bioactive Product Technology I and II, enabling the establishment of exchanges and collaborative scientific works, as well as providing updated knowledge on specific topics of Pharmaceutical Sciences.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Biosciences and Technology of Bioactive Products	2014	69	32	13	05.30	02.46
	2015	77	18	14	05.50	01.28
	2016	82	20	18	04.55	01.11
	2017	69	11	18	03.83	00.61
	2018	65	12	23	02.82	00.52

#### ■ Cellular and Structural Biology (IB)

In the quinquennium, the average ratio of incoming students to professors was 1.6. In turn, the average ratio of enrolled students to professors was around 5. These figures reflect the good distribution of students among teachers.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Cellular and Structural Biology	2014	127	24	17	07.47	01.41
	2015	118	35	19	06.21	01.84
	2016	111	29	28	03.96	01.03
	2017	115	23	29	03.96	00.79
	2018	112	28	34	03.29	00.82

#### ■ Child and Adolescent Health (FCM)

The student-professor ratio is considered adequate and professors with fewer students have been encouraged to increase the number of students under their supervision.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Child and Adolescent Health	2014	158	41	32	04.93	01.28
	2015	158	38	26	06.07	01.46
	2016	149	35	34	04.38	01.02
	2017	159	49	40	03.97	01.22
	2018	153	41	44	03.47	00.93

#### ■ Clinical Dentistry (FOP)

The program showed a reduction in the incoming student-professor ratio as a result of decrease in the number of professors, funding, and student allowance. International cooperation and internationalization programs have been implemented and should be the focus.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Clinical Dentistry	2014	172	30	30	05.73	01.00
	2015	215	80	30	07.16	02.66
	2016	178	31	32	05.56	00.96
	2017	211	81	32	06.59	02.53
	2018	162	27	34	04.76	00.79

### ■ Collective Health (FCM)

In the last evaluation, the following comment was made: “The program presented stability and renewal [of faculty] in the quadrennium. Full-time professors carry out more than 70% of supervision, which indicates some dependence on part-time professors in this regard.” To remedy this dependency, accreditation was reorganized so that nowadays there are 25 full-time advisors and four collaborating advisors, who are responsible for supervising only five students in 113 enrolled.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Collective Health	2014	138	32	21	06.57	01.52
	2015	132	40	24	05.50	01.66
	2016	120	28	26	04.61	01.07
	2017	118	33	25	04.72	01.32
	2018	125	38	26	04.80	01.46

### ■ Dental Materials (FOP)

The student-professor ratio is considered adequate.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Dental Materials	2014	47	12	10	04.70	01.20
	2015	60	17	11	05.45	01.54
	2016	55	15	11	05.00	01.36
	2017	39	1	11	03.54	00.09
	2018	38	13	11	03.45	01.18

### ■ Dentistry (FOP)

The number of enrolled and incoming students has decreased over the last five years, leading to an average of 4.38 supervised students per professor in 2018. This decrease has already been observed by the PPG-O Coordination Committee and discussed at meetings leading to some actions to reverse this scenario. It is noteworthy that with the increase in the number of PPGs in Brazil, many professionals interested in pursuing a graduate degree decide to stay in their hometowns or home states instead of attending it in other locations, even though the Program is of excellence. In order to raise visibility, PPG-O has increased the use of social media to further publicize its activities, actions and awards. However, other actions should be discussed, especially to meet the defense deadlines set by CAPES and the quality of student training. Even so, the number of incoming students is compatible with the number of full-time professors of the Program.



Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Dentistry	2014	171	65	21	08.14	03.09
	2015	124	8	24	05.16	00.33
	2016	156	50	24	06.50	02.08
	2017	126	32	25	05.04	01.28
	2018	114	21	26	04.38	00.80

#### ■ Ecology (IB)

The student-professor ratio is considered adequate. After criticism from CAPES, student enrollment was increased from 2014.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Ecology	2014	119	35	18	06.61	01.94
	2015	122	25	19	06.42	01.31
	2016	116	22	19	06.10	01.15
	2017	100	24	19	05.26	01.26
	2018	95	22	29	03.27	00.75

#### ■ Functional and Molecular Biology (IB)

All professors of the program have supervision activities and students regularly enrolled in the program. In addition, no professor in the program has a very high number of students to supervise.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Functional and Molecular Biology	2014	151	27	24	06.29	01.12
	2015	144	38	27	05.33	01.40
	2016	135	29	27	05.00	01.07
	2017	122	28	32	03.81	00.87
	2018	130	32	35	03.71	00.91

#### ■ Genetics and Molecular Biology (IB)

The student-professor ratio is considered adequate, and very few professors have a high number of students. Full-time professors clearly form larger research groups compared to part-time professors. This is considered positive since full-time professors are more committed to procuring financial resources and producing high quality publications.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Genetics and Molecular Biology	2014	292	74	26	11.23	02.84
	2015	289	64	25	11.56	02.56
	2016	258	54	35	07.37	01.54
	2017	265	70	38	06.97	01.84
	2018	284	86	39	07.28	02.20

### ■ Hemotherapy (FCM)

The student-professor ratio is considered adequate, but currently the number of full-time professors limits the creation of new classes. The full-time faculty is also limited to the characteristic of the program, as it is a very specific area of medical knowledge. The current proposal is the maximum of one class every two years, with three-year completion term, and 10 to 20 places per class.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Hemotherapy	2016	11	11	6	01.83	01.83
	2017	11	0	6	01.83	00.00
	2018	27	16	7	03.85	02.28

### ■ Human Genetics (FCM)

The student-professor ratio is not considered adequate yet since the program is under implementation.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Human Genetics	2017	2	2	9	00.22	00.22
	2018	2	0	11	00.18	00.00

### ■ Internal Medicine (FCM)

The student-professor ratio is 2.94, and the creation of new places complies with the recommended number of three students per advisor.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Internal Medicine	2014	231	70	60	03.85	01.16
	2015	229	77	62	03.69	01.24
	2016	235	81	62	03.79	01.30
	2017	249	72	68	03.66	01.05
	2018	250	72	86	02.90	00.83

### ■ Management and Collective Health (FOP)

The student-professor ratio is considered adequate.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Management and Collective Health	2014	87	8	8	10.87	01.00
	2015	77	27	12	06.41	02.25
	2016	72	11	12	06.00	00.91
	2017	87	42	12	07.25	03.50
	2018	91	23	12	07.58	01.91

### ■ Medical Pathophysiology (FCM)

Since it is a program of excellence with experienced professors, all of them with a consolidated line of research, this issue is not of prime importance to the program since the flow of students is excellent. The Program's coordination office has acted promptly when professors report any issue.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Medical Pathophysiology	2014	174	60	20	08.70	03.00
	2015	162	29	22	07.36	01.31
	2016	150	30	26	05.76	01.15
	2017	137	35	27	05.07	01.29
	2018	146	34	28	05.21	01.21

### ■ Medical Sciences (FCM)

In the last CAPES evaluation, the ratio of students to full-time professor was 2.7 and more than 80% of full-time professors had students. In 2018, this ratio (2.7 students per professor) remained. The evaluation on this item was adequate.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Medical Sciences	2014	204	44	57	03.57	00.77
	2015	198	65	55	03.60	01.18
	2016	198	63	61	03.24	01.03
	2017	207	60	68	03.04	00.88
	2018	198	30	66	03.00	00.45

### ■ Nursing (FENF)

The student-full-time professor ratio is considered adequate, and there is no need for the program to implement measures to remedy deficiencies.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Nursing	2014	136	29	12	11.33	02.41
	2015	137	33	17	08.05	01.94
	2016	138	34	19	07.26	01.78
	2017	143	34	22	06.50	01.54
	2018	129	28	25	05.16	01.12

### ■ Nutrition, Sports and Metabolism Sciences (FCA)

The student-full-time professor ratio in the Program was not adequate in the last quadrennial evaluations. The recommendation of the area is that more than 80% of full-time professors (DPs) should have a ratio above or equal to 1 per doctorate and/or above or equal to 2 per master's degree within the quadrennium. In the last quadrennial evaluation (2013-2016), the program received a "Good" classification in this evaluation item, precisely because only 11 out of 14 (78%) full-time professors presented this ratio. As a measure

to mitigate this deficiency, full-time professors are currently required to supervise at least two students to remain accredited. In addition, the professors' performance in the program started being informed through figures and tables. Data from 2017 and 2018 show a significant improvement in the student-faculty ratio (above 1, in both cases for incoming students) of the Program, which indicates that such measures started having a positive effect.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Nutrition, Sports and Metabolism Sciences	2014	59	15	23	02.56	00.65
	2015	65	26	20	03.25	01.30
	2016	66	18	23	02.86	00.78
	2017	80	28	25	03.20	01.12
	2018	93	37	23	04.04	01.60

#### ■ Oncology Patient Assistance (FCM)

All full-time professors supervise at least one regular student in the program to date. To avoid neglecting any cancer care area, students in areas with few candidates may have priority in the selection process if necessary.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Oncology Patient Assistance	2016	13	13	20	00.65	00.65
	2017	31	18	37	00.83	00.48
	2018	52	21	22	02.36	00.95

#### ■ Oral Biology (FOP)

Care is taken not to exceed the average supervised student-professor ratio recommended by CAPES and the number of professors is adequate to the number of enrolled and incoming students.

Graduate Program	Year	Enrolled Students	Incoming Students		Professors	Enrolled students / Professors	Incoming students / Professors
Oral Biology	2014	74	26		9	08.22	02.88
	2015	67	19		11	06.09	01.72
	2016	81	24		13	06.23	01.84
	2017	93	29		13	07.15	02.23
	2018	90	19		14	06.42	01.35

#### ■ Oral Pathology and Oral Medicine (FOP)

The period presented no deficiencies.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Oral Pathology and Oral Medicine	2014	59	16	9	06.55	01.77
	2015	60	17	9	06.66	01.88
	2016	55	18	9	06.11	02.00
	2017	56	16	9	06.22	01.77
	2018	62	21	10	06.20	02.10

#### ■ Oral Radiology (FOP)

The student-professor ratio is considered adequate.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Oral Radiology	2014	46	11	10	04.60	01.10
	2015	50	16	11	04.54	01.45
	2016	46	13	10	04.60	01.30
	2017	39	8	10	03.90	00.80
	2018	40	8	10	04.00	00.80

#### ■ Pharmaceutical Sciences (FCF)

The program is still in the consolidation phase. The program has 23 full-time professors and 31 students (18 master's and 13 doctoral students). This means that there are 1.35 students per full-time professor on average. Regarding the full-time professors, 71% supervise students. Efforts to attract new students are quite constant. There are two selection processes throughout the year, with 15 students enrolling per process. Due to such growth, it is expected that over the next two years the number of students will double from 30 to 60, increasing the average number of students per professor to 2.6, which is quite adequate. Fourteen (61%) out of 23 full-time professors are CNPq productivity fellow.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Pharmaceutical Sciences	2017	10	10	23	00.43	00.43
	2018	25	16	23	01.08	00.69

#### ■ Pharmacology (FCM)

The student-professor ratio is considered adequate. In 2018, the student-full-time advisor ratio was 4.8.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Pharmacology	2014	99	23	13	07.61	01.76
	2015	88	29	13	06.76	02.23
	2016	92	27	13	07.07	02.07
	2017	87	24	13	06.69	01.84
	2018	85	25	14	06.07	01.78

### ■ Physical Education (FEF)

The Graduate Program Committee of the School of Physical Education has sought to faithfully follow the recommendations of CAPES Area 21, in which Physical Education is inserted. It should be noted that until 2012, the maximum number of tutored students per full-time professor was six, maintaining the proportionality of three master's and three doctoral students, and two tutored students per part-time professor. In 2013, CAPES increased the number of students per professor to eight. In the 2013-2016 quadrennium, CPG-FEF reevaluated its internal rules and established this number for full-time professors, respecting the proportionality, and one supervision for each collaborating professor. For the 2017-2020 quadrennium, the program reevaluated the accreditation/reaccreditation criteria based on the observations and difficulties identified in the previous quadrennium, as it did in the second half of 2019, after CAPES mid-term meeting, defining the new criteria. Therefore, it is verified that the student-professor ratio is adequate and meets CAPES evaluation criteria.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Physical Education	2014	166	57	29	05.72	01.96
	2015	163	37	33	04.93	01.12
	2016	205	77	32	06.40	02.40
	2017	205	55	33	06.21	01.66
	2018	220	54	34	06.47	01.58

### ■ Plant Biology (IB)

This ratio was somewhat unbalanced at the beginning of the last four years period due to the retirement of several full-time faculty members and the accreditation of newly-hired professors. It is believed that this ratio will be more stable over the next two years, with more master's and doctoral students being supervised by the new professors.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Plant Biology	2014	122	33	12	10.16	02.75
	2015	110	24	19	05.78	01.26
	2016	112	31	21	05.33	01.47
	2017	107	28	23	04.65	01.21
	2018	101	16	29	03.48	00.55

### ■ Collective Health: Policies in Health Management (FCM)

The number is adequate. Full-time professors are chosen based on curriculum, work proposal and participation in the program, reflecting the different areas of knowledge of collective health and therefore the requirements of health care to wit: planning and management; epidemiology; environmental health; social sciences; workers' health, family medicine, occupational health; health law, and ethics.



Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Collective Health: Policies in Health Management	2014	62	21	24	02.58	00.87
	2015	70	25	24	02.91	01.04
	2016	69	24	22	03.13	01.09
	2017	68	25	24	02.83	01.04
	2018	62	17	24	02.58	00.70

#### ■ Science Applied to Medical Qualification (FCM)

The student-professor ratio can be improved. There are full-time professors who teach the subjects and others who participate in the supervision of students from various areas of health care as advisors or co-advisors. The program aims to bring together the professors who are more care-oriented and integrate them into the program. The professor-student ratio can still be improved as new professors have joined the program; in 2019, the number of places has increased from 20 to 25, and the intention is to review the productivity of professors and their projects in order to decide whether they will stay in the program.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Science Applied to Medical Qualification	2017	20	20	29	00.68	00.68
	2018	40	20	42	00.95	00.47

#### ■ Surgical Sciences (FCM)

There were 118 students regularly enrolled in the program by the end of 2018. Thus, the number of students per professor is 3.4. CAPES recommendation for this area is three students per professor. To meet this proportion more adequately, in 2019 only one selection process was opened for incoming students.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Surgical Sciences	2014	144	36	35	04.11	01.02
	2015	137	50	33	04.15	01.51
	2016	127	39	41	03.09	00.95
	2017	140	51	43	03.25	01.18
	2018	147	54	36	04.08	01.50

## 4.2.2 Exact and Earth Sciences

#### ■ Applied Mathematics (IMECC)

Considering that in 2019 the Program had 36 professors and 15 part-time professors and trained 72 master's and 101 doctors, in the last five years period (2014-2018), the ratio of students to accredited full-time professors is considered adequate.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Applied Mathematics	2014	207	65	41	05.04	01.58
	2015	215	54	43	05.00	01.25
	2016	207	39	53	03.90	00.73
	2017	183	39	50	03.66	00.78
	2018	181	59	55	03.29	01.07

#### ■ Applied and Computational Mathematics (IMECC)

The number of students accepted has dropped in the last selections. To correct this issue, the program has made contacts to offer MINTER in regions lacking graduate programs, such as the states of Acre and Roraima.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Applied and Computational Mathematics	2014	37	25	29	01.27	00.86
	2015	43	10	18	02.38	00.55
	2016	54	25	28	01.92	00.89
	2017	54	19	24	02.25	00.79
	2018	57	17	32	01.78	00.53

#### ■ Chemistry (IQ)

The average number of tutored students per accredited full-time professor in the program has varied between 4.3 and 5.9 in the period covered by this evaluation. This figure is highly significant considering the national average. The maximum number of tutored students per professor according to regulations is in practice unlimited (20 students per professor, a figure rarely reached in IQ history). However, as the Graduate Program Committee (CPG) limits the number of institutional grants allocated to each advisor to a maximum of six, and considering that funds from other sources (including FAPESP) have been limited, this factor has increasingly contributed preventing groups from having a very large numbers of tutored students. Currently, most professors (+50%) have between three and six tutored students, which is considered adequate. It is also observed that the average number of tutored students per professor has been steadily decreasing. This is a national trend in graduate chemistry programs, having been detected in almost all programs in the country. Nevertheless, CPG has acted to attract more master's and doctoral candidates: for example, in the second semester of 2018, the selection rules changed, allowing direct entry – regardless of the selection exam – of candidates who have already obtained scholarships from FAPESP or other sources as well as former Scientific Initiation grant holders who have attended at least one graduate program as a special student. It is not yet possible to evaluate the results of this recent change.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Chemistry	2014	500	104	84	05.95	01.23
	2015	488	129	90	05.42	01.43
	2016	448	114	90	04.97	01.26
	2017	465	118	93	05.00	01.26
	2018	439	93	100	04.39	00.93

#### ■ Computer Science (IC)

The student-professor ratio is 7.5. According to the CAPES report, this ratio is adequate, but there is no definitive answer to this question. For some professors this number may be large, and for others twice that number is not. Considering the deficit of grants and their low values, especially when compared to the market wage for computer occupations in the regions of Campinas and São Paulo, it is unreasonable to believe that the number of students can be increased. Moreover, there are areas that attract more students and others that attract fewer. These factors partly explain the large variability in the ratio of tutored students to advisor among faculty. No corrective action was taken.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Computer Science	2014	345	76	40	08.62	01.90
	2015	376	109	42	08.95	02.59
	2016	380	111	49	07.75	02.26
	2017	364	107	53	06.86	02.01
	2018	365	99	57	06.40	01.73

#### ■ Geosciences (IG)

Nowadays, PPG-Geosciences has 53 master's and 42 doctoral students. The program has 24 professors from DGRN (Department of Geology and Natural Resources), mostly registered as full-time and only three still as collaborators, so the average number of tutored students per advisor was 4.75 in 2019, slightly below the number of six tutored student per advisor recommended by CAPES. In 2018, 26 students enrolled to attend a master's program – 88.5% Brazilians and 11.5% from other South American countries (Colombia, Peru and Argentina). In the same year, 16 students enrolled in doctoral programs – 95.8% from Brazil and only 4.2% from abroad (Colombia). The selection process notices are widely publicized online, but a problem is the number of scholarships offered by the program per year, which is, on average, 11 for master's and five for doctoral degrees. Efforts have been made to increase the number of qualified publications in order to maintain the program's grade and thus achieve a better CAPES evaluation. On the other hand, scholarships have been procured with other funding agencies besides CAPES and CNPq, such as FAPESP and ANP.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Geosciences	2014	95	23	16	05.93	01.43
	2015	113	45	19	05.94	02.36
	2016	110	30	25	04.40	01.20
	2017	113	36	27	04.18	01.33
	2018	121	50	27	04.48	01.85

#### ■ Mathematics (IMECC)

The student-professor ratio is considered adequate.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Mathematics	2014	135	31	31	04.35	01.00
	2015	154	55	43	03.58	01.27
	2016	152	42	48	03.16	00.87
	2017	183	61	45	04.06	01.35
	2018	178	41	47	03.78	00.87

#### ■ Mathematics in National Network – PROFMAT (IMECC)

The number of professors in the program is low, since the contribution to PROFMAT is not considered when calculating the professor's internal course load. The program has many part-time professors (retirees), and the coordinating committee has been trying to attract more active professors to join the faculty.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
PROFMAT	2014	118	50	22	05.36	02.27
	2015	122	28	27	04.51	01.03
	2016	69	0	25	02.76	00.00
	2017	78	44	25	03.12	01.76
	2018	59	17	27	02.18	00.62

#### ■ Physics (IFGW)

A slight reduction in the student-professor ratio in the period is observed. This is partly due to the gradual increased of new professors in the school and the addition of part-time professors from CNPEM. However, mention should be made of the effort to reduce graduation time for master's and doctoral students. Thus, although the number of incoming students remained the same, the number of students actually enrolled fell during the period, as many of them completed their projects. It is understood, therefore, that student training has become more efficient. These numbers are in line with the national average for the area, but even so efforts have been made to attract more students, with the stimulus of direct doctoral studies via FAPESP scholarships.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Physics	2014	242	60	84	02.88	00.71
	2015	237	52	87	02.72	00.59
	2016	229	56	84	02.72	00.66
	2017	218	60	85	02.56	00.70
	2018	218	60	88	02.47	00.68

#### ■ Statistics (IMECC)

There was no increase in the number of graduate students in this period compared to the previous one. This may be due to the existence of new graduate programs and the financial resources received in recent years. An important feature of the program was the traditional summer course and summer activities. These activities have been almost terminated due to lack of financial resources. The traditional summer course offered subjects to select and level students the master's degree. In addition, there were activities for students already enrolled in the master's program. Due to lack of funding, some of these activities have been reformulated, requiring more professors cooperating with the program, in both undergraduate and graduate studies. Although new faculty have been hired during this period, this effort has not yet been sufficient to meet the demands of undergraduate and graduate subjects. Therefore, the number of accredited professors in the program can be improved.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Statistics	2014	60	15	16	03.75	00.93
	2015	58	16	17	03.41	00.94
	2016	57	17	19	03.00	00.89
	2017	50	16	21	02.38	00.76
	2018	60	22	20	03.00	01.10

### 4.2.3 Arts and Humanities

#### ■ Administration (FCA)

The student-professor ratio is considered adequate.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Administration	2017	10	10	23	00.43	00.43
	2018	23	13	23	01.00	00.56

#### ■ Applied Linguistics (IEL)

In the period covered by this report, the average number of incoming students for master's and doctoral degrees increased slightly (4% and 12%, respectively), compared to the average of the last 19 years, while the average time to graduation remained stable. The

number of graduates in master's degrees fell 14% in the period compared to the average of the last 19 years, while the number of graduates in doctorate increased 16%; therefore, considering both levels, the program's productivity in the period was compatible with the historical series, despite the decrease in faculty and the placement of several more experienced professors by newly-hired professors, between 2014 and 2017. The average number of students per professor ranged from 5.0 to 7.7 in the period, with a median of 6.6. Given that CAPES considers eight as the ideal number of students per professor, the ratio of enrolled students to full-time professors can be considered adequate. However, in 2019-2020, five of the current 18 full-time faculty members will retire or take pre-retirement leave. It should be mentioned that in 2019 the number of incoming students was atypically low in the master's program and close to the peak value of the historical series in the doctorate. Taken together, these factors indicate that the optimal maximum number of supervisions recommended by CAPES will be exceeded in the next period if the current replacement rate of retired professors remains below the required level.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Applied Linguistics	2014	141	36	15	09.40	02.40
	2015	139	30	21	06.61	01.42
	2016	139	44	25	05.56	01.76
	2017	145	47	26	05.57	01.80
	2018	144	32	27	05.33	01.18

#### ■ Architecture, Technology and City (FEC),

The list of tutored students per full-time professor was not criticized in the last evaluation. The limit of eight students per professor is established as desirable by the Program.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Architecture, Technology and City	2014	77	20	22	03.50	00.90
	2015	81	27	22	03.68	01.22
	2016	102	42	23	04.43	01.82
	2017	110	33	22	05.00	01.50
	2018	127	42	24	05.29	01.75

#### ■ Demography (IFCH)

In the last CAPES evaluation, the Program received a positive feedback, pointing out that the number of students is well distributed among the professors. Indeed, the Program has about four students per full-time professor per year, with an average of 4.2 in 2014-2018.



Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Demography	2014	68	15	13	05.23	01.15
	2015	69	18	15	04.60	01.20
	2016	67	16	15	04.46	01.06
	2017	72	19	12	06.00	01.58
	2018	62	15	14	04.42	01.07

#### ■ Economics (IE)

PGP-CE has about 36 professors, 25 of whom are full-time professors. The student-professor ratio is considered adequate.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Economics	2014	96	30	43	02.23	00.69
	2015	105	33	46	02.28	00.71
	2016	112	32	47	02.38	00.68
	2017	127	48	40	03.17	01.20
	2018	130	35	44	02.95	00.79

#### ■ Economic Development (IE)

PGP-DE has about 43 professors, 30 of whom are full-time professors. The student-professor ratio is considered adequate.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Economic Development	2014	170	54	46	03.69	01.17
	2015	189	64	48	03.93	01.33
	2016	201	67	54	03.72	01.24
	2017	207	59	56	03.69	01.05
	2018	230	77	58	03.96	01.32

#### ■ Education – PPG-E (FE)

The student-professor ratio is adequate considering the number of accredited full-time professors. This item was evaluated by CAPES as 'Very Good.' This is because, during the last quadrennium, 100% of the full-time professors taught in graduate education and supervised students at this education level; 91.2% of the subjects offered are taught by full-time professors, and 97.3% of the total number of professors in the Program have between one and 10 graduate students, which resulted, in the quadrennium, in the production of 249 master's dissertations and 284 doctoral theses. The number of tutored students per full-time professors divided by the average of full-time professors was 5.1.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Education	2014	627	120	94	06.67	01.27
	2015	591	126	103	05.73	01.22
	2016	589	155	114	05.16	01.35
	2017	583	156	105	05.55	01.48
	2018	595	154	111	05.36	01.38

#### ■ School Education – PM (FE)

In the initial phase of the Professional Master (PM) proposal, there was a very significant adhesion of full-time professors from PPG-Education who committed to developing the program's proposal as well as several requests from researchers with extensive professional experience in public schools to be accredited as part-time professors, who were incorporated as professors. Over the two years of existence of the PM, faculty composition produced distortions that could negatively impact the CAPES evaluation, as it exceeded the 30% of part-time professors allowed in the CAPES Area document. Concrete action by the coordination office showed that some professors were not effectively performing the activities inherent to a PM accredited full-time professor (offer of subjects, supervision of students), requiring them to manifest their interest in and possibility of remaining as accredited professor in this category. Several professors voluntarily asked to leave the program claiming momentary impediment, despite recognizing the importance of the PM. The faculty who remained as full-time and part-time professors were instructed to present plans to offer subjects and openings in future selection processes to meet the expectations related to an accredited professor in the quadrennium. Currently, the PM has 35 full-time professors and seven part-time professors. Another interesting advance was the review of the program's subjects. A study was carried out aiming to achieve greater consistency between subjects and Lines of Research and the scientific production of faculty. This decision will help students plan their program of studies with greater flexibility and coherence, ensuring better chances of optimizing their time to meet the tight graduation deadlines.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
School Education	2018	35	35	42	00.83	00.83

#### ■ Geography (IG)

In the period analyzed, the ratio of enrolled students/professors evolved as follows: 07.25 in 2014; to 7.61 in 2015; 06.86 in 2016; 06.75 in 2017, and 06.45 in 2018, due to two factors: the first was the increase in the number of accredited professors in the program, since two professors were hired for the Department of Geography in 2015 (one in the area of Physical Geography, and the other in the area of Geography Teaching); and second, accreditation of part-time professors from other departments of the Institute of Geosciences and other research and higher education institutions (UNESP/Ourinhos Campus, and EMBRAPA). The graduate program committee has sought to balance the number of incoming students/ year by announcing places in selection notices.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Geography	2014	145	37	20	07.25	01.85
	2015	160	53	21	07.61	02.52
	2016	158	54	23	06.86	02.34
	2017	162	40	24	06.75	01.66
	2018	155	38	24	06.45	01.58

#### ■ History (IFCH)

The faculty is made up of 34 full-time members, all doctors, of whom nine are associate professors and seven are full professors. To this were added full professors from other Unicamp academic units with different careers, but who may apply for teaching duties in undergraduate and graduate programs, provided the application is approved by the IFCH departments, Graduate Committee and Congregation. According to the CAPES evaluation for the last quadrennium (2013-2016), “the total number of full-time professors is adequate in relation to the places offered in the annual selection for master’s and doctoral degrees.” This situation remained stable in the 2017-2018 biennium.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
History	2014	233	60	25	09.32	02.40
	2015	261	75	27	09.66	02.77
	2016	242	54	34	07.11	01.58
	2017	250	60	33	07.57	01.81
	2018	244	60	38	06.42	01.57

#### ■ History Teaching (PROFHISTÓRIA) (IFCH)

The ratio is adequate. PROFHISTÓRIA’s national project requires a minimum of eight professors. In the case of Unicamp, 15 professors of the department are accredited in the program, which reflects an ideal distribution in relation to the number of 15 incoming students/year.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
History Teaching (PROFHISTÓRIA)	2016	15	15	17	00.88	00.88
	2017	15	0	14	01.07	00.00
	2018	31	16	19	01.63	00.84

#### ■ International Relations (IFCH)

The student-professor ratio is considered adequate. In 2016, two professors from IE were accredited to replace retired professors, which led to increase enrollment and an adequate enrolled student-professor ratio. It should be noted that all Unicamp professors accredited in the Program are also accredited in other programs in their original schools, which limits the number of students they can supervise, depending on CAPES parameters.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
International Relations	2014	12	2	3	04.00	00.66
	2015	12	4	3	04.00	01.33
	2016	16	7	3	05.33	02.33
	2017	16	7	3	05.33	02.33
	2018	17	4	5	03.40	00.80

#### ■ Linguistics (IEL)

According to the table above, the Graduate Program in Linguistics has maintained a stable average of students per accredited full-time professors in the last five years: between six and five students per professor. The average of five (close to the figure of the last triennium) is effectively considered optimal by CAPES. It is worth mentioning that this figure was maintained despite two very serious factors: 1) decrease in active professors due to retirement or even resignation (for fear that a pension reform would jeopardize still valid rights or prerogatives), and 2) financial difficulties in faculty hiring and career progress faced in the last two years. The Program took measures in this sense that are related, on the one hand, to the faculty: (a) stimulus for retirees to work as part-time professors; (b) commitment of the Department and the school to replacing faculty, despite the circumstances. As for students, the Program strives to motivate graduates to complete their studies in the ideal time. Measures taken in this regard were: (a) to limit the Program scholarship term to the maximum expected time (previously, it was two years for master's degree and four for doctorate, regardless of when students received the scholarship, which motivated them to postpone the defense); (b) to establish semiannual (for masters) and annual (for doctors) activity reports, following the example of the best funding agencies (such as FAPESP). All these measures aim, among other things, to prevent the entry of a significant number of new students (289 incoming students in the quinquennium) from causing an accumulation of supervised students per professor. In addition, professors have been instructed to take on a number of students per year compatible with CAPES recommendations (three to 10 per professor), taking into account the flow of defenses under their supervision.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Linguistics	2014	200	57	30	06.66	01.90
	2015	211	63	32	06.59	01.96
	2016	215	64	40	05.37	01.60
	2017	206	42	41	05.02	01.02
	2018	219	63	42	05.21	01.50

#### ■ Multimedia (IA)

The student-professor ratio is considered adequate. The program takes care to respect the average number of incoming students per year and not exceed the limits established by CAPES: eight students per professor. Currently, there are 53 enrolled students (including master's and doctoral students) for a faculty of 12 professors (10, considering the period of this evaluation), which is within the average described above.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Multimedia	2014	72	18	10	07.20	01.80
	2015	68	17	9	07.55	01.88
	2016	70	20	10	07.00	02.00
	2017	61	8	11	05.54	00.72
	2018	58	16	10	05.80	01.60

#### ■ Music (IA)

The number of master's and doctoral students in the Program is 128, and there are 38 professors supervising students, resulting in an average of 3.3 students per professor. This ratio is not homogeneous: advisors have from one to seven students, but, in general, there are no more than five students per advisor, as recommended by CAPES. It should also be considered that the Area Document provides the possibility of some full-time professors supervising more than five students – for example, in the case of productivity grant fellows or professors with proven ability in procuring research funding.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Music	2014	186	44	21	08.85	02.09
	2015	193	64	26	07.42	02.46
	2016	204	54	28	07.28	01.92
	2017	191	44	31	06.16	01.41
	2018	185	53	33	05.60	01.60

#### ■ Performing Arts (IA)

The student-accredited full-time professor ratio of the program is adequate. Prominent among the measures adopted is the reduction in the number of incoming students in order to improve the research supervision quality of PPG-ADC master's and doctoral programs.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Performing Arts	2014	150	52	25	06.00	02.08
	2015	165	47	24	06.87	01.95
	2016	137	2	29	04.72	00.06
	2017	136	40	26	05.23	01.53
	2018	105	31	28	03.75	01.10

#### ■ Philosophy (IFCH)

The ratio is adequate. There are 24 full-time professors and 40 master's and 90 doctoral students enrolled.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Philosophy	2014	161	37	13	12.38	02.84
	2015	156	39	18	08.66	02.16
	2016	151	41	22	06.86	01.86
	2017	142	43	21	06.76	01.79
	2018	130	25	24	05.41	01.04

#### ■ Political Science (IFCH)

Considering enrolled students (99) and full-time professors (15) (one of them is a postdoc in the Program), the student-professor ratio is 6.6. Although this figure meets CAPES criteria, given the low number of full-time professors in the Program over the past two years it was necessary to reduce the number of incoming students not to assign more than eight students per professor. This has implications for the number of students that graduate and for the balance between doctoral and master's graduates. It should be noted that the other excellence program in the area has an average of 19 full-time professors. Due to this scenario, in the next selection process it will be necessary to continue reducing the number of incoming students, offering about 15 places for master's and doctoral programs. This will certainly affect the number of doctoral graduates. Given the longer time to graduate at this level, in a short period of time the limit of student-professor ratio suggested by CAPES will be reached, which is worrisome. To solve this problem, the program is striving to attract part-time professors, but there are also reaching the maximum limit. The proper way to solve this issue would be to hire new professors.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Political Science	2014	107	26	14	07.64	01.85
	2015	121	33	17	07.11	01.94
	2016	112	26	19	05.89	01.36
	2017	117	32	15	07.80	02.13
	2018	111	26	19	05.84	01.36

#### ■ Social Anthropology (IFCH)

The concentration of students in few advisors had been noted as one of the most problematic points in the previous evaluation. In 2018, of the total number of active students in the program (134), 50 (37%) were under the supervision of nine full-time professors who joined the program in the last five years (average of 5.5 students per professor), and 78 (58%) students were divided among 13 full-time professors who have been in the program longer, an average of six students per professor. Other students are under the responsibility of the part-time professors. Thus, the renewal of professors in the program allowed a more equitable distribution of students, also reflecting the changes made in the program in the last three years, among them: 1) limit of eight tutored students per full-time professor, which implies the impossibility of opening new supervision vacancies for professors with more than eight students under their guidance; 2) reduction of graduation and defense terms.



Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Social Anthropology	2014	110	32	12	09.16	02.66
	2015	119	36	19	06.26	01.89
	2016	125	41	21	05.95	01.95
	2017	135	31	18	07.50	01.72
	2018	134	37	25	05.36	01.48

#### ■ Social Sciences (IFCH)

In 2018 there were 131 students enrolled in the Program. Thirty-four full-time professors were responsible for supervising 3.68 students in 2018. Over the past four years, the supervision average improved from 3.2 to 3.68 students per professor. This advance is the result of the renewal of the Program's faculty, with the gradual filling of positions of the previous staff by incoming professors. Considering that the Program has only the doctoral degree, which requires longer supervision, it is a good average, with room for improvement throughout this quadrennium. The measure adopted to improve the indicators was the definition of a minimum of two students per full-time professors and a maximum of six as a Program goal until it presents a better balance in its indicators (considering that the Program has only doctoral students). Greater attention has also been given to supervision in selection processes.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Social Sciences	2014	127	33	31	04.09	01.06
	2015	124	21	37	03.35	00.56
	2016	125	33	37	03.37	00.89
	2017	138	35	15	09.20	02.33
	2018	134	27	41	03.26	00.65

#### ■ Sociology (IFCH)

The student-full-time professor ratio is considered adequate. The program strives to maintain the ideal ratio of eight graduate students per professor, and there are 17 full-time professors at PPG-S. The challenge is to balance the distribution of supervision among these professors.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Sociology	2014	124	28	22	05.63	01.27
	2015	114	25	21	05.42	01.19
	2016	116	33	23	05.04	01.43
	2017	112	34	18	06.22	01.88
	2018	118	27	21	05.61	01.28

#### ■ Literary Theory and History (IEL)

Over time, the ratio of students to full-time professor has been maintained within the parameters established by CAPES. However, the program sought to anticipate issues arising

from a possible excess of students (especially lack of grants and difficulties in supervision) and, in a common effort of by the professors, preventively reduced the number of places offered in 2018 and 2019.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Literary Theory and History	2014	132	37	27	04.88	01.37
	2015	147	46	28	05.25	01.64
	2016	149	45	29	05.13	01.55
	2017	165	50	29	05.68	01.72
	2018	188	55	25	07.52	02.20

#### ■ Visual Arts (IA)

The enrolled student-full-time professor ratio is adequate and has remained balanced. In each selection, an average of 20 new master's and 13 new doctoral students have enrolled in PPG-AV. In the last five years, the number of defenses was as follows: 2013 – 2 doctoral theses and 9 master's dissertations; 2014 – 6 doctoral theses and 13 master's dissertations; 2015 – 5 doctoral theses 18 master's dissertations; 2016 – 12 doctoral theses and 18 master's dissertations; 2017 – 9 doctoral theses and 19 master's dissertations; 2018 – 9 doctoral theses and 16 master's dissertations.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Visual Arts	2014	136	35	19	07.15	01.84
	2015	146	38	19	07.68	02.00
	2016	153	37	20	07.65	01.85
	2017	153	37	18	08.50	02.05
	2018	146	33	22	06.63	01.50

## 4.2.4 Engineering and Technology

#### ■ Agricultural Engineering (FEAGRI)

The program's ratio of students to professors is within the values recommended by CAPES, that is, between 6 and 8. The readjustment of accreditation criteria was responsible for maintaining these adequate indexes.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Agricultural Engineering	2014	176	36	28	06.28	01.28
	2015	175	53	31	05.64	01.70
	2016	170	50	34	05.00	01.47
	2017	185	46	36	05.13	01.27
	2018	178	36	38	04.68	00.94

### ■ Chemical Engineering (FEQ)

The number of students per full-time professor has been maintained at around nine, which may be considered adequate given the faculty supervision capacity, the infrastructure available in the school, the number of grants received in FEQ from funding agencies and agreements and the amount of funds raised in the FEQ for direct research. Currently, FEQPPG faculty comprises 43 full-time professors and eight internal part-time professors. All full-time professors are members of FEQ and among the part-time professors, two are FEQ active professors and the others are FEQ retired professors. According to FEQPPG Regulation, accreditation of professors from outside FEQ as advisors is not allowed, but their accreditation as a co-advisor is possible. To date, automatic accreditation of full-time professors has been FEQPPG policy, in view of the institution's own requirements for evaluating professors' performance at specified times through the Faculty Activity Report (RAD). This situation is reflected in the reduction of indicators whose denominator is the number of full-time professors in the Program. However, the Regulations are being revised to include this item as accreditation and disqualification criteria must be described to comply with the Unicamp's Graduate Programs General Rules. The deadline for including this item in the Regulations was November 2019.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Chemical Engineering	2014	404	92	45	08.97	02.04
	2015	402	115	48	08.37	02.39
	2016	416	146	58	07.17	02.51
	2017	424	126	59	07.18	02.13
	2018	433	118	68	06.36	01.73

### ■ Civil Engineering (FEC)

The student-full professor ratio was not criticized in the last evaluation. The limit of eight students per professor is established as desirable by the Program.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Civil Engineering	2014	247	82	40	06.17	02.05
	2015	265	91	40	06.62	02.27
	2016	284	91	44	06.45	02.06
	2017	314	107	50	06.28	02.14
	2018	320	75	51	06.27	01.47

### ■ Electrical Engineering (FEEC)

Traditionally, the approximate average of tutored students per full-time professor in the graduate program is six. The Graduate committee's internal instruction establishes that professors with greater scientific production can advise a larger number of students, respecting the limit established by CAPES. There is also a grant distribution policy that favors professors who raise external grants, but also seeks to allocate at least one master's grant and one doctorate grants to each professor. In general, it is found that the most active

professors in intellectual production are the ones who supervised the most students, which is natural given that is desirable for research work developed at FEEC to be disseminated nationally and internationally, and in quality journals. At times, the number of enrolled students (about 350 in master's and 350 in doctoral programs per year) does not reflect exactly how many students are actually attending subjects or writing dissertations or theses, because a significant number of students do not formalize their dismissal from the university with Unicamp's academic board following the first voluntary enrollment on entry, students are automatically enrolled in subsequent semesters in dissertation or thesis, remaining in the system for the graduation term). There are no actual entry class in the graduate program, because in both the master's and doctoral degree each student must fulfill different stages according to their area of concentration and the line of research in which they are involved. In addition to the specific subjects, there is the individualized research work and the time required for qualification and defense. The number of full-time professors in the program has been around 80.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Electrical Engineering	2014	706	220	105	06.72	02.09
	2015	744	261	119	06.25	02.19
	2016	755	253	114	06.62	02.21
	2017	773	223	115	06.72	01.93
	2018	777	243	122	06.36	01.99

#### ■ Food Engineering (FEA)

Currently, the program has 21 accredited professors, of whom 18 are full-time professors and three part-time professors. There are thus 2.3 students per professor in the master's program and 3.7 students per professor in the doctoral program. The overall average is around six students per professor, which is considered good, taking into account the existence of new full-time advisors in early career. Professors can be accredited in the program in three categories: Full-time faculty members of the Graduate Program in Food Engineering, working in teaching, research and guidance in graduate studies; Part time – professors working in only one of the graduate activities (teaching, research, or supervision); Visiting – accredited researchers and released by their original institution for a specific activity in the program, such as teaching subjects or co-supervising students. Disqualification or category change of professors has occurred due to retirement. In some cases, professors who continue working in the program after retiring change from full-time to part-time. Although there is an imbalance in the number of students tutored by full-time faculty, especially between new and older professors, no measures have been taken to achieve immediate equity, allowing stabilization to occur naturally.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Food Engineering	2014	124	33	11	11.27	03.00
	2015	133	36	16	08.31	02.25
	2016	133	31	22	06.04	01.40
	2017	125	33	31	04.03	01.06
	2018	134	46	32	04.18	01.43

#### LABORATORY OF HIGH PRESSURE IN FOOD ENGINEERING



Antonio Scarpinetti/SEC – Unicamp.

#### ■ Food and Nutrition (FEA)

The student-professor ratio is considered adequate. All full-time professors advise master's and doctoral students and generally have at least one defense per year. The student-professor ratio has been around six during the quadrennium. In 2015 there were 62 students and 11 accredited professors, and in 2018, 78 students and 12 professors (11 full-time and one part-time professor). Disqualification of professors is due to their removal from activities, usually by retirement. There is a retired professor who continues to work as a full-time professor.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Food and Nutrition	2014	73	21	7	10.42	03.00
	2015	72	22	6	12.00	03.66
	2016	84	21	11	07.63	01.90
	2017	89	28	15	05.93	01.86
	2018	99	26	16	06.18	01.62

#### ■ Food Science (FEA)

There is a high demand and interest from students from all over Brazil and abroad regarding Food Science Graduate Program (PPG-CA), especially for some of the research

projects of the program. For large and multidisciplinary projects to be conducted and/or for competencies and skills to be developed and maintained within a research group, and to ensure the development and advance of activities, research groups of more than 10 members may be needed. Added to that is the tradition of FEA in food science in Latin America and the reputation of PPG-CA, which was created in 1969 and has graduated more than 750 masters and doctors to date, besides the pioneering work and specialty of some professors in their research projects. Thus, some professors have more than 10 students under their supervision. In this case, it does not negatively affect the program, a fact shown in the indicators of master's and doctoral degrees and intellectual production. Comparatively, in 2014 there were 163 enrolled students and 12 accredited professors (full-time and part-time professors). By 2018 there were 150 enrolled students and 19 accredited professors (full-time and part-time). In general, the number of enrolled students was maintained. The slight increase in faculty is due to retirements and subsequent hiring of professors between 2015 and 2017 in the areas of biochemistry, microbiology, toxicology, and food chemistry. According to data in the CAPES evaluation platform ("Sucupira platform"), there are 19 professors (full-time and part-time). The others are currently in the visiting or temporary researcher/professor categories (participating in co-supervision activities or teaching graduate classes).

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Food Science	2014	163	34	11	14.81	03.09
	2015	150	30	13	11.53	02.30
	2016	151	47	15	10.06	03.13
	2017	160	50	22	07.27	02.27
	2018	150	32	23	06.52	01.39

#### ■ Food Technology (FEA)

The average ratios has been five to seven enrolled students per professor and one to two incoming students per professor. These ratios have decreased in the last four years due to the retirement of some professors (who remained in the graduate program faculty) and the entry of newly-hired professors. Thus it is considered as a transition phase, since the number of enrolled students remained approximately constant. On the other hand, the increase in the number of professors is temporary and should be reduced with the defense of the last students of retired professors. Efforts have been made to increase the enrolled student-professor ratio by publicizing the selection process more widely and updating its regulations to allow distance selection of students.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Food Technology	2014	100	21	14	07.14	01.50
	2015	97	23	13	07.46	01.76
	2016	103	34	15	06.86	02.26
	2017	96	25	18	05.33	01.38
	2018	93	23	18	05.16	01.27



### ■ Mechanical Engineering (FEM)

The Mechanical Engineering program is relatively extensive when compared to other programs currently implemented at Brazilian universities. The program currently has 580 students enrolled, a number that has been increasing in recent years. It is also observed that the number of enrolled students each year is close to 180, and about 30 doctoral students and 75 master's degree students in the last five years have graduated within the required term. The number of enrolled students per professor has varied between 9.6 and 8.0. This number has fallen in recent years due to the entry of several new professors. In this context, the number of full-time professors increased from 47 to 73 in the last five years. Even considering these important changes in the period, the average number of students per full-time professor of around eight is considered adequate for the program.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Mechanical Engineering	2014	453	174	47	09.63	03.70
	2015	463	147	52	08.90	02.82
	2016	513	197	59	08.69	03.33
	2017	590	214	68	08.67	03.14
	2018	580	160	72	08.05	02.22

### ■ Petroleum Sciences and Engineering (FEM)

The program has lost experienced professors in a short time. Another point of concern is faculty aging. Former and current management efforts have been directed at attracting new professors, and the reflection of these conditions and actions may be felt in the next period. Participants of the new Petroleum Engineering Research Center, funded by FAPESP, should also positively impact the program. Another possibility under study is to expand the lines of research for closer integration with the professors of the Program in Mechanical Engineering.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Petroleum Sciences and Engineering	2014	127	57	14	09.07	04.07
	2015	144	62	14	10.28	04.42
	2016	149	53	19	07.84	02.78
	2017	145	57	23	06.30	02.47
	2018	143	56	21	06.80	02.66

### ■ Production and Manufacturing Engineering (FCA)

The ratio regular students to accredited full-time professors in the program is fairly adequate. Today the program has 18 full-time professors and a total of 59 regular students, which would result in 3.2 students per professor. The program also has seven part-time professors and two visiting professors. Thus, there are no deficiencies in this regard. Finally, it should be mentioned that the program holds a semester selection, showing noteworthy increase in the number of incoming students from other federal and state public universities (UFOP, USP, UFPR, and UTFPR) and from abroad. For example, in 2018 there were 71 students participating in the regular student selection process and only 22

students were approved and enrolled. Regarding foreign students, two were received in 2017, one in 2018 and two in 2019.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Production and Manufacturing Engineering	2014	28	12	16	01.75	00.75
	2015	44	17	22	02.00	00.77
	2016	66	34	31	02.12	01.09
	2017	81	31	25	03.24	01.24
	2018	84	22	33	02.54	00.66

#### ■ Technology (FT)

The average number of students per professor is 3.5. This figure is below the maximum recommended by the CAPES interdisciplinary area, which is 10. In the selection process, the program restricts the acceptance of students for professors who exceed the maximum number recommended by CAPES. As the number of students per professor is below the maximum recommended, there is scope for the Program to increase its student population. Actions such as publicizing the Program more widely in Brazil and Latin America may lead to an increased number of incoming students.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Technology	2014	104	36	38	02.73	00.94
	2015	151	70	46	03.28	01.52
	2016	190	76	53	03.58	01.43
	2017	208	55	60	03.46	00.91
	2018	243	77	65	03.73	01.18

### 4.2.5 Interdisciplinary Programs

#### ■ Interdisciplinary in Applied Human and Social Sciences (FCA)

The Program has 49 regularly enrolled students and 12 full-time professors, with a ratio of 4 students to each professor, considered adequate for the Evaluation Area.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Interdisciplinary in Applied Human and Social Sciences	2014	15	15	14	01.07	01.07
	2015	30	15	17	01.76	00.88
	2016	50	21	18	02.77	01.16
	2017	57	22	18	03.16	01.22
	2018	50	11	17	02.94	00.64

#### ■ Bioenergy (FEA, USP and UNESP)

As it is an interinstitutional and multiunit program, the accreditation of many professors is expected, since the faculty is composed of professors from USP, Unicamp and

UNESP. As for Unicamp faculty, they do not belong to one single school, but are dispersed in several schools. At the beginning of the period reported (2014), there were 16 accredited professors and 18 students enrolled at Unicamp and in 2018 these numbers increased to 24 professors and 45 students, which reflects the effort of the Program attract for more professors and new students. As the Program is under consolidation and explores a theme of worldwide relevance, the student-professor ratio is expected to fall until it reaches a balance in the coming years, as in other already consolidated programs.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Bioenergy	2014	18	18	16	01.12	01.12
	2015	24	8	17	01.41	00.47
	2016	32	9	20	01.60	00.45
	2017	42	12	23	01.82	00.52
	2018	45	6	24	01.87	00.25

#### ■ Energy Systems Planning (FEM)

The student-professor ratio has remained close to 5, which is considered adequate by the Program. However, actions have been taken to mitigate dispersion among professors. It should be noted that the figures presented in the Institutional Evaluation System are slightly different from those registered in the Capes evaluation platform (Sucupira Platform).

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Energy Systems Planning Interdisciplinary area	2014	57	22	10	05.70	02.20
	2015	63	21	11	05.72	01.90
	2016	73	26	13	05.61	02.00
	2017	80	27	14	05.71	01.92
	2018	85	23	15	05.66	01.53

#### ■ Environment and Society (Nepam and IFCH)

The Doctoral Program in Environment and Society has: 38 students remaining from the 2009 class, 40 students remaining from 2010, 35 from 2011, 35 from 2012, 43 from 2013 and 44 regularly enrolled in 2014-2018. By the end of 2018, the total was 59 students. There are 24 professors in the Program (full-time and part-time professors) and 2.9 enrolled students per professor.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Environment and Society	2014	44	18	15	02.93	01.20
	2015	36	8	16	02.25	00.50
	2016	44	16	16	02.75	01.00
	2017	44	9	17	02.58	00.52
	2018	44	15	15	02.93	01.00

### ■ Gerontology (FCM)

The program has 12 full-time professors, eight part-time professors and two visiting professors. In the evaluation period, it had 27 master's and 33 doctoral students. The ratio of students to professors is considered very good according to the CAPES evaluation.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Gerontology	2014	55	19	11	05.00	01.72
	2015	60	12	13	04.61	00.92
	2016	63	24	15	04.20	01.60
	2017	64	19	16	04.00	01.18
	2018	74	22	16	04.62	01.37

### ■ Health, Interdisciplinary Practice and Rehabilitation (FCM)

The professor-student ratio is considered good. Recent and prospective retirements may change this scenario. The expectation is that replacement of professors will be resumed in order to compensate for these losses, maintaining a good professor-student ratio to prevent future issues.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Health, Interdisciplinary Practice and Rehabilitation	2014	68	31	13	05.23	02.38
	2015	61	19	15	04.06	01.26
	2016	73	31	18	04.05	01.72
	2017	68	24	19	03.57	01.26
	2018	79	31	21	03.76	01.47

### ■ Multi-unit on Science and Mathematics Education (IFGW)

The ratio (between 3 and 4) of students to full-time professor can be considered good.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Multi-unit on Science and Mathematics Education	2014	80	30	18	04.44	01.66
	2015	90	30	19	04.73	01.57
	2016	101	31	21	04.80	01.47
	2017	111	43	28	03.96	01.53
	2018	123	35	30	04.10	01.16

### ■ Communication of Science and Culture (IEL, Labjor-Nudecri)

In 2018 the ratio was of 2.3 students (73) to each professor (31).

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Communication of Science and Culture	2014	72	23	22	03.27	01.04
	2015	79	25	21	03.76	01.19
	2016	74	23	21	03.52	01.09
	2017	80	29	21	03.80	01.38
	2018	73	24	25	02.92	00.96

#### ■ Science and Technology Policy (IG)

The current number of professors is adequate to the number of students. There is currently a total of 26 professors, 19 of whom are full-time professors. In the past there was a deficit of professor for the desired number of students, and Limeira-FCA professors were registered as full-time, leading to increased supervision capacity. It should be said that in the near future there may be a reduction in faculty due to the various planned retirements, which may change the current supervision capacity. The program is seeking to assess possible departures and retirements, planning the medium- and long-term needs to prepare future hiring. Unreliable funding, however, makes planning still excessively uncertain.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Science and Technology Policy	2014	98	26	17	05.76	01.52
	2015	100	27	19	05.26	01.42
	2016	95	18	23	04.13	00.78
	2017	98	30	23	04.26	01.30
	2018	93	31	24	03.87	01.29

#### ■ Teaching and History of Earth Sciences (IG)

In 2017, the program had 14 full-time professors and eight part-time professors. In the last CAPES quadrennial evaluation, the indicator of dissertations and thesis in relation to full-time faculty was rated “Very Good” in the Teaching Area for academic programs, affirming the efficiency of the Program in relation to defenses. The number of full-time supervisors in relation to the total number of full-time faculty members has remained balanced, helping to overcome difficulties of restructuring made by the Program in the beginning of the second year of the quadrennium.

Graduate Program	Year	Enrolled Students	Incoming Students	Professors	Enrolled students / Professors	Incoming students / Professors
Teaching and History of Earth Sciences	2014	45	19	9	05.00	02.11
	2015	57	25	8	07.12	03.12
	2016	63	19	10	06.30	01.90
	2017	86	33	14	06.14	02.35
	2018	91	23	14	06.50	01.64

It can be noticed that there is no single strategy to maintain or even increase student-professor ratio among PPGs. Unicamp, a young university, has only recently begun to feel

the effects of an increasingly expressive number of retirements. Moreover, as stated above, there is an increasing offer of programs around the country following an expansion of Brazilian graduate programs, but which has impaired higher education funding in recent years. But it is also worth considering that PPGs have human resources that go beyond full-time faculty, and many attract part-time professors to join the set of professors who are able to supervise, teach and research in graduate programs. This measure – sanctioned by CAPES – generally contributes to updating and filling gaps of research topics at PPGs and often allows interaction between areas of knowledge that would not otherwise come closer.

Looking more closely at visiting professors, many PPGs claim that they do not use this professor profile. Others state that this is the case of co-supervisors. Moreover, several PPGs consider this figure important to strengthen ties with international faculty or researchers and to meet the demands of graduate students more adequately: “Visiting professors work in professors co-supervision of master’s and doctoral projects, work in qualification and defense committees and participate as co-authors of publications, thus contributing to different aspects of the program”; “National and foreign visiting professors in the program, who perform both long and short term activities, are PPG external collaborators.... They are professors who play a relevant role in PPG development, performing several activities, such as publication of scientific articles and preparation of research projects together with professors of the IG, co-supervision of graduate students, teaching subjects, short courses, lectures, etc. Many of them have established ooperations not only with the school but also with other Brazilian research groups. The IG has received visiting professors from a variety of foreign institutions, particularly from the United States, Canada, England, the Netherlands, Belgium, and Czech Republic. Visiting professors importance for PPG development ... can be measured in several ways, but these contacts especially help strengthen professional ties between professors and students of the program, which enable exchanges and Sandwich PhD Programs to occur, for example.”

DOCTORAL DEGREE CERIMONY, HISTORY JOINT  
DEGREE BETWEEN UNICAMP AND SORBONNE UNIVERSITÉ



Antoninho Perri/SEC – Unicamp.



## 4.2.6 Student academic flow

Regarding graduating students, Table 4.4 shows the number of students enrolled in master's and doctoral programs per school. In the five years of the series of this Institutional Evaluation, 6,586 master's and 4,898 doctoral students received their degree. The variation between 2014 and 2018 was an increase of 16% in masters and 7% in doctors, with greater contribution in the last year of the series.

TABLE 4.4 – NUMBER OF MASTER'S AND DOCTORAL STUDENTS  
PER SCHOOL, 2011-2018

Master									Doctoral								
School	2011	2012	2013	2014	2015	2016	2017	2018	School	2011	2012	2013	2014	2015	2016	2017	2018
FCA	-	-	13	17	27	37	43	51	FCA	-	-	-	-	0	0	6	9
FCM	186	213	185	203	188	188	181	188	FCM	108	141	123	125	135	118	111	140
FE	84	63	73	71	64	56	44	61	FE	57	38	83	64	82	72	74	57
FEA	61	56	57	43	44	46	44	46	FEA	45	42	37	50	41	54	50	63
FEAGRI	25	18	18	15	28	10	13	24	FEAGRI	18	18	16	23	22	15	15	23
FEC	52	37	45	52	35	53	44	80	FEC	21	16	23	23	19	17	21	22
FEEC	80	72	75	71	75	73	79	87	FEEC	40	35	42	38	48	39	45	47
FEF	21	20	30	22	18	27	15	23	FEF	15	12	17	15	17	21	14	21
FEM	132	98	98	90	73	97	111	119	FEM	24	43	48	39	41	36	46	43
FENF	-	-	11	19	14	11	14	16	FENF	-	-	13	11	16	15	27	14
FEQ	79	69	52	40	38	39	48	59	FEQ	31	34	33	35	35	38	28	36
FOP	106	68	100	83	66	102	81	77	FOP	79	49	82	76	80	72	84	66
FT	9	21	26	18	15	30	33	31	FT	-	-	-	-	0	0	1	7
IA	43	61	52	74	66	61	106	56	IA	34	37	23	44	31	58	41	56
IB	102	83	121	85	111	80	77	85	IB	75	83	88	117	98	98	81	103
IC	38	34	40	31	41	36	39	37	IC	13	21	18	13	18	24	16	17
IE	30	34	24	35	34	43	36	51	IE	22	18	19	18	21	15	30	30
IEL	57	60	77	61	73	62	71	64	IEL	39	50	56	37	46	46	40	40
IFCH	77	93	66	73	103	56	74	90	IFCH	72	75	93	76	97	95	98	102
IFGW	28	20	26	20	28	53	25	43	IFGW	21	16	21	23	15	23	34	19
IG	53	41	46	38	47	35	60	41	IG	24	32	28	22	37	33	34	29
IMECC	41	33	36	38	77	67	55	59	IMECC	34	39	29	41	28	37	46	30
IQ	50	39	39	35	52	40	44	43	IQ	46	45	54	58	49	40	50	42
TOTAL	1.354	1.233	1.310	1.234	1.317	1.302	1.302	1.431	TOTAL	818	844	946	948	976	966	992	1.016

Source: PRPG Statistical Yearbook, 2019

Note: No indication of the number of graduating students means no defense due to the beginning date of the Graduate Program (PPG).

#### BOX 4.2 – FIRST THESIS AND FIRST DISSERTATION DEFENDED AT UNICAMP

“Planorbid Mollusks of the Federal District – Brasília” is the title of the first thesis defended at Unicamp, but developed at University of Brasília. [Luiz Augusto] Magalhães was supervised by Professor Lobato Paraense, a specialist in mollusk transmitters of schistosomiasis, with whom he worked in Manguinhos. “I was assigned to check the first occurrences of schistosomiasis in Brasília. Everything indicated that they were autochthonous, that is, people contracted the disease there. The problem mainly affected the working population that built the city and lived near the water bodies where the mollusks multiplied,” explains the professor. Luiz Magalhães presented his work to Unicamp’s board at 9 am on April 5, 1967. “Twenty-four hours later the second thesis was defended by Professor Bruno Köning Junior, from the Anatomy Department. As Bruno and I later worked at the Institute of Biology, the School of Medical Sciences does not keep records of the first two theses,” explains the doctor (Unicamp’s Journal, Issue 231 – September 29 to October 5, 2003). “Considerations on the growth and development of the face and their application in orthodontics” is the title of the first dissertation defended at Unicamp in 1969, by Disney Alves Cunha, in the Dentistry Program of the School of Dentistry of Piracicaba, supervised by professor Manoel Carlos Muller de Araújo (<http://www.repositorio.unicamp.br/handle/REPOSIP/335126>)

As expected, not all students complete their graduate studies with a degree. In a survey conducted with data from DAC in 2009-2019, the dropout rate (that is, expected number of graduates compared to actual number of graduates) ranged from close to zero to about 25%. The main reasons for withdrawing from graduate programs are described below:

- Conclusion term exceeded (term for thesis or dissertation defense has not been met);
- At Unicamp’s request;
- Foreign student with expired visa;
- Lack of supervision;
- Term to present diploma exceeded;
- Double failure in language proficiency;
- At the advisor’s request for poor performance;
- Academic Performance Coefficient (poor performance);
- Abandonment; and
- Failure in more than one discipline.

The most prevalent cause of withdrawal is conclusion term exceeded, that is, the student exceeds the time to conclude the Graduate Program (PPG). In this case, the Graduate Program Regulation establishes that the student may be reaccepted in the program for dissertation or thesis defense provided that he/she has fulfilled all other requirements necessary for the defense. PPGs with the highest dropout rate are some professional master’s and master’s programs in which the market is heated and very competitive, such as Computer Science and Electrical Engineering.

In the case of the *Lato Sensu* Specialization program in Science Journalism, the mentioned strategies to avoid and/or reduce dropout rates are: “The dropout rate of the

*Lato Sensu* graduate program is around 10%. The usual number of accepted students is 40, among journalists and professionals from other areas (there are many biologists in the program).<sup>4</sup> The main reasons for students to withdraw from the program are difficulty of getting leave from work to study, unemployment and need to bear the costs related to the program (transportation and food, for example). Graduate Programs (PPGs) thus seek to remind students of the extensive reading load and preparation of assignments that will require their dedication. “To try to solve the labor issue, we help students get grants from FAPESP the José Reis Program (*Mídia Ciência*), which encourages science journalism and awards six-month grants with the possibility of renewal for another six months. In addition to helping students remain in the program, the program forces them to produce material related to what they are learning in class, enriching their experience in the area. Finally, one measure to prevent students from dropping out is the adjustments we seek to implement with each new edition. Students are invited to evaluate all subjects during the three-semester cycle. If one subject does not seem to interest students anymore, we try to replace it with another directly linked to the program’s objectives, and within the pedagogical proposal. Communication is dynamic and new trends emerge from time to time, and we seek to adjust the program for it to continue attracting good candidates, meeting students’ expectations until the.”

The Integrated Training Program (PIF) – a “program for students regularly enrolled in Unicamp Undergraduate programs, which allows the simultaneous completion of Undergraduate and Graduate programs with a view to successively completing Undergraduate and Master’s Degrees”<sup>4</sup> – allows the participation of undergraduate students in graduate programs. The numbers indicate that there are already graduates and regular students enrolled in Graduate Programs (PPGs) coming from PIF. One of the PPGs evaluates PIF positively: “The school has inserted the PIF program in all its programs. There is a great demand for this modality by the school’s undergraduate students, and there are already graduates and regular students that came from PIF. The schools considers PIF strategic to attract young talent, especially in an adverse scenario of graduate student financing. The Program has had two excellent experiences with PIF, one in 2015 and one in 2017.” However, there are schools that chose not to integrate with PIF, especially in Humanities. Given the specificity of the area, in some Congregations it was decided that students’ term to graduate should respect the internships, experiences and maturity acquired in the undergraduate, master’s and doctoral programs.

In turn, it is noteworthy that, in the specific case of Medical Sciences, since 2010 there has been an equivalence of PIF with the Medical Researcher Program, also known as the MD/PhD Program. Briefly, two places per year are made available to medical students who present an unequivocal researcher profile during the scientific initiation development. These students are disconnected from academic activities for a period of two years to pursue a doctoral degree and resume their academic functions at the end of this period. These students are allowed to defend their doctoral dissertation upon receiving the medical degree. Following this program, the student closes a cycle of studies in eight years (six of undergraduate studies and two of graduate studies), which would normally be

4. Further information at <https://www.dac.unicamp.br/portal/estudantes/pif>

twelve years or more if he/she chose to do residency before the graduate program. The first three students of the Medical Researcher Program are enrolled in the Graduate Program in Internal Medicine.

As for the ways to publicize the admission process for selection and entry of new regular students, practically all PPGs do so on their web pages not only in Portuguese, but also in English and Spanish, as this is a CAPES requirement, and also through mailing list and more currently on digital platforms and social networking sites. Regarding the dissemination of theses and dissertations, the PPGs informed that they use Unicamp Library System (SBU) database, publications in scientific journals, and participation in congresses and events in the area. In some cases – especially in Exact and Earth Sciences, Engineering and Technology, and even Biological and Health Sciences, technical disclosure may also occur through patents and software registration.

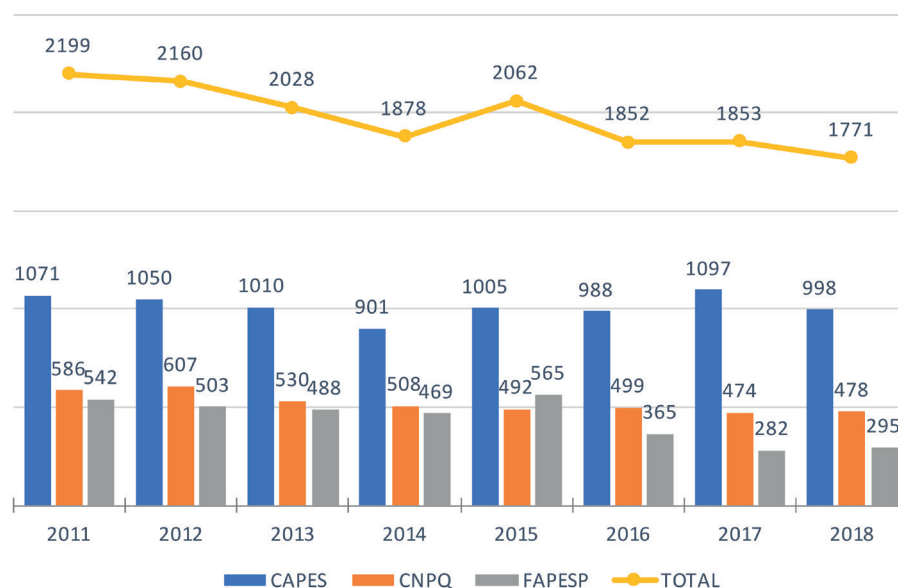
When asked about the themes of theses and dissertations, the PPGs affirmed positively that they are aligned with areas of concentration and lines of research that compose their central structure. Some programs indicated that they reviewed the lines of research based on CAPES evaluation, via the CAPES' evaluation platform (Sucupira Platform).

## 4.3 Funding

Grants are one of the most important means of ensuring a significant volume of research at master's and doctoral levels in Brazilian universities. In the case of Unicamp, Graph 4.12 and Graph 4.13 below present for master's and doctoral degrees, respectively, the evolution of the number of grants in the country from the three most important funding sources for this modality – CAPES, CNPq and FAPESP.

In the case of master's degree, it is clear that, after an increase in 2015 (more than 2,000 grants) compared to the previous year, especially due to CAPES and FAPESP, support decreased in later years – given the economic crisis and funding cuts at funding agencies – and the period ended with fewer grants (more precisely 1,771 in 2018) than in 2014 (1878), and CAPES was the agency with the largest contribution to funding for research in master's degree, through grants.

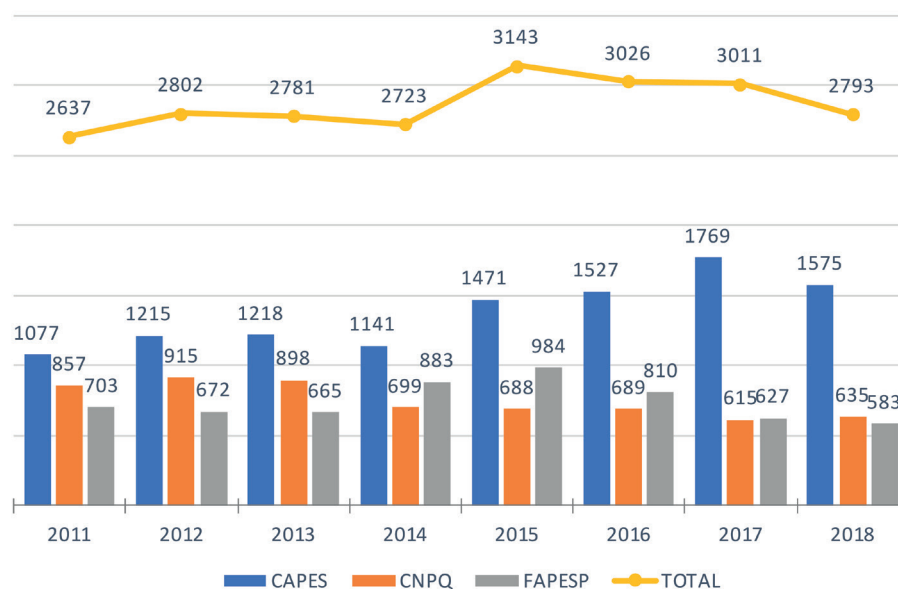
GRAPH 4.12 – MASTER'S DEGREE GRANTS AWARDED BY FUNDING AGENCIES, 2011-2018



Source: PRPG Statistical Yearbook (2019)

In the case of doctorates, 2015 (with more than 3,100 grants) was also the year in which the number of grant holders was the highest in the period under review, strongly due to CAPES, which, incidentally, again increased the number of grants in 2016 and 2017, with a drop in 2018. CNPq support remained stable, while FAPESP support decreased after a slight increase in 2015. In the last year of the period, 2018, a little fewer than 2,800 grants were awarded, a volume similar to the first year of the quinquennium, 2014, with 2,723 grants from the three agencies.

GRAPH 4.13 – DOCTORAL GRANTS AWARDED BY FUNDING AGENCIES, 2011-2018



Source: PRPG Statistical Yearbook (2019)

Given these figures, funding through grants for master's and doctoral research did not keep pace with the increase in regular graduate students at Unicamp in the second decade of the twenty-first century – this support was greater than 44% in 2012 and 2015, remaining above 40% between 2010 and 2016; in 2017 it did not reach this level, and in 2018 it was less than 37%, as can be seen in Table 4.5.

TABLE 4.5 – NUMBER OF REGULAR STUDENTS, NUMBER OF GRANTS, AND PERCENTAGE OF GRADUATE STUDENTS WITH GRANTS, 2010-2018

Year	Regular students (N.)	CAPES, CNPq, FAPESP grants (N.)	Students with grants (%)
2010	10,906	4,550	41.72
2011	11,106	4,836	43.54
2012	11,233	4,962	44.17
2013	11,404	4,809	42.17
2014	11,398	4,601	40.37
2015	11,686	5,205	44.54
2016	11,823	4,878	41.26
2017	12,230	4,864	39.77
2018	12,399	4,564	36.81

Source: PRPG Statistical Yearbook (2019)

Three relevant programs aimed at training basic education teachers in higher education, within the scope of the Professional Master Programs for the Qualification of Teachers of the Public Basic Education Network (CAPES ProEB) – PROFBIO, for high school Biology teaching; PROFHISTÓRIA, for elementary and high school History teaching, and PROFMAT, for high school Mathematics teaching – received funding at Unicamp in 2018, with practically R\$300,000 in CAPES grants: 12 grants totaling R\$135,000 for PROFBIO; 10 grants totaling R\$ 117,000 for PROFHISTÓRIA, and four grants totaling R\$ 45,000 for PROFMAT. Unicamp was awarded another 485 Support Program grants (including strategic programs) in 2018 from programs such as: CAPES/FAPESP Agreement (FAPESP grant holders are paid with funds transferred by CAPES to the Foundation; 295 grants); INCT/CNPq Program (48 grants); Biocomputacional and CNPEM (32 grants each); Procad/CAPES (12 grants); Zika Program (seven grants), among the most important programs in number terms (Office of Graduate Studies Statistical Yearbook 2019).

In 2018, CAPES' PAEP – Program of Support for Events in the Country – funded 20 events held by Unicamp's professors. The amount of funds raised reached R\$ 972,384.00. Table 4.6 below shows the amount of (direct and indirect) funding received by Unicamp from different CAPES programs in 2018, for operational costs and grants.



TABLE 4.6 – DIRECT AND INDIRECT FUNDING FROM CAPES, IN R\$, IN 2018

Program	Operational costs	Grants
PROAP (Graduate Support Program)	2,739,980	
PROEX (Academic Excellence Program)	4,496,215	
Grants in Brazil (M/D and PD) – Social Demand		25,995,000
Grants in Brazil (M/D and PD) – PROEX		30,336,800
PNPD (National Postdoctoral Program)		5,928,600
PNPD/PROEX	238,500	
PNPD/PROAP	90,050	
PROFISTÓRIA (Professional Master's Degree in History Teaching in National Network)	50,000	117,000
PROFBIO (Professional Master's Degree in Biology Teaching in National Network)		135,000
PROFMAT (Professional Master's Degree in Mathematics in National Network)		45,000
INCT (National Institutes of Science and Technology)		1,071,200
CAPES/FAPEAM Agreement (Amazonas State Research Support Foundation)		35,200
CAPES/FAPERO Agreement (Foundation to support Scientific and Technological Development of the State of Rondonia)		24,200
CAPES/FAPESP Agreement (São Paulo Research Foundation)		4,979,851
CAPES/Fundação Araucária (State of Paraná Research Foundation) Agreement		37,400
Biocomputacional (Academic Cooperation Network for the Study and Development of Tools for Structural and Functional Genomics)		506,200
CAPES/CNPq – Prevention of Zika	341,244	155,900
CAPES-ANA-DPB (Support Program for Teaching and Scientific and Technological Research in Regulation and Management of Water Resources)		16,400
CAPES-INPA (National Institute for Amazonian Research)		44,000
CNPq (Brazilian Center for Research in Energy and Materials)		592,000
CNPq-CAPES-PELD (Long-Term Ecological Research)	44,500	44,500
Socioeconomic Development in Brazil – PGPSE (Support Program for Postgraduate and Scientific and Technological Research in Socioeconomic Development in Brazil)	52,691	24,200
Publishing	47,250	
EMBRAPA (Brazilian Agricultural Research Corporation)		8,800
INTERFARMA (Pharmaceutical Research Industry Association)		8,200
IODP (International Ocean Discovery Program)	10,000	
IsF (Languages Without Borders)		165,300
Memórias (Brazilian Memories Program)		36,900
Modeling Program		40,500
Earth System Modeling Program	32,800	
PAEP (Program of Support for Events in Brazil)	972,384	
PBE-DPM (Special Scholarship Program for Doctorate in Medical Research)		132,000
PGPTA (Support Program for Postgraduate and Scientific and Technological Research in Assistive Technology in Brazil)		74,800
Award		110,700
CAPES Thesis Award	92,148	
Pro-Amazônia (Pro-Amazon Program: Biodiversity and Sustainability)		17,600
PROCAD (National Program of Academic Cooperation)	448,191	108,100
Pró-Forenses (Forensic Science Program)		170,700
Pró-Integração (Support Program for Teaching and Scientific and Technological Research in Regional and National Development Matters)		28,100
Protax-II (Taxonomy Training Program)		36,000
Vale-CAPES (Vale-CAPES Science and Sustainability Award for Doctoral Thesis)		24,200
Total Funding in 2018		80,409,304

Source: PRPG Statistical Yearbook (2019)

Certainly, a strategy of greater diversification of funding sources to sustain graduate research persists. The PPGs commented on the strategies adopted to increase funding, which are not very different from each other, although some PPGs would like to have a forum to assist them in this process. Comments include: to seek project funding from FAPESP and external agencies, such as the European Commission, without replacing CAPES funding, which supports much of PPGs activities; to diversify funding sources through investment in human resources to assist administratively in this action; to require, in the criteria for accreditation and opening of faculty positions, coordination of research projects by full-time professors, that is, professors would be expected to attract research funding for PPG; to intensify the search for international agreements as a way to complement the resources of national funding agencies; to direct funding from research agreements and outreach courses to finance part of the graduate activities; to be aligned with and updated (electronically) in relation to calls for proposals from all agencies and publicize them among students and professors to encourage them to apply for financial aid; to encourage professors to raise funds with private companies and funding agencies abroad, without giving up institutional support.

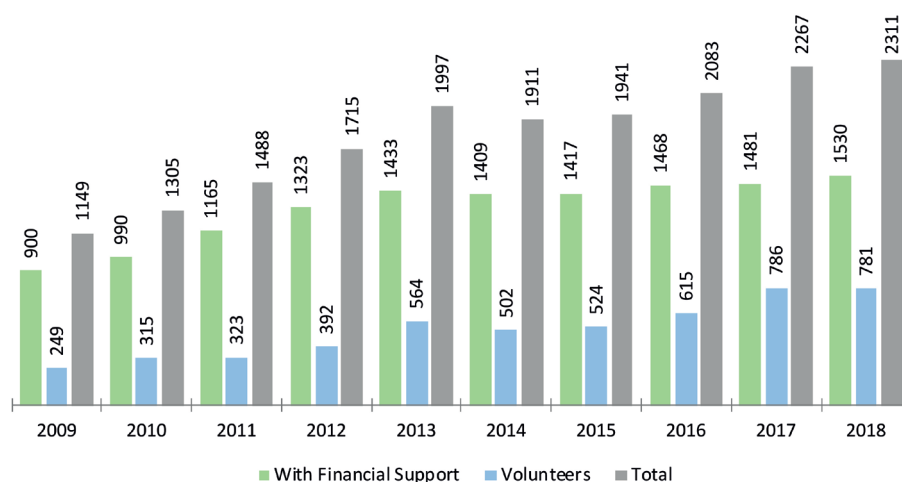
## 4.4 Teaching Internship Program (PED)

Since 1992, Unicamp has offered the Teaching Internship Program (PED), which provides the mandatory teaching experience for grant holders of CAPES, whose Ordinance No. 76, dated April 14, 2010, establishes, in Article 18 that the teaching internship is an integral part of the graduate education, aiming at preparation for teaching and qualification of undergraduate education, and is imperative for all of its grant holders. Unicamp's management accepts this premise and has directed budgetary resources to make this Program viable. The activities are performed in undergraduate subjects in all 24 schools. The semester internship can be funded or voluntary, including students with and without graduate grants.

Since 2018, PED students have benefited from the PEDMais Program, offered by EA2 (Teaching and Learning Support Space), based on on-site and distance workshops, whose objective is to offer "training opportunity for PED students to build their identity as university professors, acting effectively in the learning and training process of undergraduate students and establishing a real joint performance between professors and PEDs" (<https://www.ea2.unicamp.br/sample-page/pedmais/>).

Graph 4.14 shows the evolution of the number of PED students in 2009-2018. Both categories presented increase in the period, except in 2014. In 2009, there were 1,149 students involved, compared to 2,311 in 2018. During the period of this Institutional Evaluation, the number of PED students receiving financial support went from 1,409 (2014) to 1,530 (2018), and in the same period, volunteer students went from 502 (2014) to 781 (2018). This scenario reaffirms the consolidation of an institutional training policy carried out with budgetary resources; in turn, the remarkable increase in volunteer students reflects the success of the teacher education experience made possible by the Teaching Internship Program.

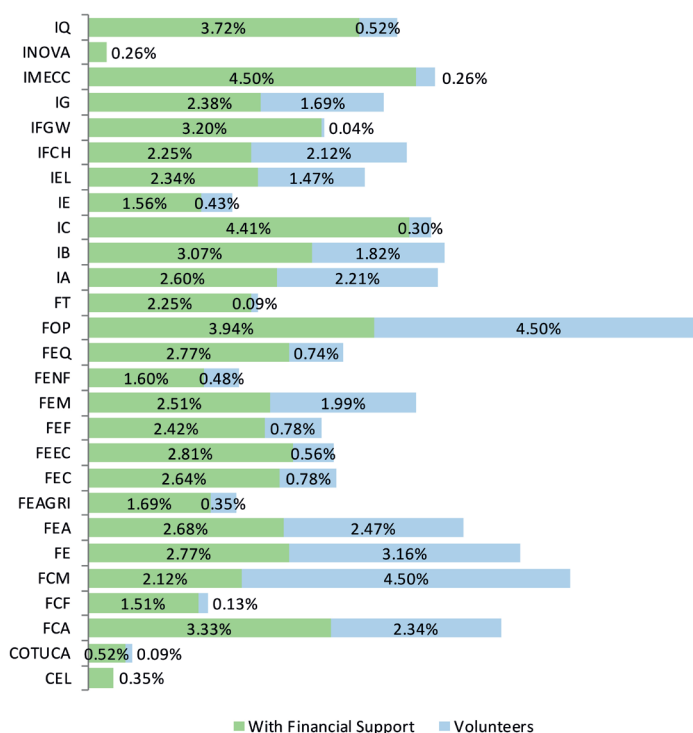
GRAPH 4.14 – STUDENTS IN THE TEACHING INTERNSHIP PROGRAM, PER CATEGORIES AND TOTAL, 2009-2018



Source: PRPG Statistical Yearbook (2019)

Per year, the budget amount allocated to PED is around R\$ 4 million, and it is considered that the return is through a more complete training of Unicamp's graduate students. Graph 4.15 shows the percentage breakdown of the 2,311 students participating in the Teaching Internship Program (PED) in 2018, with or without funding, per Unicamp's school.

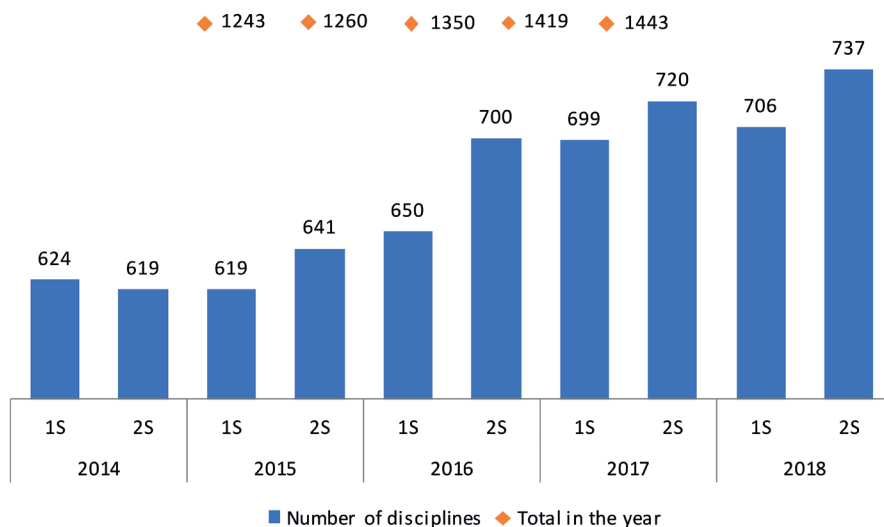
GRAPH 4.15 – PERCENTAGE BREAKDOWN OF STUDENTS PARTICIPATING IN THE TEACHING INTERNSHIP PROGRAM (PED) IN 2018, WITH AND WITHOUT FUNDING, PER SCHOOL



Source: PRPG Statistical Yearbook, 2019

The number of subjects that benefited from PED in the five years under analysis is presented in Graph 4.16. The positive evolution demonstrates the University's commitment to the Program, considering the benefits for a more complete education of Unicamp's graduate students.

GRAPH 4.16 – NUMBER OF PED SUBJECTS, PER SEMESTER AND PER YEAR, 2014-2018



Source: Office of Graduate Studies (2019)

Note: A subject may benefit from more than one PED if there is more than one class in the semester.

Regarding the impact of PED on graduate professional qualification, the overall evaluation is positive, as follows:

- "PED has great value to graduate student's qualification. It enables students to have contact with the classroom environment, and also to interact with more experienced professors in order to contribute to the elaboration of course programs and classroom activities";
- "[The School] applies PEDs in coordinated basic subjects. This allows direct interaction with professors and students by implementing a very effective program of teaching experience for students of this program. The teaching experience acquired by them is exceptional, since it is difficult for students from other Brazilian institutions to have the opportunity to teach, receiving an additional benefit, as is the case of Unicamp. In fact, given the current low grant values, we see this as an additional reason for many students to choose . Today, PED is fundamental to the adequate offer of "service subjects" (subjects offered by a school for students of Unicamp's undergraduate programs outside the school), without overloading the school's professors. There has been recently a reduction in PED budget due to the inclusion of new programs, and this has considerably affected the possibility of offering service subjects. We see that this program is hugely successful and should be expanded, and the amount of funding for existing projects should be increased";

- "... In spite of the need for stabilization and increase in the amount of grants, the result has been very positive for grant holders in their teaching internship, through which they actively participate in classes, solve students' doubts about classroom content, cooperate with the organization and dissemination of teaching resources and prepare themselves to present some topics provided in the programs, always supervised by the professors in charge";
- "Graduate student teaching internship is an activity that produces a double benefit. On the one hand, it helps in the graduate vocational training regarding the teaching process and diffusion of knowledge, and, on the other, PED activities have helped teaching activities in the classroom, benefiting a large number of undergraduate students. ... We encourage the strengthening and increase in the number of students participating in PED to assist the undergraduate students' learning process";
- "The Teaching Internship Program continues being very important in students' professional qualification, allowing experiences in teaching activities. The program is highly rated by students and has been strongly supported by the faculty. In addition, the impact on undergraduate education is very positive, allowing not only the modernization of subjects, but also the better monitoring of students."

Attention is drawn to one particular answer: "We are not aware of the existence of studies that indicate the impact of PED on graduate professional qualification. It is reasonable to speculate that students derive some benefit from participating in the planning and development of subjects."

## 4.5 Performance of Graduate Programs



Antonio Scarpinetti/SEC – Unicamp.

Unicamp's Graduate Program has presented one of the best performances and quality in Brazil in the CAPES Evaluation. Since the 1980s, the federal funding agency has adopted a very robust system for monitoring graduate programs in the country. For some years now, Graduate Programs (PPGs) have been graded from 1 to 7 (maximum 5 for PPGs that have only master's degree), and PPGs with grades 6 and 7 are considered of international excellence. Thus, it can be said that the increase in the number of graduate programs at UNICAMP was followed by the quality gain required for training graduates of excellence. Table 4.7. below shows the evolution of grades per PPG in the 2004-2006, 2007-2009 and 2010-2012 triennia, and in 2013-2016 quadrennium, for both academic master's (M) and doctoral (D) programs, as well as for professional master's degrees (PM).

TABLE 4.7. EVOLUTION OF GRADES PER PPG IN THE 2004-2006, 2007-2009 AND 2010-2012 TRIENNA AND THE 2013/2016 QUADRENNIUM, MASTER'S DEGREE AND DOCTORATE

Program	Level	2004-2006	2007-2009	2010-2012	2013-2016
Administration	M/D	-	-	-	4
Agricultural Engineering	M/D	5	5	5	4
Animal Biology	M/D	4	4	5	5
Applied Linguistics	M/D	5	6	6	5
Applied Mathematics	M/D	5	6	6	6
Architecture, Technology and City	M/D	-	-	4	5
Bioenergy	D				4
Biosciences and Technology of Bioactive Products	M/D	-	4	4	4
Cellular and Structural Biology	M/D	6	5	6	6
Chemical Engineering	M/D	7	7	6	6
Chemistry	M/D	7	7	7	7
Child and Adolescent Health	M/D	4	4	5	5
Civil Engineering	M/D	4	4	4	4
Clinical Dentistry	M/D	6	6	6	7
Collective Health	M/D	5	5	4	5
Computer Science	M/D	5	6	7	7
Dental Materials	M/D	6	6	6	6
Dentistry	M/D	7	7	7	7
Demography	M/D	5	5	6	6
Ecology	M/D	6	7	7	7
Economic Development	M/D	5	4	4	5
Economics	M/D	5	5	6	6
Education	M/D	5	5	5	5
Electrical Engineering	M/D	7	7	7	6
Energy Systems Planning	M/D	4	3	3	4
Environment and Society	D	4	5	5	6
Food Engineering	M/D	7	7	7	7
Food and Nutrition	M/D	6	6	5	5
Food Science	M/D	7	7	7	7
Food Technology	M/D	5	5	6	5
Functional and Molecular Biology	M/D	6	6	6	6
Genetics and Molecular Biology	M/D	7	7	7	7
Geography	M/D	4	5	5	6
Geosciences	M/D	5	6	6	6



TABLE 4.7. EVOLUTION OF GRADES PER PPG IN THE 2004-2006, 2007-2009 AND 2010-2012 TRIENNIA AND THE 2013/2016 QUADRENNIUM, MASTER'S DEGREE AND DOCTORATE

continued

Program	Level	2004-2006	2007-2009	2010-2012	2013-2016
Gerontology	M/D	5	5	5	5
Health, Interdisciplinary Practice and Rehabilitation	M/D	-	-	4	4
History	M/D	7	7	7	6
Interd. in Applied Human and Social Sciences	M	-	-	-	3
International Relations (*)	M/D	4	M(5) D(4)	5	4
Internal Medicine	M/D	5	5	5	5
Linguistics	M/D	6	7	7	7
Mathematics	M/D	7	7	7	7
Mechanical Engineering	M/D	7	7	7	5
Medical Pathophysiology	M/D	7	7	7	7
Medical Sciences	M/D	5	5	5	4
Multimedia	M/D	4	4	4	3
Multi-unit on Science and Mathematics Education	M/D	-	4	4	4
Music	M/D	5	5	5	6
Nursing	M/D	4	5	5	5
Nutrition, Sports and Metabolism Sciences	M/D	-	4	4	4
Oral Biology	M/D	5	5	5	5
Oral Pathology and Oral Medicine	M/D	6	6	6	6
Oral Radiology	M/D	5	5	4	5
Performing Arts	M/D	-	4	4	5
Petroleum Sciences and Engineering	M/D	4	5	4	5
Pharmaceutical Sciences	M/D	-	-	-	4
Pharmacology	M/D	5	4	4	4
Philosophy	M/D	6	6	6	6
Physical Education	M/D	4	4	4	4
Physics	M/D	7	7	7	7
Plant Biology	M/D	6	6	6	7
Political Science	M/D	5	5	5	6
Popularization of Science and Culture	M	4	4	5	4
Production and Manufacturing Engineering	M	-	-	-	3
Social Anthropology	M/D	5	5	6	5
Social Sciences	D	6	5	5	4
Sociology	M/D	5	6	6	6
Statistics	M/D	4	5	5	5
Science and Technology Policy	M/D	5	6	6	6
Surgical Sciences	M/D	4	5	5	4
Teaching and History of Earth Sciences	M/D	4	5	5	4
Technology	M/D	-	3	4	4
Theory and History of Literature	M/D	5	6	7	7
Tocogynecology	M/D	5	6	7	7
Visual Arts	M/D	-	4	4	4
Applied and Computational Mathematics	PM	-	-	-	4
Biology Education – PROFBIO	PM				4
School Education	PM				3

TABLE 4.7. EVOLUTION OF GRADES PER PPG IN THE 2004-2006, 2007-2009 AND 2010-2012 TRIENNIA AND THE 2013/2016 QUADRENNIUM, MASTER'S DEGREE AND DOCTORATE

continued

Program	Level	2004-2006	2007-2009	2010-2012	2013-2016
Hemotherapy	PM				4
History Teaching – PROHISTÓRIA	PM				4
Human Genetics	PM				4
Management and Collective Health	PM	-	-	-	5
Mathematics in National Network – PROFMAT	PM	-	-	5	5
Oncology Patient Care	PM				4
Public Health, Health Management and Policy	PM	-	-	-	4
Science Applied to Medical Qualification	PM				3

Note: M/D – Master's and Doctoral Degrees; D – Doctoral Degree; M – Master's Degree

TABLE 4.8 features the evolution of the number of PPGs with grades from 7 to 3 (Unicamp's lowest score), from the 1998-2000 triennial evaluation to the 2013-2016 quadrennial evaluation. It shows the number of academic programs and the average grade for the master's and doctoral programs. For master's degrees, the average rose from 4.80 to 5.30; for doctorates, from 4.94 to 5.40.

TABLE 4.8 – 1998-2000 TRIENNIAL EVALUATION TO 2013-2016 QUADRENNIAL EVALUATION

Grades	1998-2000		2001-2003		2004-2006		2007-2009		2010-2012		2013-2016	
	M	D	M	D	M	D	M	D	M	D	M	D
7	5	5	7	7	12	12	14	14	16	16	15	15
6	9	10	16	17	10	11	15	15	17	17	17	18
5	21	18	22	21	24	23	22	22	18	19	20	18
4	17	13	12	10	15	14	8	7	16	15	19	18
3	7	5	4	2			2	1	1	1	3	1
Total Amount of Courses	59	51	61	57	61	60	61	59	68	68	74	70
Average Grade	4.80	4.94	5.16	5.30	5.31	5.35	5.51	5.58	5.46	5.47	5.30	5.40

These are very significant indicators: 45% of PPGs had grades between 6 and 7 (excellence compared to the best international programs), and 70% of PPGs had grades above 5.

Awards are also an important indicator for the analysis of PPG performance: in the evaluation period, there were two CAPES Grand Prizes, 18 CAPES Awards and 26 Honorable Mentions for the theses defended at the University. Since 2006, the numbers have reached 12 CAPES Grand Prizes, 76 CAPES Awards and 80 Honorable Mentions, as presented in Graph 4.6. CAPES Grand Prizes, CAPES Awards, and Honorable Mentions awarded in the five-year Institutional Evaluation are detailed in Table 4.9 below. The theses titles give an overview of the topics that PPGs from various areas of knowledge have been addressing in recent years and which contributed to advancing knowledge and research in the country.

TABLE 4.9 – CAPES GRAND PRIZES, CAPES AWARDS AND HONORABLE MENTIONS, UNICAMP GRADUATE PROGRAMS, 2014-2018

2014	Program	Thesis Title	Author	Advisor
CAPES Award	Food Engineering	Production and characterization of biodegradable films of banana starch and flour reinforced with cellulose nanofibers	Franciele Maria Pelissari Molina	Florencia Cecilia Menegalli
	Medical Pathophysiology	Clinical and brain structural and functional differences between mesial temporal lobe epilepsies with and without hippocampal sclerosis	Ana Carolina Coan	Fernando Cendes
	Social Sciences	Beyond the vote: a narrative about participatory democracy in Brazil	Ana Claudia Chaves Teixeira	Luciana Ferreira Tatagiba
	Dental Materials	Evaluation of acidic functional monomers with spacer chains with different hydrophilicities and lengths	Victor Pinheiro Feitosa	Américo Bortolazzo Correr
Honorable Mention 2015	Plant Biology	Ecology, conservation and sustainable management of <i>Janaguba</i> ( <i>Himatanthus drasticus</i> ; Apocynaceae) in the Brazilian savanna	Cristina Baldauf	Flavio Antonio Maës dos Santos
	Ecology	Estimating vital rates with imperfect detection in amphibian and reptile populations	Murilo Guimarães Rodrigues	Ricardo Jannini Sawaya
	Cellular and Structural Biology	Effects of aging and Type I Diabetes Mellitus on the structure of mouse hepatocyte chromatin	Flávia Gerelli Ghiraldini	Maria Luiza Silveira Mello
	Economic Development	World of work and social protection in Brazil : essays in interpretation of recent history	José Celso Pereira Cardoso Júnior	Eduardo Fagnani
	Geosciences	Infrared monitoring of volcanoes from space	Samuel William Murphy	Carlos Roberto de Souza Filho
	Science and Technology Policy	Innovation policies of wind energy industry : an analysis of Brazilian case based on a study of international experiences	Edilaine Venancio Camillo	André Tosi Furtado
	Gynecology and Obstetric	High-dose rate brachytherapy and concomitant cisplatin for the treatment of stage IIIB cervical cancer : historical comparison and a controlled trial	Antonio Carlos Zuliani de Oliveira	Luís Otávio Zanatta Sarian
	Sociology	The political sociology of Raymond Aron	Antonio Carlos Dias Júnior	Josué Pereira da Silva
	Political Science	The resilience of the subsidies policy in the U.S.A	Thiago Lima da Silva	Sebastião Carlos Velasco e Cruz
	Electrical Engineering	Anticipation in multiple criteria decision-making under uncertainty	Carlos Renato Belo Azevedo	Fernando José Von Zuben
	Social Sciences	"I am a Police officer, but I am a woman": gender and social representations in São Paulo State Military Police	Marcos Santana de Souza	Mariza Corrêa
	Food Science	Chemical characterization and antioxidant capacity of extra-virgin olive oils from Brazil and other countries using electrophoretic, chromatographic and spectrometric techniques	Cristiano Augusto Ballus	Helena Teixeira Godoy
	Food Technology	<i>Enterococcus</i> spp. and <i>Bacillus cereus</i> isolated from ricotta processing: pathogenicity, multi-species biofilm formation and detection of the autoinducer AI-2	Meg da Silva Fernandes	Arnaldo Yoshiterv Kuaye
	Physical Education	Realities and particularities of circus professional education in Brazil : targeting a technical and college education	Rodrigo Mallet Duprat	Marco Antonio Coelho Bortoleto
	Nursing	Beliefs and psychosocial determinants factors of adherence to oral antidiabetic agents	Fernanda Freire Jannuzzi	Roberta Cunha Matheus Rodrigues
	Chemistry	Intermolecular Heck reactions with non-activated olefins. Substrate-directed processes and enantioselective formation of tertiary and quaternary stereocenters using nitrogen-containing ligands	Caio Costa Oliveira	Carlos Roque Duarte Correia

TABLE 4.9 – CAPES GRAND PRIZES, CAPES AWARDS AND HONORABLE MENTIONS, UNICAMP GRADUATE PROGRAMS, 2014-2018

continued

2014	Program	Thesis Title	Author	Advisor
Honorable Mention 2015	Social Anthropology	Agrobiodiversity and ex situ conservation: reflections on concepts and practices based on a case study of Embrapa/Brazil	Laura Rodrigues Santonieri	Mauro William Barbosa de Almeida
	Social Anthropology	Agrobiodiversity and ex situ conservation: reflections on concepts and practices based on a case study of Embrapa/Brazil	Laura Rodrigues Santonieri	Mauro William Barbosa de Almeida
	Food Engineering	Obtaining bioactive compounds from clove and rosemary using supercritical technology: influence of the bed geometry, process intensification and cost of manufacturing of extracts	Giovani Leone Zobot	Maria Angela de Almeida Meireles
	Economics	Banks, shadow banks, and endogenous money challenges for the Federal Reserve's monetary policy in the 21st century	Olivia Maria Bullio Mattos	Simone Silva de Deos
	Physical Education	Ergogenic response of melatonin at nadir and acrophase of spontaneous activity and its consequences on IKK/NF- $\kappa$ B pathway activity and muscle tissue damage	Wladimir Rafael Beck	Claudio Alexandre Gobatto
	Geography	Territory and health large technological system : the phytotherapy programs in the Unified Health System (Sistema Único de Saúde)	Luis Henrique Leandro Ribeiro	Márcio Antonio Cataia
	Medical Sciences	Evaluation by magnetic resonance imaging of functional and structural connectivities of neurofunctional networks in mild Alzheimer's disease dementia and amnesic mild cognitive impairment subjects	Marina Weiler	Marcio Luiz Figueredo Balthazar
	Chemistry	Intermolecular Heck reactions with non-activated olefins. Substrate-directed processes and enantioselective formation of tertiary and quaternary stereocenters using nitrogen-containing ligands	Caio Costa Oliveira	Carlos Roque Duarte Correia
	Ecology	Plant-hummingbird interactions: natural history and ecological networks	Pietro Kiyoshi Maruyama Mendonça	Marlies Szazima
	Civil Engineering	Experimental and numerical analysis of piled rafts executed in soil of the Campinas/SP region	Jean Rodrigo Garcia	Paulo José Rocha de Albuquerque
	Computer Science	Evolutionary algorithms for some problems in telecommunications	Carlos Eduardo de Andrade	Flávio Keidi Miyazawa
	Teaching and History of Earth Sciences	The potential teaching of geoscientific images in text books of secondary education: graphic representations of internal dynamic of the Earth	Edson Roberto De Souza	Denise De La Corte Bacci / David Brusi Belmont
	Nursing	Validation of the method for introduction of nasogastric feeding tube in adults: randomized clinical trial	Sandra Cristina Veiga de Oliveira Santos	Maria Isabel Pedreira de Freitas
	Medical Sciences	Functional and structural connectivity in patients with focal epilepsy	Brunno Machado de Campos	Fernando Cendes
	Food Technology	Effect of high isostatic pressure processing on milk-clotting enzymes	Bruno Ricardo De Castro Leite Junior	Marcelo Cristianini
	Economic Development	Multidimensional poverty in rural and urban Brazil	Adriana Stankiewicz Serra	Walter Belik
	Music	Body gesture as potentiator of meaning in guitar performance	Bruno Madeira	Fábio Scardueli
	Computer Science	Engineering Augmented Suffix Sorting Algorithms	Felipe Alves Da Louza	Guilherme Pimentel Telles

TABLE 4.9 – CAPES GRAND PRIZES, CAPES AWARDS AND HONORABLE MENTIONS, UNICAMP GRADUATE PROGRAMS, 2014-2018

continued

2014	Program	Thesis Title	Author	Advisor
	Political Science	Poor people movements : the urgencies and the right	Karin Deleuse Blikstad	Luciana Ferreira Tatagiba
	Genetics and Molecular Biology	From science to industry: metabolic engineering and adaptive evolution of <i>Saccharomyces cerevisiae</i> for second-generation ethanol production	Leandro Vieira Dos Santos	Gonçalo Amarante Guimarães Pereira
	Philosophy	Ontological underpinnings of Aristotle's philosophy of science	Breno Andrade Zuppolini	Lucas Angioni
	Mathematics	Graded central polynomials in associative algebras, and embeddings of Jordan algebra	Claudemir Fidelis Bezerra Junior	Plamen Emilov Kochloukov
	Medical Pathophysiology	Neuroimaging in Friedreich's ataxia : new approaches and clinical application	Thiago Junqueira Ribeiro De Rezende	Marcondes Cavalcante Franca Junio
	Clinical Dentistry	Narrow diameter dental implants as mandibular overdenture retainers : one year of clinical, biological and functional monitoring	Raissa Micaella Marcello Machado	Altair Antoninha Del Bel Cury
	Demography	Regional urban-rural arrangements: the rural in the state of São Paulo in 21st century	Natalia Belmonte Demetrio	Rosana Aparecida Baeninger
	Collective Health	Judicialization on health policies in Brazil : ethical, legal, economic and political foundations	Sergio Xavier De Camargo	Gastao Wagner De Sousa Campos

Source: Office of Graduate Studies , 2019

Other types of awards, excluding CAPES Awards, were also received by PPG students and faculty throughout the five years of Institutional Evaluation review, according to the schools' answers. Table 4.10 features the numbers achieved year by year by PPGs in the five areas of knowledge – from 185 in 2014 to 391 in 2018. PPGs that are not listed received no award in the Internal Evaluation.

TABLE 4.10 – NUMBER OF GRADUATE STUDENTS' AND PROFESSORS' AWARDS, PER PPG, 2014-2018

AREA OF KNOWLEDGE	GRADUATE PROGRAM	2014	2015	2016	2017	2018
Biological and Health Sciences	Animal Biology		11	4	2	6
	Biosciences and Technology of Bioactive Products	4	6	14	16	5
	Cellular and Structural Biology	8	12	5	17	9
	Child and Adolescent Health	18	5	3	14	24
	Clinical Dentistry	10	25	11	15	
	Collective Health					1
	Dental Materials	2	1	1	4	2
	Dentistry		1		5	12
	Ecology	1	4	6	1	
	Genetics and Molecular Biology		13			
	Hemotherapy – PM	4	4		5	1

TABLE 4.10 – NUMBER OF GRADUATE STUDENTS’ AND PROFESSORS’ AWARDS, PER PPG, 2014-2018  
continued

AREA OF KNOWLEDGE	GRADUATE PROGRAM	2014	2015	2016	2017	2018
Biological and Health Sciences	Internal Medicine	1	3	17	11	
	Medical Pathophysiology		5	7	4	6
	Medical Sciences			1	1	25
	Nursing	3	8	6	4	20
	Nutrition, Sports and Metabolism Sciences	3	2	3	7	8
	Oncology Patient Assistance – PM				7	
	Oral Biology	4	6	2	3	
	Oral Pathology and Oral Medicine	9			1	
	Oral Radiology	12	6	11	10	6
	Pharmaceutical Sciences					9
	Pharmacology		1	4	3	9
	Physical Education	7	7	17	18	15
	Plant Biology			1	14	2
	Surgical Sciences	10	9	12	16	38
Exact and Earth Sciences	Chemistry	2	9	5	9	12
	Computer Science	18	28	27	14	16
	Geosciences	1	1	2	7	2
	Mathematics	2	2	1	1	4
	Physics	1	3	4	7	6
	Statistics		1	1		2
Arts and Humanities	Administration				1	1
	Applied Linguistics				1	2
	Architecture, Technology and City	2	3	3		1
	Demography		1	1		2
	Economic Development	1	2	7	2	3
	Economics	1	3	4	4	3
	Education	14	18	2	14	10
	School Education – PM				1	
	Geography		1	1		1
	History		4	3	4	7
	International Relations	1	2	1		
	Linguistics			1		1
	Music	1				3
	Performing Arts				3	2
	Political Science					5
	Social Anthropology	1	1	6	4	6
	Social Sciences	2	1		2	7



TABLE 4.10 – NUMBER OF GRADUATE STUDENTS' AND PROFESSORS' AWARDS, PER PPG, 2014-2018  
continued

AREA OF KNOWLEDGE	GRADUATE PROGRAM	2014	2015	2016	2017	2018
Arts and Humanities	Sociology				1	2
	Literary Theory and History			3	5	
	Visual Arts		1			2
Engineering and Technology	Agricultural Engineering	12	7	1	4	6
	Chemical Engineering	1		7	7	16
	Civil Engineering	1		3	2	4
	Electrical Engineering	1	7			
	Food Engineering	6		5	4	5
	Food and Nutrition		1	6	4	4
	Food Science	1	4	1		1
	Food Technology	7	8	2	10	
	Mechanical Engineering	6	5	3	8	7
	Petroleum Sciences and Engineering		9	6	5	9
	Production and Manufacturing Engineering		2	2	3	
	Technology	2	2	4	8	
Interdisciplinary area	Bioenergy	2	4	1	4	9
	Energy Systems Planning	1	4	4	3	4
	Environment and Society		1	1		7
	Health, Interdisciplinarity and Rehabilitation				13	14
	Popularization of Science and Culture	2	1	1		
	Science and Technology Policy				7	7
	Teaching and History of Earth Sciences			1		
Total		185	265	245	340	391

Source: Internal Evaluation Committees Reports, 2019

## 4.6 Social Insertion

Unicamp Graduate Programs have promoted the strengthening of Graduate Programs in different Brazilian regions, through CAPES MINTER and DINTER Programs. "Interinstitutional Master's Degrees (MINTER) and Interinstitutional Doctorates (DINTER) are academic master's and doctoral classes conducted by a national promoting institution necessarily at a receiving teaching and research institution."<sup>5</sup>

Unicamp was involved in 10 DINTER and two MINTER Programs in the period, as seen in Chart 4.1.

5. <https://www.capes.gov.br/avaliacao/projeto-minter-e-ou-dinter>

CHART 4.1 – INFORMATION ON MINTER AND DINTER AT UNICAMP, 2014-2018

AREA	SCHOOL	INSTITUTION	PROGRAM	AGENCY	BEGINNING	SITUATION
BIOLOGICAL AND HEALTH SCIENCES	FOP	INTA – Instituto Superior de Teologia Aplicada	Management and Collective Health – MP	CAPES	2017	In progress
	FCM	UFMT – Federal University of Mato Grosso (Rondonópolis Campus)	Internal Medicine	CAPES	2019	Approved in 2018
	FENF	UFJF – Universidade Federal de Juiz de Fora	Nursing	CAPES	2012	In progress
SOCIAL SCIENCES, HUMANITIES AND ARTS	FE	UFPA – Federal University of Pará	Education	CAPES	2019	Approved in 2018
	IEL	UFMS – Universidade Federal do Mato Grosso do Sul (Campo Grande Campus)	Applied Linguistics	CAPES	2019	Approved in 2018
	IFCH	UFAM – Universidade Federal do Amazonas	Philosophy	CAPES	2019	Approved in 2018
EXACT AND EARTH SCIENCES	IG	UNEB – Universidade do Estado da Bahia	Geography	CAPES	2015	In progress
	IG	IFMG – Instituto Federal de Educação, Ciência e Tecnologia	Science and Technology Policy	CAPES	2018	In progress
	PECIM IFGW	Federal University of the Semi-Arid Region (UFERSA)	Multi-unit on Science and Mathematics Education	CAPES	2019	Approved in 2018
ENGINEERING AND TECHNOLOGY	FEM	IFES – Instituto Federal de Educação, Ciência e Tecnologia do Espírito Santo	Mechanical Engineering	CAPES	2015	In progress
	FEM	UEMA – Universidade Estadual do Maranhão	Mechanical Engineering	CAPES	2012	In progress
	FEEC	UTFPR – Federal University of Technology – Paraná	Electrical Engineering	CAPES	2015	In progress

Source: Unicamp Statistical Yearbook (2019)

There are different PPG initiatives that deserve to be highlighted in the area of social inclusion. Some of them are from Unicamp's PPG Surgical Sciences, School of Medical Sciences, through programs that strongly involve society in general. The initiatives are as follows: P.A.R.T.Y. Program (Prevention of the Risk of Trauma Related to Alcohol in Youth), developed with the Campinas Municipal Administration and carried out with basic education schools; Colorectal Cancer Prevention Program, developed within the University population, in which students of the Program participate, and the prostate cancer awareness campaign, conducted by professors and students of the aforementioned Program. Another interesting case is the PPG in Food Technology which, among its results in knowledge transfer, presents the creation of startups, which is an important way of

valuing new technologies with society (in fact, Unicamp is the Brazilian leading university in the generation of technology-based companies, known as Unicamp's alumni companies and which are the subject of analysis in another chapter of this Institutional Evaluation). Other PPGs have established a direct interface with basic education, recognized by official bodies such as the Ministry of Education (MEC), generating significant social impact when compared to similar programs.

As for affirmative action for admission to graduate programs, Chart 4.2 features comments from 38 PPGs, with answers different from just "No" for question 37 of the Institutional Evaluation: "Does this program adopt any kind of affirmative action for admission (to the Program)?" Fifteen PPGs responded that they do not use this mechanism – most of Biological and Health Sciences and Engineering and Technology programs; 17 answered that they use this mechanism – the vast majority in Arts and Humanities; five answered "Not Yet," two of them in the Interdisciplinary area.

Those who answered "No" understand that admission has to be on merit; however, many PPGs have stated that they pay attention to low-income students and are looking for ways to ensure some financial support for them. Ethnic-racial quotas are the most commonly used actions among PPGs who answered "Yes," that is, quotas for self-declared black and brown candidates and also for indigenous people. And other PPGs have been discussing the issue and some are already planning to reserve places in their future selection processes.

CHART 4.2 – COMMENTS ON AFFIRMATIVE ACTION FOR  
ADMISSION TO GRADUATE PROGRAMS, PER PPG

PPG	Comments
Cellular and Structural Biology (IB)	No. Admission has to be on merit, but that does not mean that there are not assistance programs for low-level candidates to be approved. Such candidates are expected to attend undergraduate classes, especially in subjects that will be addressed in the entry exam.
Ecology (IB)	Not yet.
Internal Medicine (FCM)	Our selection process prioritizes academic merit; however, we seek to prioritize low-income students to obtain institutional grants.
Medical Pathophysiology (FCM)	Performance excellence is the sole criterion for admission.
Nursing (FENF)	Although there are no exclusive affirmative action grants, students' performance in the Selection Process and their social and financial condition are the main criteria for awarding CAPES-DS grants. In addition, the Program plans to adopt affirmative action policy aimed at black (black and brown) and indigenous candidates, with Brazilian nationality; it intends reserve a percentage of places, in a quota system, for self-declared black and indigenous candidates, who should opt for this way of entry, also fulfilling all stages of the Selection Process defined in the notice. Similarly, there is discussion about the prioritization of grants for these candidates, so they can remain in the Program during their studies.
Tocogynecology (FCM)	No. There is no need yet. It is an open multiprofessional program, with a high proportion (more than 50%) of women among students, also with an important component of research in the social sciences area, covering subjects such as gender violence, homosexuality, transsexuality, etc.
Applied Mathematics (IMECC)	No, with regard to admission to the graduate program, any criteria not based on knowledge and quality of understanding of the subjects to be researched would be considered inadequate.
Applied and Computational Mathematics (IMECC)	Not applicable.

CHART 4.2 – COMMENTS ON AFFIRMATIVE ACTIONS IN THE  
ADMISSION TO GRADUATE PROGRAMS, PER PPG

continued

PPG	Comments
Chemistry (IQ)	PPG-Q does not adopt affirmative action policies in its admission process, and this issue has not been discussed at CPG and faculty. Our admission process is nationwide, selecting candidates from all over the country, which certainly contributes to further diversification. In addition, many of these are undergraduates from public universities that already adopt affirmative action policies in their selection processes, and candidates for graduate studies naturally end up having a strong representation of minority groups already benefited in these selections. Although we do not have access to statistical data to document this statement, it seems to us that currently the student body of Unicamp's PPG-Q reflects very closely the Brazilian society in its composition.
Physics (IFGW)	The program has no quota policies but is sensitive to affirmative actions regarding student admission and maintenance. It seeks to encourage female participation, as women are underrepresented in physics. The current coordination team seeks effective mechanisms for specific additional grants to support action directed at minorities.
Applied Linguistics (IEL)	Yes, since the 2018/2019 selection process the Program reserves 25% of its places for self-declared black and brown students, and at each phase of the process this same proportion of approved students is assured, except if they score zero in any of the tests. In 2019, all places for quota holders were filled. This policy will be maintained in the next two selection processes and will be re-evaluated after the third one (2022).
Demography (IFCH)	Yes, selection process with places reserved for racial quota.
Economics (IE) and Economic Development (IE)	In 2017, discussions began on the implementation of affirmative action in the selection processes of the two graduate programs. Based on discussion seminars with faculty, students, staff and external guests, an affirmative action policy was proposed for incoming students in 2018, with the establishment of 20% of places for black and brown students. After approval by the Graduate Commission and the IE Congregation, the policy was implemented in 2018.
Physical Education – PG(FEF)	The quota policy for PPG-E was approved by the Graduate Committee (CPG) in 2016. For the selection process of academic master's degrees and doctorate in Education for 2017, 171 places were opened, with the approval of 136 students, and 27 quota holders. There were 995 candidates enrolled in this process. The number of places to be offered depended on the supervision availability of the professors of the Program, and it is not mandatory to fill all places, whether reserved or of wide competition. Of the total of the places offered, 10 (master's or doctorate) were reserved for candidates with disabilities, and 10 (master's or doctorate) were reserved for indigenous candidates. Regarding the remaining places, 35% (53 places) were reserved for self-declared black and brown candidates. Fractional numbers were rounded up. Unreserved places were of open competition among students that opted or not for the quota system.
School Education – PM (FE)	The quota policy for PPGE includes the Professional Master's Program.
History (IFCH)	Yes, since 2015 the program has adopted ethnic-racial quotas, reserving 25% of places for black, brown and indigenous people.
History Teaching (PROFHISTÓRIA) (IFCH)	Yes. The test is applied nationally and does not require a research project from the master's degree student, which increases the chances of professors long removed from academic experience or who do not have contacts with HEI. Of the 15 places offered per year, there are three places for P.B.I applicants (self-declared black, brown and indigenous) and one place for people with disabilities.
International Relations (IFCH)	Yes. From 2018, refugees were admitted to the Program, with a notice. In the 2019 Selection Notice there were places for ethnic minorities.
Linguistics (IEL)	Since 2018 the Program has adopted a specific notice for the selection of indigenous people, and, in the common notice, it adopts the quota system for blacks (black or brown). Both notices are available on the Program website. ( <a href="https://www.iel.unicamp.br/br/content/processo-seletivo">https://www.iel.unicamp.br/br/content/processo-seletivo</a> ).
Multimedia (IA)	It is in the program's plans.

CHART 4.2 – COMMENTS ON AFFIRMATIVE ACTIONS IN THE  
ADMISSION TO GRADUATE PROGRAMS, PER PPG

continued

PPG	Comments
Music (IA)	In June 2019, the program approved the principle of ethnic-racial quotas to be adopted in the 2021 selection process.
Performing Arts (IA)	No, but we are discussing this issue within the school's Graduate Commission for the next selections.
Philosophy (IFCH)	Yes. Admission of students to the master's and doctoral degrees in Philosophy is through a selection process, in which the following are observed: quality of the projects, suitability of the projects to the lines of research of the Program, applicant's research experience, and availability of professors for supervision. The program aims to reach 25% of approved candidates according to the ethno-racial criterion. Black, brown and indigenous applicants may opt for entry quotas (see item 1 of this Notice). To do so, they must submit a statement with the following: (i) applicant's identification (full name and identity document); (ii) applicant declaring himself /herself black, brown or indigenous; (iii) applicant's option for the entry quotas; (iv) applicant's signature.
Political Science (IFCH)	Yes, we adopt quotas for blacks, browns or indigenous people, in the percentage of 25% of incoming students. Among our active students, 22% opt for quotas.
Social Anthropology (IFCH)	Undoubtedly, one of the greatest achievements of recent years at Unicamp has been the implementation of ethnic-racial quotas. Since 2015, PPG-AS has adopted the affirmative action policy in its master's selection processes, and in 2016 the doctoral program was included. In three years, until 2018, the program received eleven quota students who, as decided by the program grants committee, have priority in the distribution of grants. Most of these students have been outstanding for their performance and debate in class, also bringing a much more diverse perspective on the graduate experience, thus enriching the dynamics of the classes as a whole.
Social Sciences (IFCH)	Yes. PPG-CS adopts ethnic-racial quotas, which were implemented in 2015-2016, in which 25% of total places are reserved for self-declared black or indigenous candidates (who opt for it). In 2019, 14 out of the total of 126 new incoming students opted for self-declaration. No self-declared students enrolled dropped out and all have grants, except one student in 2019. It is important to highlight that with the implementation of quotas, the following effects were noted: student body diversity; pluralization of research problems, themes and bibliographies research as a whole; incorporation of bibliography in subjects addressing previously neglected perspectives (race, black feminism, race and gender, among others); black feminism study group, etc. However, some challenges still remain: to increase enrollment of self-declared students and better distribution among lines of research; to remedy the perception, anxieties and feelings of deficit linked to the instrumentalization of foreign languages and the proficiency approval required by the program, and to guarantee the permanence and offer of grants and resources in the face of fund cuts.
Sociology (IFCH)	Since 2015, PPG-S has been one of the pioneers at UNICAMP in the creation of an Affirmative Action Program for admission in Graduate Studies of black, brown and indigenous people, reserving 25% of places for the first two groups and one place for indigenous people.
Agricultural Engineering (FEAGRI)	Not yet.
Chemical Engineering (FEQ)	No, the selection of incoming students is based on the analysis of academic and professional items, that is, criteria essentially associated with the quality of students' academic and professional education are used for admission.
Food Engineering (FEA)	PPG-EA decided not to participate in affirmative actions.
Food Science (FEA)	Not applicable to date.
Food Technology (FEA)	No. We intend to hold discussions to adopt affirmative measures in the future.
Petroleum Sciences and Engineering (FEM)	No. The program is based on meritocracy regardless of any other feature.
Bioenergy (FEA)	Not applicable to date.

CHART 4.2 – COMMENTS ON AFFIRMATIVE ACTIONS IN THE  
ADMISSION TO GRADUATE PROGRAMS, PER PPG

continued

PPG	Comments
Environment and Society (IFCH)	Black and brown candidates will be able to choose the places offered by the affirmative action policy.
Multi-unit on Science and Mathematics Education	The program has not yet adopted any affirmative action for student admission. There are several ongoing discussions about this.
Popularization of Science and Culture (IEL)	In line with the creation of the Unicamp Human Rights Observatory and the encouragement of increased access and accessibility for students with special needs, an affirmative action committee was created to evaluate the possibilities of creating and implementing quotas in PPG-DCC. This committee is currently composed of professors, students and staff and, in addition to regular meetings, held public debates on the subject. The discussion that has been held with the committee aims to implement racial and accessibility quotas from 2020. Other categories of quotas such as LGBTQIA and socioeconomic quotas are still in initial debate. Refer to links: <a href="http://www.labjor.unicamp.br/?page_id=3240">http://www.labjor.unicamp.br/?page_id=3240</a> and <a href="http://www.labjor.unicamp.br/?p=3637">http://www.labjor.unicamp.br/?p=3637</a>

Source: Internal Evaluation Committees Reports, 2019

The master's and doctoral research projects of Unicamp students are a source of inspiration for further research considering the number of visits, accesses and virtual downloads carried out in 2018, as seen in Table 4.11 below, reaching more than 1.2 million hits and over 3.2 million downloads in 2018.

FCM is the school that has contributed most to these absolute numbers. This relates to the efficient disclosure of projects completed at different stages of graduate studies by the Unicamp Library System.

TABLE 4.11 – THESES AND DISSERTATIONS AVAILABLE AT UNICAMP  
VIRTUAL LIBRARY AND NUMBER OF DOWNLOADS, 2018

School	Number of theses and dissertations available	Downloads (N.)
FCA	165	11,489
FCM	6,970	431,718
FE	3,950	363,642
FEA	2,895	163,949
FEAGRI	1,016	83,972
FEC	1,344	179,568
FEEC	3,667	104,433
FEF	966	138,469
FEM	3,544	213,542
FENF	112	9,469
FEQ	1,994	159,444
FOP	3,895	156,177
FT	186	24,347
IA	2,115	160,047
IB	4,866	104,011
IC	1,290	28,497
IE	1,412	120,020



TABLE 4.11 – THESES AND DISSERTATIONS AVAILABLE AT UNICAMP  
VIRTUAL LIBRARY AND NUMBER OF DOWNLOADS, 2018

continued

School	Amount of theses and dissertations available	Downloads (N.)
IEL	2,724	255,175
IFCH	4,030	307,721
IFGW	2,131	30,315
IG	1,494	88,970
IMECC	2,062	70,233
IQ	2,630	78,541
Total	55,458	3,283,749

Source: Unicamp Library System (SBU) and PRPG Statistical Yearbook, 2019

Table 4.12 below features the most downloaded dissertations and theses in the period of the Institutional Evaluation.

TABLE 4.12 – MOST DOWNLOADED DISSERTATIONS AND THESES IN THE PERIOD, 2018

Title	Author	Level	School	Total downloads
Anthropometric status in children with cerebral palsy	Ana Lucia Alves Caram	Master's degree	School of Medical Sciences – FCM	5,519
Learning difficulties in reading and writing and their relations with anxiety	Gisele A. do Patrocinio Bazi	Master's degree	School of Education – FE	5,106
Parents and their children's school life	Maria Marcia Sigrist Malavazi	Doctoral degree	School of Education – FE	4,788
Female genital ulcers: clinical, histopathological and microbiological characteristics	Christiane Maria Moreira Gomes	Master's degree	School of Medical Sciences – FCM	4,738
General Gymnastics: a Physical Education knowledge area	Elizabeth Paoliello Machado de Souza	Doctoral degree	School of Physical Education – FEF	4,365
A study on children education through choir singing practice	Cleodiceles Branco Nogueira de Oliveira	Master's degree	Arts Institute – IA	4,164
Open contents in Education: motivation and authorship	Mariângela Pisoni Zanaga	Doctoral degree	School of Education – FE	2,055
School physical education: sport as a pedagogical content of elementary school	Roberto Rodrigues Paes	Doctoral degree	School of Education – FE	1,627
Sizing and analysis of a hybrid solar desalinator	Joaquim Teixeira Lopes	Master's degree	School of Mechanical Engineering – FEM	1,107
By Love and By Force: routines in early child education	Maria Carmen Silveira Barbosa	Doctoral degree	School of Education – FE	1,067
Cooperative Games: Game and Sport as Companionship	Fabio Otuzi Brotto	Master's degree	School of Physical Education – FEF	773
Education, authoritarianism and eugenics: work exploitation and violence against helpless children in Brazil	Sidney Aguilar Filho	Doctoral degree	School of Education – FE	713
Use of construction waste as aggregate in concrete composition	Sergio Eduardo Zordan	Master's degree	School of Civil Engineering, Architecture and Urban Planning – FEC	699
The meaning of the senses: sensitive education	João Francisco Duarte Junior	Doctoral degree	School of Education – FE	591

## 4.7 Unicamp's Graduate Programs Achievements and Challenges

In Brazil, research largely depends on public universities, since up to now it has not been possible to count on a greater involvement of companies in this activity, despite different governmental policies to encourage R&D and innovation. By way of example, in the United States, which houses several top-ranked universities in this category, the best-placed university ranks 15<sup>th</sup> in number of patents; the other 14 positions are held by companies. The opposite is true here, among the 10 largest patent fillers, 9 were public universities evidencing the strength of universities in research as well as the fragility of the Brazilian research and development system. This is a problem that the country must face, but it cannot be remedied by penalizing universities with horizontal cuts in their budgets and graduate and postdoctoral grants, a policy that has been pursued in recent times.

Since the late 1960s, the country has chosen to make its graduate programs more institutional and the result has been the establishment of a robust national graduate system of internationally recognized excellence, with many agreements with foreign universities, aiming at training teaching staff (at all levels) and thus expanding research activities in all areas of knowledge. For this purpose, it also constituted a vigorous system of grants linked to federal government funding agencies, such as the Brazilian National Council for Scientific and Technological Development (CNPq) and the Coordination for Improvement of Higher Education Personnel (CAPES), created in the early 1950s, and to the State Research Support Foundations – FAPESP, in the case of São Paulo – in addition to grants, in very small and non-stable numbers, from other support foundations, associations and non-profit institutions.

Unicamp is considered a research-intensive university, as it has historically had a significant number of graduate programs and students, having about the same number of graduate and undergraduate students. Graduate activities automatically connect to research since pursuing a master's or doctoral degree necessarily means carrying out research work.

There were several *achievements* over the 50 years of the university. One of the most important is the internationally recognized academic excellence (especially by Latin American countries) of its courses and programs, measured not only by the CAPES Evaluation system, but also by students attracted from all regions of the country and abroad, by the volume and quality of scientific production (8% of scientific articles indexed in Brazil include a Unicamp author or co-author, equivalent to 2.4 publications per university faculty member), and by the number of awards received by professors and students, among other indicators.

Other *achievements* concern the strategies created or reinforced by the University that allow the training of high-level and more complete professional in the most diverse areas of knowledge – Teaching Internship Program (PED), Integrated Training Program (PIF) and permanence and access to education programs – as well as engagement in programs that aim to promote the excellence of high school and elementary school teachers, and to use CAPES Programs to raise graduate education to the levels of the world's most recognized universities and the opening of PPGs to receive special students, creating an

opportunity for those who often cannot dedicate themselves exclusively to studies and those that need more time to take courses.

One of the *great achievements* is the search for greater flexibility of the curriculum, allowing Unicamp's graduate students to have a more diverse education from their perception and perspective of professional and personal life, as well as the creation of interdisciplinary (there are 11 PPGs in the CAPES Interdisciplinary Area), multidisciplinary (involving not only different schools, but also Interdisciplinary Research Centers), and multi-institution courses and programs, such as the PhD in Bioenergy, involving University of São Paulo (USP), Unicamp and São Paulo State University (UNESP), and interinstitutional, such as San Tiago Dantas International Relations, involving Unesp, Unicamp and Pontifical Catholic University of São Paulo (PUC-SP), based on the special induction project – CAPES San Tiago Dantas Notice.

The *achievements*, however, do not mean a relaxation in the pursuit of enhancement and improvement on many fronts, which great poses challenges to Unicamp's graduate programs. The following is an analysis of the main challenges.

The first is the maintenance of quality and excellence in training graduate students (remembering that Unicamp is one of the universities in Brazil with the best PPGs performance), especially in times of decreasing funding for research and teaching activities in the country, and discredit of science, a potential element in the division between countries that have achieved the highest values of social justice and equity and that best promote the well-being of their citizens and countries that do not offer such opportunities to their population.

Facing this *challenge* can help create more robust goals for Unicamp, contributing not only to more effective results and impacts on the country's S&T, but also to the university itself – including placing it back in the top position regarding CAPES awards for best theses defended in Brazil.

In addition to this challenge, there is the quest to replace the more senior professor that are leaving the university, especially due to retirement, thus reformulating the faculty, a complaint of several PPGs in the Institutional Evaluation. Unicamp has been experiencing this situation more recently, as it is a “young” university in its early 50s. Moreover, there is also the difficulty of attracting younger and early-career professionals as the current university career is not as attractive as it was a few years ago, either for monetary reasons or for promotion rules. Brazil has been named one of the countries with the most “brain drain,” given the funding conditions for research, the profile of university and academic careers, and the attacks that scientists and professors have suffered in recent years.

One strategy to face this situation is to use more and attract collaborating faculty and researchers – including postdoctoral students, foreigners among them – both to support teaching and supervising activities and to develop research and new studies. Many PPGs reported that they do not use such professionals while others stated that they could further integrate these professors into various graduate activities.

It is worth noting that, in general, the Office of Graduate Studies (PRPG) is aware of the aspects described above and has been designing strategies to strengthen PPGs whose excellence is already recognized by peers and funding agencies, and to improve

those Graduate Programs (PPGs) that have not been able to reach higher performance – for example, strategies to merge PPGs are being developed, and one of them is already with CAPES for evaluation. Other actions are related to follow-up of study opportunities and/or stays abroad (from open calls in the country and abroad), in universities or centers of recognized academic excellence, for students or professors; increase of International Thesis Co-Supervision Agreements<sup>6</sup>; approval of academic projects under the CNPq Academic Doctoral Program for Innovation – DAI,<sup>7</sup> through which Unicamp approved 10 doctoral scholarships at the end of 2018 in PPGs in Bioenergy, Mechanical Engineering and Chemistry; among other initiatives.

One of the biggest and most pressing *challenges* is to increase graduate school enrollment and improve the student-professor ratio, which have been falling in recent years. In addition, there is the problem of dropout rate in some graduate programs (an aspect poorly measured at the university that should be addressed). There is a lot of expertise at Unicamp, which can reach a larger number of students, including special students, as well as those interested in taking *Lato Sensu* specialization, Improvement and Residency programs – who are still few at the University. Another option to expand graduate education is through professional master's and doctoral degrees, but this is another harsh challenge regarding both improving the quality of programs and reducing dropout rates.

Besides this effort, there is the need to persuade employers and society in general of the value of graduate education and the benefits to sustainable economic growth. It is well known that one of the elements that directly affect a country's economic growth is the development of skilled labor through training and qualification of researchers. Transferring publicly funded research knowledge to the productive sector is crucial. Specifically, one of the biggest benefits of publicly funded research is associated with the migration of scientists to the private sector. The benefits are associated not only with the direct application of university-acquired knowledge, but also with the transfer of acquired competencies such as problem-solving strategies, creative, innovative and autonomous thinking, and the ability to analyze and make decisions based on data and evidence, among others.<sup>8</sup>

In turn, the disclosure of research work carried out in graduate studies at Unicamp should be pursued more vigorously next year. The PPGs report the various forms of disclosure, many academic and following traditional practices. However, the media have diversified and nowadays there are many digital platforms. On the other hand, it is necessary to think about reaching non-academic audiences and allowing other communities to access the knowledge generated here. This scenario has become more critical in recent times and the

6. "Partnership established through an international academic agreement between Unicamp and a foreign research and education institution aiming at the preparation of the master's or doctoral student to obtain a valid and recognized title in both institutions. The dissertation/thesis is defended only once, at Unicamp or at the other University, and each one will award the student a diploma conferring the title stipulated in the Agreement," <http://www3.prpg.gr.unicamp.br/sites/site1/index.php/cutting-the-program/>
7. "The program seeks to contribute to the increase of innovative capacity, competitiveness of companies, and scientific and technological development in the country, aiming to strengthen the Regional Innovation Systems. The grant holder will develop his/her thesis as a regular student in an existing graduate program and must have an academic advisor and a supervisor from the Partner Company, to which the doctoral project is related, [http://www.cnpq.br/web/guest/noticiasviews/-/journal\\_content/56\\_INSTANCE\\_a6MO/10157/6234478](http://www.cnpq.br/web/guest/noticiasviews/-/journal_content/56_INSTANCE_a6MO/10157/6234478)
8. EU Commission, "The Economic Rationale for Public R&I Funding and its Impact". *Policy Brief Series*. March 2017.

University, like other public entities, has to review its communication policy. New channels have opened up to reach groups that are traditionally not part of the University's potential student population (indigenous, for example), but there are also other means and tools for bringing in knowledge generated outside the University, which may promote greater diversity and new perspectives on the challenges of advancing science.

Another set of challenges involves the issue of funding. Grants for Unicamp's graduate activities from the three most important funding agencies – CAPES, CNPq and FAPESP – over the last few years. A more assertive strategy is needed to recover funding levels and expand the number of agreements with other entities that fund graduate research and education. Unicamp has about 980 master's grants, 1500 doctoral grants and 127 CAPES postdoctoral grants, distributed among its 75 academic master's and doctoral programs according to CAPES rules. Several have been suspended by CAPES and CNPq in recent months, including the entire quota of the Office for Graduate Studies (PRPG) itself (a quota that serves as institutional support for emergency situations), an attitude incompatible with a policy of strengthening universities in the country. It is worth considering that the PPGs, when conducting their selection processes for new graduate students, have precisely the number of grants required to plan their activities and have a good estimate of how many students can participate in their master's and/or doctorate programs. Unexpected cuts or suspensions severely affect graduate education in any institution, not only because of immediate harm to programs and grant holders, but also in the medium and long term, as it decreases the attractiveness of graduate education, especially in areas with a heated labor market.

The Teaching Internship Program (PED), despite being recognized as a success case, can be improved to continue to be one of the most interesting actions for training a more complete graduate student, with greater opportunities to present to society the skills acquired at University. PED regulations are being reviewed for greater adjustment to the evolution of the pedagogical structure of undergraduate and graduate studies in general. But a bigger challenge is to look for methods to assess the impact of PED on graduate professional qualification – and several PPGs confirmed this desire when asked in the Institutional Evaluation. Moreover, the issue of monitoring graduates is also a challenge for the University in general – creating an efficient mechanism that allows former students (alumni) to report their location and professional activity.

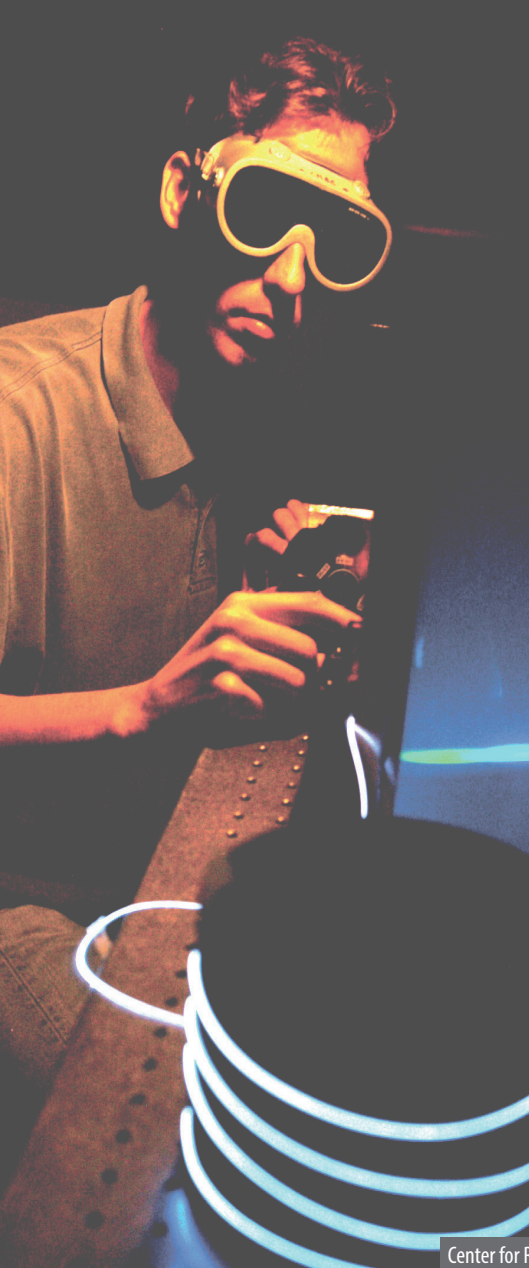
The theme of internationalization will, for a long time, remain a challenge to be faced and overcome, as detailed in the chapter on the topic. Unfortunately, there was a drop in the number of Unicamp's graduate students studying abroad with CAPES grants, reflecting the decrease of government agency funding, as well as the situation of uncertainty, while the number of foreign students is stable and postdocs have increased considerably in recent years. There should be more strategies to diversify sources of funding to send students to complement their education abroad and more assertive policies to attract foreign students – certainly to increase the number of subjects taught in English and broaden the scope of the Center for Teaching Languages (aiming at greater language proficiency of Unicamp's students); co-supervision agreements should also be part of the strategy, as well as strengthening foreign student reception structures and rationalizing bureaucratic procedures. CAPES PrInt, which will last five years, can be a program that allows us to reach

another level on internationalization , as new high-level cooperation is expected as a result – especially via projects and research networks –, and also invitations for lectures and courses abroad, co-organization of international events, student co-supervision, training of professors and students abroad, studies and postdoctoral missions abroad, participation in congresses, workshops and international fairs, and expansion of exchanges with foreign research institutions, among others.

Finally, it is clear that even with the increasingly intensive use of information and communication technologies, new and more integrated ways of generating and collecting data and information at the university must be sought, and also to further and better evaluate the impacts of its mission – related both to research and to graduate students, among many other topics which involves research in evaluation, self-evaluation, strategic planning and so on, which will bring greater self-knowledge to Unicamp and enable it to plan policies and actions strategically, besides allowing a more direct and effective accountability to society.







## RESEARCH

Brazilian Research Institute for Neuroscience and Neurotechnology



Center for Research into Optics and Photonics – Campinas

The Obesity and Comorbidities Research Center



Center for Computational Engineering and Sciences





## 5.1 Introduction

The numerous technological developments of the last century that pervade our daily lives confirm that science is unarguably the greatest legacy of humankind. Current advances are so widespread that lately we have been forced to discuss how to use them to benefit rather than harm humanity. Science is the means by which humankind differs from other species on this planet. That is not always positive given some of the repercussions of scientific and technological progress such as global warming and deforestation, human degenerative diseases, economic instability and inequality, social challenges regarding gender equity and opportunities, among others. And it is also in science that we will find the answers to such reflexes, seeking adjustments to make the best possible use of our planet in favor of equity, health and preservation of the environment in which we live.

These are some of the reasons why science is one of the main pillars of universities. And more than ever, given the aforementioned challenges as well as recent economic ones, it is necessary to strengthen this pillar so that society can enjoy scientific findings to pursue a healthy and socially just life on an equally healthy planet.

UNICAMP<sup>1</sup> is recognized in Brazil and abroad for the quality and vigor of its research, not only in terms of sheer quantity, but also the way in which the university was forged. In general, in the last five-year period, UNICAMP's research performance was also affected by the slowdown of the Brazilian economy. Despite the nominal increase in funding from different agencies, one must bear in mind that from December 2013 to December 2018, the cumulative rate of inflation was 35% while funding over the same period did not grow accordingly in most areas. On one hand, the quantification of performance is also affected by the inaccuracy of currently available data and increased faculty turnover, so that many research groups are still being consolidated. On the other hand, the figures show that the university has been able to resist and overcome the worst effects of the crisis.

In the past few years, as shown in Table 5.1, an increase of around 8% was observed in the number of articles published in journals, comparing the 2009-2013 and 2014-2018 periods. A similar increase was observed in the number of invited talks and organization of meetings and events. Regarding scientific production in audiovisual format, the volume doubled between the two five-year periods. However, over the same period of time there was a reduction of approximately 15% in the volume of other kinds of academic production, which may be a consequence of the economic situation faced by the country in the last five years, combined with faculty turnover.

TABLE 5.1 – UNICAMP SCIENTIFIC OUTPUT IN 2009-2013 AND 2014-2018

DESCRIPTION	2009-2013	2014-2018
Published Books	962	761
Articles Published in Journals	21,726	23,494
Published Book Chapters	4,726	3,973
Full Papers Published in Congress Proceedings	8,867	6,865
Published Abstracts	16,700	12,264
Participation in Congresses and Other Events	30,171	26,238
Other Miscellaneous Publications	3,730	2,507
Films, Videos, CD-ROMs, Audio and Audiovisual Recordings	105	212
Artistic Production	1,989	1,570
Editorial Activities	687	469
Technical Work	3,887	3,347
Organization of Events and Lectures	3,968	4,271
Lectures given	10,168	8,953
Outreach courses	1,238	692
Advisory Services	444	303
Other Services	3,148	3,165

Source: Unicamp Statistical Yearbook 2019.

Table 5.2 shows an increase in nominal funding by FAPESP and FINEP of 23% in Biological and Medical Sciences, 26% in Math, Earth and Natural Sciences, 30% in Arts and Humanities, 200% in Multidisciplinary Studies and 5% in Technology. Analyzing the total funding and CNPq grants for research by five-year period shown in Table 5.3, reveals an increase of about 7% in total nominal funding. Considering the inflation rate from December 2013 to December 2018 of approximately 35%, one notes that there was essentially a reduction in the volume of funding from the abovementioned agencies, contributing to the reduction in various kinds of production, as shown in Table 5.1.

TABLE 5.2 – RESEARCH FUNDING BY FAPESP AND FINEP/CT-INFRA

Areas	2009-2013	2014-2018
	R\$ (million)	R\$ (million)
Biological and Medical Sciences	227.35	281.33
Math, Earth and Natural Sciences	154.74	195.17
Arts and Humanities	76.87	99.80
Multidisciplinary Studies	6.31	18.85
Engineering and Technology	113.16	118.95

Source: Fapesp and Finep/CT-Infra.



TABLE 5.3 – CNPQ FUNDING (RESEARCH FUNDING + GRANTS)

2009-2013		2014-2018	
Year	Amount (R\$ million)	Year	Amount (R\$ million)
2009	55,919	2014	94,694
2010	63,338	2015	75,952
2011	61,067	2016	66,807
2012	70,070	2017	58,657
2013	79,504	2018	57,939
Total	329,898	Total	354,049

Source: Unicamp Statistical Yearbook 2019.

The information featured in the previous tables demonstrates the ability of UNICAMP faculty and researchers to raise funds, even in economically adverse conditions. Despite the effective reduction in funding, given the inflation rate over the period, a significant increase was obtained in specific kinds of production, especially published articles, audiovisual productions and organized events.

UNICAMP's faculty, which comprises 1,909 professionals, is highly qualified. More than 99% have doctoral degrees and 673 are CNPq Productivity Fellows (35% of faculty), a sign of recognition in the Brazilian scientific community, as shown in Table 5.4. Compared to the previous five-year period, the number of these fellowships (667 fellowships for 1,734 faculty members, according to the previous institutional evaluation) was basically maintained and the faculty grew by approximately 10%. The breakdown of grants in the last five-year period is relatively homogeneous among the areas of Biological and Medical Sciences (175 or 26%), Math, Earth and Natural Sciences (187 or 28%), Arts and Humanities (123 or 18%) and Engineering and Technology (176 or 26 %). Of the 673 grants, 355 (53%) are Level 5.1.

TABLE 5.4 – BREAKDOWN OF PRODUCTIVITY IN RESEARCH FELLOWSHIPS BY MAJOR KNOWLEDGE AREAS

Level	Biological and Medical Sciences	Math, Earth and Natural Sciences	Arts and Humanities	Multidisciplinary Studies	Engineering and Technology	TOTAL
PQ-1A	28	20	26	1	29	104
PQ-1B	19	25	24	0	12	80
PQ-1C	26	19	17	0	12	74
PQ-1D	25	23	15	1	33	97
PQ-2	75	97	41	10	86	309
PQ-SR	2	3	0	0	4	9
TOTAL	175	187	123	12	176	673

Source: PRP/CNPq.

The percentage of productivity fellows varies significantly among the academic units (that is, Institutes and Schools), as shown in Table 5.5. The following units showed an increase in the percentage of fellows compared to the previous five-year period: FCA, FCM, FEC, FEEC, FEM, IE and IMECC. With the exception of FCF and FEF, which did not figure



in the table of productivity fellows in the previous evaluation, the other units recorded a drop in their percentage of research fellows. The most significant reductions occurred in FEAGRI (36.8% to 14.7%), IA (19.1% to 6.9%), IEL (64.6% to 53.8%), IFCH (64.7% to 55.8%) and IQ (77.6% to 64.1%). The greatest increases in the percentage of fellows among faculty occurred in FEM (33.8% to 45.9%) and IMECC (45.2% to 55.4%).

TABLE 5.5 – BREAKDOWN OF CNPQ RESEARCH GRANTS BY SCHOOL

Unit	Active faculty	Number of fellows	Number of Level 1 and Senior fellows	% of fellows in the school	% of Level 1 fellows in the school
FCA	101	12	2	11.9	2.0
FCF	16	8	2	50.0	12.5
FCM	319	62	35	19.4	11.0
FE	87	21	13	24.1	14.9
FEA	57	23	14	40.4	24.6
FEAGRI	34	5	4	14.7	11.8
FEC	66	19	7	28.8	10.6
FEEC	78	39	24	50.0	30.8
FEF	37	6	2	16.2	5.4
FEM	74	34	17	45.9	23.0
FENF	30	4	2	13.3	6.7
FEQ	45	21	8	46.7	17.8
FOP	86	34	21	39.5	24.4
FT	74	8	3	10.8	4.1
IA	101	7	4	6.9	4.0
IB	118	61	38	51.7	32.2
IC	53	27	13	50.9	24.5
IE	64	12	4	18.8	6.3
IEL	65	35	27	53.8	41.5
IFCH	86	48	34	55.8	39.5
IFGW	84	51	28	60.7	33.3
IG	55	30	13	54.5	23.6
IMECC	101	56	24	55.4	23.8
IQ	78	50	25	64.1	32.1

Source: Unicamp Statistical Yearbook 2019 and CNPq.

The fact that only seven units showed an increase in the percentage of faculty with productivity fellowships suggests the need to implement an institutional policy to both encourage both applications and better adapt the profile of faculty members to meet CNPq expectations. Nevertheless, at a time when UNICAMP feels the impact of the general economic situation in Brazil, which leads to reduced funding in several spheres, the decrease in these figures may be associated with the lack of financial resources of CNPq. This possibility confirms the importance of having policies in place, including institutional ones, which confer scientific merit on faculty without the cost of awarding grants.

In the five-year period under evaluation, there was also a reduction in UNICAMP's share of indexed scientific production in Brazil, from 7.25% on average in the previous five years to 6.18% in this last period, as detailed in a Table 5.6.

TABLE 5.6 – UNICAMP'S SHARE OF INDEXED SCIENTIFIC PRODUCTION IN BRAZIL

Year	Brazil	Unicamp	%	USP	%	Unesp	%
2014	52,579	3,257	6.19%	10,191	19.38%	4,080	7.76%
2015	55,549	3,389	6.10%	10,606	19.09%	4,078	7.34%
2016	60,248	3,663	6.08%	11,410	18.94%	4,560	7.57%
2017	64,250	3,984	6.20%	11,765	18.31%	4,667	7.26%
2018	67,535	4,284	6.34%	12,237	18.12%	4,912	7.27%

Source: Incites/Web of Science (articles and reviews – May 2, 2019).

Table 5.7 and Table 5.8 detail the number of articles published in specialized peer-reviewed journals, book chapters, books and full papers in conference proceedings in the five-year periods 2009 – 2013 and 2014 – 2018 at UNICAMP. They also show the distribution of the number of faculty members in different tracks [*Magistério Superior* (MS) *versus* others]. There is a consistent reduction in the quantity of these publications in 2013 and 2014, coinciding with the beginning of the period of economic crisis in Brazil. There is also a trend of recovery in the number of published articles and book chapters over the last five years. It is important to notice the reduction in the number of faculty members over the last three years. It is also relevant to note that the ratio “published articles in specialized peer-reviewed journals” to “full papers in conference proceedings” went from 2.1 in 2009 to 3.8 in 2018, an increase of approximately 80% in the period; in the same period of time, the number of faculty members in the MS track increased only 8%; this behavior suggests a possible transition between the forms chosen to disseminate scientific findings.

TABLE 5.7 – EVOLUTION OF SCIENTIFIC PRODUCTION IN 2009-2013 AND 2014-2018

Year		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Type	Articles	3,617	3,742	3,821	4,161	4,134	3,887	3,994	4,262	4,422	4,574
	Book Chapters	980	862	1,027	951	906	692	737	814	827	860
	Books	245	165	183	218	151	124	155	224	112	141
	Full papers in conference proceedings	1,724	1,989	1,869	1,720	1,565	1,300	1,248	1,395	1,576	1,213

Source: Unicamp Statistical Yearbook 2019.

TABLE 5.8 –NUMBER OF FACULTY MEMBERS PER TRACK

	Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Track	MS	1,733	1,750	1,727	1,739	1,759	1,795	1,867	1,910	1,894	1,865
	Others	110	91	84	80	73	66	63	54	49	44
Index (per faculty member in MS track)	Articles	2.09	2.14	2.21	2.39	2.35	2.17	2.14	2.23	2.33	2.45
	Book Chapters	0.57	0.49	0.59	0.55	0.52	0.39	0.39	0.43	0.44	0.46
	Books	0.14	0.09	0.11	0.13	0.09	0.07	0.08	0.12	0.06	0.08
	Full papers in conference proceedings	0.99	1.14	1.08	0.99	0.89	0.72	0.67	0.73	0.83	0.65

Source: Unicamp Statistical Yearbook 2019.

There is reason for concern regarding the ways in which faculty research activities are published, since part of the faculty do not publish articles in indexed journals or full papers in congress proceedings. That makes it more difficult to keep track of research.

Table 5.9 shows the systematic increase in the participation of foreign co-authors in UNICAMP output and also the number of articles indexed in Web of Science (WoS) per faculty member. In 2009-2013, about 23% of indexed articles were produced with foreign co-authors and, on average, there were 1.30 indexed articles per faculty member. In the following five-year period, 2014 – 2018, approximately 35% of indexed articles include the participation of foreign co-authors and, on average, each faculty member is associated with 1.93 indexed papers. This corresponds to increases of 52% and 48% respectively between the two five-year periods.

TABLE 5.9 – PARTICIPATION OF FOREIGN CO-AUTHORS IN UNICAMP PUBLICATIONS AND AVERAGE PRODUCTION PER FACULTY MEMBER

Year	Indexed articles with foreign co-author	Indexed articles	Number of faculty	Indexed articles per faculty member
2014	955	3,257	1,861	1.75
2015	1,043	3,389	1,930	1.76
2016	1,272	3,663	1,964	1.87
2017	1,460	3,984	1,943	2.05
2018	1,721	4,284	1,909	2.24
2014-2018	6,451	18,577	9,607	1.93

Source: Incites/Web of Science (article and reviews – May 2, 2019).

Table 5.10 shows the evolution over the last five years of the participation of foreign co-authors in UNICAMP publications. One notes a growing trend in several units, confirming the enhanced internationalization of the university. It is also observed that these figures do not adequately represent the situation in Arts and Humanities. Therefore, the schools of this area need to improve the strategies used to quantify their production.

TABLE 5.10 – PARTICIPATION OF FOREIGN CO-AUTHORS  
IN UNICAMP PUBLICATIONS (ARTICLES AND REVIEWS)

Percentage (%) of participation of foreign co-authors in UNICAMP publications/year					
Unit	2014	2015	2016	2017	2018
FCA	23.44	21.43	26.74	22.99	21.65
FCF	13.33	10.34	24.49	23.88	22.06
FCM	23.92	24.84	29.23	28.31	31.14
FE	0.00	14.29	50.00	14.29	62.50
FEA	20.57	23.44	23.19	34.55	33.01
FEAGRI	13.21	25.00	25.00	31.58	30.88
FEC	24.00	20.00	21.43	34.48	46.67
FEEC	34.09	23.71	34.58	35.29	28.38
FEF	23.81	22.22	40.74	34.62	36.84
FEM	19.32	23.66	28.81	27.74	26.83
FENF	23.53	17.65	25.00	31.00	14.71
FEQ	31.18	24.11	22.58	21.88	29.08
FOP	27.76	34.86	35.27	39.74	43.91
FT	42.86	47.62	22.22	34.62	28.00
IA	0.00	33.33	0.00	50.00	33.33
IB	27.31	26.53	33.99	37.87	43.63
IC	42.86	40.00	33.33	39.22	41.67
IE	33.33	14.29	33.33	43.75	33.33
IEL	25.00	50.00	33.33	0.00	75.00
IFCH	33.33	10.00	18.18	14.29	25.00
IFGW	64.57	72.64	75.49	74.45	77.35
IG	35.71	36.23	50.00	43.04	45.31
IMECC	32.43	35.04	35.92	41.10	46.67
IQ	26.52	25	32.97	28.69	30.48

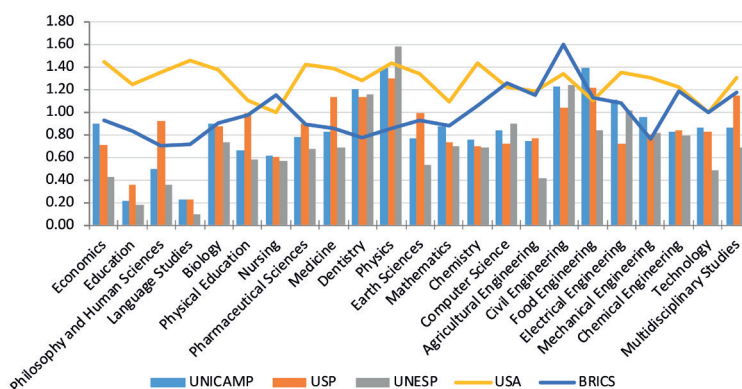
Source: Incites/Web of Science (May 2, 2019).

Note: The database used in this compilation is not efficient in collecting data for Arts and Humanities.

In 2014-2018, the Category Normalized Citation Impact (CNCI) of UNICAMP academic output exceeds that of USP and UNESP production in most areas, as shown in Graph 5.1 through Graph 5.7. In physics, UNICAMP production is comparable to North American, Australian and New Zealand standards, and exceeds those of Europe, Asia, BRICS, Latin America and Brazil. Food Science (also referred to as Food Engineering) occupies a prominent position, being the area with the highest CNCI index in all these comparisons. In dentistry, civil engineering and electrical engineering, UNICAMP output is above the world average. As shown in Graph 5.7, UNICAMP production exceeds Brazilian production in all areas, and is even superior to the production of the best Brazilian standard<sup>2</sup> in most areas (Graph 5.6).

GRAPH 5.1: COMPARISON OF CATEGORY NORMALIZED CITATION IMPACT (CNCI)

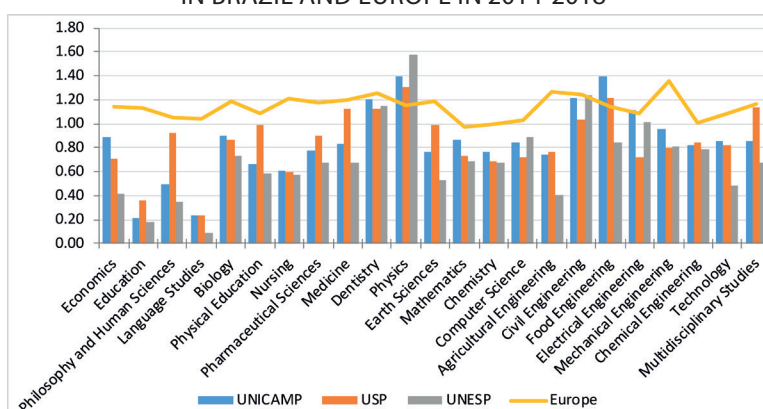
BETWEEN UNICAMP SCIENTIFIC OUTPUT (ARTICLES AND REVIEWS)  
AND STANDARDS IN BRAZIL AND ABROAD IN 2014-2018



Source: Incites/Web of Science (May 2, 2019).

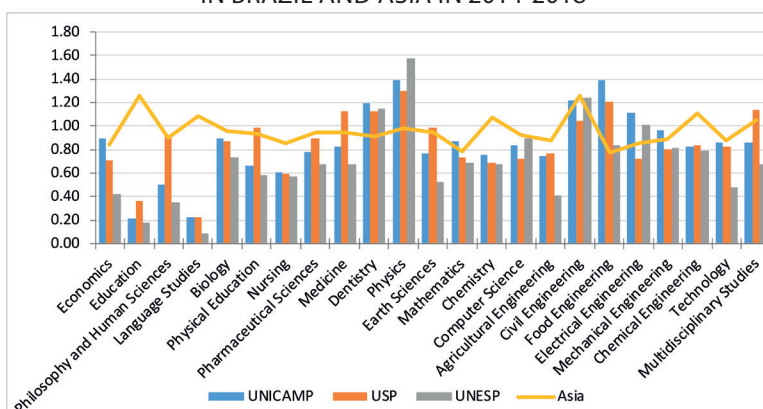
Notes: Rating: CAPES 121. Brazil not included in BRICS.

GRAPH 5.2: COMPARISON OF CATEGORY NORMALIZED CITATION IMPACT (CNCI)  
BETWEEN UNICAMP SCIENTIFIC OUTPUT (ARTICLES AND REVIEWS) AND STANDARDS  
IN BRAZIL AND EUROPE IN 2014-2018



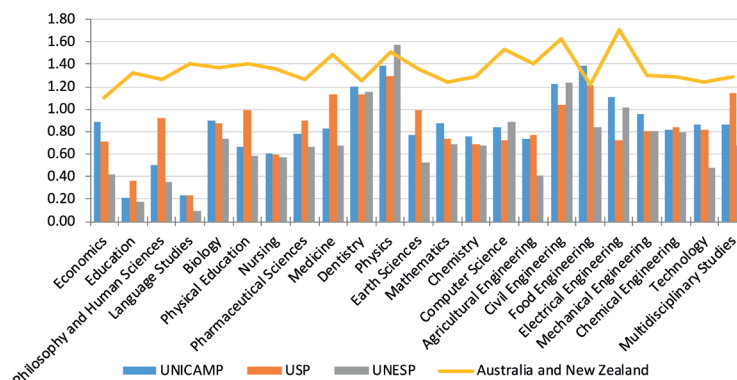
Source: Incites/Web of Science (May 2, 2019).

GRAPH 5.3: COMPARISON OF CATEGORY NORMALIZED CITATION IMPACT (CNCI)  
BETWEEN UNICAMP SCIENTIFIC OUTPUT (ARTICLES AND REVIEWS) AND STANDARDS  
IN BRAZIL AND ASIA IN 2014-2018



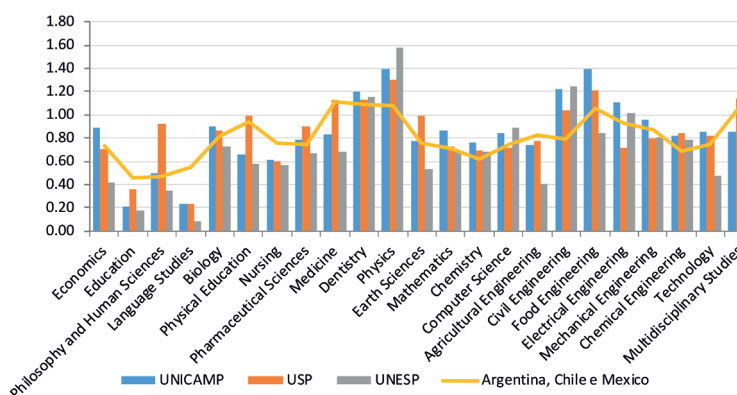
Source: Incites/Web of Science (May 2, 2019).

GRAPH 5.4: COMPARISON OF CATEGORY NORMALIZED CITATION IMPACT (CNCI) BETWEEN UNICAMP SCIENTIFIC OUTPUT (ARTICLES AND REVIEWS) AND STANDARDS IN BRAZIL AND AUSTRALIA AND NEW ZEALAND IN 2014-2018



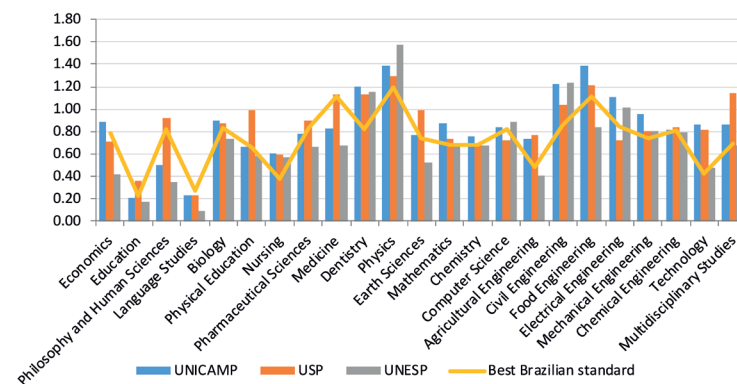
Source: Incites/Web of Science (May 2, 2019).

GRAPH 5.5: COMPARISON OF CATEGORY NORMALIZED CITATION IMPACT (CNCI) BETWEEN UNICAMP SCIENTIFIC OUTPUT (ARTICLES AND REVIEWS) AND STANDARDS IN BRAZIL AND IN ARGENTINA, CHILE AND MEXICO IN 2014-2018



Source: Incites/Web of Science (May 2, 2019).

GRAPH 5.6: COMPARISON OF CATEGORY NORMALIZED CITATION IMPACT (CNCI) BETWEEN UNICAMP SCIENTIFIC OUTPUT (ARTICLES AND REVIEWS) AND STANDARDS IN BRAZIL AND THE BEST BRAZILIAN STANDARD IN 2014-2018

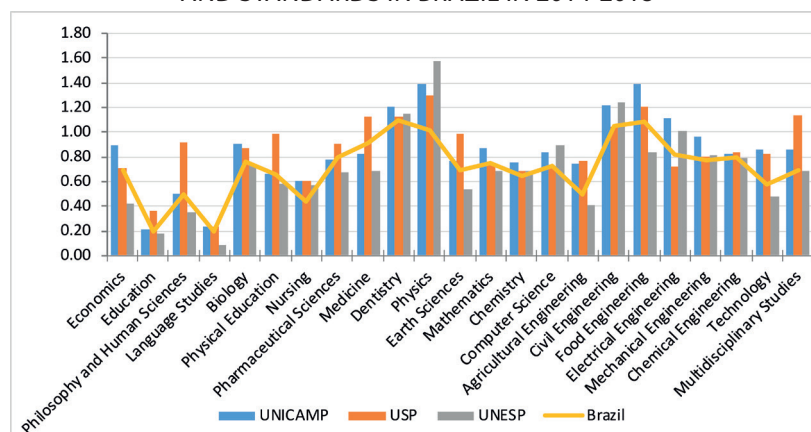


Source: Incites/Web of Science (May 2, 2019).

Note: The best Brazilian standard is based on institutions with graduate programs mostly highly rated by CAPES in the respective areas.



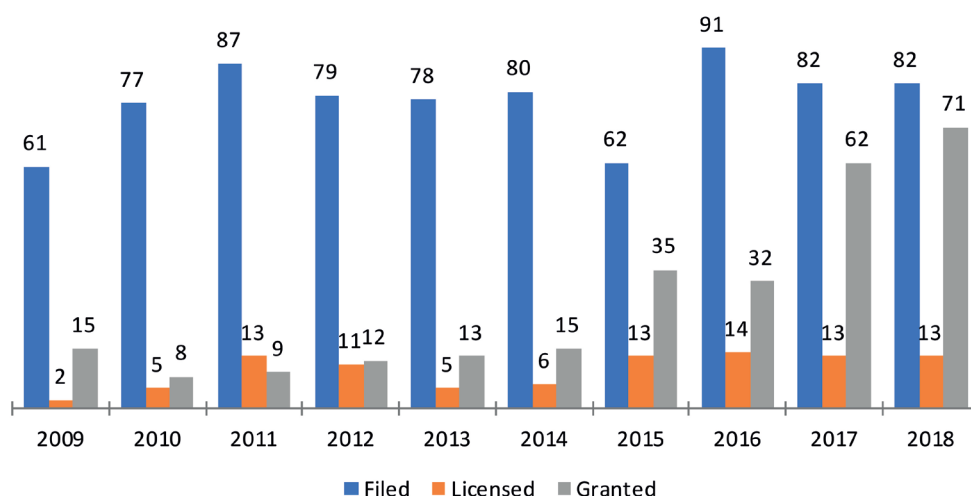
GRAPH 5.7: COMPARISON OF CATEGORY NORMALIZED CITATION IMPACT (CNCI) BETWEEN UNICAMP SCIENTIFIC OUTPUT (ARTICLES AND REVIEWS) AND STANDARDS IN BRAZIL IN 2014-2018



Source: Incites/Web of Science (May 2, 2019).

As shown in Graph 5.8, in 2014-2018, an average of 80 patent applications were filed. In the same five-year period, the number of granted patents rose from 15 to 71, approximately 4.7 times higher in 2018 over 2014. This is in line with UNICAMP's strong innovation profile and the initiatives that triggered this growth pattern should be strengthened.

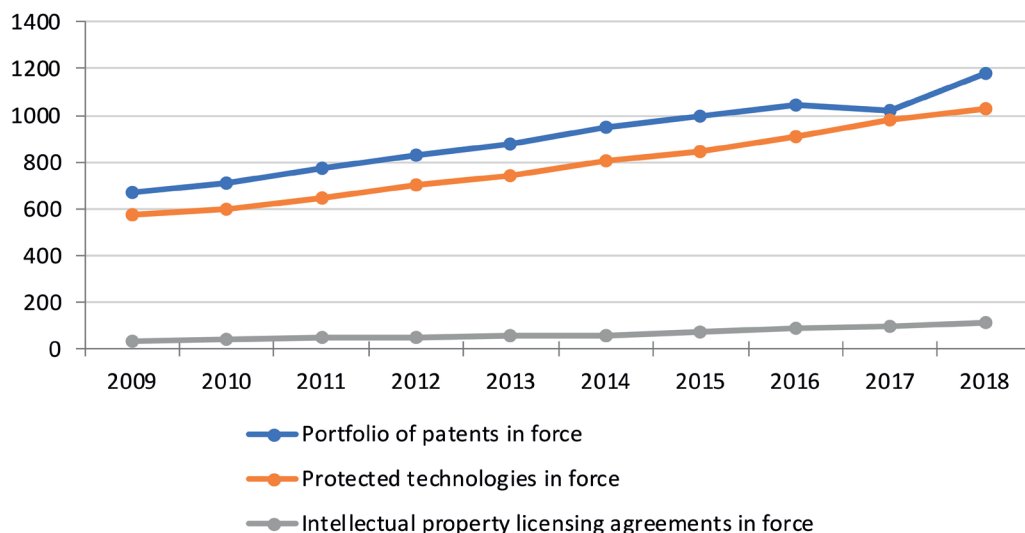
GRAPH 5.8: NUMBER OF BRAZILIAN AND INTERNATIONAL PATENTS FILED, LICENSED AND GRANTED IN 2009-2018



Source: Unicamp Statistical Yearbook 2019.

One also notes that the number of patents and protected technologies grew consistently at a rate of around 6% per year over the last five years, as shown in Graph 5.9. In the same period, the number of intellectual property licensing agreements in force grew approximately 14% per year.

GRAPH 5.9: EVOLUTION OF THE NUMBER OF PATENTS, PROTECTED TECHNOLOGIES AND IP LICENSING AGREEMENTS IN FORCE IN 2009-2018



Source: Unicamp Statistical Yearbook 2019.

## 5.2 Research at Unicamp by knowledge areas

### 5.2.1 Biological and Health Sciences

One of the facts that makes life sciences one of UNICAMP's most competitive areas is the volume and consistency of research funding (Table 5.11) from public sources.<sup>3</sup> In the past five-year period there was a nominal increase of over 20% in research funding in this area, which attracts most funds for research at UNICAMP. However, adjusting for inflation, funding in the last five-year period was around 8% lower than in 2009-2013, a probable consequence of Brazil's economic conditions.

This area comprises five academic units: School of Medical Sciences (FCM), School of Dentistry of Piracicaba (FOP), School of Physical Education (FEF), Institute of Biology (IB) and the newly created School of Nursing (FENF) and Faculty of Pharmaceutical Sciences (FCF), established in 2012 and 2014, respectively.

TABLE 5.11: COMPARISON OF FACULTY RESEARCH FUNDING  
IN BIOLOGICAL AND MEDICAL SCIENCES

2009 – 2013	FCF	FCM	FEF	FENF	FOP	IB	TOTAL
Fapesp (R\$)*	-	89.38	1.74	0	29.63	94.76	215.51
Finep (R\$)*	-	2.66	0	0	0	9.18	11.84
Total (R\$)*	-	92.04	1.74	0	29.63	103.94	227.35
No. of faculty (average)	-	346.4	31.4	11.2	82	116.6	587.6
Average/faculty member (R\$)*	-	0.27	0.06	0.00	0.36	0.89	0.39
2014 – 2018	FCF	FCM	FEF	FENF	FOP	IB	TOTAL
Fapesp (R\$)*	2.96	98.43	2.12	0.65	25.55	147.44	277.15
Finep (R\$)*	0	1.79	0	0	0	2.38	4.17
Total (R\$)*	2.96	100.22	2.12	0.65	25.55	149.82	281.32
No. of faculty (average)	11.6	320.6	36.8	29	87.8	118.2	604
Average/faculty member (R\$)*	0.26	0.31	0.06	0.02	0.29	1.27	0.47

Source: Fapesp, Finep-CT-Infra, Unicamp Statistical Yearbook 2019.

Note: \* Million reais. Nominal values.

IB, FCM and FOP, which have a strong track record of capturing research funding, maintained their good performance in the latter period. IB shows an increase in funding by FAPESP: compared to 2009, the institute obtained 150% more in research funds in 2018 for a 15% increase only in the number of approved grant proposals. In 2018, funding for IB accounted for 20% of the total public research funding for UNICAMP, which is the second most funded university by FAPESP, after USP. It is striking that IB raised funds with FAPESP and Finep-CT-Infra in the current period amounting to 1.27 million reais per faculty member on average, compared to 0.89 million in the previous period. It is the most funded UNICAMP department in this regard.

In terms of research funding from public sources external to Unicamp, FOP raised most funds in 2009-2018, almost 26 million reais, followed by FCM with a little over 25 million. FCM consistently raised funds compared to other institutions in the same area. In the years of global reduction of funding (2016 and 2017), despite the decrease in the number of faculty members compared to the previous period (Table 5.16), FCM was able to maintain practically the same level of funding, with a small reduction of 3%, while USP and UNESP recorded drops of 12% and 11%, respectively. In 2017-2018, funding for FCM was higher than other institutions in the same area: 25% increase in funding against 10% of USP and 6% of UNESP over the previous year. FCF raised 6.8% of funding for health care at UNICAMP and FEnf, also a newly created School, has been working to improve funding. FEF stresses that a considerable part of funding (an average of R\$ 400 thousand per year) is obtained as research grants from public sources.

While funding in Brazil is exemplary in this area, funding by foreign institutions is quite limited. Regarding research funding, it is noteworthy that Unicamp has two of the eight Research, Innovation and Dissemination Centers (CEPIDs, in Portuguese) supported by FAPESP in the areas of health and biological sciences. The growing funding for research in the area in question came partly from CNPq, despite the drop in funds offered by this agency in the past five-year period (up 7%).

The amount of funding is naturally reflected in academic output. In the last five-year period almost 1800 articles were published in this particular area of knowledge, commensurate with the number of faculty from the different schools. FCM (44%) and IB (28%) concentrate 72% of published articles. While the figures are impressive, the impact of such research measured as number of citations can still improve internationally.

In terms of national and international scientific output, the Biological and Medical Sciences units are generally slightly below the best international standards, but above Brazilian standards, and actually play an important role in setting Brazilian benchmarks:

- FCM evaluates its academic output as significant, with a per capita average of 2.78 published articles on various subjects and aligned with contemporary international medical and biomedical science.
- FENF stresses that its Category Normalized Citation Impact is above the Brazilian average, coming closer to figures for the area in the USA.
- IB has an average production of 4 articles per faculty member with about 10 citations per article: considering the Category Normalized Citation Impact, IB is above the average of BRICS, UNICAMP, USP and UNESP, with a relative impact on the world exactly at the global average, below only international benchmarks (USA, Europe, Australia and New Zealand and Asia).
- Although FCF was created in the first year of the five-year period, in 2014, its Category Normalized Citation Impact is close to UNICAMP's and above UNESP's. This good performance is a direct consequence of the continuous increase in the number of published articles, which leaped from 22 international articles in 2017 to 116 in 2018, reaching 122 in 2017.
- FEF, in turn, showed a Category Normalized Citation Impact equal to UNESP's but lower than the impact of UNICAMP as a whole.
- Finally, FOP stands out for its Category Normalized Citation Impact above the best Brazilian, Asian and BRICS (Brazil excluded) standards.

Despite the positive prospects in terms of productivity, changes in research figures emerge when comparing the current five-year period with the previous one. FCM and FOP experienced a reduction in the total number of published articles, which might be attributed to the reduction in the number of faculty. On the other hand, IB had a slight increase in the number of articles published in indexed international journals in the last 5 years. FCM and IB exhibit an increase in the number of patents and licenses in the last five-year period. FEF, in turn, reports that its scientific output was able to catch the attention of society, the same happening with IB, given the 112% increase in the disclosure of its works in the media. FENF and FCF had a significant increase in their figures, which is expected for being new school.

TABLE 5.12: ACADEMIC OUTPUT IN THE AREA IN 2018

Biological and Medical Sciences	2018						
Production	FCF	FCM	FEF	FENF	FOP	IB	TOTAL
Published Books	-	9	-	2	1	-	12
Articles Published in Journals	116	784	67	94	230	498	1,789
Published Book Chapters	2	97	12	18	18	20	167
Full Papers Published in Congress Proceedings	1	17	2	-	2	1	23
Published Abstracts	28	317	32	49	169	212	807
Participation in Congresses and Other Events	100	911	43	179	155	247	1,635
Other Miscellaneous Publications	-	101	3	-	5	3	112
Films, Videos, CD-ROMs, Audio and Audiovisual Recordings	-	-	-	-	-	-	-
Artistic Production	-	2	-	-	-	-	2
Editorial Activities		2	2	-	-	-	4
Technical Work	1	115	9	9	17	2	153
Organization of Events and Lectures	11	86	4	28	9	8	146
Lectures given	26	548	34	64	32	36	740
Outreach courses	5	12	4	7	-	3	31
Advisory Services	2	112	10	7	-	-	131
Other Services	-	16	-	1	-	3	20
TOTAL	292	3,129	222	458	638	1,033	5,772

Source: Unicamp Statistical Yearbook 2019.

Table 5.13 below features the number of indexed articles by faculty in the area. Table 5.14 features the number of indexed articles with the participation of foreign co-authors by faculty in the area. In both cases, IB has the best average performance, followed by FOP. The peak in FCF figures in 2014 refers to the period when the School started its activities.

TABLE 5.13: NUMBER OF INDEXED ARTICLES BY FACULTY MEMBER IN BIOLOGICAL AND MEDICAL SCIENCES

Year	FCF	FCM	FEF	FENF	FOP	IB
2014	15.00	2.52	1.14	0.83	3.16	4.32
2015	3.22	2.88	1.53	0.63	3.57	4.38
2016	3.12	2.65	1.46	1.10	3.30	5.09
2017	4.19	2.87	2.03	1.13	3.65	5.70
2018	4.25	2.85	1.92	1.27	3.92	5.75

Source: Incites/Web of Science (articles and reviews – April 16, 2019).

TABLE 5.14: NUMBER OF INDEXED ARTICLES WITH FOREIGN CO-AUTHORS BY FACULTY MEMBER IN BIOLOGICAL AND MEDICAL SCIENCES

Year	FCF	FCM	FEF	FENF	FOP	IB
2014	2.00	0.60	0.29	0.21	0.88	1.18
2015	0.33	0.72	0.34	0.10	1.25	1.17
2016	0.75	0.77	0.59	0.29	1.17	1.73
2017	1.00	0.81	0.70	0.37	1.45	2.16
2018	0.94	0.89	0.70	0.20	1.72	2.51

Source: Incites/Web of Science (articles and reviews – April 16, 2019).

Research developed in Biological and Medical Sciences is aligned with strategic themes for state and national development during the evaluation period. Prominent research subjects include global climate change, diabetes and obesity, mental health, women's health, senior health, eScience, Zika virus, Paralympic sports, applied genomics and bioethanol production, among others.

According to a survey carried out with the Incites and Web of Science tools on April 19, 2019, academic production in the branch of Biological and Medical Sciences in cooperation with research and development personnel from industry and business showed a significant increase only in IB (from 11 joint works in the previous five years to 27 in the current period) and FOP, which increased from 1 to 7 cases of cooperation with companies from one five-year period to the other. As a new School, FCF has made progress in this sense, introducing new partnerships. FCM, FOP and FENF are stagnant in this respect, acknowledging that they must improve conditions to attract new private sector partners.

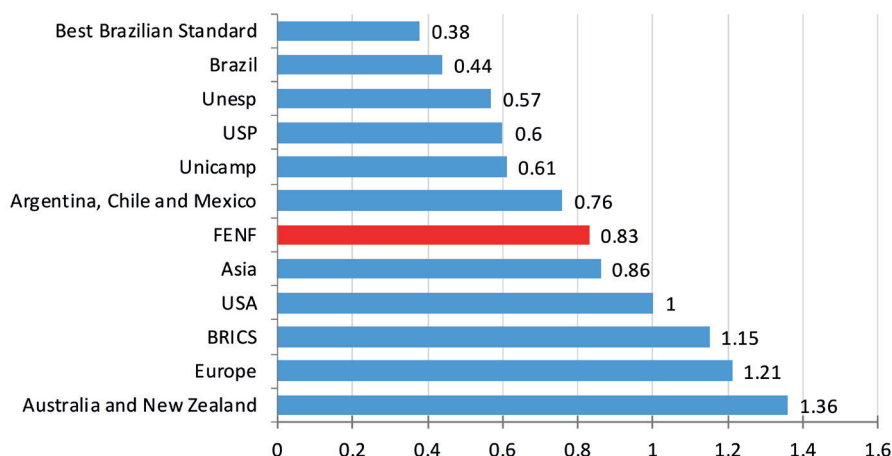
Interaction with public bodies, regulators and the third sector is more favorable: almost all schools carry out part of their research in cooperation with bodies such as the Ministry of Health and Ministry of Science, Technology, Innovation and Communications and the Unified Health System, in the case of FCM and FENF. FCF and FOP have worked with the National Supplementary Health Agency (ANS) and public healthcare systems, respectively. And in IB there is involvement with national and international bodies associated with environmental preservation, including the Environment Department, the Inter-American Institute for Global Change Research and the UN, mediated by Prof. Carlos Alfredo Joly.

In terms of impact, FCF and FEF have made progress, given that their normalized impact is higher than UNESP's, but still below UNICAMP's (as a whole) and the best Brazilian standard. The impact of FCM is almost equal to the UNICAMP average, although it is still below the best Brazilian standard. FENF is above the averages of the three São Paulo state universities, the best Brazilian standard and also Argentina, Chile and Mexico, setting a national benchmark (Graph 5.10). FOP, in turn, sets a national and international benchmark, being above the best Brazilian standard, BRICS and also Asia. Finally, IB stands out for being second only to international benchmarks (USA, Europe, Australia and New Zealand and Asia), establishing itself as a leader in Brazil, above Latin America and BRICS.

Postdoctoral researchers are among the most qualified workforce in society and are drivers of scientific development and academic production in Brazil. They are essential not only for the development of research projects, but also for joint supervision of students and occasional involvement in teaching activities in all academic units evaluated here. IB, for example, had 143 postdoctoral researchers in late 2018, which is more than one professional per faculty member (57% more than in the previous period). In FENF, about 30% of faculty members in the graduate program supervise postdoctoral researchers. Therefore, retaining and attracting postdoctoral researchers with outstanding backgrounds should be an institutional priority, especially in times of budget cuts like today and considering the cost of these professionals. Nevertheless, the schools believe that their efforts in this regard have been insufficient.



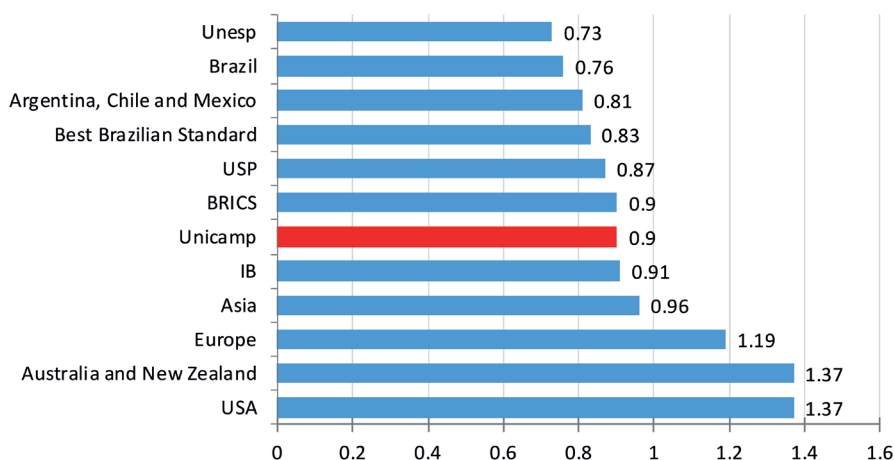
GRAPH 5.10: COMPARISON OF CATEGORY NORMALIZED CITATION IMPACT (CNCI) OF FENF SCIENTIFIC OUTPUT (ARTICLES AND REVIEWS) AND OTHER TEACHING AND RESEARCH INSTITUTIONS IN BRAZIL AND WORLDWIDE IN 2014-2018



Source: Incites/Web of Science (May 2, 2019).

Notes: Rating: CAPES 121. Brazil not included in BRICS. The best Brazilian standard is based on institutions with graduate programs mostly highly rated by CAPES in the respective areas.

GRAPH 5.11: COMPARISON OF CATEGORY NORMALIZED CITATION IMPACT (CNCI) OF IB SCIENTIFIC OUTPUT (ARTICLES AND REVIEWS) AND OTHER TEACHING AND RESEARCH INSTITUTIONS IN BRAZIL AND WORLDWIDE IN 2014-2018



Source: Incites/Web of Science (May 2, 2019).

Notes: Rating: CAPES 121. Brazil not included in BRICS. The best Brazilian standard is based on institutions with graduate programs mostly highly rated by CAPES in the respective areas.

Admittedly, attracting foreign postdoctoral researchers would be of great value for scientific exchange, but this is still limited and sporadic, usually on the initiative of the faculty members. There is no institutional mechanism to attract postdoctoral researchers from abroad. FAPESP has been instrumental in this regard, requiring that offers of postdoctoral grants be announced in international websites. On the other hand, postdoctoral grants are awarded only for cases of research projects that include such grants as budget items. According to the academic units, this number is quite small compared to the demand. Researchers should look for alternative funding to postdoctoral grants.

Tradition and influence are also trademarks of the area of Biological and Medical Sciences in this university. IB was one of the first institutes founded at UNICAMP. In over 40 years of existence it has supported decision-making processes that impact environmental public policies and cutting-edge biomedical research. In turn, FCM and FENF, and despite the short existence of the latter, add to such political impact their great interaction with various aspects of the life of Campinas, its metropolitan area and neighboring municipalities, including those of southern Minas Gerais, through medical services offered at the University Hospital. FOP and FEF are likewise known for services offered to surrounding communities.

In late 2018, this area comprised 606 faculty members, as shown in Table 5.15, almost all of them holding doctoral degrees and dedicated exclusively to teaching and research. As discussed above, they attract a significant amount of research funding, which is among the largest in the Brazil.

TABLE 5.15: NUMBER OF ACTIVE FACULTY IN BIOLOGICAL AND MEDICAL SCIENCES IN THE LAST TWO FIVE-YEAR PERIODS

Biological and Medical Sciences – Active Faculty									
2009-2013					2014-2018				
2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
608	605	587	570	568	575	603	623	613	606
Period average: 588					Period average: 604				

Source: Unicamp Statistical Yearbook 2019.

In general, the output improved over the previous period, despite a 6.7% increase only in faculty, suggesting that their efforts and skills have improved.

As a result, scientific output is exemplary. Many of the professionals are considered leading experts in Brazil – and sometimes worldwide – in the subjects studied at UNICAMP. This is supported by the fact that a significant number of faculty sit on the editorial boards of indexed international journals: 13 from IB, 12 from FOP and four from FCF, besides FCM. The large number of faculty who are CNPq Productivity Fellows also evidences the academic recognition of this area (Table 5.16). Noteworthy is FCF, where half of its 16 faculty members are productivity fellows, despite being a recently created School. Also noteworthy are IB and FOP, where 51.7% and 39.5% of faculty hold CNPq grants, respectively. In IB and FOP, which have 118 and 86 faculty, 32.2% and 24.4% respectively hold Level 1 grants.

TABLE 5.16: BREAKDOWN OF CNPQ PRODUCTIVITY IN RESEARCH  
FELLOWSHIPS IN BIOLOGICAL AND MEDICAL SCIENCES (AUGUST/2019)

BIOLOGICAL AND MEDICAL SCIENCES							
Level	FCF	FCM	FEF	FENF	FOP	IB	TOTAL
PQ-1A	0	14	0	0	6	8	28
PQ-1B	0	5	0	0	7	7	19
PQ-1C	2	6	1	1	7	9	26
PQ-1D	0	10	1	1	1	12	25
PQ-2	6	27	4	2	13	23	75
PQ-SR	0	0	0	0	0	2	2
TOTAL	8	62	6	4	34	61	175
%	4.6%	35.4%	3.4%	2.3%	19.4%	34.9%	100.0%

Source: PRP/CNPq.

The quality of faculty in this area is attested by the hundreds of awards and commendations received from the academic community. Some highlights are: Rodrigo Ramos Catharino (FCF), awarded the “Young Scientist Prize” by the World Academy of Sciences (TWAS), Regional Office for Latin America and the Caribbean (ROLAC) in 2015; Heloisa Helena Baldy dos Reis (FEF), awarded the *Cruz do Mérito do Empreendedor Juscelino Kubitschek* in 2016; the IB professors Marco Aurélio Ramirez Vinolo (2016), Rafael Vasconcelos Ribeiro (2016), Daniel Martins-de-Souza (2017) and Marcelo Alves da Silva Mori (2018), elected affiliated members of the Brazilian Academy of Sciences (ABC); Patricia Moriel (FCF), awarded the *Comenda do Mérito Farmacêutico* by CRF/SP in 2018; and Sara Teresinha Olalla Saad (FCM), awarded the *Medalha Nacional do Mérito Científico, Classe Comendador*, and Aníbal Eugênio Vercesi (FCM), awarded the *Ordem Nacional do Mérito Científico, Categoria Grã-Cruz*, both in 2018 by the Ministry of Science, Technology, Innovations and Communications.

In contrast to the evident excellence of faculty in this area, five of the six schools lack a regular cycle of scientific research seminars organized at administrative level. IB is the only one with two specialized cycles. This interferes not only with the quality of the professionals being trained, but also with the continued improvement of permanent faculty. Permanent seminar cycles can increase the chances of interdisciplinary cooperation and enhance the qualified and critical view of scientific problems, leading to future projects on the frontiers of knowledge. In addition, seminar cycles could be a distinctive feature in attracting professionals of excellence to UNICAMP, either through applications or as visiting researchers on sabbatical.

The hiring and retirement processes in recent years have produced a blend of young and experienced professors, which can prove to be a very interesting combination, especially considering that many of these new faculty members boast international education and experience.

The increase in the number of students is not commensurate with the number of faculty in this area compared to the previous five-year period. This requires the attention of school administrators to plan future recruitment. The strategic plans should address



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the issue of future hires as well as the promotion of current professors to keep the faculty motivated. Aligning teaching and academic interests is one of the great challenges that can only be successfully addressed through investigation and planning.

The above goes hand in hand with the need to create strategic research plans not only in the short term (up to five years), as exemplarily reported by FCM and FEF, but also in the medium and long term. Such plans should include strategic actions that are compatible with the future desired by the scientific community within at least 15 and ideally 20 years. Several specific measures have been implemented in the school of this area, usually associated with fundraising, small grants and interdisciplinarity promotion. Such initiatives are always welcome, but they should be used to support more contemporary, broader and ambitious plans. The schools must address in the strategic plans ways to qualify their scientific output, such as publishing research in journals of greater impact, since, in terms of sheer quantity, the area of Biological and Medical Sciences at UNICAMP is very prolific. Given that this is one of the areas that most attracts financial resources, funding is not the only answer to increasing the quality of our science. Long-term strategic planning must address this issue, along with other equally essential matters: attraction of human resources; formation of new groups to meet the demands of the research area in contemporary subjects, whether in basic research or studies that can be shared with society; increased integration among different research groups by implementing a greater number of large-scale cooperative projects; among others.

On the other hand, some of the short-term strategic plans reported by the units may have a positive impact on long-term research. FCM, aiming to expand research of excellence at national and international level, has focused on developing multiuser laboratories and activating the Center for Clinical Research. In this sense, IB already has a Virtual Equipment Sharing System and is creating a lab facility to enhance existing infrastructure. A few years ago IB created an Institutional Service to Support Researchers (SAIP) to encourage and support research funding. SAIP enables researchers to better focus their time on research, thus contributing to increase their productivity. FCM has had a similar service since 2017.

While the issue of how to publish a significant part of research done at UNICAMP in higher-impact journals must be addressed – a discussion that goes beyond the research area to involve graduate programs – one sees clearly the impact of UNICAMP's scientific production on innovation and entrepreneurship, as well as on solutions to outreach society, which should be one of the core activities of the university. The number of patents filed by the Biological and Medical Sciences Schools is significant and, according to the schools, comparable to the best Brazilian standards. FCF faculty, which comprises only 16 members, filed 7.8% of UNICAMP patents. IB, in turn, records an average of 15% of total patents filed by UNICAMP. FOP kept up a stable production, filing 23 patents in the period, while one of the newest units in this area, FENF, which views itself below Brazilian standards, has been concerned with setting targets to increase the number of filed patents, a potential strategy to be implemented also by FEF.

While the number of filed patents is an important aspect to be noted, intellectual property licensing agreements are indications of the quality of what has been filed. In this sense, IB and FCM stand out. Licensing agreements with IB patents range between 10 and 20% of the UNICAMP total. FCM, in turn, reports an increase in the number of intellectual

property licensing agreements in the current evaluation period. Seven agreements were signed in 2014-2018 compared to only three in 2009-2013. Although patent licensing is still a future goal at FENF, the unit developed a scar cream for diabetic patients and a computer program to support the teaching of clinical reasoning in nursing. FOP licensed two patents.

Regarding the founding of new companies, FCM spawned five startups in 2014-2018 (IMMUNOGENIC, Instituto Neuron, PORTALPED, Cambuí Ophthalmology and Plug and Care). IB reported a deficiency in this respect, creating only one startup company in the period, while the other units did not spawn any. Given this scenario, one wonders whether students graduating from Biological and Medical Sciences courses are facing difficulties to translate the practical knowledge acquired in the university into technological applications. This may be a reflex of the undergraduate programs, whose efforts in entrepreneurship are still incipient. Although the issue has already been individually and locally addressed by some faculty members, it should be considered in medium- and long-term strategic planning.

While FEF and FENF are not the largest patent producers in this area, their efforts to translate their intellectual production into solutions for society are admirable. FENF is focused on applying its intellectual production in nursing care, resulting in direct social impact. The contents generated in FENF lead to reflection on healthcare processes and technologies. FEF, in turn, carries out projects with relevant social insertion. Examples are the Unicamp Gymnastic Group (GGU), whose coordinator, Prof. Marco Bortoleto, is a member of one of the committees of the International Gymnastics Federation (FIG); adapted physical activity and sport, given Brazil's striking presence in the international Paralympic scene; besides work in High Performance Paralympic Sport.

It is important to mention that research produced in the area of Biological and Medical Sciences has gained prominence in the academic environment and also in media for wider audiences. Articles have been published in the best journals worldwide and gained international attention, such as by the professors Gustavo Quevedo Romero in *Nature Climate Change*; Luis Felipe de Toledo Ramos Pereira in *Science*; Marcelo Alves da Silva Mori in *Nature*; Marco Aurelio Vinolo in *Nature Communications*; and Pedro Moraes Vieira in *Cell Metabolism*. Prominent in mass media is work by Jacqueline Mendonça Lopes de Faria on the development of eye drops for the prevention and treatment of diabetic retinopathy; by Licio Augusto Velloso on brain damage caused by weight gain; and by Otávio Rizzi Coelho on the development of an exam capable of detecting changes in the heart of patients undergoing chemotherapy. Also noteworthy is the work by Gonçalo Guimaraes Pereira on the use of non-burnt sugarcane straw to increase energy production; by Clarice Arns on a quick Zika virus test; and by Daniel Martins-de-Souza on tests to predict antipsychotic response patients with schizophrenia.



Antonio Scarpinetti/SEC – Unicamp

The abovementioned long-term strategic plans should address the internationalization of science, not only through interaction abroad, but also by systematically bringing international science to Brazil. The units should create a local internationalization office with at least a Portuguese/English bilingual staff to prospect new international partnerships and facilitate the execution of joint projects with institutions from other countries. Only IB has already taken effective steps to this end.

### 5.2.2 Exact and Earth Sciences

The area of Math, Earth and Natural Sciences at UNICAMP comprises four academic units: the Institute of Mathematics, Statistics and Scientific Computing (IMECC), the Institute of Geosciences (IG), the Institute of Chemistry (IQ) and the “Gleb Wataghin” Institute of Physics (IFGW). These units are ranked at least above the best Brazilian standards in terms of academic output, measured as relative impact on the world. IMECC, IG and IFGW have similar indicators to international bodies. It is noteworthy that research carried out in these schools is markedly interdisciplinary and not restricted to the larger areas commonly associated with their names. In 2009-2013 there were 350 active faculty on average; in 2014-2018 this figure increased slightly to an average of 368 active professors, as shown in Table 5.17.

TABLE 5.17: BREAKDOWN OF ACTIVE FACULTY IN MATH, EARTH AND NATURAL SCIENCES

	Year									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Active faculty	352	352	345	346	354	356	370	368	376	371
Average	350					368				

Source: Unicamp Statistical Yearbook 2019



One observes in this period a steady growth in the participation of international co-authors in articles published by faculty, as shown in Table 5.18, from 42% in 2014 to 54% in 2018. There is also an absolute increase in indexed publications and a growth in the average number of articles per faculty member, from 2.83 articles/faculty in 2014 to 3.64 articles/faculty.

TABLE 5.18: PARTICIPATION OF FOREIGN CO-AUTHORS IN PUBLICATIONS IN MATH, EARTH AND NATURAL SCIENCES AND AVERAGE PRODUCTION PER FACULTY MEMBER

Year	Indexed articles with foreign co-author	Indexed articles	Number of faculty	Indexed articles per faculty member
2014	368	871	308	2.83
2015	409	914	319	2.87
2016	525	1,023	316	3.24
2017	528	1,078	321	3.36
2018	620	1,156	318	3.64
2014-2018	2,450	5,042	1,582	3.19

Source: Incites/Web of Science (article and reviews – May 2, 2019).

Table 5.19 shows a systematic growth of indexed articles published by faculty member. IQ stands out with approximately five indexed articles by faculty member per year, followed by IFGW with about 4.5 indexed papers by faculty member per year. When analyzing Table 5.20, which is restricted to articles with international co-authors, this ranking is reversed: IFGW has approximately 3.5 indexed articles (with international co-authors) by faculty member per year, while IQ has 1.4 indexed articles (with international co-authors) by faculty member per year.

TABLE 5.19: NUMBER OF INDEXED ARTICLES BY FACULTY IN MATH, EARTH AND NATURAL SCIENCES

Year	IFGW	IG	IMECC	IQ
2014	3.83	0.62	1.43	4.88
2015	3.81	1.43	1.54	4.53
2016	4.89	1.05	1.71	5.23
2017	4.57	1.62	1.97	5.03
2018	5.71	1.35	1.94	5.21

Source: Incites/Web of Science (articles and reviews – April 16, 2019).

TABLE 5.20: NUMBER OF INDEXED ARTICLES WITH FOREIGN CO-AUTHORS BY FACULTY IN MATH, EARTH AND NATURAL SCIENCES

Year	IFGW	IG	IMECC	IQ
2014	2.47	0.22	0.46	1.29
2015	2.77	0.52	0.54	1.13
2016	3.70	0.53	0.62	1.73
2017	3.40	0.69	0.81	1.44
2018	4.42	0.62	0.90	1.59

Source: Incites/Web of Science (articles and reviews – April 16, 2019).

IMECC is recognized for its contribution to research training. Alongside its production, IMECC helped promote Brazil to the elite of world mathematics (Group 5 of the International Mathematical Union), as reported by IMECC. Its four most prominent branches in number of article citations are mathematics (1587), physics (487), computer science (330) and probability and statistics (199). In these fields, the relative impact on the world is 1.04, 1.23, 0.96 and 1.11, respectively. It is noteworthy that the department's branches of mathematics, physics and probability/statistics have performed above the world averages of 4%, 23% and 11%, respectively. This shows the capacity of IMECC for interdisciplinary work and its alignment with international research standards. The performance of its computer science area is 4% below the world average and is the department's third largest in production and citations, suggesting it is a field of great interest to its faculty, despite being the main research area of the Institute of Computing.

IG stands out for its unique trait: it is an institute that has one branch of earth sciences (geology), two that blend earth and human sciences (geography and geoscience teaching) and a fourth branch characterized as interdisciplinary (scientific and technological policy). Thus, its profile differs significantly from traditional earth sciences institutes. As an example, the institute has no relevant lines of research in the field of agronomy, although it features importantly in the school's output, possibly resulting from the production of a research group in soil science. The prominent branches (earth sciences, environmental sciences, soil science, history of earth sciences, mining engineering and computational sciences), according to the number of articles produced and also the number of citations, are guided by the activities of CNPq Productivity Fellows. It should be noted that typical metrics of academic evaluation may not be appropriate to analyze this school.

An important aspect in the Institute of Chemistry (IQ) is the great interaction between research areas. In particular, over 68% of the output is concentrated in the branches of chemistry, materials science and metallurgy, physics and biochemistry. In 2014-2018, more than 2,800 articles were published, totaling approximately 23,000 citations (around eight citations per article). The figures reported highlight the quality of production, since the CNCI of prominent areas indicate above-world average performance: biology (2.24), agronomy (2.21), nutrition (1.77), physiology (1.67) and biotechnology (1.59). The figures of relative impact on the world are also encouraging, especially in physiology (2.60), biology (2.45) and biotechnology (2.07).

IFGW stands out for having the highest CNCI (0.89) in the state of São Paulo, approximately 40% above the Brazilian average (0.65). The school has shown consistent increase in academic output per faculty member since 2011 (reaching 3.5 articles/member, 16.7 citations/article and 88% of articles with at least one citation). With an output aligned with international levels and distributed among mathematical sciences, biology, health care and humanities (including basic and applied studies), IFGW published over 3,400 documents in recent years, especially in physics, materials science and astronomy.

The Math, Earth and Natural Sciences academic units focus their academic production on the publication of articles in international peer reviewed journals, as well as the production of scientific books and book chapters. All academic units in this grand field report an increase in volume of publications, participation in radio and TV programs and organization of meetings and scientific events. The 2016-2018 period was particularly the

most productive for IMECC. A highlight in IG was the effect of the school's internationalization policy, leading to a reduction in the number of publications in Brazil (41 to 27, comparing 2009-2013 and 2014-2018) and an increase in the publication of international articles (from 68 to 103). The Institute of Chemistry (IQ) maintained the high-level output of its faculty in the past 10 years, confirming the soundness and maturity of its production, reporting a 5% increase in the number of publications in peer reviewed international journals (from 1772 to 1860) and a fivefold growth in published book chapters (from 5 to 28). In IFGW, production in peer reviewed international journals increased by 61%, from 1,271 (in 2009-2013) to 2,043 (in 2014-2018).

With such output figures, the school are nationally recognized by the Brazilian peer review system, a fact usually reflected in the number of faculty members who are CNPq research fellows. Table 5.21 features the breakdown of CNPq productivity fellows by academic unit. For the sake of illustration, approximately 54% of IMECC faculty are CNPq productivity fellows; in the Institute of Physics, 43% of faculty hold this prominent position. This figure is around 30% in IG and 36% in IQ.

TABLE 5.21: BREAKDOWN OF PRODUCTIVITY IN RESEARCH  
FELLOWSHIPS (CNPQ) IN MATH, EARTH AND NATURAL SCIENCES

Level	IFGW	IG	IMECC	IQ	TOTAL
PQ-1A	8	2	3	7	20
PQ-1B	5	3	8	9	25
PQ-1C	6	3	7	3	19
PQ-1D	8	5	5	5	23
PQ-2	23	17	32	25	97
PQ-SR	1	0	1	1	3
TOTAL	51	30	56	50	187

Source: PRP/CNPq.

It is important to note that some academic units, such as IG, claim that their faculty often develop activities like technical designs and reports, community service, opinions and others which are not systematically reported in the Lattes information system and consequently in SIPEX. The lack of information in the Lattes Platform is mainly due to faculty/researchers not updating their personal data. In some cases the information is entered in incorrect fields, so that it is not properly represented in systems that depend on said platform (such as SIPEX and RAD). Added to the lack of a single repository for data storage, this creates a damaging situation for monitoring and evaluating activities, which do not yet have mechanisms in place to consolidate academic production information.

Partnerships with industry and business have been positively viewed by the schools. This is especially due to the possibility of connecting the university to the outside community, diversifying funding options and expanding not only the impact, but also the dissemination and application of products stemming from such cooperation. Although the volume of publications involving co-authors from industry and business is not yet significant, there has been a modest growth in recent years. In IQ, such collaboration is still slight and accounts for less than 1% of output but increased from 26 to 34 documents

between the two five-year periods in question (up around 30%). Cooperation with IBM, Petrobras and AT&T stands out among the institutes.

In turn, interaction with public bodies, regulators and the third sector has also increased at different levels. Noteworthy is the participation of faculty in committees of public and private funding agencies such as FAPESP, CAPES, CNPq and Instituto Serrapilheira. Also prominent is cooperation with regulators, including the National Petroleum Agency (ANP), the Agency for Technological Development of the Brazilian Mining Industry (ADIMB) and the National Electricity Agency (ANEEL). Other institutions, such as the Brazilian Center for Research in Energy and Materials (CNPEM), including its laboratories – National Synchrontron Light Laboratory (LNLS), National Laboratory for Scientific Computing (LNCC) – and the Brazilian Agricultural Research Corporation (Embrapa) are partners in projects, publications and access to data, with huge significance for the evolution of research in these institutes and in line with strategic themes at state and federal levels. The participation of faculty members of these units in boards and councils of scientific societies is a catalyst for the production of high-level science and confirms the importance of evidence-based decision making. The schools also interact with the community outside UNICAMP through events such as workshops and lectures for different audiences.

The academic units report the execution and coordination of projects related to individual research, international cooperation and interaction with FAPESP, CEPIDs (FAPESP Centers for Research, Innovation and Dissemination) and INCTs (National Institutes of Science and Technology) in various subjects. The Institute of Chemistry harbors the Center for Computing in Engineering and Sciences – CCES, one of three CEPIDs created in 2013. The projects cover the topics of energy and bioenergy, health care, safety, biomass, food, climate change and sustainability, among others. Therefore, all academic units prove to be in tune with subjects of national and international interest, noting that IG and IQ have projects in more than one of these areas. IFGW emphasizes the importance of its activities in the nuclear and particle physics field and also in new materials (especially nanomaterials).

Research in the institutes is mainly funded by FAPESP. The agency provides different types of financial support, from student grants at different levels to funding of advanced research centers. Competition for these funds is intense and success in obtaining them is used as a practical metric of performance and excellence. In this respect, two equally relevant viewpoints should be distinguished: one is the share of funding obtained by a specific area (in UNICAMP) of the agency's total funding to UNICAMP; the other is the share of funding obtained by a specific area (in UNICAMP) of the agency's total funding to that specific area (regardless of the applicant's specific department). The first metric is associated with the ability to attract funds within UNICAMP while the second provides an analogous measurement, but based on the area-specific pattern.

Overall, the institutes in this field report a nominal increase in FAPESP funding in the last two five-year periods (2009-2013 and 2014-2018), as shown in Table 5.22. It should be noted that Brazil was hit by a financial crisis in the last five years that caused a significant reduction in ICMS taxation levied in all states. As the source of the financial resources managed by FAPESP is ICMS taxation in the state of São Paulo, a reduction in absolute funding was expected. Considering the inflation rate of approximately 35% between December 2013 and December 2018, the nominal increase in funding reported

by the schools did not follow the increase in prices over the period. Therefore, effectively speaking, there was a reduction in funding.

TABLE 5.22: COMPARISON OF RESEARCH FUNDING IN MATH, EARTH AND NATURAL SCIENCES

2009 – 2013	IFGW	IG	IMECC	IQ	TOTAL
Fapesp (R\$)*	57.81	13.52	17	63.66	151.99
Finep (R\$)*	1.26	1.35	0.05	0.09	2.75
Total (R\$)*	59.07	14.87	17.05	63.75	154.74
No. of faculty (average)	84.2	48	94.6	76.2	303
Average/faculty member (R\$)*	0.70	0.31	0.18	0.84	0.51
2014 – 2018	IFGW	IG	IMECC	IQ	TOTAL
Fapesp (R\$)*	65.57	16.86	26.53	82.69	191.65
Finep (R\$)*	2.91	0.05	0.05	0.51	3.52
Total (R\$)*	68.48	16.91	26.58	83.2	195.17
No. of faculty (average)	85.2	54.4	100	76.8	316.4
Average/faculty member (R\$)*	0.80	0.31	0.27	1.08	0.62

Source: Fapesp, Finep-CT-Infra, Unicamp Statistical Yearbook 2019 (Tabela 11.4).

Note: \* Million reais.

In the branch of mathematical sciences, there was a decline in funding over the past few years, even in nominal values. In 2015, funding for this branch accounted for 2.97% (R\$ 4.6 million) of all funding for UNICAMP. In 2018, this figure fell to 2.45% (R\$ 4.4 million). This pattern is more clearly evidenced by observing that in 2015 UNICAMP accounted for around 26.45% of all FAPESP funding for mathematics. In 2018 this share was reduced to 22.52%.

In the branch of Earth Sciences, there was a reduction in funds disbursed by FAPESP over the past few years. In 2015, UNICAMP's Earth Sciences area received 2.16% (R\$ 3.3 million) of total FAPESP funding for the university; in 2018 this share fell to 1.33% (R\$ 2.4 million). Additionally, it is noted that in 2015, Earth Sciences at UNICAMP received 12.95% of all FAPESP funding for this area; in 2018 this share dropped to 7.44%.

In the branch of Chemistry, UNICAMP ranks second in total FAPESP funding, behind USP. Compared to total FAPESP funding for UNICAMP, the Chemistry area showed a systematic growth in funding share, from 7.31% (R\$ 11.3 million) in 2015 to 9.44% (R\$ 16.9 million) in 2018, as shown in Table 5.23. Within the branch of Chemistry, UNICAMP's funding grew from 18.83% in 2015 to 25.27% in 2018. Also noted is an increase in FAPESP funding through support for Young Researchers.

The branch of Physics shows a similar pattern of growth in FAPESP funding, from 6.48% (R\$ 10 million) of total FAPESP funding for UNICAMP in 2015 to 9.28% (R\$ 16.6 million) in 2018. Regarding the branch of Physics, UNICAMP received 17.15% of all FAPESP funding for the area in 2015, which increased to 26.41% in 2018.

TABLE 5.23: SHARE OF UNICAMP AREAS OF FAPESP FUNDING FOR UNICAMP

AREAS	2015	2016	2017	2018
Chemistry	7.31%	8.88%	8.92%	9.44%
Physics	6.48%	6.96%	6.26%	9.28%
Mathematics and Statistics	2.97%	2.79%	2.72%	2.45%
Earth Sciences	2.16%	3.00%	2.00%	1.33%

Source: FAPESP.

TABLE 5.24: UNICAMP SHARE OF FAPESP FUNDING FOR AREAS

AREAS	2015	2016	2017	2018
Chemistry	18.83%	20.63%	24.14%	25.27%
Physics	17.15%	16.66%	17.82%	26.41%
Mathematics and Statistics	26.45%	22.01%	22.93%	22.52%
Earth Sciences	12.95%	6.62%	8.78%	7.44%

Source: FAPESP.

The main intellectual output in the institutes in question is scientific articles. In this regard, IFGW is the UNICAMP unit with the largest number of articles published in indexed journals (both in absolute figures and in number of articles per faculty member).

The stimulus for innovation, as reported by the unit, is intrinsic to the culture of the Institute the Chemistry, which stands out as the institute with the largest number of filed patents in the history of UNICAMP and significant interaction that benefits its startup companies. IQ manages large-scale projects on strategic themes of different FAPESP-funded strategies (Research, Innovation and Dissemination Center – CEPID, Center for Engineering Research – CPE, Bioenergy Research – BIOEN and Partnership Research for Technological Innovation – PITE). A significant number of research agreements with private and public companies is also reported by this institute. It is essential to encourage this kind of culture in other units. IG, for example, stresses the importance of social and technological innovation associated with its research work, highlighting the potential growth (in research volume and impact) to be achieved with activities focused on the subject and supported by INOVA (UNICAMP’s innovation agency).

Compared with IQ, the volume of filed patents and new products with direct applicability in society is low in other institutes of the field. IMECC reports participation in CEPID projects and the creation of startup companies by its alumni. IG highlights the execution of a FAPESP São Paulo Excellence Chair (SPEC) project focused on innovation (Innovation, Strategies and Policies System) which should soon stand out mark within UNICAMP’s innovation ecosystem.

With the exception of IMECC, all academic units in the area of Math, Earth and Natural Sciences report great contributions to society. Outreach courses and the development of highly qualified human resources are stressed by these institutes as important means for the widespread transfer of technical and scientific knowledge outside the university. The Institute of Geosciences executed projects with direct impact on public policy, including urban mobility (projects involving electric vehicles with ANEEL and companies in the sector), definition of priorities for research investment, production of teaching material



for indigenous peoples and a proposal of a new IT regulatory framework. The activities developed by IFGW had a major impact on health care available to citizens, as its research spawned products of widespread medical use (such as a method to monitor blood flow and detect ischemia with optical technologies and the development of virtual reality applications for motor and cognitive rehabilitation of patients affected by stroke and other pathologies); in addition, the institute's production is also aligned with policies for scientific dissemination and participation in studies designed by the federal government on strategic topics. IMECC, as noted above, does not disclose any information regarding impacts on society; the institute reports that it has no data in this regard, suggesting it has difficulties to manage such information.

Regarding the repercussion of the research activities of these institutes among society, this occurs initially through the media, which serves as a showcase. Then specific demands can be handled in a customized manner, often involving direct contact between interested parties and researchers. In this regard, there is need for an institutional policy to centralize or even standardize these activities, simplifying the collection and treatment of such data. The following list of selected works that resonated among society shows the different areas of interest of these researchers, attesting to the great importance of the Math, Earth and Natural Sciences:

- Cover article of *Physics Review Letters* journal for April 8, 2016, by Prof. Ricardo A. Mosna on the use of the mathematics of relativity to describe liquid crystal (IMECC) : <http://goo.gl/aXWfkZ>
- Participation of Prof. Alessandro Batezelli in an expedition to Antarctica (IG), with a summary of his findings: <https://g1.globo.com/sp/campinas-regiao/terra-da-gente/noticia/2019/02/19/expedicao-brasileira-na-antartica-acha-fosseis-de-80-milhoes-de-anos.ghtml>
- Participation of Prof. Alvaro Crósta (IG) in a BBC news story on the Araguaina Crater: <https://www.bbc.com/portuguese/brasil-46269719>
- Progress in the fight against Chagas disease with research by Prof. Luis Carlos Dias (IQ): <https://noticias.uol.com.br/saude/ultimas-noticias/redacao/2014/04/08/cientistas-brasileiros-avancam-no-combate-a-doenca-de-chagas.htm>
- Use of biomarkers in breast cancer detection resulting from the doctoral thesis of Cecília de Carvalho e Silva, supervised by Prof. Lauro Kubota (IQ): <http://g1.globo.com/sp/campinas-regiao/noticia/2015/11/sensor-detecta-cancer-de-mama-seis-meses-antes-de-nodulo-aparecer.html>
- Potential groundbreaking work in telecommunications by Prof. Gustavo Silva Wiederhecker and Thiago Alegre (IFGW): <https://exame.abril.com.br/tecnologia/efeitos-optomecanicos-podem-revolucionar-telecomunicacoes>

Another reflex of this kind of repercussion is awards and tributes granted to researchers. Such recognition happens in different ways, including awards at national and international scientific events, dissertation and thesis competitions, acknowledgment and titles offered by national and international scientific societies, in addition to those from research funding agencies. During the period in question, UNICAMP researchers in Math, Earth and Natural

Sciences received many awards, the most prominent being: *Ordem Nacional do Mérito Científico (classe Grã-Cruz)* to Lauro Kubota (IQ) and Oswaldo Luiz Alves (IQ), Order of the British Empire (Honorary) to Carlos Henrique Brito Cruz (IFGW) and *Prêmio Jabuti* to Ennio Peres da Silva (IFGW).

Internationalization has been achieved through cooperation involving international institutions and also thanks to the individual efforts of faculty in their research projects. From the perspective of the institutes, it is also important to evaluate the participation of foreigners in their faculty, which has been recurrent, but mostly driven by the personal efforts of such foreign professors through their cooperative networks abroad. A faculty with consistent international participation is extremely important for aligning research topics, increasing output visibility and, especially, increasing competitiveness. Therefore, strategies to attract these professionals should be well structured and institutionally supported. This is not commonly observed in the departments, whose initiatives are generally limited to disclosing calls in existing contact networks.

The information provided by IG and IQ suggests that these two institutes have better targeted initiatives to increase the internationalization of their research: IG reports a lasting relationship with Cardiff University and cooperation with George Washington University, as well as European institutions, which contribute to the consistent organization of international events; IQ reports a series of high-impact activities that can serve as templates for other schools, including encouraging faculty to pursue postdoctoral studies abroad, offering graduate entrance exams in other Latin American countries, providing access to graduate programs through the international standardized Graduate Record Examination (GRE) test and holding entrance exams in English.

As with foreign faculty, foreign postdoctoral researchers are not attracted through specific policy, but through faculty contact networks and publicizing in area-specific international channels. Strikingly, there are no specific attraction policies for Brazilian postdoctoral researchers either. Once in the institute, all postdoctoral researchers, regardless of nationality, are actively involved in academic production, executing projects, co-supervising students and mediating local groups engaged in the most recent trends in their fields of study. In teaching, postdoctoral researchers may volunteer to lecture subjects (theoretical or experimental) and/or contribute to modernizing teaching material. Such activities greatly depend on the proactivity of researchers and are highly evaluated

#### RESEARCH ON CHAGAS DISEASE BY PROF. LUIS CARLOS DIAS



Antonio Scarpinetti/SEC – Unicamp.

by the schools, since several of these postdoctoral researchers rank highly in department examinations and eventually become faculty members. However, such teaching support is hindered by current requirements of the Academic Board such as the need for the researcher to be linked to the department for an entire semester (which is not easy due to the lack of synchronization between the arrival/departure of postgraduate students and the beginning/end of semesters), rendering this kind of support suboptimal. It is noted that the lack of specific metrics to quantify the contribution of these researchers hinders the adequate evaluation of their recognized importance.

The schools report that the volume of publications with foreign co-authors has increased over the last few years. The figures informed by some of them, such as IMECC and IQ, rank them below the Brazilian standard. However, efforts towards internationalization made by the units reveal potential to turn this situation around, thanks to research internationalization initiatives. Scientific publications are the most common means of cooperation with foreign institutions, but they generally result from other forms of cooperation such as visiting faculty on both sides, student exchange programs at different levels and organization of and participating in international events. One also notes a trend of multidisciplinary topics in current international cooperation.

During the period in question, these institutes organized three FAPESP São Paulo Schools of Advanced Science (two at IFGW and one at IQ). IMECC hosted the 2018 CNMAC, the Brazilian Congress of Applied and Computational Mathematics (the largest event in Brazil in the area), to celebrate the school's 50th anniversary and the 40th anniversary of the Brazilian Society of Applied and Computational Mathematics (SBMAC), attended by 800 participants, and where half of the speakers were foreigners. Faculty members of the Institute of Geosciences are traditionally invited to organize international events in the field of earth sciences and remote sensing. Interaction at IQ is well aligned with UNICAMP's strategic partnerships, such as intense cooperation with the University of Cardiff which resulted in projects funded by SPRINT/FAPESP and Newton Fund. According to the Institute of Chemistry, hosting international speakers on a regular basis (whether at seminars or major events organized at the school) has been extremely positive for graduate students, who can interact with such guests, despite not often attending events abroad. This strategy can be adopted by other schools, expanding the scope of such visits.

The faculty of these institutes take active part in editorial boards of internationally recognized peer-reviewed journals. At least five IG professors sit on the editorial boards of at least 20 journals. In IQ, 15 professors took part in 30 journals in 2014-2018. IFGW reports six faculty members on the editorial board of nine journals. It is clear that these units are inserted in relevant scientific media in their respective fields.

It is necessary to invest in funding from international sources to carry out research at UNICAMP. Although individual initiatives of beneficiaries are important, it is essential to reduce the institutional bureaucracy of such processes to increase funding. Examples of difficulties reported include drawn-out proceedings and legal requirements for documents, with versions in different languages.

With the exception of IMECC, which does not view the pursuit of new international partnerships as a major component of the work of the institute's Research, Outreach and Graduate Committees, the Math, Earth and Natural Sciences institutes report efforts by these committees to identify such opportunities. Albeit incipient and not yet structured as

policy, such strategies have already proved to be of great value to the scientific community. They consist of constant monitoring and publicizing of calls, with the institute's support in organizing and centralizing information used to formulate projects, and also activities aimed at strengthening project management skills.

Each unit develops strategic planning in distinct ways. The Institute of Geosciences employs strategies with different scopes: a broader one to identify values among the institute's community, always striving for academic excellence; another at graduate program level, with discussions on funding strategies and goals to meet Capes requirements; and a third at sector level, where hiring discussions take place. The strategic goal of IQ, in turn, is to hire faculty attuned with its forward-looking vision, seeking distinctive features such as high qualification, national development and leadership, and ability to develop excellence in research; new lines of research are encouraged, while those already in place and consolidated are supported. The sectors discuss opportunities aligned with national and global strategic themes, interacting with the board. IFGW follows Resolution 093/02 of its council, which requires a committee of experts (internal and external) to evaluate documents on demands and opportunities submitted by its departments and the school's board, leading to the preparation of a report with future hiring recommendations, setting priorities for the following five years. IMECC, in turn, has no short-, medium- or long-term strategic planning.

Regarding strategies implemented in the institutes to increase the quantity and quality of academic output, different decisions were made by the units, some of which are listed below:

- Mandatory publication in specific journals for students to defend their master's and doctoral theses (IG);
- Creation of a Research Coordination Office focused on reducing bureaucracy imposed on faculty, including project management, procurement, accountability and others (IQ);
- Encouragement of interaction with centers of excellence (IFGW).

The attraction of qualified candidates to apply for positions is usually done through contact networks and there is no official committee to this end. Most of the time, when a candidate whose profile interests the unit is found, he or she is contacted directly and encouraged to apply for the position in question.

The institutes have regular seminar programs which are usually managed by their schools. These events are attended by graduate students and faculty. A noteworthy strategy adopted by IQ and IFGW is encouraging seminars with guest speakers from the education and business areas. This policy helps reduce the distance between the university and the non-academic community, enhancing cooperation with different sectors of society. Such a strategy could also be adopted by other schools.

### 5.2.3 Arts and Humanities

In present times, the role of human sciences in interpreting facts and designing alternative paths for humankind makes research in this area almost automatically aligned

with major themes of national and international interest. On the one hand, economics and the issues linked to or dependent on it – education, health care, public security, etc. – are the center of attention of society. On the other hand, there is now a broad consensus on the importance of education, the influence of the media and the role of various forms of artistic and cultural production in spreading ideas and knowledge. The Arts and Humanities area comprises five UNICAMP units (schools and institutes): School of Education (FE), Institute of Language Studies (IEL), Institute of Economics (IE), Institute of Human Sciences and the Humanities (IFCH) and Arts Institute (IA). In the last five-year period these schools maintained an average of 414 active faculty (Table 5.25), recognized by the Brazilian academic system and awarded a total of 123 CNPq Productivity Fellowships (Table 5.26).

TABLE 5.25: BREAKDOWN OF ACTIVE FACULTY IN ARTS AND HUMANITIES

	Year									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Active faculty	420	410	403	408	411	411	423	420	414	403
Average	410					414				

Source: Unicamp Statistical Yearbook 2019.

TABLE 5.26: BREAKDOWN OF PRODUCTIVITY IN RESEARCH FELLOWSHIPS (CNPQ) IN ARTS AND HUMANITIES

Level	FE	IA	IE	IEL	IFCH	TOTAL
PQ-1	2	0	1	12	11	26
PQ-1B	5	2	0	4	13	24
PQ-1C	1	1	1	6	8	17
PQ-1D	5	1	2	5	2	15
PQ-2	8	3	8	8	0	27
PQ-SR	0	0	0	0	14	14
TOTAL	21	7	12	35	48	123

Source: PRP/CNPq (Sistema AI/GA53)

Table 5.27 displays the number of indexed articles by faculty in Arts and Humanities, while Table 5.28 is similar but restricted to articles with foreign co-authorship. Analyzing these tables, it is evident that the indexation in question is not able to adequately express production in this area. Closer interaction with the units is necessary to identify metrics that correctly quantify the area's output.

TABLE 5.27: NUMBER OF INDEXED ARTICLES BY FACULTY IN ARTS AND HUMANITIES

Year	FE	IA	IE	IEL	IFCH
2014	0.10	0.00	0.16	0.09	0.18
2015	0.37	0.10	0.33	0.58	0.30
2016	0.26	0.20	0.32	0.86	0.52
2017	0.29	0.14	0.32	0.75	0.41
2018	0.28	0.11	0.48	0.66	0.48

Source: Incites/Web of Science (articles and reviews – April 16, 2019).



TABLE 5.28: NUMBER OF INDEXED ARTICLES WITH FOREIGN CO-AUTHORS BY FACULTY MEMBER IN ARTS AND HUMANITIES

Year	FE	IA	IE	IEL	IFCH
2014	0.00	0.00	0.06	0.03	0.06
2015	0.05	0.03	0.04	0.30	0.03
2016	0.13	0.00	0.10	0.28	0.09
2017	0.04	0.07	0.15	0.00	0.06
2018	0.17	0.04	0.16	0.49	0.12

Source: Incites/Web of Science (articles and reviews – April 16, 2019).

The analysis of the impact of scientific output in the area reveals two units (FE and IFCH) with performance close to the best international standards and two others (IEL and IE) above the best Brazilian standards. Indeed, the Category Normalized Citation Impact of FE is 0.39, higher than the global index of Brazil (0.20), UNICAMP (0.21), USP (0.36) and well rated Latin American countries such as Chile, Mexico and Argentina. In turn, IFCH publications have an impact index of 1.08, higher, for example, than the USA figure (0.84). Similarly, IE and IEL exhibit figures above the Brazilian average, though below the USA and Europe. Finally, although the Category Normalized Citation Impact of the Arts Institute is 0.36, lower than the Brazilian figure (0.43), it is still higher than UNICAMP's average index. Moreover, it must be borne in mind that such indexes consider only articles published by the schools, disregarding actual artistic production, an area in which IA stands out.

However, the impact of this academic output is not always a direct consequence of its quantity. Thus, a comparative analysis between 2009-2013 and 2014-2018 shows a downward trend in absolute production numbers in FE, IEL, IFCH and IA. The exception is the Institute of Economics, which showed a clear growth in the number of journal articles, books and book chapters. The causes for this decrease include, for example, the decrease in the number of faculty in the area. Faculty in Arts and Humanities as a whole fell from 420 active members in 2009 to 403 in 2018. In the case of FE, the drop in production indicators was due to the retirement of faculty and the decrease in funding for education projects. In other units, such as IA and IFCH, the decrease in absolute values was accompanied by a change in the profile of publications, with a relevant increase in the number of publications in international journals and participation in events abroad. In IFCH, faculty turnover, with the hiring of younger professionals, reduced participation in radio and television programs. At the same time, the figures for 2017 are well below the historical series, which seems to indicate some problem in gathering data. The figures for IA also have problems. While SIPEX shows a fall in production between the two five-year periods, the Sucupira database shows a substantial increase in this sense. Importantly, also in the case of IA, there was an increase in publications in international journals and participation in conferences, besides the filing of two patents. The great impact of the academic output of the five units, reported in the previous paragraph, indicates the need for adjustments in the information collection systems and also in the evaluation criteria of academic production to account for the specificities of Arts and Humanities.

Marked by interdisciplinarity, research carried out by the Humanities schools is commonly related to strategic issues at state and federal level. Thus, the academic output of IE addresses important topics such as food, climate, economy, digital society and health care. Health care is also addressed in the production of IEL, whose Center for Coexistence



and Aphasia (CCA) develops activities aimed at the reorganization of language altered by neurological impairment. In IFCH, prominent among the various graduate studies involving strategic themes are the Graduate Program in Environment and Society – offered in partnership with NEPAM (Center for Environmental Studies and Research) – and the Graduate Program in Demographics, both with a score of 6 in the last CAPES evaluation. FE naturally has great affinity with public education, a subject that benefits from specific FAPESP funding, the Public Education Program. In August 2017, funding from this program was approved for the FE project “Lesson Study: Knowledge and Professional Development of Math Teachers,” managed by Prof. Dario Fiorentini, which ran through July 2019. In the case of AI, one must highlight the role played by its academic output in establishing connections with social demands arising from themes such as accessibility, education, urbanism, marginalized groups and public policy, serving as a sounding board of society’s feelings for society itself. At the same time, specific research programs such as “Accessibility of Music for the Visually Impaired” and “TAPESTRY – Audiovisual-Based Instruction to Promote Empowerment and Social Transformation for At-Risk Youth” are deeply embedded in strategic themes such as “Converging and Empowering Health Care and Technology” and “Social Science and Technology,” respectively.

TABLE 5.29: COMPARISON OF RESEARCH FUNDING IN ARTS  
AND HUMANITIES, 2009-2013 AND 2014-2018

2009 – 2013	FE	IA	IE	IEL	IFCH	TOTAL
Fapesp (R\$)*	7.49	13.23	2.79	15.69	34.55	73.75
Finep (R\$)*	0.05	0	0	0.34	2.74	3.13
Total (R\$)*	7.54	13.23	2.79	16.03	37.29	76.88
No. of faculty (average)	87	101.2	72.2	64.8	85.2	410.4
Average/faculty member (R\$)*	0.09	0.13	0.04	0.25	0.44	0.19
2014 – 2018	FE	IA	IE	IEL	IFCH	TOTAL
Fapesp (R\$)*	9.69	12.7	3.67	16.14	47.63	89.83
Finep (R\$)*	0	0	0	0.48	9.58	10.06
Total (R\$)*	9.69	12.7	3.67	16.62	57.21	99.89
No. of faculty (average)	90.4	100.4	68.2	67.2	88	414.2
Average/ faculty member (R\$)*	0.11	0.13	0.05	0.25	0.65	0.24

Source: Fapesp, Finep-CT-Infra, Unicamp Statistical Yearbook 2019.

Note: \* Million reais.

The quality of the output of the Arts and Humanities units is also confirmed by increased funding in both absolute and relative terms. Thus, in 2014-2018, funding in the area grew from R\$ 76.87 million to R\$ 99.80 million, as described in Table 5.2. The corresponding percentage increase of 29.82% exceeded that of Math, Earth and Natural Sciences (26.12%), Biological and Medical Sciences (23.74%) and Engineering and Technology (5.11%), being second only to multidisciplinary studies, whose funding leaped from R\$ 6.81 million to R\$ 18.85 million, up 198.73%. It should be noted that the cumulative inflation rate in the period was approximately 35%, so these nominal gains do not represent real gains, reflecting the country’s financial situation.

Another important fact is that the area's share of total FAPESP funding for UNICAMP is more significant than in other institutions. Thus, at UNICAMP, the branches of arts, humanities, economics and administration accounted together for 13.17% of total UNICAMP funding over the five-year period, compared to 8.1% at USP and 10.1% at UNESP. Finally, a comparison between funding for each branch and total FAPESP funding for that branch reveals that the humanities and social sciences were allocated 19% of this total, second only to USP (39.8%) and ahead of UNESP (13.8%) and other institutions served by FAPESP. This figure is also higher than UNICAMP's share of 13.4% of the total amount disbursed by FAPESP. The same goes for IE, which received 16.1% of all funds allocated by FAPESP to the area of economics and business administration.

The social impact of FE intellectual production is attested by the partnerships and agreements executed over the period with the local governments of Campinas and Paulínia, the federal government and the Down Syndrome Foundation to offer specialization programs (Educational Management, Special Inclusive Education, among others) and provide advisory services on teacher training. Also noteworthy is the creation of three FE startup companies during the five-year period with the support of INOVA (UNICAMP's innovation agency). At the same time, many of the units' concluded or ongoing research projects involve partnerships with public and private actors in search of solutions to improve public policy for education, health care, justice and labor, such as: "Homeschooling in Brazil: Expansion of Rights or New Means of Privatization?"; "Public Policy and Schooling Practices Aimed at Providing Bilingual Education for the Deaf"; "Judicialization of the Right to Education"; "Current Labor Contradictions in Brazil – Formal Employment, Instability, Outsourcing and Regulation."

As a result of the work of its professors and researchers, IEL also influenced public policy aimed at teacher training in the areas of language studies and their technologies, especially through the participation of the professors Jacqueline Peixoto Barbosa and Roxane Helena Rodrigues Rojo in the development and critical review of the Brazilian Common Curriculum Core (BNCC) for Elementary and High School, published respectively in 2017 and 2018.

In turn, research carried out at IE influences the design of many other public policies such as macroeconomic, monetary and fiscal policy; labor policy; agricultural, industrial and technological policy; social policy and regional and urban development policy.

Covering an even wider range of knowledge areas, IFCH organizes the National Brazilian History Olympiad and offers the professional master's program in history. PIBID (Institutional Program for Teaching Initiation Scholarships) impacts 10 schools in Campinas in the areas of philosophy, history and sociology/social sciences. The institute has partnerships with many public administration and civil society bodies, such as the Labor Prosecutor's Office, Institute of Applied Economic Research (IPEA), Institute of National Historical and Artistic Heritage (IPHAN), International Council of Monuments and Sites (ICOMOS), Civil Defense Agency and National Council on Drug Policy (CONAD). The institute also has several applied research projects, some with results and products immediately transferred to society, such as the Observatory of Rural Conflicts (CERES/IFCH), research on therapeutic communities with the National Department of Drug Policy (SENAD) and research on drug trafficking and child labor for the municipal government of São Paulo. IFCH also provides

on-demand advisory services to social entities and supports movements by encouraging events aimed at the defense of human rights and taking part in such events, in social rights defense networks and the Network for Labor Reform Studies and Monitoring, which brings together researchers from different Brazilian institutions for systematic interdisciplinary investigation of the various effects of the labor reform on Brazilian society.

In the interaction of AI with society, the community outside academia both enjoys artistic activities stemming from academic research and benefits from the actual results of such research. For example, the Acoustics and Sound Art Laboratory (LaSom) provides consulting and development services in areas such as restoration and preventive conservation, environmental comfort, sound design, acoustics and audio technology to clients such as BBC Media City and Instituto Itaú Cultural. Also noteworthy is the project called “From Visual Accessibility to Musical Interactivity through Multimodal Computational Methods.” Executed in partnership with the Interdisciplinary Center for Studies on Sound Communication (NICS), the project develops computational tools for the accessibility of visually impaired musicians and includes among its results the invention of the Braille Writing Device, for which a patent was filed in 2016 with the support of INOVA. There are also initiatives of immediate social impact promoted by the Teaching Laboratory and linked to the “Music Education: Theory and Practice” project, which provides outreach activities for the outside community. Examples include “Music Awareness Workshops for Children,” “Choir Singing for Children” and “Music Workshop for Educators,” which offers a grounding in theoretical and practical music to early education and elementary school teachers. One of the highlights is the First Note Project – CEMANNECO, a partnership with the Campinas Municipal Department of Education, which offers more than 500 places in music classes for children and adolescents aged 6-14 years at the Manoel José Gomes Municipal Music Center (Cemmaneco). Besides education/training, prominent in the areas of health care and social inclusion are “Music Workshops for Children and Adolescents with Cognitive Impairment,” developed at CAPS II – Sumaré Psychosocial Care Center, and the Art and Psychiatry Project, funded by the UNICAMP Fund for Research, Teaching and Extension (FAPEX), which developed artistic activities with patients at the UNICAMP Psychiatric Clinic, on the premises of the University Hospital.

Important impact also comes from artistic and cultural productions coordinated by faculty of the graduate program in music and linked to their respective research projects. Noteworthy are the Campinas Contemporary Choir and the UNICAMP Opera Studio, both linked to the Interpretive Aspects of Singing project, formed by undergraduate and graduate students of Unicamp. These bodies, in cooperation with the UNICAMP Symphony Orchestra and the Campinas Symphony Orchestra, are in charge of organizing the opera and choir season in the region. The instrumental groups Metalumfonia (linked to the project of the same name), Grupo Breusil (linked to the Bowed Instruments in Brazil project), GrupU (linked to the Brazilian Percussion project) and IA Big Band (linked to the Popular Instrumental Production project), which comprise faculty and students from undergraduate and graduate programs, also significantly contribute to the cultural and musical scene of the region, both in autonomous performances and in cooperation with other municipal and state bodies. The activities of the Research Group on Music, Language and Culture (Musilinc), initiated with the “Conversations on Music” outreach course,

developed into a radio program and a new outreach course offered to students of the Universidade Program, a UNICAMP outreach program for middle-aged and senior citizens. The organization of scientific and artistic events, including the international congress of the International Association for the Study of Popular Music (IASPM) and the congress of the National Association for Research and Graduate Studies in Music (ANPPOM), enhances the production and dissemination of knowledge.

RELEASE OF THE TEUTO BRASILEIRO" ALBUM WITH PAULO RONQUI (TRUMPET),  
KNUT ANDREAS (REGENCY), UNICAMP SYMPHONY ORCHESTRA AND METALLUMFONIA GROUP



Antoninho Perri/SEC – Unicamp.

In visual arts, examples of events organized over the period include “Cinema Cycles – Mantis,” held at the Campinas Museum of Image and Sound; the 10th Hercule Florence Photography Festival and the exhibition *Poetic Crossings*, a collective exhibit that inaugurated the multipurpose hall of Casa de Vidro/Museu da Cidade, both in Campinas; Aesthetic Resistance Permanent Forum: Africanities and Diasporic Narratives, in partnership with the Unicamp Cultural Development Coordination Office. The courses “Visual Culture: Matters of Method” (online) and “The Figure of the Photographer: Subject of Modernity” were offered for the Brazilian History Olympiad. Lastly, several master’s and doctoral projects developed in recent years addressed relevant issues of basic education and art education, such as: Appropriation and Use of the UNICAMP Open Teaching Project: Process of Organizing Teacher Education of the Unicamp Arts Institute; Art Textbooks: Evaluation and Critical Analysis; Processes of Creation and Reading of Image Books: Interlocution between Artists and Children; Blindness and Visual Arts: How Assistive Technology Can Be an Inclusion Tool; Online Teaching of Drawing: Possibilities and Limits; Art and Technology Activities for Elementary Students: Contributions to Aesthetic and Technological Fluency; Art Notebook in School: Symbolic Space in the Construction of Sensitive Knowledge; Digital Games as Educational Artifacts: Development of Digital Games as an Educational Strategy.



Artistic production resulting from teaching, research and outreach projects developed by dance and theater faculty and students travels way beyond the district of Barão Geraldo and the region of Campinas, with national and international reach. For example, many IA alumni work in the Vocational Program and also in the Dance and Theater Calls of the municipal government of São Paulo. As part of the “Practice of Theatrical Action in the Community” subject, from the teaching degree in performing arts, students develop projects for direct social intervention in the neighborhoods of Barão Geraldo, the district where Unicamp is located, under the supervision of the institute’s faculty. In addition, students taking a teaching degree in dance do internships in NGOs or schools of the state education system in the city of Campinas. Organization of events is also important, especially editions of the international symposiums Reflecting on Contemporary Performing Arts and Rethinking Contemporary Myths. The repercussion of artistic works performed through dance and theater calls can also be considered as a sign of social impact, as these shows are produced by groups and collectives directed by AI faculty and students. A good example is LUME Teatro, another interdisciplinary center of UNICAMP, and the groups Cia Elevador de Teatro Panorâmico, Silvia Geraldi Cia de Dança, Boa Companhia, Performa Teatro, Os Geraldos, Matula Teatro, Cia SeisAcessos, Grupo Tempo, Grupo Vão, Cia. Domínio Público, Cia. Seis+1 and Grupo Dançaberta, whose works tour the state of São Paulo or Brazil thanks to such public calls (ProAC, Funarte, FICC, among others). These are groups with great visibility in regional media achieved through interviews, news stories, newspaper reviews and disclosure in digital media.

It is important to mention the partnership with the space “CIS Guanabara: UNICAMP Cultural Center for Inclusion and Social Integration,” created and managed by the Outreach and Culture Office (PROEC). It is a listed public space comprising the architectural structure of the former Guanabara Station and intended for the development of education, culture and leisure projects for the community of Campinas and its metropolitan area. Several faculty members and students of the institute have used this venue for artistic and educational activities, such as the research group “Dancer-Researcher-Performer (BPI) and Dance of Brazil” which, in 2017, staged there the theatrical performance “The Body as a Reliquary” (a project selected in the 2016 PROAC call of the São Paulo State Department of Culture). Also noteworthy is the spread to the outside community of artistic techniques and knowledge produced by faculty and students through a significant number of short courses and lectures given in various organizations, not only educational institutions (universities and technical schools) but also SESC and SESI centers, NGOs and various non-formal education contexts. Several student projects involve work with specific communities, whether through artistic-educational activities or artistic performances for audiences not used to attending theaters. A case in point is the activities of the research group Dancer-Researcher-Interpreter (BPI) and Dance of Brazil, which has performed to communities with little access to culture and art in their regions, such as the community of women babassu coconut breakers in Tocantins or even of an *Umbanda* temple in the city of São Paulo, SP. In 2015, Prof. Mariana Baruco M. Andraus gave the “Dance, Music and Disability Learning Workshop” together with Dr. Vilson Zattera (postdoctoral researcher in music) as part of the “Prototyping and Library: Accessibility for Visually Impaired Students” project, proposed by a faculty member of the Creativity Development Nucleus (NUDECRI). In 2016, she supervised the project “Audio Description in Art: Accessibility in Static and Moving Art,” which included

among its activities a contemporary dance workshop for six high school students. These two activities were developed in partnership with the UNICAMP Accessibility Laboratory.

The IA maintains network connections beyond the university walls that include exchange programs with entities such as the Campinas Museum of Image and Sound, cultural centers and NGOs. In addition, many of its students and faculty are members of debate groups focused on proposing solutions to social problems in the surrounding Campinas region. A case in point is the cooperation between Prof. Fábio Akhas and the Brazilian Institute of Neuroscience and Neurotechnology (BRAINN), a FAPESP Research, Innovation and Dissemination Center, for the development of an audiovisual animation system for epilepsy awareness in partnership with researchers from the UNICAMP School of Medical Sciences. Another example of social insertion is the curatorship of the Tiradentes Film Festival, one of the main film festivals in Brazil, currently in the charge of Prof. Pedro Maciel Guimarães. The participation of faculty and students in art galleries and cultural venues maintained by UNICAMP, institutions aimed at wider audiences, is another means of social insertion. Prominent in this context are the activities or events at the Art Gallery of the UNICAMP Arts Institute (GAIA) and at Espaço Cultural Casa do Lago. Espaço Cultural Casa do Lago – whose main goal is to foster artistic and cultural dialogue within the university campus and also between the academic community and the various segments of society – offers free and open film screening sessions. Also worth mentioning is an outreach project coordinated by Prof. Gilberto Sobrinho in 2013-2014, but which produced developments in 2017 through community public screenings of the results, materialized in a documentary film entitled *Diário de Exus*, the first title of the Black Trilogy produced in partnership by two research groups, NACID – Audiovisual Narratives (coordinated by the professor) and PINDORAMA (coordinated by Grácia Navarro of the Performing Arts Department). Such artistic investments are also ways of extending teaching and research interests to the community in the form of workshops and, mainly, the production of documentaries that record and disclose Afro-Brazilian culture among different communities in the Campinas region. The abovementioned films have been screened in communities and local festivals such as Mostra Luta, Campinas Audiovisual Week (SEDA) and Campinas Audiovisual Short Film Festival, besides taking part in national festivals and events abroad, reaching widespread and heterogeneous audiences.

The repercussion of Arts and Humanities activities among society should be sought both through mass media and non-academic specialized outlets. Below are some examples of works that came to the attention of the public at large and professional sectors outside academia:

- 181 endangered indigenous languages (IEL) (Empresa Brasil de Comunicação): <http://www.ebc.com.br/cidadania/2016/04/de-1500-linguas-indigenas-no-descobrimento-restaram-181-todas-ameacadas-aponta>
- Interview with Prof. Jacqueline Peixoto Barbosa (IEL) about BNCC (Revista Nova Escola): <https://novaescola.org.br/conteudo/12148/6-novidades-da-bncc-de-lingua-portuguesa-para-levar-em-conta-no-planejamento>
- UNICAMP study shows that 59% of real estate in Campinas is not registered (IE) (Portal G1): <https://g1.globo.com/sp/campinas-regiao/noticia/59-do-imoveis-de-campinas-nao-tem-registro-em-cartorio-aponta-estudo-da-unicamp.ghtml>



- In a dossier, researchers detail the impacts of the labor reform (IE) (Revista Carta Capital): <https://www.cartacapital.com.br/politica/em-dossie-pesquisadores-detallham-os-impactos-da-reforma-trabalhista/>
- UNICAMP study concludes that SP lost the chance to learn from the drought and warns: “The water crisis is permanent” (IE) (Portal G1): <https://g1.globo.com/sp/campinas-regiao/noticia/estudo-da-unicamp-avalia-que-sp-perdeu-chance-de-aprender-com-seca-e-alerta-crise-hidrica-e-permanente.ghtml>
- Forbidden to forbid? The cultural echoes of May 1968 yesterday and today (IFCH) (O Povo): <https://www.opovo.com.br/noticias/mundo/2018/05/e-proibido-proibir-os-ecos-do-maio-de-1968-na-cultura-ontem-e-hoje.html>
- Brazilians believe criminals are better defended than victims (IFCH) (Jornal Gazeta do Povo): <https://www.gazetadopovo.com.br/justica/brasileiros-acreditam-que-bandidos-sao-mais-defendidos-que-as-vitimas-dk0tqen2uv50bs9pcu015yyft/>
- Licensing for churches in Campinas increases 73.6%, says local government (IFCH) (Portal G1): <https://g1.globo.com/sp/campinas-regiao/noticia/concessao-de-alvaras-para-igrejas-em-campinas-aumenta-736-diz-prefeitura.ghtml>
- With 850 students enrolled in the “coup course,” Unicamp will offer video lessons (IFCH) (Portal G1): <https://g1.globo.com/sp/campinas-regiao/noticia/com-850-inscritos-no-curso-do-golpe-unicamp-vai-disponibilizar-aulas-em-video.ghtml>
- Who was Maria Lacerda de Moura? (IFCH) (Jornal Folha de Pernambuco): <https://www.folhape.com.br/noticias/noticias/mulheres-em-movimento/2018/09>
- Interview with Prof. Ricardo Antunes (IFCH) on the 2019 truckers strike (BBC Brasil): <https://www.bbc.com/portuguese/brasil-44271476>
- The show *Perch – A celebration of Flights and Falls*, organized by LUME Teatro and performed simultaneously in Campinas (SP) and Glasgow (Scotland): <http://perchcarnival.com/brasil/>; <http://www.unicamp.br/unicamp/eventos/2014/04/22/perch-uma-celebracao-de-voose-quedas>
- 2016 season of the Contemporary Choir (IA): <http://www.corocontemporaneo.com.br/2016>
- *The Rainbow House Woman*, directed and written by Luiz Rosemberg Filho (IA): <http://afrocariocadecinema.org.br/programacao-encontro-de-cinema-negro-brasil-africa-e-caribe-zozimo-bulbul-11-anos>
- Participation (IA) in the collective exhibition *Unleashing*, at Teachers College, Columbia University, NY: <https://www.unleashing.tc.columbia.edu/about>

## PERCH – A CELEBRATION OF FLIGHTS AND FALLS



LUME/Unicamp (photo archive).

The output of the five Arts and Humanities units is not only recognized by non-academic audiences. The awards and honors granted to its researchers also attest to the quality of the research. Many awards were received by faculty, students and researchers in this area in 2014-2018, some of which are selected below, starting with the name of the awardee.

- Prof. Dermeval Saviani (FE), second place, *Prêmio Jabuti* for Education for “Openings to the History of Education” (Editora Autores Associados); Brazilian Book Chamber, 2014.
- Fabiana Karla Gomes Urbano (FE), *Menção Honrosa*, PIBIC, 2016 for “The Development Conditions of a Student with Disabilities in Public Schools.” Supervisor: Prof. Ana Luiza Bustamante Smolka.
- Prof. Ângela Fátima Soligo (FE), *Diploma de Mérito Educacional “Prof. Darcy Ribeiro,”* Campinas City Council, 2017.
- Prof. Sérgio Antônio da Silva Leite (FE), *Diploma de Mérito Educacional “Prof. Darcy Ribeiro,”* Campinas City Council, 2018.
- Prof. Marcos Antonio Siscar (IEL), third place, *Prêmio Jabuti* for Literary Theory and Criticism for “Back to the End: The End of the Avant-Garde as a Matter of Contemporary Poetry,” Brazilian Book Chamber, 2017.
- Prof. Thiago Oliveira da Motta Sampaio (IEL), *Menção Honrosa CAPES para Tese de Doutorado 2016* for “Aspectual Coercion: A Linguistic Approach to Time-Based Perception.” Supervisor: Prof. Aniela Improta França (UFRJ). Co-supervisor: Prof. Marcus Antônio Rezende Maia (UFRJ).
- Ana Paula Theodoro Biachi (IE), third place, *Prêmio Banco do Nordeste de Economia Regional 2015* for “Investment Constraints and Negotiations in the Suape Industrial and Port Complex – PE.” Supervisor: Prof. Fernando Cezar de Macedo Mota.
- Olivia Maria Bullio Mattos (IE), *Prêmio Capes de Tese de Doutorado 2016* for “Banks, Shadow Banks and Endogenous Currency: Challenging Federal Reserve Monetary Policy in the 20th Century.” Supervisor: Prof. Simone Silva de Deos.

- Laura Santonieri (IFCH), *Grande Prêmio Capes de Tese 2016* for “Agrobiodiversity and Ex-Situ Conservation: Reflections on Concepts and Practices from the Embrapa/Brazil Case.” Supervisor: Prof. Mauro Almeida.
- Crislayne Gloss Marão Alfagali (IFCH), *Prêmio Internacional de Investigação Histórica Agostinho Neto, edição 2017/2018*, Fundação Dr. António Agostinho Neto (Angola) and Instituto Afro-brasileiro de Ensino Superior, for “Blacksmiths and Founders of Ilamba. A Social History of Ironmaking and the Nova Oeiras Royal Factory (Angola, second half of the 18th century).” Supervisor: Prof. Silvia Hunold Lara.
- Prof. Antonio Guerreiro (IFCH), third place, *Prêmio Jabuti* for Human Sciences for “Ancestors and their Shadows. An ethnography of Kalapalo Chiefs and their Mortuary Ritual,” Brazilian Book Chamber, 2016.
- Prof. Luiz Marques, (IFCH), first place, *Prêmio Jabuti* for Natural Sciences, Environment and Mathematics for “Capitalism and Environmental Collapse,” Brazilian Book Chamber, 2016.
- Prof. Thomas Dwyer (IFCH), Silver Medal Pitirim Sorokin for contribution to science, Russian Academy of Sciences, Institute of Sociology, 2018.
- Amanda Vilas Boas Goldberg (IA), *Prêmio Mérito Científico*, PIBIC 2017, for “Dance and Mental Health: Artistic Experience as a Humanizing Element in a Context of Psychiatric Hospitalization.” Supervisor: Prof. Ana Maria Rodriguez Costas.
- Leandro de Souza (IA), *Prêmio Melhor Intérprete de Dança* for the solo dance “Earthquakes and Volts,” São Paulo Art Critics Association (APCA), 2018.

Internationalization has been achieved through agreements with foreign institutions, participation in programs and also thanks to the individual efforts of faculty in their research projects. International participation in the academic production of the schools is extremely important for aligning research topics, increasing output visibility and, especially, increasing competitiveness. Therefore, strategies to attract these professionals should be well structured and institutionally supported. This is not commonly observed in the units, whose initiatives are generally limited to publicizing calls in existing contact networks. From the viewpoint of the units, it is also important to evaluate the participation of foreigners in their faculty, which has been frequent but mostly driven by the personal efforts of these foreign teachers through their cooperative networks abroad.

At FE, several faculty members take part in the Humanities Without Borders program and international cooperation programs of the former VRERI, now the International Office (DERI). Other professors and researchers took part in postdoctoral work and stays abroad. FE develops joint activities with Latin America, such as Rede Flacso (Latin American School of Social Sciences), and with African countries (South Africa, Cape Verde and others), resulting in internationalized production that tends to grow, expanding the scope of work available to Brazilians.

During the evaluation period, IEL signed 18 partnership agreements with foreign universities. At the same time, it encouraged participation of its community in events and fellowships abroad through sandwich doctoral programs and postdoctoral studies. In this five-year period alone, 329 faculty members were granted leave to take part in conferences,

academic partnerships, courses, lectures, technical visits and postdoctoral fellowships. In the same period, 70 graduate students attended events or sandwich doctoral programs abroad and 31 undergraduate students took part in exchange activities.

In turn, IE has made consistent efforts to send faculty, researchers and students abroad to support the visit of foreign professionals to give lectures and short courses in graduate studies. This has enabled the institute to expand its networks with institutions from major countries – Cambridge University, Université Paris XIII, Leeds University, Scuola Superiore Sant'Anna and others – and also with universities from developing countries, especially BRICS. In particular, 12 of the institute's proposals were selected in the CAPES BRICS University Network Call (Call 3/2015). The institute also takes part in a proposal for an International Interinstitutional Master's Degree called Erasmus Mundus, which aims to bring together 12 universities from different countries so the course may be partly developed as an exchange program, which should strengthen the internationalization process of research. Faculty members also helped design the International Master's Program of Global Labour University (GLU), involving the University of Kassel and the Berlin School of Economics in Germany, the University of Witwatersrand (WITS) of South Africa and the TATA Institute of Social Science (TISS) of India. Following its creation, besides cooperating with the GLU partners, graduate faculty started teaching courses in English at IE and supervising foreign students, while the University of Kassel has received undergraduate students from the institute to study subjects of courses offered in English under the cooperation agreement.

At IFCH, internationalization initiatives are mainly developed from research in the institute's graduate programs and interdisciplinary research centers. Institutional encouragement happens mainly through disclosure of funding opportunities and interaction with international institutions. In addition, researchers receive support from the institute's Research Office and Financial Sector for their projects. The results have been positive given the number of publications co-authored with foreign researchers (average participation of 20.16%, against 18.82 of Unicamp), visiting professors and students, faculty on exchange programs and international cooperation projects in force (six partnership agreements with universities from Portugal, Chile, France, USA, Italy and Belgium).

In IA, the main difficulty reported regarding internationalization is the lack of staff to create a Research and Outreach Office, proposed in the reaccreditation process started in 2017. This office will be in charge of organizing the institute's cultural agenda and ensuring production is properly reported to the evaluating bodies, helping the institute better understand its own artistic production and institutionalize the numerous international partnerships already in place under its programs, so far limited to individual initiatives by faculty. The calls issued by PRP (Office of Research), PRPG (Graduate Office) and DERI (International Office) are widely publicized among the institute's faculty, but many are unable to submit proposals due to lack of time to design projects given the overload of work related to teaching and management activities.

Of the five units of the Arts and Humanities area, only FE claims to address funding and fund allocation in its strategic planning, specifically at graduate level. The goal of such planning is to increase the number of funded projects involving different groups and lines of research in order to attract funding, especially from public sources, for the development of international exchange students, the execution of academic activities by faculty abroad

and by foreign professors in the school, and also the sharing of research results in open access scientific outlets. In the case of IFCH, although there is no strategic plan for the entire school, such planning is carried out within each of its six sectors and graduate programs. IE reports that initiatives of this nature – funding, strategic hiring, etc. – have been randomly taken, with no integrated strategic planning, but that the institutionalization of these practices is on the unit's agenda. IEL does not address these topics in its strategic plan, while IA acknowledges that the institute needs to improve reporting on graduate extra-budgetary spending, which is currently unfeasible due to the lack of technical administrative staff.

## 5.2.4 Multidisciplinary Studies

The area of multidisciplinary studies at UNICAMP comprises the School of Applied Sciences (FCA) and the Interdisciplinary Research Centers, presented in different subsections below, due to their different natures: FCA is a school, while the Interdisciplinary Research Centers are research-only units.

### 5.2.4.1 School of Applied Sciences

The academic output of the School of Applied Sciences (FCA), which was created in 2009, has a relative impact on the world 2% (1.02) above the world average, below Asia (1.04), Europe (1.14), Australia and New Zealand (1.19) and the United States (1.32), but above the Brazilian average (0.65), so that the unit views itself at a par with the best Brazilian standards. About 77% of its publications are cited at least once. It is a multidisciplinary unit in which the most prominent areas, due to their high relative impact on the world, are multidisciplinary sciences (3.39), medicine (2.98), cell biology (2.68), food science and technology (1.75), chemical engineering (1.73) and endocrinology and metabolism (1.59). In the last five-year period, as shown in Table 5.30, its active faculty increased 86%.

TABLE 5.30: BREAKDOWN OF ACTIVE FACULTY IN MULTIDISCIPLINARY STUDIES

	Year									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Active faculty	18	36	49	71	74	83	87	96	98	101
Average	50					93				

Source: Unicamp Statistical Yearbook 2019

The unit reports that the first five-year period, 2008 – 2013, is characterized by the creation of groups and that in the second (2014 – 2018), output figures come closer to those of older institutes, from 1.5 documents per faculty member for 2 documents per faculty member. In the last five-year period, approximately 0.93 indexed articles were produced per faculty member. Also, in this second period the unit filed nine technology patents and signed 40 partnership agreements with companies, which helped train staff and fund equipment and supplies. In addition, six startup companies were created and three software



patents were filed, highlighting the school's potential for entrepreneurship and innovation, comparable to the best Brazilian standards. FCA has sought partnership agreements with public agencies, regulators and the third sector and already carries out joint activities with UNIVESP, FINEP, School of Financial Administration of the Brazilian Ministry of Finance, Embrapa and others. Another important fact is the alignment of research activities with strategic issues, especially sustainability, entrepreneurship and health care. However, the school claims the effects such initiatives cannot be evaluated yet.

TABLE 5.31: PARTICIPATION OF FOREIGN CO-AUTHORS IN FCA PUBLICATIONS AND AVERAGE PRODUCTION PER FACULTY MEMBER

Year	Indexed articles with foreign co-author	Indexed articles	Number of faculty	Indexed articles per faculty member
2014	15	64	83	0.77
2015	17	77	87	0.89
2016	26	98	96	1.02
2017	21	93	98	0.95
2018	22	101	101	1.00
2014-2018	101	433	465	0.93

Source: Incites/Web of Science (articles and reviews – May 2, 2019)

Table 5.32 shows that faculty output increased over the five-year period in question, with a growth of approximately 30% in the production of indexed articles. Regarding indexed articles with foreign co-authors, the school remained stable at the level of 0.21 articles per faculty member, suggesting there is scope for qualitative increase in internationalization.

TABLE 5.32: NUMBER OF INDEXED ARTICLES PER FACULTY MEMBER IN MULTIDISCIPLINARY STUDIES

Year	FCA
2014	0.77
2015	0.89
2016	1.02
2017	0.95
2018	1.00

Source: Incites/Web of Science (articles and reviews – April 16, 2019).

TABLE 5.33: NUMBER OF INDEXED ARTICLES WITH FOREIGN CO-AUTHORS PER FACULTY MEMBER IN MULTIDISCIPLINARY STUDIES

Year	FCA
2014	0.18
2015	0.20
2016	0.27
2017	0.21
2018	0.22

Source: Incites/Web of Science (articles and reviews – April 16, 2019).



Over the two five-year periods in question, the unit reports 319 applications for FAPESP funding, 60% of which was granted during the second five-year period. Between the first and second period, total FAPESP funding leaped from R\$ 6 million to R\$ 18 million, as shown in Table 5.34, accounting for approximately 2% of all funding allocated to related areas (health care, engineering, human and social sciences, administration and economics) and 5% of total FAPESP funding for UNICAMP.

TABLE 5.34: COMPARISON OF RESEARCH FUNDING IN MULTIDISCIPLINARY STUDIES

2009 – 2013	FCA	TOTAL
Fapesp (R\$)*	6.31	6.31
Finep (R\$)*	0	0
Total (R\$)*	6.31	6.31
No. of faculty (average)	49.6	49.6
Average/faculty member (R\$)*	0.13	0.13
2014 – 2018	FCA	TOTAL
Fapesp (R\$)*	18.85	18.85
Finep (R\$)*	0	0
Total (R\$)*	18.85	18.85
No. of faculty (average)	93	93
Average/faculty member (R\$)*	0.20	0.20

Source: Fapesp, Finep-CT-Infra, Unicamp Statistical Yearbook 2019

Note: \* Million reais.

FCA lists several concluded or ongoing partnership agreements, including with FURNAS, ALESP and *Institut Polytechnique de Grenoble* (double diplomas). However, there is no information on the impact generated by these partnerships. Prominent among research with potential for technological innovation is participation of faculty in projects such as CEPID (health care area) and interaction of researchers in human and social sciences with the Population Studies Center “Elza Berquó” (NEPO).

The institute’s research activities are shared with society through its website, YouTube channel and Facebook page. Members of the FCA community received various kinds of awards and honors, especially for best presentations at scientific congresses, peer review in scientific journals and best CAPES thesis. The following stand out:

- *Prêmio CAPES de Tese 2016* – Prof. Claudio Alexandre Gobatto;
- *Prêmio Jabuti 2016* – Prof. Maria Ester Soares Dal Poz; and
- *Prêmio Josué de Castro 2017* – Prof. Julicristie Machado de Oliveira.

FCA researchers are recognized by the Brazilian scientific evaluation system and 12 of them hold CNPq Productivity, as shown in Table 5.35. The unit reports difficulties to evaluate the impact of the output of a multidisciplinary unit and highlights the five works with most citations, all in the field of biomedicine.

TABLE 5.35: BREAKDOWN OF PRODUCTIVITY IN RESEARCH FELLOWSHIPS (CNPQ) IN MULTIDISCIPLINARY STUDIES

Multidisciplinary Studies		
Level	FCA	TOTAL
PQ-1A	1	1
PQ-1B	0	0
PQ-1C	0	0
PQ-1D	1	1
PQ-2	10	10
PQ-SR	0	0
TOTAL	12	12

Source: PRP/CNPq

As reported by FCA, internationalization initiatives relate to promoting international mobility, encouraging postdoctoral studies by faculty abroad. In the first five-year period nine professors were granted leave for this purpose, and in the second this figure increased to 37. Foreign co-authors take part in approximately 23% of the output, comparable to universities in the state of São Paulo. The institute has partnerships with a few international institutions but does not report the major areas of interaction or the results obtained. It also reports holding events in its different sectors, attended by foreign participants, considering the ensuing exchange of knowledge to be positive.

FCA reports the participation of faculty in editorial boards, with a growing trend over the period in question. There is cooperation with international institutions, notably with the Office of Naval Research (Global), which resulted in US\$ 80,000 in research funding in the unit. The following internationalization initiatives are highlighted: a) contact with the internationalization departments of universities of interest to students to sign partnership agreements; b) support for international fellowships; c) incentive for mobility initiatives. In this respect, FCA reports attempts to attract postdoctoral researchers from abroad, but the main flow has been to send faculty to fellowships abroad.

FCA does not describe any clear initiative to attract new postdoctoral researchers. However, it stresses that they are encouraged to participate in teaching activities, especially in undergraduate subjects. Similarly, it is not possible to ascertain the impact of the participation of postdoctoral researchers on the schools scientific output.

FCA has a strategic plan defining short- and long-term activities related to topics of interest. Briefly, it aims in the short term to improve local research infrastructure; in the long term, it expects to improve production indicators and increase the number of research fellows and full professors, while attracting large projects to the unit. Also mentioned but not detailed are initiatives aiming to make application processes more attractive to candidates. Several of them have already been implemented with the goal of increasing the quality of academic production which, as reported, is quantitatively and qualitatively consistent with the unit's mission and vision statements and strategic goals.

FCA has a regular "Interdisciplinary Wednesdays (IQ)" seminar program, which furthers the debate on science and society and brings academia closer to the public and

private sectors. At the same time, the graduate programs have courses aimed at seminar practice, with lectures by both internal and external members (academia and business sector). The presence of visiting foreign researchers is irregular and usually the result of individual initiatives or specific UNICAMP programs. The unit does not detail the number of external guests (public and private sectors, Brazilian or foreign) compared to the number of internal participants.

#### 5.2.4.2 *Interdisciplinary Research Centers*

Evaluation of the research activities of the Interdisciplinary Research Centers focused on interdisciplinarity and the main lines of research developed, highlighting their suitability, quality and quantity compared with national and international strategic themes. It is noteworthy that these centers are linked to the UNICAMP Coordination Office for Interdisciplinary Research Centers (COCEN). In general, due to their interdisciplinary nature, UNICAMP's interdisciplinary research centers have always addressed at least two fields of knowledge each, for example, demographics and society, journalism and science communication, meteorology and public policy, nanotechnology and medicine, among others. The 21 interdisciplinary research centers at Unicamp are:

- CIDDIC – Unicamp Center for Integration, Documentation and Cultural Dissemination
- CEB – Center for Biomedical Engineering;
- CEMIB – Multidisciplinary Center for Biological Investigation on Laboratory Animal Science;
- CBMEG – Center for Molecular Biology and Genetic Engineering;
- CEPAGRI – Center for Meteorological and Climatic Research Applied to Agriculture;
- CEPETRO – Center for Petroleum Studies;
- CCSNano – Center for Semiconductor Components and Nanotechnology;
- CESOP – Center for Studies on Public Opinion;
- CLE – Centre for Logic, Epistemology and the History of Science
- CMU – Memory Center at Unicamp;
- CPQBA – Pluridisciplinary Research Center for Chemistry, Biology and Agriculture;
- LUME – Interdisciplinary Center for Theatrical Research;
- NEPA – Center for Food Studies and Research;
- NEPAM – Center for Environmental Studies and Research;
- NEPO – Population Studies Center “Elza Berquó”;
- NEPP – Center for Public Policy Studies;
- NICS – Interdisciplinary Nucleus for Sound Studies;
- NIED – Nucleus of Applied Informatics to Education;
- NIPE – Interdisciplinary Center on Energy Planning;
- NUDECRI – Creativity Development Nucleus;
- PAGU – Center of Gender Studies.

The main lines of research developed in the interdisciplinary research centers address the following subjects: genetics (animal, plant, microorganisms and human); systems biology,

bioengineering and bioinformatics; medical and biological engineering; clinical engineering; biophysics; obtaining drugs from medicinal and aromatic plants; natural products (essential oils, extracts, fractions and isolated compounds); fermentation and process optimization for the sugar and alcohol industry; optimization of breeding and freezing of murine embryos; certification and genotyping of animal models; petroleum engineering; control and automation; reservoir engineering and geophysics; development of maritime production systems; applied and computational geophysics; modeling and simulation; fluid physics; plasma physics and electrical discharge; condensed matter physics; polymers and colloids; electrochemistry; electrical and materials engineering; analytical instrumentation; distance learning (DL); educational robotics; mobile learning (m-learning); open education; information and communication technologies in special education; food science and technology, ecology; nutrition; music and computing, education, engineering and psychomotor skills; energy systems planning; bioenergy; energy policy, environment and sustainable development; political science; election studies and political parties; political attitude and ideologies; language technology and multimedia; language, writing and urban studies; scientific culture and society; literature, arts and communication; public perception of science and technology; public policy evaluation; health systems; social assistance, work and income; reproductive health, gender and family; urbanization; environment; ethnicity and historical demographics; memory, city and sensibilities; economic and social history of Campinas and western São Paulo State; memory and education; non-classical and epistemic logics; traditional and non-standard epistemologies; metaphysics; philosophy of language and religion; history of formal sciences; characterization and conservation of biodiversity; public archeology; energy and sustainability; dance; theater: artistic, conceptual and formative research; music analysis, creation and performance.

When compared to the previous evaluation (2009 – 2013), the current evolution of the scientific and cultural output of the interdisciplinary research centers showed highly positive results in some areas, as well as decline in some items (Table 5.36). Several advances were reported in some centers, including a leap from 10% to 111% in the production of articles and abstracts published in indexed national and international journals and congress proceedings for most areas of knowledge, significant increase in the number of research projects (57% – Table 5.37), even doubling in some centers, and development of a large number of software and patents (48), an item not compiled in previous evaluations but which has an immediate impact on the relationship with society.

TABLE 5.36: COMPARISON OF SCIENTIFIC OUTPUT OF UNICAMP  
INTERDISCIPLINARY RESEARCH CENTERS IN THE LAST TWO FIVE-YEAR PERIODS

Scientific Production	Period		Variation (%)
	2009-2013*	2014-2018	
Articles in international journals	1,527	1,767	+ 15.7
Articles in Brazilian journals	668	499	- 25.3
Articles in non-specialized journals	465	287	- 38.3
Articles published in congress proceedings	923	1,206	+ 30.6
Abstracts published in congress proceedings	551	1,165	+ 111.4
Patents and software programs	-	48	-

TABLE 5.36: COMPARISON OF SCIENTIFIC OUTPUT OF UNICAMP  
INTERDISCIPLINARY RESEARCH CENTERS IN THE LAST TWO FIVE-YEAR PERIODS

continued

Scientific Production	Period		Variation (%)
	2009-2013	2014-2018	
Books	303	174	- 42.6
Book chapters	1,004	728	- 27.5
Translation/publishing/introductions of books and journals	76	251	+ 330
Presentations in congresses	2,225	2,200	- 1.12
Posters in congresses	1,095	742	- 32.2
Other presentations	2,637	1,191	- 54.8
Interviews and other forms of disclosure	22,833	1,787	-92.17
Films, videos, CD-ROMs, DVDs, audio and audiovisual recordings	-	189	-
Participation in exhibitions and/or artistic performances	954	935	- 2
Artwork creation	16	89	+ 556
Development or creation of specialized technical work	45,656	57,851	+ 26.7
Development of research support material	-	240	-
Research technical reports	-	1,155	-
Database organization over the period	-	16	-
Awards and tributes	-	207	-

Source: COCEN and 2009-2013 Final Report of Institutional Evaluation (Volume II).

TABLE 5.37: NUMBER OF PROJECTS EXECUTED AND AGREEMENTS SIGNED BY UNICAMP  
INTERDISCIPLINARY RESEARCH CENTERS IN THE LAST TWO FIVE-YEAR PERIODS

Type	Period		Variation (%)
	2009 – 2013*	2014 – 2018	
Funded projects	1,055	1,449	+ 37.34
Non-funded projects	199	314	+ 57.78
Agreements	248	365	-
Total projects + agreements	1,269	2,128	
Amount (R\$)	-	631,875,771.53	-

Source: COCEN and 2009-2013 Final Report of Institutional Evaluation (Volume II).

Some figures are worth highlighting, such as:

- one of the centers (CCSNano), and consequently UNICAMP, has a publication among the 1% most cited articles in 2019 in the area of materials science (*Web of Science*);
- publications in Biological and Medical Sciences reached 25% among the most representative works of the journal's core knowledge area (CBMEG – *SC Imago JournalRank*);
- significant increase in the number of agreements signed with the manufacturing sector (public and private companies) and, consequently, in extra-budgetary funding (Table 5.38) and FAPESP funding (Table 5.39);
- increase of approximately 90% in research internationalization and creation of an academic recognition award for researchers in 2017;

- increase of artistic and outreach output of 65.81%;
- over 400% increase in the creation of theatrical performances (LUME), from five in the previous period to 24 in the current one;
- creation of research groups gathering master's, doctoral and undergraduate research students and faculty to reflect on issues related to science, arts – in various forms – communication and philosophy;
- creation of a donor database for different areas of knowledge and maintenance of collections.

It is important to highlight UNICAMP's great capacity to attract investments through agreements with public and private companies, as shown in Table 5.38. This makes UNICAMP an institution committed to bringing its scientific findings to the community outside the University, contributing positively to technological and social innovation across the country.

TABLE 5.38: BREAKDOWN OF RESEARCH PROJECTS DEVELOPED OVER THE LAST FIVE-YEAR PERIOD BY UNICAMP INTERDISCIPLINARY RESEARCH CENTER

Center	2014 – 2018		Total no. of projects	Amount (R\$)
	Funded	Non-funded		
CBMEG	200	2	202	45,550,614.04
CCSNano	14	-	14	14,280,000
CEB	21	7	28	23,936,595.78
CEMIB	12	3	15	17,443,926.64
CEPAGRI	21	16	37	8,211,845.62
CEPETRO	135	-	135	418,850,239.88
CESOP	37	3	40	4,489,785.32
CIDDIC	32	18	50	688,318.35
CLE	100	26	126	7,778,504.09
CMU	23	9	32	1,318,399.65
CPQBA	116	41	157	18,781,291.15
LUME	81	-	81	4,532,896.16
NEPA	11	3	14	659,488.33
NEPAM	92	-	92	8,861,319.17
NEPO	94	21	115	6,162,312.76
NEPP	15	28	43	2,008,052.51
NICS	45	28	73	3,855,424.82
NIED	23	23	46	588,973.22
NIPE	109	13	122	25,981,189.01
NUDECRI	135	51	186	5,842,428.83
PAGU	133	22	155	12,054,166.20

Source: Cocen.

On the other hand there was a decrease in some kinds of academic output, such as a significant drop of up to 42% in the publishing of books and book chapters. Another



item that fell significantly was interviews and other means of dissemination, over 90%. This drop is worrying as it indicates a decrease in the dissemination of scientific work done at the university and, consequently, in the relationship with society in general. The decrease in interviews as a means of communication can be put down to the change in communication channels, such as scientific articles, websites and social networking sites for scientific dissemination, among others. The average amount of funding from the state funding agency, FAPESP, per faculty member (Table 5.40) remained practically stable, with a slight decrease of approximately 8%.

In almost all situations related to reduced output, the main and most important factor reported was lack of staff, especially researchers. This was due to either retirement or death, leaving several important lines of research unaddressed. Interdisciplinary research centers that had the opportunity to hire new staff in the current five-year period reported a significant improvement in their research and development activities thanks to the hiring and integration of these new professionals.

TABLE 5.39: FAPESP FUNDING FOR THE INTERDISCIPLINARY RESEARCH CENTERS

Period	2009-2013	2014-2018
Amount (million R\$)	43.78	48.41

Source: Fapesp.

TABLE 5.40: FAPESP FUNDING PER RESEARCHER IN 2009-2013 AND 2014-2018

Period	2009-2013			2014-2018		
Amount (million)	Total funding	Average number of researchers	Average per researcher	Total funding	Average number of researchers	Average per researcher
R\$	43.78	72.4	0.60	48.41	88.4	0.55

Source: Fapesp and Unicamp Statistical Yearbook.

Regarding the performance of Unicamp Interdisciplinary Research Centers compared to equivalent Brazilian and/or international institutions, one can conclude that they are on a par with them. The following facts are worth highlighting:

- high-impact article published in a *Nature* group journal (*Nature Communications* – *Impact Factor*: 11.878), jointly produced by CEB, UFRJ and FIOCRUZ with the cooperation of three foreign institutions;
- award of *Prêmio de Inovação Tecnológica da Agência Nacional de Petróleo, Gás e Biocombustíveis* (ANP) to CEPETRO in 2018;
- creation of new research centers within CEPETRO (Center for Innovation on New Energies – CINE, Energy Production Innovation Center – EPIC e Engineering Research Center in Reservoir and Production Management – ERC-RPM);
- partner centers of the MCTIC Nanotechnology Associated and Strategic Laboratory System (SisNano) and the FINEP National Multi-User Centers, such as CCSNano, a center linked to the SisNano program;
- publication included in SCielo (CBMEG), considered the best publication in the area in Latin America;

- “TRIPAS” theatrical performance (LUME), awarded the *Prêmio Especial Shell* in 2018;
- SysNEPO – Android-based Field Questionnaire System (2016) designed by Rogério Fabbri Broggian Ozelo (NEPO) for the administration of field questionnaires both online and offline;
- TEDx-UNICAMP since 2011 coordinated by Dr. José Eduardo Fornari Novo Junior (full-time researcher – NICS).

#### OPENING OF THE OIL FLOW TESTING CIRCUIT AT CEPETRO



Antonio Scarpinetti/SEC – Unicamp.

In addition, national and international bilateral projects were signed which, in some cases, benefited from support by state and federal funding agencies (FAPESP, CNPq and CAPES) and/or by UNICAMP itself, via FAEPEX. Another relevant fact is the participation of Unicamp full- and part-time researchers on the boards of the Brazilian Association of Oral History (chair-ABHO), National Association of History (vice-chair-ANPUH) and Brazilian Society of History of Education (Southeast region board-SBHE). All of these excellent results are due to close internal (among the centers or with Unicamp schools), national and international cooperation, as exemplified below:

- **Internal:** The interdisciplinary research centers cooperated with each other and with all Unicamp schools in the period in question;
- **National:** *Universidade Federal de Rio de Janeiro (UFRJ); FIOCRUZ; CENPES Petrobras; Universidade Federal da Paraíba; Center for Sonology Research (NUSOM) – ECA/USP; “Renato Archer” Center for Information Technology (CTI); SESC; UNIRIO; Ibope; Datafolha; Datasenado; Universidade Federal de Minas Gerais (UFMG); Universidade Estadual do Rio de Janeiro (UERJ); Universidade de São Paulo (USP); Universidade Federal do ABC (UFABC); Universidade de Brasília (UnB); Universidade Tecnológica Federal do Paraná (UTFPR); Universidade Federal do Rio Grande do Norte (UFRN); Universidade Federal de Uberlândia (UFU); Universidade*

*do Vale do Sapucaí (Univás); Universidade Federal de Santa Maria (UFSM); Universidade Federal do Paraná (UFPR); Instituto Federal de Educação, Ciência e Tecnologia Baiano; Universidade Federal da Bahia (UFBA); Universidade Federal de Sergipe (UFS); Fundação Getúlio Vargas – São Paulo; Universidade Federal do Rio Grande do Sul (UFRGS); Universidade Estadual do Centro-Oeste – Paraná; Brazilian Institute for Space Research (INPE); Instituto Butantan; Brazilian Institute of Amazonian Research (INPA); Universidade Federal de Pernambuco (UFPE); Brazilian Center for Research in Energy and Materials (CNPEM); Universidade Estadual Paulista (UNESP); Brazilian Agricultural Research Corporation (EMBRAPA); Universidade Federal de São Carlos (UFSCAR); Universidade Federal de São Paulo (UNIFESP); Universidade Federal do Triângulo Mineiro (UFTM); Universidade Federal do Ceará (UFC); Universidade do Estado de Santa Catarina (UDESC), Fundação Universidade Regional de Blumenau (FURB); Universidade Estadual do Mato Grosso do Sul (UEMS), Universidade Estadual de Amazonas (UEAM); Universidade Federal de Alagoas (UFAL); Universidade Federal de Alfenas (UNIFAL); Universidade Federal de Integração Latino-Americana (UNILA).*

- **International:** *Universidad Nacional de La Plata – Argentina; Universidad de País Vasco – Spain; University of Bonn – Germany; NORCE and NTNU laboratories – Norway; University of Tulsa – USA; Universida de Pompeu Fabra, Barcelona; McGill University – Canada; Institut de Recherche et Coordination Acoustique/Musique – France; University of Miami – USA; Universidad de Zaragoza – Spain; Delft University of Technology – Netherlands; Office of Naval Research – USA; CIRAD – France; University of Kansas – USA; University of Michigan – USA; Imperial College London – UK; Università degli Studi di Brescia – Italy; University of California – USA; Washington University – USA; University of Oxford – England; Universidad Politecnica de Madrid – Spain; Harvard Medical School – USA; Genome Institute of Singapore – Singapore; EMPA – Switzerland; University of Varanasi, University of Delhi and IIT Bhubaneswar – India; ITMO University, University of N. Novgorod, Institute of Meteorology – Russia; VUB – Belgium; Swinburne University of Technology – Australia; Universidade Nacional de Rio Negro – Argentina; Universidade de Salamanca – Spain; Queen's University – Canada; Simon Fraser University – Canada; Universitat de Valencia – Spain; Instituto Tecnológico de Monterrey – Mexico; Universidad de Córdoba – Argentina; Vrije Universiteit Brussel – Belgium; Université Rouen – France; Universidad Nacional de Córdoba – Argentina; Universidad Autónoma del Estado de México – Mexico; Universidad de Buenos Aires – Argentina; University of California San Diego – USA; Pontificia Universidad Javeriana – Colombia; ISCTE/Lisboa – Portugal; Universidad del Norte – Chile; Universidade de Córdoba e de Buenos Aires – Argentina; Universidad de Jaén – Spain; University of Maryland – USA; Columbia University – EUA; Universidade de Évora – Portugal; York University – Canada; University of California at Riverside – USA; Universidad de Granada – Spain; Frei Universitat Berlin – Germany; Université Paris I – France; Medical College of Wisconsin – USA; Children's Hospital of Philadelphia – USA; Technical University of Munich – Germany; Université Rennes 2 – France; Institut National de la Recherche Agronomique – France; National Institute of Agricultural Technology – Argentina; University of Colorado – USA; Conflux group – Scotland;*

Legs on the Wall group – Australia; *Universidade do Minho* – Portugal; *Universidade Nova de Lisboa* – Portugal; East London University – England; *Universidade Eduardo Mondlane* – Mozambique; University of Manitoba – Canada; University of Alberta – Canada; University of Bath – England; University of Washington – USA; Stanford University – USA; United Nations Educational, Scientific and Cultural Organization – UNESCO; Yale School of Public Health – USA; Vienna Institute of Demography of the Austrian Academy of Sciences – Austria; University of New South Wales – Australia; Hanoi Medical University – Vietnam; *Universidad Peruana Cayetano Heredia* – Peru; University of Illinois at Urbana-Champaign – USA; *Universidad de la República* – Uruguay.

Despite this long list of national and international cooperation in all areas of knowledge, many interdisciplinary research centers reported once again the lack of qualified staff as a key factor hindering the development of research. With the university's relatively difficult financial situation since 2016, the large number of retirements in view of the country's political and economic situation and the "aging" of university staff, some centers have few full-time researchers. Even with an improvement in the numbers of active full-time researchers (Table 5.41), some centers face a difficult situation. Cases in point are CESOP and CCSNano, which have only one and two full-time researchers, respectively, for their activities related to research, outreach and provision of services to users (internal and external).

Another important aspect that hinders research in UNICAMP's interdisciplinary research centers is infrastructure, which is often inadequate for the development and maintenance of research, collections and other materials and equipment that require special conditions. Centers that have long reported inadequate facilities are: NIED, CMU, CCSNano, NICS, LUME, NEPP and NEPO. CEB, PAGU and CESOP concluded in the current evaluation period their move to new purpose-built facilities, but their output was nevertheless affected. The reduction of personnel in general, especially regular staff who provide technical and administrative support, and the decrease of budgetary and extra-budgetary funds are again reported as decisive for hindering the proper execution of academic activities.

Over the period there was an increasing number of awards and research grants among full-time researchers. It is noteworthy that in 2017 Unicamp introduced the academic recognition award for full-time researchers, granted to Dr. Alpina Begossi (NEPA) and Dr. Valeria Maia Merzelmm (CPQBA) in 2017 and 2018, respectively.

TABLE 5.41: BREAKDOWN OF CNPQ PRODUCTIVITY IN RESEARCH FELLOWSHIPS AMONG FULL-TIME RESEARCHERS OF INTERDISCIPLINARY RESEARCH CENTERS

Active researchers	Number of grants	Number of Level 1 and Senior grants	% of grants	% of Level 1 and grants
90	16	1	18	1

Source: Unicamp Statistical Yearbook 2019 e CNPq.

Sixteen of a total of 90 full-time researchers (according to DGRH) hold CNPq Productivity in Research (PQ) and Productivity in Technological Development and

Innovative Outreach (DT) Fellowships (Table 5.42), accounting for 18% of personnel. These grants cover various levels, as shown in Table 5.42. The number is even higher if one includes part-time researchers in the centers, totaling 82 grants.

TABLE 5.42: BREAKDOWN OF CNPQ PRODUCTIVITY IN RESEARCH FELLOWSHIPS FOR FULL-TIME RESEARCHERS

PQ-SR	PQ-1A	PQ-1B	PQ-1C	PQ-1D	PQ-2	Total
1	-	1	2	2	10	16

Source: CNPq

The awards and honors granted to COCEN researchers in 2014-2018 acknowledge the quality of the work, scientific research and contribution to society through specific actions. Below we list some of them, showing once again the interdisciplinary nature of our activities:

- Outstanding Student Chapter Award (CEPETRO);
- “Methodologies for Integration between Numerical Reservoir Simulation and 4D Seismic” project – *Inovação Tecnológica da Agência Nacional de Petróleo, Gás e Biocombustíveis* award – ANP (2018) for projects developed by universities (CEPETRO);
- Dr. Carmen Cecília de Campos Lavras – “*Moeda 30 anos do CONASEMS – devido aos relevantes serviços prestados em defesa do Sistema Único de Saúde*” award (NEPP);
- UNESCO recognition award to the project “Feminism, Science and Politics – the Legacy of Bertha Lutz, 1881-1985” (CMU);
- *Prêmio FESSACAL 2014* in bioterism for Mr. Robson da Silva Pontes (CEMIB);
- *Medalha Defesa Civil do Município de Campinas*, Campinas Municipal Government/ Civil Defense Department and Tribute for contribution to Agricultural Climate Risk Zoning (CEPAGRI/EMBRAPA);
- “TRIPAS” theatrical performance, winner of *Categoria Especial do Prêmio Shell 2018 no Rio de Janeiro* (LUME);
- *Profissionais da Carreira PAEPE* award for staff of interdisciplinary research centers: 2015 – NEPO and CPQBA, 2016 and 2017 (CEB and Labeurb/NUDECRI);
- Prof. Pedro Paulo Abreu Funari – Award for work at the Unesp Center for Ancient and Medieval Studies, 2015 (NEPAM);
- Dr. João Vilhete Viegas d’Abreu – XXVI UNICAMP Congress of Undergraduate Research – *Menção Honrosa Pró-Reitoria de Pesquisa da Unicamp*, 2018 (NIED);
- Dr. João Vilhete Viegas d’Abreu – “Enhancement and Development of Hardware and Software Tools for Audio Tactile Mapping (MTS)” – *Prêmio Inova Unicamp de Iniciação à Inovação (Exatas e Tecnológicas)*, 2018 (NIED).

Many centers reported difficulties in funding for early career researchers (Table 5.42) for various reasons, the main one being the financial situation of funding agencies. Another important reason is the lack of knowledge about the full-time research career, which leads the CNPq Advisory Committees (CAs) to give excessive consideration researchers’ role in teaching and training activities, which is not a specific requirement for this career. It is relevant to mention here the importance of the University’s role in informing funding agencies about



the full-time research career, which is specific to UNICAMP. This role, which should include an official explanation of what the full-time research career represents within the university and the researchers' main tasks and duties, will certainly afford a clearer view of the main activities of these researchers and consequently lead to an increase in the number research grants. In turn, the lack of CNPq Productivity Fellowships for the field of arts hinders this kind of aid for theater, dance and music professionals of the COCEN system.

Despite the somewhat unfavorable financial and staffing situation, especially in the last three years, the interdisciplinary research centers have always pursued solutions and created strategies to increase the quantity and quality of their academic output, create new groups and expand current groups and lines of research, recruit new researchers, internationalize their activities and offer outreach activities. To this end, initiatives such as those listed below have been successfully implemented:

- participation of researchers in scientific societies, editorial boards of international journals and organizations in the area, in international meetings;
- research and exchange interaction with foreign institutions;
- publishing of results in internationally renowned journals;
- search for international scope in social projects developed by the centers;
- organization of large-scale international events;
- exchange with visiting professors;
- courses, seminars and lectures offered and/or attended by foreign professionals;
- community service;
- technology transfer;
- semester cultural performances: theater – LUME, “Zipper na Boca” choir and Unicamp Symphony Orchestra – CIDDIC;
- agreements and partnerships with public institutions (ANP, Finep, FAPESP, CAPES and CNPq, etc.) and with public companies to encourage academic intellectual production and train skilled professionals;
- exchange programs for researchers, students and postdoctoral researchers in interdisciplinary research centers of donor companies in Brazil and abroad;
- specialized services, technical analyses and diagnostics, patent filing and technical consultancy are some of the outreach activities;
- contribution to the formation and strengthening of external groups (examples: UFTM, UFC – created new groups on micro sensors; UFMG – set up an electron beam lithography group with the help of CCSNano).

As previously stressed, limited physical space significantly compromises the creation of new research groups and expansion of existing ones. This also curtails the expansion of current lines of research.

Another strategy to maintain and improve research in the interdisciplinary research centers is to attract postdoctoral researchers. In the five-year period, more than 200 postdoctoral students engaged in research activities in the centers in a wide range of areas, supported by both Brazilian and international funding agencies and hired via university partnerships and agreements (Table 5.43) The INCT CNPq program, the FAPESP *Projetos Temáticos* program



and regular funding from agencies have encouraged the development of research in themes ranging from democracy and democratization of communication to nanotechnology, scientific dissemination, sexuality and gender, climate change research and modeling, theater and performing arts, and ecology and computing in education. On the other hand, postdoctoral researchers from Latin America (Bolivia, Colombia, Peru), Central America (Cuba), North America (USA, Canada), Europe (Portugal, Spain, Switzerland), Asia and the Middle East (India, Iran) took part in research development in the Unicamp interdisciplinary research centers. It is noteworthy that the exchange of experience also happened through fellowships of Brazilian researchers abroad. Some centers such as CEMIB believe this kind of activity does not fit their characteristics. Others report the lack of physical space as an impediment to attracting postdoctoral researchers over the period. In positive cases, following the conclusion of their work, the researchers were hired by national and international research institutions or private companies operating in the research area of interest. Generally speaking, postdoctoral researchers are essential for the development of cutting-edge research and scientific and technical production, and work in laboratories and study groups.

TABLE 5.43: ENGAGEMENT OF POSTDOCTORAL RESEARCHERS  
IN INTERDISCIPLINARY RESEARCH CENTERS IN THE LAST TWO FIVE-YEAR PERIODS

Center	Period	
	2009 – 2013	2014 – 2018
CBMEG	20	58
CCSNano	–**	17
CEB	–	2
CEMIB	–	–
CEPAGRI	–	6
CEPETRO	37	46
CESOP	–	1
CIDDIC	–	0
CLE	–	–
CMU	–	0
CPQBA	–	–
LUME	–	6
NEPA	–	–
NEPAM	–	11
NEPO	–	11
NEPP	1	0
NICS	–	9
NIED	–	4
NIPE	–	15
NUDECRI	–	–
PAGU	–	23
TOTAL	58	209

Source: Cocen.

Note: \*\*

## 5.2.5 Engineering and Technology

The area of Engineering and Technology at UNICAMP comprises eight academic units: School of Food Engineering (FEA); School of Agricultural Engineering (FEAGRI); School of Civil Engineering (FEC); School of Electrical and Computer Engineering (FEEC); School of Mechanical Engineering (FEM); School of Chemical Engineering (FEQ); School of Technology (FT) and Institute of Computing (IC). With a slight increase in faculty, from 479 active members in 2009 – 2013 to 494 in 2014 – 2018 (Table 5.44), this is an area of great academic recognition in the Brazil, totaling 176 CNPq Productivity in Research Fellows (Table 5.45), of whom approximately 50% are Level 1.

TABLE 5.44: BREAKDOWN OF ACTIVE FACULTY IN ENGINEERING AND TECHNOLOGY

	Year									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Active faculty	488	486	473	472	474	484	498	509	497	481
Average	479					494				

Source: Unicamp Statistical Yearbook 2019.

TABLE 5.45: BREAKDOWN OF PRODUCTIVITY IN RESEARCH FELLOWSHIPS (CNPQ) IN ENGINEERING AND TECHNOLOGY

Level	FEA	FEAGRI	FEC	FEEC	FEM	FEQ	FT	IC	TOTAL
PQ-1A	6	1	0	9	6	2	0	5	29
PQ-1B	2	0	2	4	1	1	0	2	12
PQ-1C	0	1	2	2	3	1	1	2	12
PQ-1D	6	2	3	7	5	4	2	4	33
PQ-2	9	1	12	15	17	13	5	14	86
PQ-SR	0	0	0	2	2	0	0	0	4
TOTAL	23	5	19	39	34	21	8	27	176

Source: PRP/CNPq.

Table 5.46 shows the high productivity per faculty member of units such as FEA, FEQ, FEEC and IC. Regarding the per capita production of indexed articles with foreign co-authors, IC and FEA stand out for the positive results in the internationalization of their activities.

TABLE 5.46: NUMBER OF INDEXED ARTICLES PER FACULTY MEMBER IN ENGINEERING AND TECHNOLOGY

Year	FEA	FEAGRI	FEC	FEEC	FEM	FEQ	FT	IC
2014	3.98	1.47	0.55	2.58	1.64	3.13	0.49	3.15
2015	4.46	1.85	0.58	2.90	1.37	3.41	0.41	2.82
2016	4.10	1.78	0.53	2.39	1.71	2.54	0.42	3.21
2017	5.22	1.58	0.61	3.19	2.10	2.75	0.51	2.82
2018	5.95	2.00	1.00	3.26	2.55	3.47	0.43	1.91

Source: Incites/Web of Science (articles and reviews – April 16, 2019).

TABLE 5.47: NUMBER OF INDEXED ARTICLES WITH FOREIGN  
CO-AUTHORS PER FACULTY MEMBER IN ENGINEERING AND TECHNOLOGY

Year	FEA	FEAGRI	FEC	FEEC	FEM	FEQ	FT	IC
2014	0.82	0.19	0.13	0.88	0.31	0.98	0.21	1.35
2015	1.04	0.46	0.12	0.69	0.33	0.82	0.19	1.14
2016	0.95	0.44	0.11	0.82	0.49	0.58	0.10	1.08
2017	1.81	0.50	0.21	1.12	0.58	0.60	0.18	1.11
2018	1.96	0.62	0.47	0.92	0.69	1.00	0.12	0.79

Source: Incites/Web of Science (articles and reviews – April 16, 2019).

Analyzing the relative impact on the world of academic output, these are units with different profiles. The production of FEEC and FEA is comparable to the best international levels. FEQ, FEAGRI and IC are above Brazilian standards, while FT, FEM and FEC are comparable to Brazilian standards. It is important to implement continuous plans to increase the impact of this output so it may reach international standards of excellence. A reduction is observed in the volume of full-length publications in proceedings of scientific meetings for several academic units. This may be associated with the economic crisis over the period, but may also be a strategy for the dissemination of results in international journals.

Over the past few years, FEEC has maintained a steady standard of academic production, with average figures per faculty member remaining practically constant and a gradual improvement in qualified publications. Several professors are recognized authorities in their research areas, actively participate in the organization of world-class international events and are editorial board members and peer reviewers of internationally high-quality journals. The relative figures of FEEC, although below USA, New Zealand and Australia indices, are on a par with those of UNICAMP and Europe. The unit's production focuses on electrical and computer engineering, with relevant output also in computer science, physics, production engineering, chemical engineering, materials, mathematics, earth sciences, engineering, technology and management, and biomedical engineering. Its output increased from 120 articles per year in 2009-2013 to 133 in 2014-2018. FEEC has a fairly advanced innovation culture, spawning more than 20% of UNICAMP's startup companies (with a turnover of R\$ 4.8 billion in 2018 and 30 thousand jobs). In the last 10 years more than three R&D agreements were signed per year with industry and business and the school received the first-place award for "Technology Transfer to Companies" by INOVA (UNICAMP's innovation agency) in 2017 and 2018.

More than 88% of FEA works are cited, which exceeds the averages of the state, Brazil and other countries, with a Category Normalized Citation Impact of 1.20. This affords FEA a prominent position worldwide. The school stresses the absence of data on food science and technology, which would, in its opinion, allow a comparison of FEA production with fairer criteria. Nevertheless, analyzing the scientific production subjects, the three areas with the highest rate of publications in the school are food science and technology, chemistry and chemical engineering. It should be noted that FEA produces scientific knowledge in various branches, from engineering to nutrition. The branches of chemistry and chemical engineering, the second and third most prominent, reflect the scientific output of FEA's most highly rated graduate programs. The unit reports an increase

in publications in international journals and a decrease in the number of articles published in Brazilian journals in the periods in question. In the last five years there has also been an increase in the number of patents (from 11 to 24). The unit emphasizes the importance of its researchers appearing in radio and TV programs, a very significant activity that should be expanded. The cooperation of industry in FEA research is still incipient and an issue to be addressed in the school's Strategic Plan.

FEQ is considered a leader in its area but in some cases its production falls below international institutions of excellence. The volume of production in 2018, for example, is well rated by CAPES (3.3 articles/professor) and is mostly available in journals of excellence, according to the criterion used by CAPES that year. The unit also produced two academic-scientific books and 10 chapters in the same period. It is also noteworthy that six patents were granted and 11 patents were filed in 2018 in Brazil and one abroad (France). The unit's scientific output focuses on new energies, (bio)materials employed in biomedicine, polymers, environmental technology, fine chemistry, petroleum and applied thermodynamics. Thus, the school unequivocally contributes to scientific, economic and social development at national and international levels. The volume of production over the last two five-year periods increased slightly, from 133 articles per year in 2009-2013 to 140 in 2014-2018. The school has produced an average of one book and twelve chapters per year. The number of granted patents increased from six in 2014 to 25 in 2018. The unit has 60 volunteer researchers – FEQ partner researchers and R&D collaborators from industry and business – who actively participate in research (with the possibility of being accredited to teach in graduate programs). Within this cooperative environment, the school stresses the complementary training of students and staff through courses designed by such collaborators from the private sector, which includes access to the facilities of external research laboratories, such as the National Bioethanol Science and Technology Laboratory (CTBE) of CNPEM.

Although scientific output in FEAGRI was below the best Brazilian standards in terms of volume, the relevance of its research, measured in terms of citations and impact, exceeds all Brazilian standards and comes very close to international standards. Considering the context of the evaluated years, the number of faculty and the area of expertise, one may conclude that FEAGRI is very well ranked in terms of the relevance and impact of its publications. In international terms, the school stood out mainly in the branches of environmental sciences, ecology, microbiology, physics and nutrition. It is noted that its production is greater in the areas of agronomy and agricultural engineering, whose international impact was not so prominent due to the regional nature of the research (considered a trait of agrarian sciences). Scientific production in the form of articles published in international journals has remained constant over the last few years. Participation of the private sector in FEAGRI research activities is very limited. For this reason it has held workshops with industry representatives in the hope of encouraging scientific cooperation.

The Category Normalized Citation Impact (CNCI) of FT is 0.55, which places the unit above UNESP (0.48) and on a par with Brazil (0.58), but below all other continents (0.88 – 1.24). More than half of the unit's output (57%) related to the branches of physics, computer science, environmental sciences, electrical engineering and materials science and metallurgy. This pattern suggests a potential for interdisciplinarity that should

be encouraged and explored in a planned manner. The areas that stood out for having averages above global indices ( $CNCI > 1$ ) were environmental sciences, physics, civil engineering, chemistry and chemical engineering, which are natural candidates for the interdisciplinary effort suggested above. In the last two five-year periods one notes an increase in publications in international journals (from 171 to 286) with a simultaneous reduction in publications in Brazilian journals. There was also a change in faculty profile: in 2013, 35 professors were in regular higher education (MS) and 26 were in technological higher education (MTS); in 2017 the figures were 54 and 20 for MS and MTS, respectively. Regardless of faculty dynamics, the change in the publication pattern is viewed as positive, but action is needed to optimize the article/professor ratio. In the five-year periods in question, the participation of R&D collaborators from industry and business was restricted to events, with low impact on the evolution of research.

FEM presents similar statistics, with a CNCI of 0.71, comparable to the best Brazilian standard (0.74). The relative impact on the world of FEM production was 0.99, close to the best Brazilian standard (1.02). Its most prominent branches are diverse and include materials science and metallurgy, mechanical engineering, physics, chemical engineering, production engineering and engineering/technology/management, accounting for over 70% of all production. Over the past two five-year periods there has been a reduction in the number of full papers published in congress proceedings. It is noteworthy that between these two periods there was an increase of about 30% in the average number of articles per year. In this unit, a large number of articles and student support stems from agreements with industry and business; however, it is not common for institutions from those sectors to appoint individuals to take part in research activities at FEM. Thus, the metrics extracted for evaluation underestimate the actual importance of this type of cooperation, since participants from industry and business may not be among the authors of works executed as a consequence of the kind of support provided. The exception to this rule is Petrobras, with its Research Center (CENPES), which commonly participates directly in research carried out in the school.

The academic output of FEC focuses on civil engineering and architecture and urbanism. Prominent among civil engineering research subjects are construction, structures and geotechnics, water, energy and environmental resources, sanitation and environment and transport. In turn, subjects studied in architecture and urbanism relate to architecture foundations, methodology and design, technology in architecture and urbanism, and urban planning and design. There is great cooperation in the unit geared towards problem solving and proposed solutions in the general areas of infrastructure, built environments, cities, among others. FEC stressed the need to increase internationalization in order to reach international standards in its production. Regarding the number of articles published in journals with selective editorial policy produced by FEC graduate programs in the evaluation period, most papers are published in CAPES A2 and B1 levels, which is a good ranking in Brazil but indicates the need for strategies that improve the school's international visibility. The school has seen a reduction in the number of publications in national journals over the last two five-year periods; however, the number of publications in international journals increased more than 52%, from 259 in 2009-2013 to 394 (in 2014-2018). In this same period there was a conspicuous reduction in the production of book chapters: 95 in

the first five-year period versus 54 in the second. The number of patents increased from 4 to 7 in this period. The unit stresses that these changes reflect its internationalization strategy, valuing publication in international journals. The school reports participation in R&D by industry and business, such as Petrobras and Vale, which has been essential for the evolution of the school's academic production.

Due to the multidisciplinary and interdisciplinary nature of the computer science area, the academic production of IC encompasses several fields of knowledge, both theoretical and applied. In quantitative terms, prominent branches include information systems, artificial intelligence, software engineering, computer theory, machine learning, computer architecture, computer networks and telecommunications. It is observed that scientific output reaches high quality levels (number of citations and Category Normalized Citation Impact) in various fields of knowledge such as computational biology, medicine, ecology, biotechnology, applied microbiology, remote sensing, operational research and data communication. In the institute's self-evaluation, it has one of the top five intellectual production programs in Brazil. The unit also stresses the increasing participation of collaborators from industry and business in research and development, cooperating in the publication of scientific articles and also in the funding of grants for undergraduate and graduate students.

All schools with no exception recognize the importance of cooperation with public agencies, regulators and the third sector. They are active in this regard, with faculty engaging in such cooperation in various ways, from participation in different committees, including of funding agencies and regulators, to being members of initiatives managed by international organizations. Notably, FT faculty take part in the International Initiative on Water Quality (UNESCO group) and ABNT committees. FEM reports important cooperation with the Ministry of Science, Technology, Innovation and Communication (MCTIC) and the Ministry of Industry and Commerce (MDIC), besides advisory services to FAPESP and projects managed by ANEEL (National Regulatory Agency for Electric Energy) and ANP (National Regulatory Agency for Oil and Gas). RNP (National Research Network), Cia Energética do Maranhão and Rio Grande Energia signed agreements with FEEC. FEQ has a broad portfolio of such cooperation, including with Petrobras and Shell. FEAGRI has been involved in issues associated with rural settlements, having a research group for rural outreach activities. FEA reports faculty members on the National Food Security Council and in ANVISA (National Regulatory Agency for Health and Sanitation) working groups. FEC, in turn, stresses cooperation with ANEEL and ANA (National Regulatory Agency for Water and Hydric Resources), as well as local governments (such as Capão Bonito, Santos and Itapemirim). IC reports cooperation with the National Petroleum Agency (ANP), National Electricity Agency (ANEEL), National Institute for Space Research (INPE), Brazilian Institute of Geography and Statistics (IBGE), National Laboratory for Scientific Computing (LNCC), Eldorado Research Institute, National Synchrotron Light Laboratory (LNLS) and National Center for Energy and Materials Research (CNPEN).

The lines of research of the Engineering and Technology schools are well aligned with issues of state and national interest. They report several projects in the areas in question, which highlight UNICAMP's position as a pioneer in these areas and a leader in Brazil for issues of great importance. The School of Technology has projects related to



water, e-Science and data science themes, all of them funded by FAPESP. FEM has procured funding for and done research in aerospace and defense (in partnership with Embraer and Boeing), climate change, energy (fossil and renewable sources), strategic minerals, biofuels and data science. Renewable energy, internet of things and medicine are researched at FEEC. FEQ reports a range of subjects that show alignment with strategic issues, including: biofabrication (INCT), bioenergy (BIOEN/FAPESP) and biomaterials development. FEAGRI develops research activities aligned with water, food, biomes and bioeconomics. Bioenergy is also a topic developed at FEA, which reports projects on water, biomes, social sciences and technologies and energy. IC is also involved in strategic themes projects, especially in health care, agriculture, energy and e-Science.

The number of CNPq Productivity in Research Fellowships serves as an index to assess academic recognition in the Brazilian system (Table 5.5). At UNICAMP, about 20% of faculty and researchers have research grants. Among the Engineering and Technology units, the following are below this level: School of Technology (seven fellows, accounting for 13% of MS career faculty), School of Mechanical Engineering (17 professors, accounting for 5.4% of faculty) and School of Agricultural Engineering (three fellows holders). At another end of the spectrum, the School of Chemical Engineering reports that 20 of its 43 permanent faculty members have productivity in research fellowships, a mark close to 50%. FEC reports a constant figure around 30% of faculty with CNPq Productivity in Research Fellowships over the last years, close to that reported by IC, 29%. The School of Electrical and Computer Engineering has 26 fellows. This index varies significantly among the units and cannot be used in isolation for decision making, as it is naturally low in units with a large number of young faculty and, equally important, the award productivity fellowships is affected by the budgetary difficulties of CNPq. It is important to identify indices that can measure the recognition of schools regardless of budgetary factors (for example, a professor/researcher may be greatly relevant to his/her research area even without a CNPq Productivity in Research Fellowship, which may have been denied solely for lack of funds) and, moreover, do not distort interpretations based on normal variations in faculty (such as retirements and consequent faculty turnover).

All units stress the importance of the contribution of postdoctoral researchers to their academic output. Postdoctoral researchers often serve as a bridge between faculty and graduate students in different activities, taking part of research teams, helping in supervision, executing projects and partly drafting scientific production. These researchers also occasionally engage in teaching activities in undergraduate and graduate subjects.

FT raised approximately 0.6% (R\$ 3.6 million) of UNICAMP funding (R\$ 618 million) in 2014-2018. Using the interdisciplinary area as reference point, as the unit itself suggests, this amount accounts for about 5% of all FAPESP funding assigned to the area. FEM reports an increase in funding for engineering in 2014-2018. FEEC has raised important funds with FAPESP, resulting in support for both faculty and students. Regarding the area of computer science and computer engineering, there is a particular pattern: the share of FAPESP funding allocated to this area (when compared to all other UNICAMP areas) was approximately 1.4% in 2015, rising to 2.6% in 2016 and 2017 and falling to 0.5% in 2018. The same pattern is seen when comparing this area at UNICAMP against all other institutions: 9% in 2015, leaping to 19% in 2016 and falling to 0.3% in 2018. It is also reported that

IC has a policy in place for extraordinary funding (through research projects, agreements, outreach courses and consultancies), mostly from private companies, institutions and outreach activities, which is used to defray everyday expenses. FEQ stresses that FAPESP has favored large projects (CEPIDs and thematic) over regular projects, so that stimulating new faculty members has been a strategy at the school to attract funds. FEAGRI reports a reduction in FAPESP funding and hopes the faculty renewal will contribute to turn things around. FEA stresses that 2018 was the best year of funding from the agency, totaling 149 projects and over R\$ 7.15 million. FEC reports a reduction in FAPESP funding compared to 2015 of around 40%; however, there have been signs of recovery, albeit slow, in recent years, especially the significant increase in funding for research abroad.

Raising research funds abroad is an activity pursued at FEM (with agreements with *Escuela Superior Politécnica del Litoral* and The Boeing Co.) and FEQ (in the areas of petrochemicals, biofuels, pharmaceuticals, biomaterials and biotechnology). It is noteworthy that national funding is also procured in several of these international partnerships. In IC, most extra-budgetary funds come from private companies, outreach courses and consulting services. About R\$ 600,000.00 were raised by this school with international institutions in 2014-2018.

The Engineering and Technology schools have a vocation for innovation. With the exception of FEAGRI, which only recently initiated activities to stimulate technological innovation, all schools have a relevant background of innovation and technology transfer, especially FEA, FEQ and FEEC. The differences observed between the units suggest the need for increased interaction between those more experienced in this field and the others, sharing experiences and identifying points of synergy. Closer interaction with INOVA, guided by prior planning, will surely pay off.

In 2014-2018, the impacts of FT output include six intellectual property licenses, 10 patent applications, 12 software registrations and the founding of seven companies by alumni (which accounts for 3% of UNICAMP startup companies during the period in question). The unit signed seven international agreements with institutions in South America and Europe. In its research activities, the unit also produced material related to public policy, including regulatory criteria for water potability and use. Outreach activities also had a direct impact on society, especially workshops on environmental education with public school students.

Over the period in question, FEM coordinated approximately 98 agreements per year (with development agencies and companies), the largest number with Petrobras. Thirteen international partnership agreements were signed (10 with universities and three with Boeing). The school filed 29 patents and licensed another two. A total of 22 startup companies were created. FEM reports interdisciplinary graduate programs whose immediate goals are studies, discussions and proposals for: A) the energy sector, interacting with regulators (such as ANEEL, ANA and ANP) and cooperating to formulate energy policy; and B) the development of technology and scientific analysis methodologies in different areas of oil and gas exploration and production. The course was initially aimed at Petrobras and today serves different oil companies.

FEEC stands out for the volume of activities with cooperation outside the university. The five-year period includes a large amount of international cooperation and 14

agreements with universities and research centers. Innovation in the unit is attested by 18 patent licenses, 66 patent applications and at least 36 UNICAMP startup companies founded over the period. The award received by FEEC for the second year in a row for “Outstanding School in Technology Transfer” confirms the school’s ability and great potential for social impact. The unit focuses on research that creates breakthrough technology in renewable energy, IoT, smart cities, biomedicine, industry 4.0 and artificial intelligence. These are all important topics with immediate impact on society.

In 2018, consolidating the important task of transferring technology to the Brazilian production sector, six patents were granted by INPI in 2018 to FEQ faculty in the most diverse areas of chemical engineering and the like, and 13 other patents were filed, one of them abroad (France). Notably, in 2018 four inventor awards were granted by INOVA to FEQ faculty. The unit also reports the development and filing of four software programs and the creation of 25 startup companies between 1982 and 2018. It is worth mentioning the execution and fulfilment of an agreement with Total S.A. and five others with international universities. FEQ also does research in bioenergy and biomaterials.

The impact resulting from research activities at FEAGRI is the creation of one startup company per year on average. The unit has agreements and partnerships both in Brazil and abroad. Thanks to its research activities on rural settlements, the school serves as a bridge for technology transfer. Consequently, the settlements are usually where the technologies developed at the unit are first applied.

FEA, which received the 2019 Unicamp *Prêmio Inventores* for 18 patent applications in 2018, stresses its culture of innovation, hosting 38 UNICAMP startup companies. In the last five-year period it has intensified its technical production, progressing from 5 to 11 technology licenses and from 44 to 67 patent applications. As FEA is a national leader in its research areas and its faculty take part in outside organizations (such as CONSEA, CREA, ILSI), there is no doubt regarding the reach and impact of its activities on society. Being also a very active school in technological innovation, products resulting from its research are readily adopted by the community.

In 2008-2013, 11 startup companies were created at FEC. In the following five-year period this number rose to 14. The unit also highlights the granting of two patents and the registration of one software program in 2015-2018. Currently there are 10 agreements in force at the unit with institutions from France, Italy, Portugal and England. Regarding the impact on society of its research, the school claims not to have the information required to qualify and quantify such influence.

Regarding technological innovation, the Engineering and Technology schools demonstrate their ability to align research with key strategic issues, especially in research on energy, communications and health care. FEAGRI describes submitted projects within the scope of BIOEN but does not detail any ongoing activities at the time. In this particular case, the unit reports the opportunity to undertake projects associated with development in the agricultural sector using precision strategies such as IoT. FT reports the undertaking of a single project with potential for application under the Research Program for Public Policy for SUS. FEM stresses the participation of its faculty in two CEPIDs (CCES – Center for Computing in Engineering and Sciences; CeMEAI – Center for Mathematical Sciences Applied to Industry), in the Bioenergy Research Program (BIOEN) and in the Center for Research in Engineering

(CPE, in partnership with companies). FEEC executes and coordinates projects with great application potential and has faculty members in the Brazilian Institute of Neuroscience and Neurotechnology (CEPID FAPESP), the Center for Innovation in New Energies (CINE) and the theme-based project “Photonics for New Generation Internet.” FEQ also vigorously explores the execution of projects associated with technological innovation, taking part in the BIOEN program and the CINE project and coordinating theme-based projects in the area of advanced biofuels production. FEA emphasizes its potential in bioenergy and research in partnership with companies, with five funded projects under the BIOEN program and four PIPE projects. FEC shows potential to develop research and applications in strategic themes, such as characterization, conservation and sustainable use of energy and waste, and has a track record of research with small companies, technological innovation in construction, transportation and management and engineering research. The results of research carried out at the Institute of Computing are available to society in different ways: among products the unit highlights a kit for multiple collection of fecal material for laboratory analysis (patented and licensed), which reduces the cost of such tests for the population and is used by several Brazilian laboratories; TelEduc software, used by numerous institutions in Brazil and abroad to manage distance education; and participation in the first DNA sequencing in Brazil, encouraging the disclosure of bioinformatics research in the country.

The research activities are often communicated to society via radio and TV interviews and news stories. The Engineering and Technology schools carry out multidisciplinary research, moving easily among the branches of health care, energy, telecommunications and digital security. Below are listed some of the works that have come to society’s attention, demonstrating the variety of academic production in this area:

- Radio interview on *Rádio Jovem Pan* with Prof. André Leon Sampaio Gradvohl (FT) on election cybersecurity: <https://zenodo.org/record/1403228#.XQOzYohKjIU>
- Interview on *Programa Ideias em Debate*, Prof. Gisela de Aragão Umbuzeiro (FT) and Dr. Rhaul Oliveira on the Agrochemicals Bill: <https://youtu.be/KzVeMKUV4e0>
- Portal with information on energy efficiency (FEM) – Agência FAPESP: <http://agencia.fapesp.br/portal-reune-dados-sobre-eficiencia-energetica/29436>
- How Plastic Enables Floating Solar Plant Projects – Industrial Plastic (FEM): [https://www.unicamp.br/unicamp/sites/default/files/2017-11/impressao\\_boxnet\\_2017-11-09\\_-\\_14h07m41s.pdf](https://www.unicamp.br/unicamp/sites/default/files/2017-11/impressao_boxnet_2017-11-09_-_14h07m41s.pdf)
- Research supervised by Prof. Letícia Rittner (FEEC); Unicamp researchers create system to accelerate brain disease diagnoses: <https://g1.globo.com/sp/campinas-regiao/noticia/pesquisadoras-da-unicamp-criam-sistema-capaz-de-ajudar-medicos-no-diagnostico-de-doencas-cerebrais.ghtml>
- Hader Azzin (FEEC) – Unicamp research creates software that saves up to 40% in corporate energy consumption: <https://g1.globo.com/sp/campinas-regiao/noticia/pesquisa-da-unicamp-cria-software-que-economiza-ate-40-da-conta-de-luz-em-empresas.ghtml>
- Paulo Gurgel Pinheiro (FEEC) – Unicamp uses facial expression for wheelchair control: <http://g1.globo.com/sp/campinas-regiao/noticia/2016/05/unicamp-usa-expressoes-faciais-para-produzir-controle-de-cadeira-de-rodas.html>



- Rubens Maciel Filho (FEQ) – Unicamp develops skull prosthesis cheaper than imported models and sets a benchmark in Brazil: <https://g1.globo.com/sp/campinas-regiao/noticia/protese-de-cranio-desenvolvida-em-parceria-com-a-unicamp-custa-3-se-comparada-a-importante-e-vira-referencia.ghtml>
- Melissa Gurgel Adeodato Vieira (FEQ) – Silkworm glue is used in the removal of toxic metals from water: <http://g1.globo.com/sp/campinas-regiao/noticia/2016/10/pesquisa-usa-cola-do-bicho-da-seda-para-remover-metais-toxicos-da-agua.html>
- FEAGRI – Robot for agricultural work: <https://g1.globo.com/sp/campinas-regiao/noticia/pesquisa-da-unicamp-cria-robo-capaz-de-realizar-tarefas-agricolas.ghtml>
- Interview with Fernanda Bovo (FEA) on “good bacteria mix” that reduces the activity of health-damaging microorganisms in artisanal cheese: <https://g1.globo.com/sp/campinas-regiao/noticia/unicamp-descobre-uso-de-bacterias-do-bem-para-deixar-queijo-artesanal-mais-saudavel.ghtml>
- News report on work supervised by the professors Mário Roberto Maróstica Júnior and Maria Alice da Cruz Höfling (FEA) in which the researcher Ângela Giovana Batista identifies that Brazil Grapetree berries and Malay apple have chronic disease prevention properties: <https://g1.globo.com/sp/campinas-regiao/noticia/pesquisa-da-unicamp-diz-que-a-jabuticaba-e-o-jambo-vermelho-atuam-na-prevencao-de-doencas.ghtml>
- False digital image detection, Prof. Anderson Rocha (IC): <https://sao-paulo.estadao.com.br/noticias/geral,projeto-detecta-imagens-digitais-falsas,10000088091>
- Creation of algorithm to investigate crimes in social media, Prof. Anderson Rocha (IC): <https://www.uol.com.br/tilt/noticias/redacao/2018/07/25/csi-nacional-algoritmo-brasileiro-quer-investigar-crimes-e-acidentes.htm>

#### ROBOT FOR AGRICULTURAL WORK – FEAGRI



Antonio Scarpinetti/SEC – Unicamp.

The research activities carried out in these units earned professors, researchers and students several awards and distinctions. Such recognition reflects the impact of their research and includes awards for best thesis and dissertation, best article and presentation

at scientific conferences, and recognition for peer review activities by scientific publishers. Among the awards granted to members of the UNICAMP community over the period in question, the following stand out:

- *Ordem do Mérito MMDC*: Prof. Laura Maria Canno Ferreira Fais;
- *Prêmio ANP de Inovação Tecnológica*: Prof. Denis José Schiozer and Dr. Alessandra Davolio Gomes;
- *Ordem Nacional do Mérito Científico*: Prof. José C. Geromel and Prof. Reginaldo Palazzo Jr.

In general, the units depend on individual initiatives to boost research internationalization, as there is no clear institutional policy. Individual initiative and the publicizing of opportunities through contact networks are the main means to attract foreign researchers to the schools, whether as professors or postdoctoral researchers. Combined with issues of financial attractiveness and research conditions in Brazil, this situation results in structural inefficiency to attract international talent to UNICAMP.

Internationalization activities commonly stem from the participation of faculty in international events and the hosting of international visiting scholars. Outside this pattern, FEEC highlights the encouragement for co-mentoring, which spurs scientific dynamism through exchange among students and promotes further international cooperation. FEQ emphasizes the planning featured in the PRINT/CAPES proposal, whose adequacy is attested by the coordination of four projects within this context. The unit stresses the importance of the international experience acquired by its students through BEPE/FAPESP and Santander grants and co-mentoring and highlights long-term stays by foreign researchers. FEAGRI reports the creation of an internationalization committee whose activities are in the early stages, while FEC claims having faculty members who were attracted by calls publicized abroad. IC furthers internationalization by attracting students from abroad and encouraging faculty to cooperate with international institutions, increasing agreements for double degree programs.

The simplification of procedures and co-mentoring agreements is essential to increase the number of participants in co-mentoring programs. In addition, reducing delays in international procedures would significantly increase the opportunities available to the UNICAMP community. An additional impediment is the lack of an institutional and staffing strategy to host foreign students, researchers and professors to carry out part of their research activities at UNICAMP.

Academic production with international co-authorship is a strong indicator of international participation in research done in the units, as shown in Table 5.48. In FT, there was a reduction from 43% to 28% in international participation in intellectual production between 2014 and 2018. The average over the two five-year periods was 35%, equal to USP, above UNESP (29%) and Brazil (26%) and below UNICAMP's standard average (45%). In FEM, average foreign participation in production is 25.3%, slightly below the UNICAMP average (27.7%) but significantly lower than the "Best Brazilian Standard" (35.5%). Over the years of this period, 2016 recorded the highest participation of foreign co-authors (28.8%),



while the last two years (2017 and 2018) have higher percentages than the FEM average for the period. On average, 31.21% of FEEC academic output has international participation (consistent with annual rates), ranking the school below UNESP (33.33%), USP (33.82%), Brazil (36%) and best Brazilian standard (43.81%). FEEC also reports that foreign partnership is no longer a necessary condition to maintain quality production, as it is a consolidated school. In 2018, about 24% of FEQ academic output included foreign co-authors, with an increase in cooperation with foreign co-authors over the years. At FEA, the volume of academic production is slightly above the Brazilian standard in the period. FEC reports an increase in international participation in its production over the last few years. IC presents a fairly stable picture of production with foreign co-authors, fluctuating around 40% in 2014-2018 (except for 2016, when this percentage reached 33%).

TABLE 5.48: PARTICIPATION OF FOREIGN CO-AUTHORS IN PUBLICATIONS IN ENGINEERING AND TECHNOLOGY AND AVERAGE PRODUCTION PER FACULTY MEMBER

Year	Indexed articles with foreign co-author	Indexed articles	Number of faculty	Indexed articles per faculty member
2014	281	979	484	2.02
2015	274	1,031	498	2.07
2016	283	1,011	509	1.99
2017	377	1,149	497	2.31
2018	383	1,205	481	2.51
2014-2018	1,598	5,375	2,469	2.18

Source: Incites/Web of Science (articles and reviews – May 2, 2019).

The areas of cooperation with international partners are diverse in Engineering and Technology, in line with the academic output of these schools. FEAGRI has ongoing projects in rural management and digital agriculture, showing key alignment with strategic topics in society today. FEQ reports that it was granted funding (under the so-called PRINT/CAPES) for four projects in the following subjects: development of micro and nanostructured materials for biomedical applications; product and process development using biomass as raw material; development of new energy technologies. The school's partnerships are mainly in North America, Latin America and Europe.

All units reported the participation of students and faculty in exchange programs with foreign institutions, covering all areas of activity. Many students took part in these activities through the Science without Borders program, and BEPE/FAPESP and PDSE/CAPES funding was also used in graduate studies. Regarding faculty, it is reported that increased teaching load due to non-replacement of retired faculty and the strategy to use sabbaticals may significantly affect the participation in such exchange programs, especially in schools with predominantly younger faculty, creating pent up demand.

From 2014 to 2017, FT received 11 international visiting scholars who gave lectures and short courses to its community. From 2014 to 2018, FEM organized several international events attended by many foreign researchers. FEEC regularly organizes symposiums involving international researchers, and highlighted the ongoing organization of SEMINATEC, always attended by IEEE Electron Device Society Distinguished Lecturers.



IC reports the organization of several international events, attended by about 20 faculty members. The topics addressed in these events include distributed systems, computer networks, computer architecture, machine learning and encryption. FEQ reports a tradition in organizing international events and hosting foreign researchers on short- and long-term stays. All of these events related to the unit's production areas, as previously mentioned. In the last five-year period, FEA highlights the organization of the Latin American Symposium on Food Science and a São Paulo School of Advanced Science: Reverse Engineering of Processed Foods, but organized 60 other events on different subjects. These events were attended by foreign researchers and students, but the impact of attracting such researchers to the school could be enhanced through institutionally organized policies that facilitate interaction between faculty and students and international visiting scholars. There is no consolidated database with information on events and foreign visiting scholars. The implementation of such a database could be a starting point for the definition of strategic policies to attract foreign researchers to the university as a whole.

Regarding the participation of faculty on editorial boards of indexed journals, FT reports having only one faculty member performing such activity from 2014 to 2018 in *International Journal of New Computer Architectures and their Applications* and *International Journal of Digital Information and Wireless Communications*. FEM reports three editors in *Journal of Marine Science and Technology*, *Journal of the Brazilian Society of Mechanical Sciences and Engineering* and *Energy*. FEEC and FEQ are more active in this sense, having faculty on the editorial board of more than 10 journals (each school). FEA and FEC have at least four faculty members on editorial boards of international journals. Despite not citing numbers, IC reports that several faculty members are on editorial boards of indexed journals published by IEEE, ACM, Springer and Elsevier. The units reported recurrent problems in the metrics used to evaluate this kind of faculty participation, suggesting the need to review the strategy currently employed.

Most Schools and Institutes report that the search for new international partners depends on the individual initiatives of faculty, and therefore there are no school efforts in this sense. The committees involved basically publicize calls. FEQ is more active in this regard, reporting educational efforts to offer subjects that serve both foreign students and schools students in the international market. There is no efficient channel linking the schools with DERI and PRP, which would certainly facilitate the prospecting of opportunities, with the potential to streamline the entire bureaucratic process involved.

FT does not have a strategic plan for raising/allocating funds or hiring faculty to impact its output. Currently the allocation of funds is discussed in council and hiring takes place according to specific needs, without necessarily considering themes of contemporary scientific interest. FEM reports the drafting of a strategic plan in 2008, which requires revising. FEEC claims to have strategic planning for raising/allocating funds and hiring faculty (due to retirement). FEQ does not clarify whether there is indeed a strategic plan for the school, but reports that short-term plans include: a) setting up instruments to follow up on former undergraduate and graduate students, evaluating their social insertion in the labor market; b) encouraging the attraction of external funds from tax benefits for companies investing in technology research; and c) stimulating faculty participation in larger-scale projects (such as CEPID and ANP). FEAGRI reports that the school's strategic

plan, formulated in 2017, provides for the creation of a committee for an institutional line of research, without further details about other activities or terms. FEC's strategic plan provides for the creation of a Teaching, Research and Outreach Board to manage all the unit's academic coordination offices. However, it does not report any funding and hiring actions that may positively impact its output. FEC stressed that subjects of relevance to the unit relate to sustainability and innovation.

Among the strategies to encourage and support increased quality output, many units list faculty profiles (including changes) required for promotion and publishing requirements for students in graduate programs. FEM has a set of actions in place that includes institutional support to help procure physical space for the execution of research projects and gain access to support services for the translation of articles into English. FEQ stresses the importance of UNICAMP initiatives through the Writing Space and the Incentive Program for Publishing in High-Impact Journals. FEQ and FT also organized scientific writing events. FEC highlights its Program to Prioritize and Encourage Qualified Publications in which, if the requirements are met, applications for funding to review articles accepted for publication may be supported by the school. With the aforementioned aid, the units describe their production as consistent in quality and volume with their mission statement, values and strategic goals. Some specific reports, such as FEA's, indicate the lack of clear mission and vision statements and strategic goals and that this is a point to be addressed in strategic planning. Additionally, FEAGRI reports a reduction in the school's output that correlates well with the volume of retirements in the period in question. IC has implemented a set of initiatives to increase academic output productivity and quality that includes: mandatory publication in specific journals to defend master's and doctoral thesis; internal meetings to discuss program evaluation issues; faculty productivity recovery program, with the cooperation of volunteer faculty who support the realignment of research topics of low-productivity professors; and definition of minimum profiles for accreditation and promotion.

Attracting new talent to teaching positions is not systematically carried out by a recruiting committee. However there are local initiatives to prioritize understaffed areas, such as the Teaching Vacancies Committee – Local set up at FEC to guide hiring interests. Opportunities of positions have been disclosed through contact networks.

FT, FEM, FEQ and FEA do not have an internal program of seminars, but emphasize that during research visits, seminars are usually held attended by faculty and researchers from the visiting scholar's area. FT reports the creation of a seminar program which was discontinued for lack of attendance by its faculty. FEEC and FEC hold regular seminars. CI has an important strategy that can be explored by other units, which encourages seminars attended by guests from the field of education and the business sector, reducing the distance between the university and the non-academic community and enhancing cooperation with different sectors of society. Although seminars are not regularly held by most technology schools, they are attended by national and international guests, including from the business sector.

## 5.3 Conclusion

Over the past five years UNICAMP has proved to be a university that achieves significant levels of excellence in research, occupying top positions in international rankings and standing out significantly in Latin America. Most academic units (Schools and Institutes) rate their output above Brazilian levels and some stand out for production above world averages, setting global benchmarks in their areas. A more careful analysis of internationally recognized metrics to quantify research places UNICAMP above the Brazilian average in all areas and in a prominent position among South American institutions. Thus, it is necessary to structure action to achieve a better ranking in relation to the best international standards.

Efforts have been made to increase internationalization. Some units used well-structured policies to drive activities in this direction, including the appreciation of profiles that encourage this trait as a criterion for career advancement. Such initiatives may be positively associated with the increase of events held at UNICAMP during this period and also with the increase from 23% to 35% of indexed articles with international cooperation. In this regard, there is need for initiatives to internationalize research-related activities, such as the suggestion of offering subjects in foreign languages on a more regular basis.

The five-year period analyzed here included years of severe economic slowdown in Brazil. Although this is not the only factor behind the difficulties described here, it should be noted that the inflation rate exceeded nominal increases in funding. On the other hand, the faculty turnover at UNICAMP in the same period means that new research groups are being consolidated. Although there was no intentional search for specific reasons for the decrease of some types of production, it is believed that the abovementioned factors, combined with inaccuracy in quantifying research-related information, contributed to this fact. In this regard, efforts have been made in various schools to procure funds through public-private partnerships, which often run up against bureaucratic and lengthy procedures. Such initiatives would be more effective and frequent with a more robust institutional structure focused on this goal, in order to encourage innovation and research with constant interaction with society.

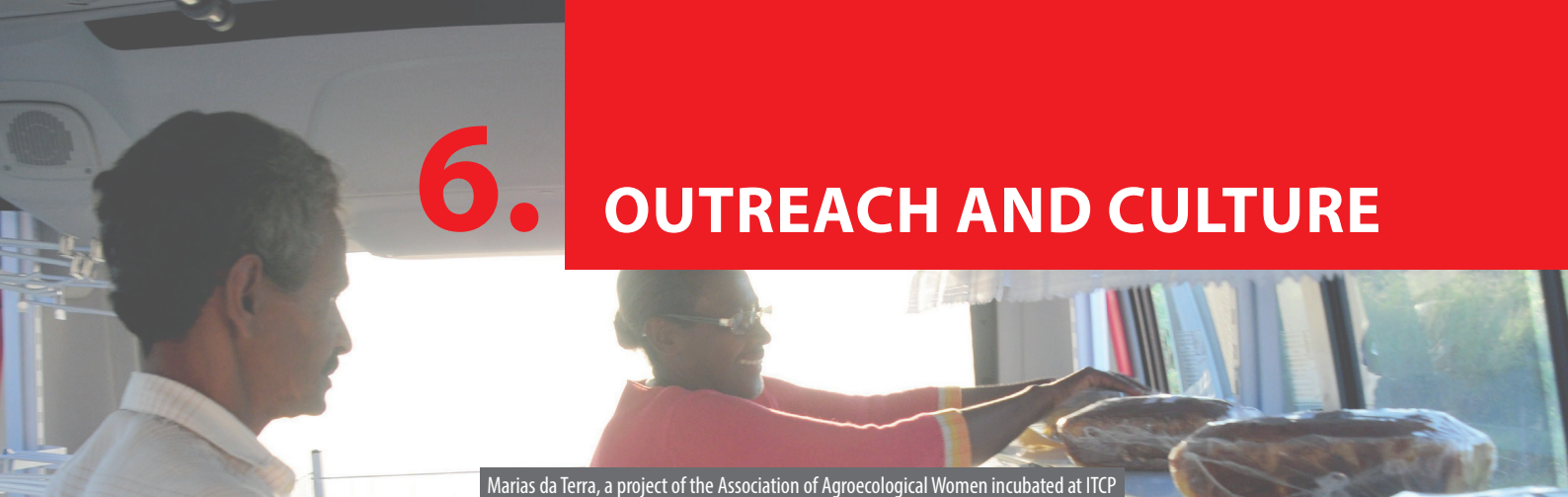
Heading towards its 60th anniversary, UNICAMP has achieved a national level of excellence in research. Now it is necessary to implement strategies to guide the university towards similar recognition at the best international levels, optimizing processes that stimulate scientific output and enhance interaction with society.





# 6.

## OUTREACH AND CULTURE



Marias da Terra, a project of the Association of Agroecological Women incubated at ITCP



Choir Ziper na Boca



Universidade Program



Students of Rondon Project in activities with indigenous children in 2018 at Miranda, MT.



Marias da Terra, a project of the Association of Agroecological Women incubated at ITCP e Choir Zíper na Boca:  
Antonio Scarpinetti/SEC – Unicamp.  
Unlversidade Program: Programa Univerldade – Unicamp (photo archive).  
Rondon Project: Proec/Unicamp (photo archive).



The goal of this chapter is to present the outreach and culture activities developed at Unicamp and describe how they are aligned with the university's Strategic Plan and relevant concepts and regulations. In addition, we analyze the impact of such action and the strategies to support outreach and culture activities. We believe that communicating these activities with and for society and the community is a key factor for the university's transparency and impact on society.

Therefore, over the following sections we discuss the current status of outreach and culture activities at Unicamp (1.1.1 and 1.2.1), their alignment (1.1.2 and 7.2.2) and impact (1.1.3 and 1.2.3), and the university's current support strategies (1.1.4 and 1.2.4).

Created as the Outreach Office (PRE – 1980s-90s), reformulated as the Outreach and Community Affairs Office (PREAC – late 1990s to 2017) and eventually redesigned as the Outreach and Culture Office (ProEC – 2017 to date), this university division has been marked by three main traits. PRE worked within a more general concept of outreach, supporting and fostering academic activities that were not exactly related to teaching and research. PREAC introduced and focused on community action, with special mention to the creation of the Technology Incubators for Popular Cooperatives (ITCP) and the promotion of community engagement projects (through calls for Community Outreach Projects). In its last years the Office opened its outreach activities to institutions, including communities and public or private organizations. ProEC endorses and practices the broader concept of outreach, not focused only in communities, strengthening and stimulating relationships with various institutions, regardless of their formal characteristics and nature. In addition, greater attention has been given to culture, with impacts ranging from the organizational framework of ProEC to the funding of cultural action.

## 6.1 Outreach at Unicamp

As an active member of the Brazilian Public Universities Outreach Forum (Forproex), Unicamp follows its concept and guidelines. The concept of outreach adopted is that of Forproex (2012, p.16), which states that "University Outreach... is an interdisciplinary, educational, cultural, scientific and political process that provides transformative interaction between the university and other sectors of society." But outreach is also an academic practice that must be inseparable from teaching and research in order to provide and guarantee "democratic values, equity and the development of society in its human, ethical, economic, cultural and social dimensions." (FORPROEX, 2012, p.17)

According to Forproex (2012), University Outreach should be guided by five principles:

1. Dialogic Interaction: Integrated and coordinated activities that transform society while providing the university with new knowledge, reflection and practice.
2. Interdisciplinary and Interprofessional Action: This relates to interaction among and combination of concepts, methodologies and models from various fields of knowledge, as well as partnerships between different organizations and professionals.

3. **Teaching-Research-Outreach Interface:** Outreach activities are more effective when linked to teaching and knowledge generation (research) processes, at the same time teaching and research benefit from transformations stemming from practical application and exchange of knowledge with society.
4. **Impact on Student Education:** University Outreach activities are decisive for the students, “either by expanding resources and point of views or offering direct contact with major contemporary issues.” Engagement with outreach activities enhances theoretical, methodological and practical experience while enabling the “practice of ethical and social commitments of the Brazilian Public University.” (FORPROEX, 2012, p.19).
5. **Social Impact and Transformation:** The joint activities of university and society should be a transformative action focused on the interests and needs of the population and its development, as well as the improvement of public policy. Such interaction should also benefit the university through new knowledge, new methodologies, better student education, new lines of research, patents and other forms of intellectual property, etc.

These principles should guide the university’s outreach action. The analysis of how current activities are aligned with these principles is presented in section 7.1.2.

According to FORPROEX (2007), the different kinds of outreach activities are:

- I** – Program: Coordinated set of medium- and long-term projects and other outreach initiatives (courses, events, services) (...);
- II** – Project: Process-based and ongoing educational, social, cultural, scientific or technological activity with a specific goal and term;
- III** – Course: Theoretical and/or practical educational activity, either on-site or distance learning, systematically planned and organized, with a minimum workload of 8 hours and defined assessment criteria;
- IV** – Event: Public presentation or performance, open or for a target audience, of cultural, artistic, sports, scientific and technological knowledge or products developed, preserved or valued by the university;
- V** – Services: Provision of services offered by the higher education institution or commissioned by third parties (community, company, public agency, etc.). Service provision is characterized by intangibility and process/product inseparability and does not result in the possession of a good. When the service is provided as a course or outreach project it should be recorded as such”.

### 6.1.1 Current status of Outreach at Unicamp

This section aims to present a survey of the current status of outreach activities at Unicamp and examine the differences and similarities within and between the Schools and the Interdisciplinary Research Centers.

The outreach activities are partly supported by the ProEC, but many activities are carried out by the schools and, sometimes, are not reported to the Office. There are also outreach activities autonomously created and executed by students in student associations (clubs, independent co-curricular associations, voluntarism etc.).

Table 6.1 features the number of outreach programs and projects and the number of participants in those projects (from the university and from partners and beneficiaries), as reported by the school.

The following schools did not report the number of participants or outreach activities: Institute of Computing, Institute of Human Sciences and the Humanities , School of Mechanical Engineering and School of Chemical Engineering.

TABLE 6.1 – SCHOOLS OUTREACH ACTIVITIES (PROJECTS AND PROGRAMS) IN 2014 – 2018

School	No. of activities	No. of internal and external participants
School of Electrical and Computer Engineering (FEEC)	72	UNDETERMINED
School of Physical Education (FEF)	42	30,403
Institute of Mathematics, Statistics and Scientific Computing (IMECC)	42	3,515
“Gleb Wataghin” Institute of Physics (IFGW)	35	1,505
School of Applied Sciences (FCA)	25	269
School of Agricultural Engineering (FEAGRI)	10	306
School of Medical Sciences (FCM)	9	1,421
Arts Institute (IA)	9	537
School of Nursing (FENF)	7	8,220
Institute of Biology (IB)	7	UNDETERMINED
School of Education (FE)	6	760
Institute of Language Studies (IEL)	6	66
Faculty of Pharmaceutical Sciences (FCF)	5	1,158
Institute of Economics (IE)	5	1,200
Institute of Chemistry (IQ)	5	1,825
School of Civil Engineering (FEC)	3	3,649
School of Technology (FT)	3	2,729
Institute of Geosciences (IG)	3	111,000
School of Food Engineering	3	140
School of Dentistry of Piracicaba (FOP)	2	UNDETERMINED
Total	299	168,703

Source: Internal Evaluation Committees Reports (2019).

Table 6.2 features the outreach activities by category carried out in 2018 and supported by ProEC through equipment, human resources or facilities. It is noteworthy that the figures presented in Table 6.2 refer to outreach actions supported by ProEC, which means that the total figure is greater if we consider activities supported by other partners or institutions or even managed autonomously by each school or Interdisciplinary Research Center. Examples of projects/programs are the History, Physics, Geography and Mathematics Olympiads, which involve the largest number of participants and have a significant impact on public school students and teachers throughout Brazil.

TABLE 6.2 – OUTREACH AND CULTURE ACTIVITIES  
MANAGED BY SCHOOL OR SUPPORTED BY PROEC – 2018

	No. of activities	Beneficiaries
Programs	63	791
Projects	217	98,432
Events (supported or executed by ProEC)	1,934	80,574
Courses	1,941	2,598
Total	4,155	182,395

Source: Internal Evaluation Committees Reports (2019).

The following are programs supported or managed by ProEC:

- Unicamp Technology Incubator for Popular Cooperatives (ITCP) – A group of students coordinated by a professor that develops courses, projects and events for popular cooperatives consisting of underprivileged communities such as settlements and squats. These initiatives aim to offer technical training to groups of people who will then develop income-generating activities for the community, ensuring their economic emancipation. Examples of cooperatives include waste recycling, production of processed foodstuffs such as potato and cassava chips and other initiatives.
- Projeto Rondon – Sponsored annually by the Brazilian Army, this program takes groups of students, led by two or more professors, to the most remote and needy regions in Brazil with the purpose of imparting knowledge to native or rural populations related to health issues, education and basic engineering (creation of cisterns, septic tanks, toilets, water use, etc.). The results are always surprising and positive both for the communities, whose learning produces important social impacts, and the students, who have contact with and experience conditions that are very different from daily academic life.
- Universidade – A program run by ProEC aimed at offering courses and various events for people over fifty years old, whether professionally active or retired. The workshops and courses are taught by volunteer instructors from Unicamp or from the community.
- Preparatory courses for admission to higher and professional education – In Brazil, the top professional and higher education institutions have entrance exams that can be very challenging. Every year, Unicamp students, coordinated by professors, organize annual or monthly preparatory courses to increase the chances of admission of students from underprivileged backgrounds.

Some activities reported as projects by the schools and Interdisciplinary Research Centers, should be considered programs. This reveals a possible lack of knowledge of the characteristics of this type of action.

Another aspect that deserves attention and improvement is the fact that many outreach activities are not systematically reported by project coordinators and executors

because they view them solely as research or teaching projects. In addition, as outreach activities do not directly contribute to faculty evaluations and promotions and students evaluation, there is less interest to formalize them as such. Moreover, external funding agencies give priority to research projects and many do not sponsor outreach projects.

Unicamp adopts the concept of outreach from FORPROEX, but the schools and interdisciplinary research centers have a broad understanding of the concept of outreach, ranging from courses, whether aimed at internal or outside audiences, to activities that are not directly integrated with teaching and research, often of a purely social nature. Most schools have a very comprehensive view of outreach action, but some of them do not realize that certain research projects may also be partly considered as outreach. For reasons previously described they end up being formalized as research only.

Therefore, several activities performed within the schools that should be classified as outreach are not formally documented or characterized as such. The lack of alignment of the concepts of outreach and the underappreciation of outreach activities in academic areas greatly contribute to these distortions. A case in point is a research project that needs to be applied to a controlled set of people in the community to test its hypotheses and thus reach the desired knowledge. Often the studied community also benefits from the spread of knowledge or even any technical preparation or specific skills required by the research. The positive impacts produced by the interaction between the research team and the community can be considered as outreach action, especially if one of the aims of the research project is to improve the conditions of the participating community in any possible way.

Outreach courses are among the most frequent outreach activities in the university. In general, the courses aim to bring the university closer to the community, contributing to its development through technical and cultural training, besides providing constant exchange of knowledge. Outreach courses develop activities that reach students from the community, offering content of the official curricula of undergraduate and graduate programs. They provide part of society with knowledge and skills that help complement the education of professionals or people who are preparing to enter the labor market.

Extcamp, the Unicamp Outreach School, linked to ProEC, supports the students and coordinators of outreach courses in many ways, from recruiting students and providing administration software and tools to collecting fees, when applicable. The courses offered range from short outreach courses to graduate specialization degrees, both on-site and distance learning. These courses are yet another form of Unicamp activity that goes beyond the regular undergraduate and graduate programs of the various schools. The university's outreach courses increase the opportunities for different segments of society to take advantage of academic skills and expertise outside the process of admission to official courses.

Table 6.3 features the number of outreach courses offered by the schools. However, there are also courses offered by the ITCP and Universidade programs and the cultural venues of Casa do Lago and CIS-GUANABARA (departments of ProEC).



## CASA DO LAGO AND CIS-GUANABARA



Antoninho Perri/SEC – Unicamp.



Antoninho Perri/SEC – Unicamp.

The offer of outreach courses follows a specific and autonomous dynamic to meet the constant changes, combining academic expertise and the requirements of society. Outreach courses may be free of charge or not, and about 50% of people enrolled in all Unicamp courses are exempt from at least part of the fee. In some schools there is a trend to increase the number of free courses. Some of them offer workshops and short courses that are not registered or formalized as outreach courses, as is the case of other outreach activities. There is a rule that prevents Interdisciplinary Research Centers from creating outreach courses, which is a sole prerogative of schools. Therefore, Interdisciplinary Research Centers and schools commonly form partnerships to create and implement outreach courses, under the responsibility and coordination of the latter.

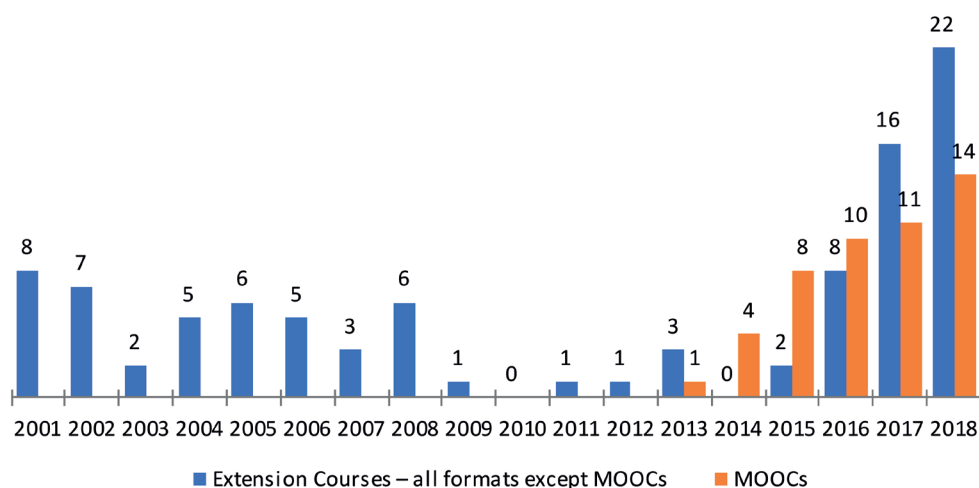
TABLE 6.3 – NUMBER OF OUTREACH COURSES AND ENROLLED STUDENTS – 2016 TO 2018

School	Number of outreach courses				Number of enrolled students			
	2016	2017	2018	Total	2016	2017	2018	Total
CEL	21	22	25	68	214	223	261	698
COTUCA	2	2	5	9	24	47	76	147
FCA	25	40	29	94	665	840	953	2,458
FCF	0	1	0	1	0	31	0	31
FCM	60	70	72	202	1,013	1,223	1,266	3,502
FE	24	31	40	95	705	891	1,727	3,323
FEA	3	6	4	13	183	192	234	609
FEAGRI	3	7	5	15	95	139	128	362
FEC	27	32	22	81	643	661	540	1,844
FEEC	30	37	35	102	1,771	1,708	1,194	4,673
FEF	2	1	2	5	54	65	91	210
FEM	1	1	1	3	45	46	49	140
FENF	2	1	2	5	43	27	35	105
FEQ	12	12	11	35	460	377	320	1,157
FOP	21	32	23	76	524	629	410	1,563
FT	7	13	11	31	285	447	359	1,091
IA	11	9	6	26	224	249	169	642
IB	2	1	3	6	20	85	44	149
IC	5	7	7	19	178	255	264	697
IE	17	21	20	58	1,269	1,442	1,521	4,232
IEL	53	78	88	219	715	1,203	1,064	2,982
IFCH	0	2	2	4	0	156	94	250
IFGW	1	0	1	2	18	0	11	29
IG	6	4	6	16	622	180	178	980
IMECC	12	15	15	42	360	417	440	1,217
IQ	5	1	0	6	114	20	0	134
Total	352	446	435	1,233	10,244	11,553	11,428	33,225

Source: PROEC.

Besides the on-site courses offered by the teaching and research schools, there is a clear interest of the community in distance learning (D/L) courses and hybrid arrangements combining both formats. Graph 6.1 below features the evolution and scope of distance learning courses, a trend in personal development and education at Unicamp.

GRAPH 6.1 – DISTANCE LEARNING COURSES



Source: PROEC.

Note: Coursera Partnership started in 2014. In 2016, ProEC launched the first call for fund distance learning courses.

The first D/L initiatives at Unicamp date back to 1997, when the Center of Information Technology Applied to Education (NIED) launched the first version of AVA TelEduc (D/L support software for facilitators and students). Since then, sectors and working groups have alternately worked on developing D/L in the institution.

An important milestone was the inclusion of D/L activities in PLANES/Unicamp in 2004 to encourage/consolidate D/L initiatives, facilitate access to information and learning materials and provide technical and operational support to organize such activities using Digital Information and Communication Technologies. One of the developments was the creation of a department to support, coordinate and promote activities related to the use of ICT in education, which resulted in the creation of the Educational Technologies Steering Group (GGTE) in 2009.

Extcamp has been an important element of distance learning, as its specific bylaws allow this type of teaching. At Unicamp, Extecamp pioneered the offer of Massive Open Online Courses (MOOC), and prominent among its main initiatives to promote D/L are the Calls for the Selection of Projects for the Development and Offer of Distance Learning Courses, issued by ProEC in 2016 and 2019.

Although outreach courses are a reality nowadays at the university, there is significant potential for expansion, especially in distance learning, which has grown in Brazil and abroad at much higher rates than the DL courses offered by Extecamp. Moreover, there is a group within the university that still has reservations regarding D/L courses for various reasons, such as doubts about student assessment, misinformation, integration between faculty and students. In short, they question the quality and positive impacts that distance learning courses can provide.

Another important outreach activity are events. Although essentially comprehensive in nature, events must have specific nuances and characteristics to be considered outreach activities. This understanding is not shared by all schools, as can be verified in the information provided by the schools. Events identified as outreach activities range from forums,

roundtables, cultural manifestation, meetings, symposiums, seminars and conferences on the most diverse subjects, either for specific audiences or open to the public at large. Examples include the Permanent Forum on Neglected Diseases (Faculty of Pharmaceutical Sciences), Health Walk (School of Medical Sciences), Food Engineering Week (SEMALIM – School of Food Engineering), Regional Meeting of Biology Students (Institute of Biology), among others.

Once again there is need for alignment, not only of the concept of outreach but of which events should be considered as such. And as with projects and other actions, the recording and value of events as academic and outreach production, when appropriate, should be improved to publicize the university's work, especially when it benefits the outside communitycommunity.

TABLE 6.4 – EVENTS COORDINATED BY SCHOOLS HELD AT THE CONVENTION CENTER – PROEC

Year	2014	2015	2016	2017
Number of events	133	174	171	110

Source: PROEC.

Besides the events featured in Table 6.4, the schools hold events in various specific venues on and off campus, totaling 2,000 in 2014-2018.

Outreach is an important source of extra-budgetary income for Unicamp, considering the courses offered by the Outreach School and the provision of services. Such activities make it possible for academic knowledge to be shared with society, meeting the needs of the various segments of the society. These actions may involve faculty, students and staff, when appropriate, inverting the normal flow of knowledge dissemination and problem solving and thus improving working methods, fostering the development of professionals involved and strengthening relationships between university and society. The provision of services through agreements, contracts and other partnership instruments results in the following services by the university's schools:

- Consultancy services in the fields of manufacturing, pharmaceutical, agro-environmental, physics, electrical engineering, economics, chemistry, food engineering, biology, computing, agricultural engineering, healthcare, strategic planning and innovation, mining, oil and geosciences.
- Provision of services to communities and municipal bodies regarding youth and adult education and teacher training in municipal schools; environmental engineering; engineering/architecture; microbiological analysis, enzymology, molecular biology, biochemical and molecular identification of microorganisms and plants; chemical analysis; services in the areas of cryogenics; X-ray diffraction analysis; surface physics, optics and photonics; thin film preparation; geochronology and electronic devices; etc.
- Execution of projects in the areas of information technology for national and international institutions (in Florence, Coimbra, Ontario, Liverpool, Bern, Oviedo, Tsukuba, etc.), which end up becoming master and doctoral theses.
- Dentistry projects focused on clinical treatment and training for the community;



- Arts activities involving the university and the community;
- Partnership agreements in Education with the Ministry of Education and Culture under the National Pact for Right Age Literacy (PNAIC); Center for Education and Society Studies (CEDES); Brazilian Reading Association (ALB);
- Provision of technical services in various laboratories of the schools, such as the Wood Structure Laboratory, Soil Laboratory, Electrification Laboratory, Post-Harvest Laboratory, Precision Agriculture and Machinery Design Laboratory, Multi-User Laboratory (LAMULT-Institute of Physics) and CEMIB laboratories;
- Execution and support of events with public or private entities, such as Olympics; Paralympics; state, national and international championships;
- Community use of Unicamp's facilities, such as the convention center, multi-sport courts and multidisciplinary gymnasium, libraries and others, in partnership with institutions and social groups.

GENETICS LABORATORY AT CEMIB



CEMIB – Unicamp (photo archive).

The analysis of the outreach activities developed through consultancies, projects, events and services reveals the relevance of their contribution to the university's community, which can be summarized in the following points:

- Personal development of participants in outreach projects or programs regarding technical knowledge, skills and culture. Examples include the work developed by the ITCPs in training cooperative members in the use of technologies and various professional skills; the healthcare projects which not only enable early diagnosis of chronic diseases such as high blood pressure and diabetes, but also offer guidance in hygiene, eating habits and prevention against STD (Sexually Transmitted Diseases).
- Closer interaction between university and society, enabling the exchange of knowledge with communities as well as with undergraduate and graduate students, who gain access to knowledge and information generated and held

back in academia. In turn, the student body and faculty, by building closer ties with the community, whether national or international (countries of all continents), align themselves with social realities, their characteristics, needs and specificities, producing change and improvement in academic knowledge.

- Distinct improvement of students through participation in outreach actions, enabling a deeper and accurate view of theoretical knowledge applied in projects and consultancy partnerships with institutions and social groups.

It is evident that the participation of staff members in the main activities of outreach projects is low, being mainly limited to administrative and bureaucratic roles. One can observe that the faculty is predominantly in charge of outreach activities, with the student body at times being the most interested party in opportunities to take part in outreach projects. It is noteworthy that in some schools the participation of students and faculty in outreach actions is not significant compared to teaching and research activities. This occurs due to the high appreciation given to research in the students resume and faculty evaluation reports and the financial resources available for this area. In addition, faculties and students have no obligation to develop outreach actions to enhance their evaluation reports, as happens with research. In this context, considering the three cores areas of teaching, research and outreach, we can consider that, at this moment, the latter does not bear the same importance as the other two.

Some schools, due to their characteristics, develop most of their research projects with the community, such as those in the biomedical area – School of Physical Education, School of Medical Sciences, School of Nursing, etc. Even so, the reports indicate that outreach activities are mostly isolated initiatives of professors and students, which implies a lack of systematization and institutional motivation to impart greater significance to outreach, on a par with teaching and research. This prevents a long-term and integrated view of institutional and social needs. Nevertheless, on the whole, several outreach activities were carried out inside and outside the university in the last five years, with a significant number of people from the university and outside community participating in and benefiting from them.

Regarding Interdisciplinary Research Centers, a wide range of outreach activities were identified in the surveyed period, comprising courses, provision of specialized services, cooperation between researchers and schools. Table 6. features the figures broken down by category.

TABLE 6.5 – NUMBER OF OUTREACH ACTIVITIES REPORTED  
BY INTERDISCIPLINARY RESEARCH CENTERS

	Patents	Organization of events	Inter-schools activities	International Cooperation and Agreements	Consultancy	Other services
CBMEG	5	12	24	2	115	212
CCSNANO	3	-	-	1	22	-
CEB	8	-	7	-	106	*
CESOP	-	16	1	-		750
CEPETRO	8	5	8	8	9	22
CIDDIC	-	524	10	-	44	2,130
CLE	-	121	5	-	-	195,485
CMU	-	48	12	9	74	54,675



TABLE 6.5 – NUMBER OF OUTREACH ACTIVITIES REPORTED  
BY INTERDISCIPLINARY RESEARCH CENTERS

continued

	Patents	Organization of events	Inter-schools activities	International Cooperation and Agreements	Consultancy	Other services
CEPAGRI	2	18	2	2	52	16,060
CEMIB	2	-	1	2	87	**
CPQBA	16	7	15	-	223	1,017
NUDECRI	4	152	12	2	141	5,657,746***
PAGU	-	86	85	1	464	-
NEPP	-	126	1	3	78	1,443
NEPO	1	177	21	-	183	3,049
NEPAM	-	254	305	16	167	-
NEPAM	1	7	12	13	79	32
NIED	1	35	19	-	61	169
NICS	1	36	22	5	110	-
LUME	-	320	7	-	388	2500
NIPE	2	54	4	-	20	-
Total	53	1,821	552	64	2,240	5,932,241

Source: Internal Evaluation Committees Reports, 2019.

Notes: '-' means "non-applicable" or no information available;

\* The center was unable to quantify;

\*\* The center provides a detailed description of the services, check complementary table for more information.;

\*\*\* Each search on the web and mobile terminal was computed as a service;

\*\*\*\* The center did not submit the file with this information.

The outreach activities mentioned by all 21 Unicamp Interdisciplinary Research Centers are mainly related to staff training and qualification, scientific dissemination and service. The reports reveal increasing and active participation of researchers in the Unicamp Open Doors Program (UPA), mainly prompted by the availability of a stand of the Coordination Office for Interdisciplinary Research Centers (COCEN), where high school students can learn more about interdisciplinary research developed in the Interdisciplinary Research Centers under COCEN.

Due to their characteristics, some of the Interdisciplinary Research Centers interact more closely with the external community, as is the case of the Center of Integration and Cultural Diffusion (CIDDIC) and the Interdisciplinary Center of Theatrical Research (LUME), greatly influencing the view of the external community of the activities and research developed by Unicamp. Other Interdisciplinary Research Centers develop activities with greater impact on government bodies and the private sector, such as the Center for Studies on Public Opinion (CESOP) and the Center of Public Policy Studies (NEPP), whose research and databases assist public managers from different levels in policy making and public management.

Service is another outreach activity commonly executed by various Interdisciplinary Research Centers, as attested by the Table 6.5, with varying degrees of involvement by researchers and staff. Such services can be divided into on-demand services and core activities. Examples of on-demand services include quick response to technological or specific testing requirements of oil companies by the Center of Petroleum Studies (CEPETRO), or outreach action in the areas of agricultural zoning and climate change performed by the meteorology and climatology areas of the Agricultural, Meteorological and Climatic Research Center (CEPAGRI). The Multidisciplinary Center of Chemical, Biological

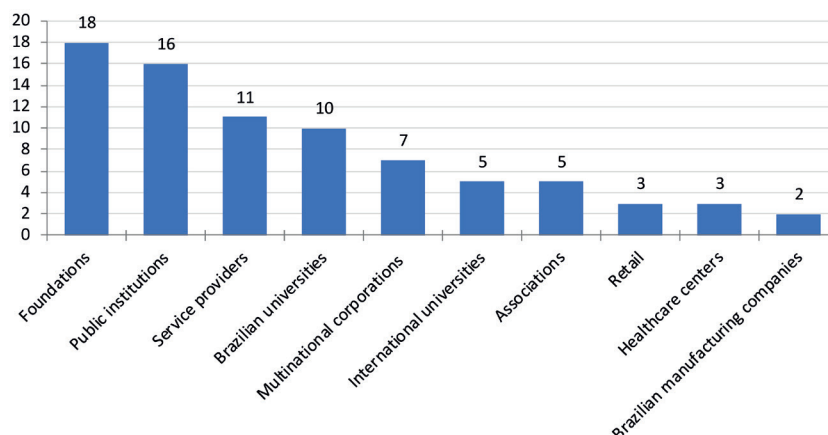
and Agricultural Research (CPQBA) is an example of service provision as core activity, since such services are integrated into the center's routine with well-established procedures and practices. An example of these activities was reported during data collection through the Institutional Assessment form: "[At] CPQBA outreach activities occur mainly through the involvement of researchers and staff, although in some cases such as courses and training, the Senior Citizens program, which offers courses on cultivation of medicinal plants and develops practical activities with the center's seedling nursery, the Science and Arts during Vacations (CAF) program and field trips, there is also support by postdoctoral students, grant holders, interns and visiting researchers. This community participation occurs by demand and with enough balance, bringing financial benefits and visibility to the CPQBA."

The Interdisciplinary Research Centers offer outreach courses always in cooperation with an institute or school. As mentioned before, it is noteworthy that despite their participation in offering specialization programs, according to Unicamp regulations, Interdisciplinary Research Centers researchers cannot be responsible for courses. This influences the relationship of the centers with this type of outreach activity, since the credit for offering it does not go to the Interdisciplinary Research Centers, but to the partner schools.

Regarding partners in outreach activities, there are various different configurations (Graph 6.2). In the case of schools, the most frequent partners are foundations such as: Fundação Itaú Social (with FCA), FUMEC – Municipal Foundation for Community Education (with FE), São Paulo State Foundation for Conservation and Forestry (with FEA), Fundação Fórum Campinas Inovadora (with FT), Fundação Casa do Estado de São Paulo (with FCM), etc. Also significant are partnerships with public institutions such as municipal governments (Campinas, Limeira, Itatiba, Paulínia, etc.) and state and federal government agencies.

It is noteworthy that Unicamp faces challenges to manage projects funded by the federal government due to a number of incompatibilities in spending regulations. In addition, there are many delays in the transfer of funds for projects funded through MEC calls, sometimes up to a year, thus affecting the execution schedules.

GRAPH 6.2 – MAIN PARTNERS OF SCHOOLS – 2014 A 2018

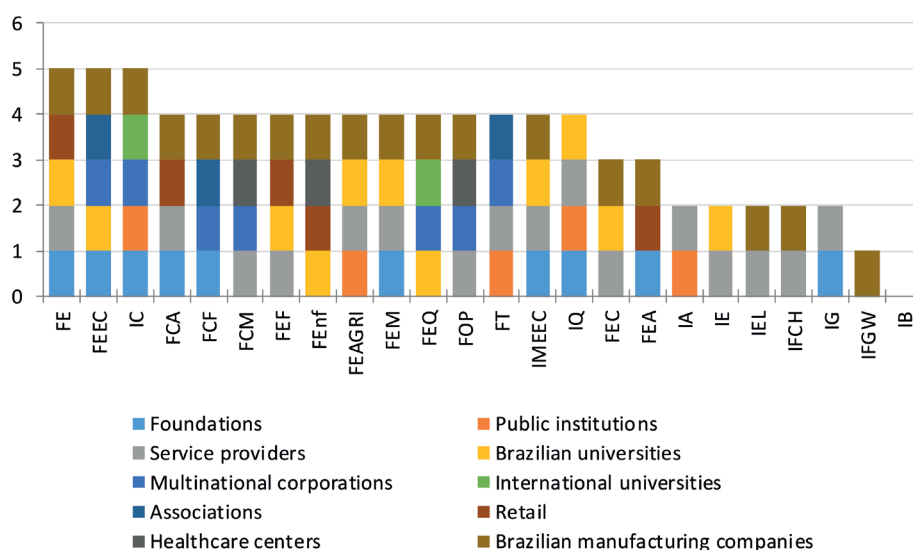


Source: Internal Evaluation Committees Reports, 2019.

Looking at the types of partners cited by the schools (Graph 6.3), one observes a wide variety. Also noteworthy are partnerships with other Brazilian and international

universities, such as University of São Paulo (USP), Getúlio Vargas Foundation (FGV), Julio de Mesquita State University (UNESP), São Paulo State Virtual University (UNIVESP), etc. The main national partners universities are in the state of São Paulo; demonstrating the need of partnerships in other Brazilian states. Another striking fact is that the number of schools that cited partnerships with international industries is higher compared those that reported partnerships with Brazilian manufacturing companies.

GRAPH 6.3 – PARTNER ORGANIZATIONS BY SCHOOLS



Source: Internal Evaluation Committees Reports, 2019.

### 6.1.2 Alignment of outreach activities

The purpose of this section is to analyze the alignment of the outreach activities with the Strategic Plan (Planes) and Forproex outreach guidelines such as interface among teaching, research and outreach; dialogic and transformative relationship; interdisciplinarity; active student participation; etc.

The university's Strategic Plan for Outreach and Culture gives priority to three programs: "Outreach and Society"; "Outreach Evaluation"; and "Infrastructure." Each school has its own Outreach and Culture plan and their alignment is also detailed in this section.

The "Outreach and Society" program aims to support and expand initiatives and partnerships for outreach and culture, strengthening the relationship between the university and other members of society through knowledge exchange and transfer, academic and community contributions; and debate and develop solutions to regional, national and global challenges. In this sense, the goals of this program are to Unicamp:

- expand agreements and partnerships, including with alumni;
- encourage the offer of cultural and academic outreach activities to meet society's demands;
- take part in policy making;

- promote initiatives that provide and organize opportunities for reflection and debate on relevant and complex issues that contribute to policy making;
- develop means to enable the integration of internal and external knowledge in teaching, learning and research activities.

The section on Supporting Strategies for Culture and Outreach also features what the university schools and ProEC are doing to support and improve the activities. Regarding ProEC, the following will be detailed: outreach grants for undergraduate and graduate students; calls for outreach projects (PEC/PEEx); Faculty Outreach Award; outreach programs managed by ProEC (ITCP, Unverslidad, Cescon Entrance Exam Course, etc.); emergency funding for outreach and cultural actions; disclosure and communication of culture and outreach activities (Outreach 48 Project; outreach activities database); etc.

The outreach activities database (BAE) was created upon request by the public universities of the state of São Paulo. The tool has a map featuring the outreach activities, thus making it easier to understand the distribution and characteristics of outreach activities carried out by such universities and enabling more appropriate planning of partnerships and new initiatives.

The Cescon program is a partnership with the NGO Centro Estudantil Social de Convivência (CESCON – Student Social Interaction Center) and aims to prepare students for the entrance exams of technical secondary courses. It is supported by Unicamp through scholarship holders supervised by faculty from the School of Education, course management (including student selection) and purchase of inputs such as food and booklets (ProEC).

The “Outreach Evaluation” program, in turn, aims to enhance evaluation of outreach activities through the following goals:

- Defining and creating indicators;
- Establishing monitoring mechanisms with processes and tools.

To this end, the Outreach and Culture Office has worked on four fronts: 1) conducting surveys and producing reports on university outreach (study and research group; publication of articles and book chapters); 2) taking part in the design, discussion and monitoring of indicators within Forproex; 3) creating a database of outreach activities for public universities in the state of São Paulo; 4) creating assessment manuals and guides (such as the Outreach Award Guide; Curriculum Integration Evaluation System); etc.

The third program addresses the challenge of providing outreach and culture activities with adequate infrastructure and, aims to improve ProEC’s facilities in this sense. ProEC invested in layout adjustment, information technology and training and reallocation of human resources.

Regarding the alignment between outreach and strategic goals, the schools consider that the outreach activities carried out during the period were guided by and consistent with their strategic goals, defined in the annual PLANES.

Most of the schools (17 schools) reported having strategic goals for outreach and developing initiatives to achieve those goals, citing specific projects and activities. Two

schools develop actions to promote and manage outreach but they are not aligned with strategic goals, and five other schools did not declare having strategic goals, but reported outreach activities.

The main goals cited by the schools were related to increasing outreach activities (approximately 50% of the schools), improving outreach management (creation of regulations and guidelines, outreach committees, outreach funds, improving infrastructure) and enhancing communication and relationship with society and student organizations (25%). Further details of the challenges and improvement initiatives are featured in section 6.1.3.

According to the reports of Interdisciplinary Research Centers related to arts, especially CIDDIC and LUME, these seem to have a more structured planning of outreach projects, as do Interdisciplinary Research Centers more involved in providing services, such as CPQBA. Nonetheless, in some Interdisciplinary Research Centers services are still provided on-demand, with specific approval of the service project.

It is important to stress the need to communicate best practices so the schools can learn from each other and adapt such practices to their needs.

Outreach activities based on the dialogic relationship between the university and other sectors of society have enabled the schools to align their activities, especially in adapting and changing curricula and creating outreach courses. However, some schools reported the challenge of integrating various outreach and community initiatives, programs and projects.

The schools have a broad understanding of the outreach activities, ranging from courses, whether aimed at internal or outside audiences or both, to activities that are not directly integrated with teaching and research, often of a purely social nature. The last ones show a lack of understanding of the Forproex concept and principles. On the other hand, several initiatives carried out in the schools should be classified as outreach but are not formally recorded and therefore do not feature in the statistics of outreach work. The lack of alignment of the concepts of outreach and the underappreciation of outreach work in academic areas greatly contribute to these distortions.

According to the interdisciplinary research centers, most of the outreach activities relate to staff training and cultural expression. Again, staff training would not be considered outreach as does not integrate the community. When there is a well-defined strategic plan (PLANES) in the Interdisciplinary Research Centers, it always includes proposals and general guidelines for outreach action. Some Interdisciplinary Research Centers only carry out outreach activities on demand, so there is no mention of these in their PLANES.

Almost all the short and long-term goals for outreach activities of the Interdisciplinary Research Centers are defined by opportunity, i.e., usually research projects linked to government bodies and funding agencies with applied action. The scientific board of each Interdisciplinary Research Centers are reported as being in charge of approving such activities and monitoring of results. Few Interdisciplinary Research Centers claim to have regular meetings to plan structured outreach activities. An example of this type of action is CESOP, whose "... planning of outreach activities is done through regular meetings involving researchers and student representatives. At these meetings we set our short- and medium-term goals. These meetings are held twice a year and planning is adjusted to new requirements and realities arising over the period." In the case of CIDDIC, planning of cultural outreach activities is annual, prior to the period of project execution.

It is worth noting the report of two good examples of alignment between PLANES and execution, one of them by NUDECRI: *“The activities developed are in perfect agreement with the priorities defined in the center’s strategic plan, whose mission statement is... to develop interdisciplinary projects with different areas of knowledge and technology, focusing specially on urban issues and their political and social repercussions, and reflection and criticism of journalism in the face of changes in technology and production processes, and scientific and cultural dissemination.”* In turn, PAGU reports: *“The outreach activities developed in the five-year period are in line with the strategic goals and priorities defined in the strategic plan, which ensured a closer relationship between university and society.”*

Little is mentioned in the data collection forms on alignment of activities with Forproex concepts. Thus, the Interdisciplinary Research Centers are almost totally unaware of those concepts and principles. Also unclear is the role of full researchers in leading outreach activities, since not all outreach action can have a researcher in charge (courses). In the next Strategic Plan it is important to include outreach concepts and activities in the discussion, aiming not only to align them with FORPOEX principles but also to encourage their offer. Integration of outreach in curricula can also bring about positive effects regarding the knowledge of those concepts and the impact of outreach activities.

Although the principle of inseparability among outreach, teaching and research has been provided in the Brazilian Constitution since 1988, it is not clear from the survey whether the activities developed in outreach are directly related to the teaching and research activities of the schools. The participation of students in outreach is often reported, but such participation is not integrated with their learning. However, in some schools such as FCA, FCM, FE, FEF and IA, outreach is a recurring practice (including in teaching and faculty research). Moreover, many student associations develop outreach activities, among them ENACTUS, AIESEC, junior enterprises, clubs, etc., but they are also disconnected from students’ formal curriculum.

The Brazilian Guidelines for the Inclusion of Outreach in Higher Education, MEC/CNE/CES Resolution No. 7/2018, (integration of outreach in curriculum), open up new perspectives for expanding the integration between teaching and outreach. This expansion will be due to it is predicted on the above resolution, that 10% of the university workload will be integrated with outreach actions.

The same is true for research: although many projects include the outreach component and vice versa, they are often reported only as research projects. Nevertheless, in general, outreach programs and projects have generated research and learning opportunities, with various undergraduate, master’s and doctoral studies carried out.

The concept of inseparability of teaching, research and outreach underlies all activities described by the Interdisciplinary Research Centers, since many outreach activities are executed on demand and commonly linked to research projects promoted by government agencies at different levels. It is commonly reported that all activities involve administrative staff, researchers and undergraduate, graduate and postdoctoral students. Even in the provision of specialized services a widespread outreach activity among Interdisciplinary Research Centers (table 6.5), one notes an intricate relationship between teaching and research evidenced by the constant participation of graduate and undergraduate students in the development of technologies required to provide the services, as reported by CPQBA and CEPETRO.



In the Interdisciplinary Research Centers, interdisciplinarity is present in almost all outreach activities. Interdisciplinarity aims to combine several branches of knowledge in the pursuit of a common goal, e.g., a specific subject or theme. Multidisciplinarity, unlike interdisciplinarity, does not aim at the linearity of issues, and therefore this concept should also be included as part of the outreach activities of all Interdisciplinary Research Centers. Such (inter|multi) disciplinarity present in Interdisciplinary Research Centers activities greatly influences the adhesion, engagement and trust of the community in those activities, as reported by CEPETRO. A case in point is the audience of the opera productions reported by CIDDIC and the logistics operated by that center to produce such events.

Although all schools and Interdisciplinary Research Centers offer outreach activities, many in compliance with FORPROEX guidelines, there is obviously no clear view about what outreach is or even which activities can be defined as outreach, thus reinforcing the need for ProEC and the outreach boards and committees to spread the concepts of what is considered outreach.

### 6.1.3 Impact of outreach activities

The goal of this section is to describe the impact of outreach activities on (i) all missions of the university (general, schools, departments, Interdisciplinary Research Centers etc.) and ii) society.

Regarding the impact on teaching, it is noteworthy that the outreach activities have allowed the development of strategies to bring undergraduate students closer to their professional practice, which in turn has enabled the expansion of teaching activities, with students learning from the reality of the professional field. The relationship with society has had an impact on different aspects, besides improvement of curricula, such as knowledge and technologies generation (protected by intellectual property). Many faculty members develop field activities involving the creation of processes and methodologies of theoretical and practical teaching. An example was the development by FEnf faculty in 2010 of a software called Fuzzy Kitten, a Fuzzy-Based Logic Model to Assess Diagnostic Accuracy.

In many schools, faculties and students are immersed in outreach. Healthcare projects are frequent and provide (or potentially provide) a dialogic relationship between the university and other sectors of society, since such spaces enable the practice of research, curriculum changes, new methodologies and technology development.

Some schools report that the outreach activities have not yet been able to create new research or bring change in curricula, although they have already resulted in several undergraduate research papers, dissertations, and theses.

Outreach's social, political, economic and cultural impact at national level is evident, but few activities have the same scope internationally. This not surprising, since the university is expected to provide local services and local positive impacts. In this sense, international outreach initiatives are quite rare at the university.

The approval of MEC/CNE/CES Resolution No. 7/2018 which addresses the guidelines for the integration of outreach activities in all undergraduate programs (which should account for 10% of the workload) opens up new opportunities for involvement

and appreciation of outreach activities. In this sense, the schools were asked about the involvement of students and the encouragement for them to engage in outreach, cultural and sports initiatives. Only one school reported lack of such encouragement.

Most of these activities are not directly integrated with students' learning (curriculum and pedagogical project), the most frequent being: credit for cocurricular activities; participation in student associations (extracurricular); participation in outreach projects of faculty detached from teaching (cocurricular); and volunteer work in school or university events. Other activities mentioned were: support to outreach courses; attending events; knowledge and skills competitions; and artistic production. Only two schools cited participation in outreach projects integrated with teaching (curriculum).

Another issues related to learning and outreach integration are:

- creation of courses
- credit for cocurricular activities
- changes in subject syllabuses to accommodate outreach content and activities
- student participation in outreach courses
- mapping of outreach activities in undergraduate programs
- organization of outreach activities from social needs which meet the schools' interests
- participation of students in events
- undergraduate scientific research
- lectures on the results of studies, research, course assignments and outreach work
- volunteer work
- participation of students in associations such as: junior enterprises, students' representative councils, sports clubs, NGO, etc. s
- organization of scientific and cultural events
- participation in outreach projects
- submission of proposals and/or projects for problem solving/improvement within the school or externa community
- partnerships with non-governmental entities and civil society to plan joint outreach activities.

Some of these initiatives are not outreach activities as such and are not provided in MEC/CNE/CES Resolution No. 7/2018, like student participation in events, undergraduate scientific research, participation in student organizations, etc. However, they may be related to outreach, for example, curriculum-based student associations activities, undergraduate scientific research working with communities, etc.

Other items mentioned are important suggestions for integrating outreach in the curriculum, such as the creation of courses, formal agreements, proposals regarding society challenges, etc.

It is interesting to note the case of the Arts Institute, whose outreach and culture activities are already integrated in the courses, but mainly as events and courses.

The School of Medicine stressed that, to appreciate student participation in outreach projects and strengthen outreach activities in the institution, the university should set down parameters to evaluate faculty members in outreach activities, considering outreach activities as an important part of student learning and no less important than teaching and research.

And the new curriculum of the Faculty of Food Engineering (FEA), to be introduced in 2020, includes outreach activities as a compulsory element. The changes were also made in the program's pedagogical project.

Regarding Interdisciplinary Research Centers, the data indicate that the outreach activities carried out during the survey period opened up the university to dialogue among researchers and different groups of society at different levels: municipal, state and national. The international impact of the activities still seems to be small, basically focused on the publication of scientific articles, filing of patents and licensing of products resulting from Interdisciplinary Research Centers research.

Also noteworthy is the impact of Interdisciplinary Research Centers activities on the design of public policies for education, health, economy, social security and management at municipal, state and federal level. A case in point is the work developed by CEB with the Brazilian Ministry of Health and ANVISA to design health policies in the branches of clinical engineering and medical physics. Also noteworthy is the curatorship of databases on the political and social behavior of Brazilians since the 1980s, an essential source for public and private professionals in Brazil and abroad interested in longitudinal data about the Brazilian population.

In some Interdisciplinary Research Centers, outreach is closely linked with applied high performance research, resulting in activities of great social and economic impact outside academia through the filing of several patents and/or licenses (see Table 6.5), as well as national and international cooperation projects and public-private partnerships. Two examples are significant here: CBMEG, which stands out for being the first division of Unicamp's Brazilian Company of Research and Industrial Innovation (EMBRAPII) with the Center for Medicinal Chemistry of Open Innovation (CQMED), developing work in the early stages of new drug development and therapeutic targets, aiming at innovation in the pharmaceutical industry and the creation of new training opportunities for graduate and undergraduate researchers. Another example is CEPETRO, which provides services to help oil companies respond quickly to technological requirements or specific tests, thus impacting society as a whole with the results of such action for Brazilian oil production.

CQMED AT THE CENTRAL LABORATORY OF HIGH PERFORMANCE TECHNOLOGIES (LACTAD)



Lactad – Unicamp (photo archive).

For more information about the management and results of intellectual property at Unicamp see chapter 8 about Social and Technological Innovation.

The multiple Interdisciplinary Research Centers outreach activities allow different segments of society to benefit from knowledge generated at UNICAMP. Their multi- and interdisciplinarity facilitate the exchange of expertise and experience among Interdisciplinary Research Centers and between them and other areas of the university. From such traits one can infer the quality and social engagement of the activities, attested both by partnerships with the external community, whether companies, governments or society as a whole, and the growing request for such contact.

#### 6.1.4 Strategies to value and support outreach activities

The goal of this section is to identify and analyze the challenges of outreach at Unicamp and the ways to address them, as well as current forms of support.

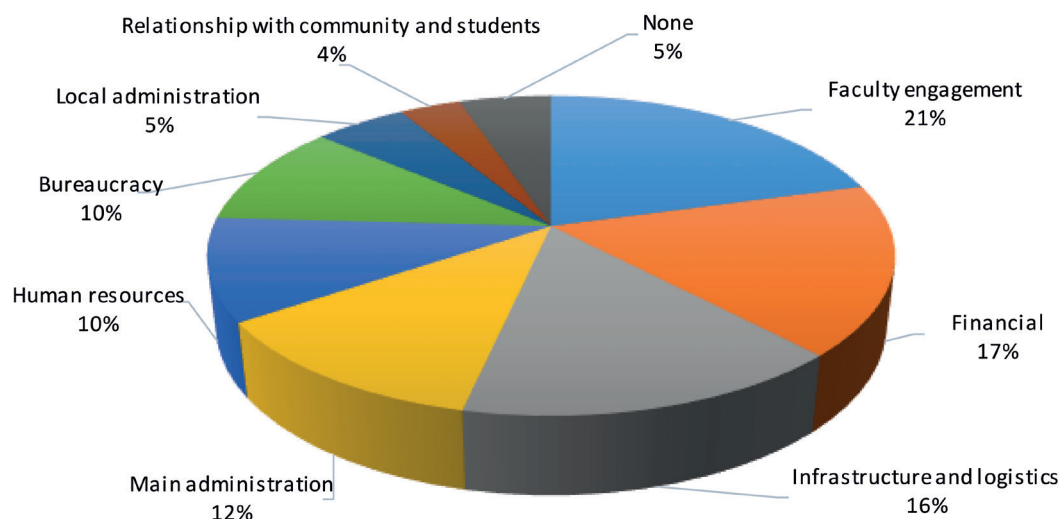
The schools cited 26 challenges to develop and enhance outreach activities, and three schools (two in Engineering and Technology and one in Exact and Earth Sciences) claimed not to have difficulty with outreach. The challenges were classified into the following groups:

- Financial: need to diversify funding sources; high rental costs; high administrative fees for providing courses and services; non-payment of and dropout from outreach courses; short-term funding of ProEC calls for projects.
- Human resources: understaffing; work overload of staff and faculty; staff turnover;
- Infrastructure and logistics: lack of infrastructure and maintenance of facilities; lack of transportation; need to open the university cafeteria to non-Unicamp participants of events and courses.
- Local administration (schools, Interdisciplinary Research Centers): lack of regulations and organizational structure for outreach; lack of outreach managers; lack of information, organization or management of outreach activities.
- Main administration (Unicamp, ProEC): poor advertising of outreach courses; lack of support in managing inter-school projects (e.g., joint projects of the School of Education and schools offering teaching programs); lack of integrated outreach programs; lack of best practice models; lack of reward for outreach managers; lack of evaluation of outreach activities in faculty and staff performance evaluations.
- Bureaucracy: excessive procedures and terms for approvals.
- Faculty engagement: few faculty members engaged in outreach; faculty overload; faculty participation below expectations; higher requirements for teaching and research.
- Challenges from the relationship with community and students: inappropriate use of venues by the community (equipment breakdown, poor hygiene conditions after use) and student commitment.

Regarding the lack of integrated institutional projects and programs, an aspect mentioned was the importance of a common line and integrated institutional initiatives combining schools and teaching and research activities.

A recurring cited challenge was bureaucracy (Graph 6.4), which is related to the many levels of approval for outreach activities, the term to approve agreements and courses (around 60 days) and the requirement to establish partnership agreements for outreach activities.

GRAPH 6.4 – CHALLENGES TO DEVELOP AND ENHANCE OUTREACH ACTIVITIES



Concerning the relationship with the community and participating students, the challenges mentioned included inappropriate use of venues by the community, causing equipment and infrastructure breakdown and misuse; use of venues for financial gain by community members; etc. In the case of students, the difficulty is to motivate them to carry out outreach activities up to the end. It is important to note that these items were mentioned by only two schools (IB and FEF). This number was expected to be higher, since it is understood that the more frequent the relationship with the community, the greater the conflicts. This shows that either the relationship with the community is already harmonious or, which is more likely, few outreach actions actually involve dialogic interaction with the community.

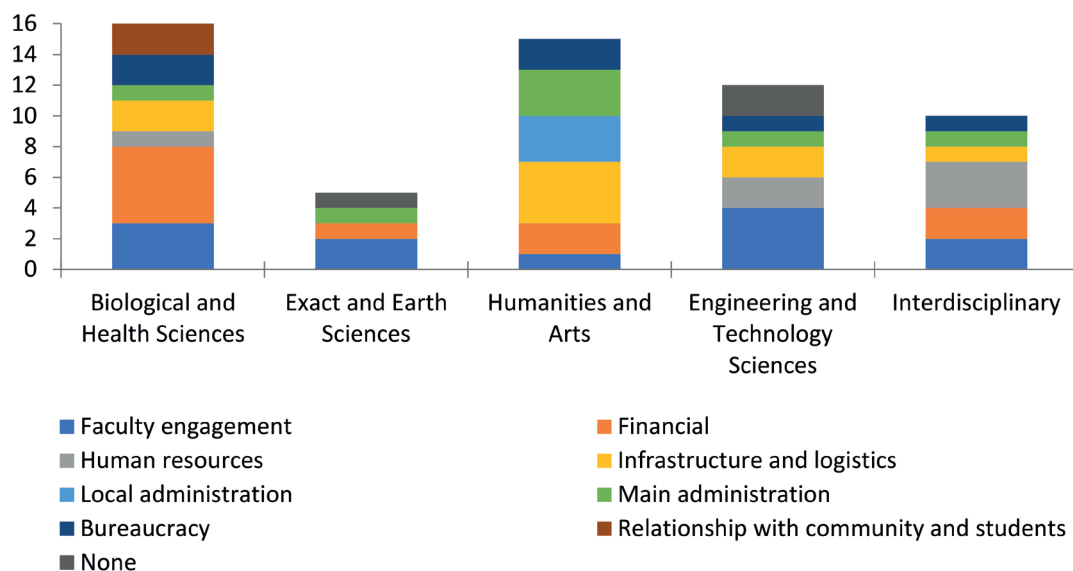
Although faculty engagement is often cited as difficulty (12 schools), no difficulty was mentioned regarding the interdisciplinarity of outreach activities. Again, this may be a sign that outreach initiatives are not yet (or not perceived as) integrated and interdisciplinary.

Another important point cited by one school was the difficulty of evaluating the impact of outreach activities on the community and the university.

When analyzing the challenges by area of knowledge, one notes that most of them are mentioned by the areas of Biological and Health Sciences and Arts and Humanities. Faculty engagement and main administration were cited as challenges by all areas, but local outreach administration is mentioned only by the area of Arts and Humanities. We may conclude that, first, there are certain specificities of knowledge areas and schools that must be respected when designing institutional policies for outreach; and second, initiatives to improve the main administration and bureaucracy are key to improving outreach at Unicamp.



GRAPH 6.5 – CHALLENGES BY KNOWLEDGE AREA



Source: Internal Evaluation Committees Reports, 2019.

The issue of human resources also receives many comments. The university has dealt with a significant number of retirements, which may have influenced these numbers. In addition, the understaffing of outreach is sometimes reflected in the workload of faculty members, who need to take on tasks normally performed by staff.

One important challenge is the low value of outreach activities in the evaluations reports and promotion. There has already been some improvement in this regard with awards and funding of outreach activities, but they still fall short.

Two schools mentioned information sharing and best practices as important challenges, one school mentioned the lack of collection, processing and availability of best practice data to guide outreach action and another mentioned the need to create an internal network of social outreach projects to provide dialogue and sharing of information and experiences, making the projects more effective.

The main challenges cited by Interdisciplinary Research Centers are lack of funding and staff to increase outreach activities. The view is that these two problems will increase due to the non-replacement of retirees, leading to a decrease in staff.

Another challenge faced to expand outreach activities is the offer of courses in the Unicamp Outreach School (Extecamp) by Interdisciplinary Research Centers researchers, as mentioned before. According to Extecamp bylaws, such courses cannot be offered directly by a Interdisciplinary Research Centers, requiring the cooperation of a Unicamp school or institute. A proposal to amend Extecamp bylaws to allow outreach courses to be offered directly by Interdisciplinary Research Centers researchers is under discussion. Current negotiations between the Coordination Office for Interdisciplinary Research Centers (COCEN) and Extecamp are advanced and there is great possibility that they will result in a new understanding regarding the offer of outreach courses directly by Interdisciplinary Research Centers.



The schools and Interdisciplinary Research Centers also answered questions regarding strategies adopted to address such challenges, but 10 schools did not mention any strategy. These strategies are featured in Table 6.6 and Graph 6.6. Table 6.6 features the schools' strategies and Graph 6.6 shows the strategies that should be adopted by the university or other actors.

TABLE 6.6 – STRATEGIES ADOPTED BY SCHOOLS TO OVERCOME CHALLENGES

Strategy	Number of Schools
Mentoring by experienced students	1
creation of a system to identify outreach requirements	1
definition of an extension period AMC [checar significado]	1
negotiation with the university to hire additional staff	1
role of coordinator exercised by the vice-dean	1
new processes to analyze and approve activities	1
sharing of teaching and research infrastructure	1
reporting of challenges to the school	1
hiring of interns	1
regulation of the outreach committee	2
motivation of faculty to outreach	2
offer of school infrastructure and resources for outreach	3
creation of an outreach fund or use of outreach resources	4

Source: Internal Evaluation Committees Reports, 2019.

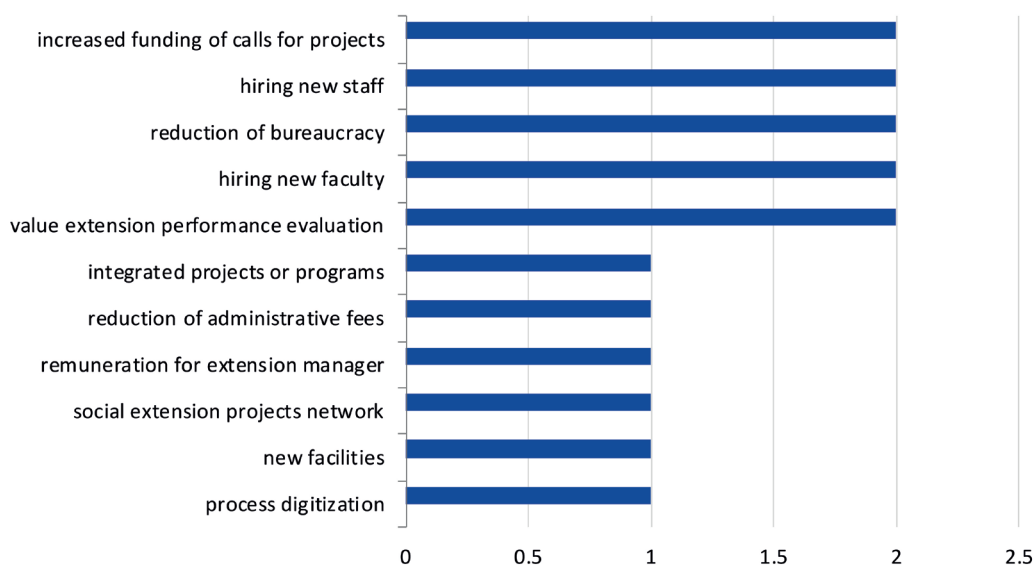
Few strategies were cited to address the challenges, most of which refer to local administration, including the creation of outreach funds to foster outreach, but which also serve as a source of resources for school administration, teaching and research. An important suggestion to reduce bureaucracy was the creation of the Outreach Board (CONEX) which ended up centralizing several bureaucratic tasks in a single body. At FEEC, for example, an alternative model to analyze outreach projects was adopted.

In many schools, outreach courses use the same classrooms and library facilities available for undergraduate and graduate programs. Similarly, service provision agreements use the same school research laboratories. In fact, in some schools outreach resources are used for infrastructure maintenance, hiring of administrative support services, graduate program grants, research resources, etc.

A virtual tool was created by the School of Technology to identify outreach requirements of the community. Thus, those interested can encouraged the creation of new outreach courses in their areas of interest. These suggestions are regularly passed on to the faculty in charge to evaluate concrete interests for new outreach courses and activities.

Analyzing the strategies by knowledge area (only one schools did not respond), one notes that the adoption of strategies to strengthen and improve outreach activities as well as communication with the community (essential for outreach) are not unanimous in the university. Of particular concern is the fact that outreach is disconnected from teaching and research decisions.

GRAPH 6.6 – STRATEGIES TO BE ADOPTED BY ACTORS OUTSIDE THE SCHOOL



Source: Internal Evaluation Committees Reports, 2019.

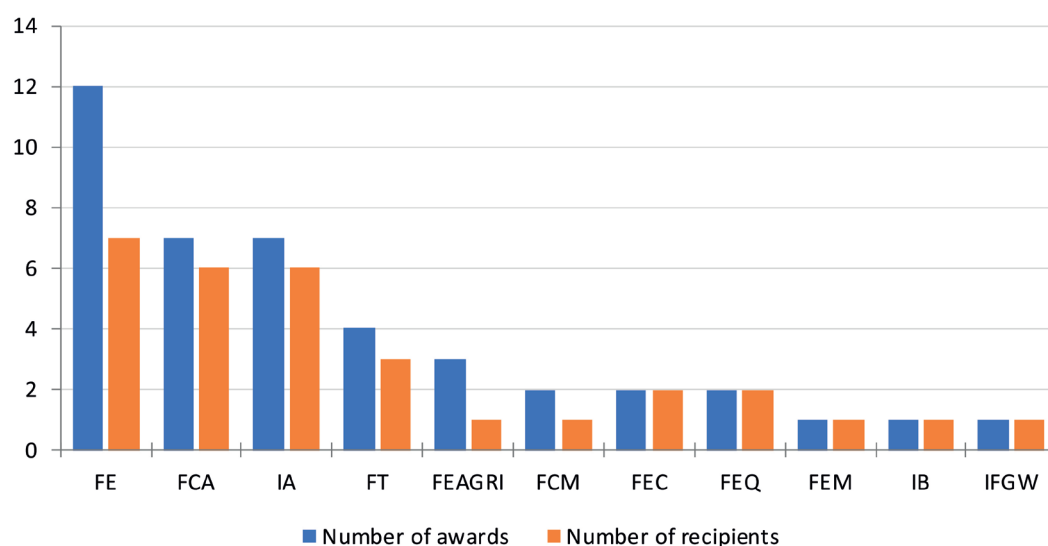
TABLE 6.7 – STRATEGIES ADDRESSED IN THE SCHOOL STRATEGIC PLAN – 2014-2018

	Strategies to strengthen research and fundraising	Strategies to strengthen outreach and culture activities	Strategies to improve the training of staff that support core activities	Strategies to improve communication between the school's internal and external communities	Strategies to improve how the internal and external communities are informed about the school	Considers the results of outreach activities for decision making in teaching and research
Interdisciplinary	100%	100%	100%	100%	100%	50%
Biological and Health Sciences	100%	80%	100%	100%	60%	40%
Exact and Earth Sciences	100%	67%	100%	100%	33%	33%
Arts and Humanities	40%	40%	60%	60%	0%	40%
Engineering and Technology	100%	89%	89%	89%	67%	44%
% of total school	87.50%	75.00%	87.50%	87.50%	50.00%	41.67%

Source: Internal Evaluation Committees Reports, 2019.

Faculty, staff and students received awards from organizations outside the university for significant contributions to the relationship between society and academia, represented by the School, and several national and international partners. Graph 6.7 features the number of outreach awards and recipients by schools. Thirteen schools reported having no awards over the period.

GRAPH 6.7 – AWARDS RECEIVED BY THE SCHOOLS



Source: Internal Evaluation Committees Reports, 2019.

Table 6.8 features the number of schools that received awards, broken down by knowledge area.

TABLE 6.8 – AWARDS BY KNOWLEDGE AREA

Area	Number of schools
Engineering	6
Health	3
Agriculture	1
Arts	1
Computer science	1
Human rights	1
Education	1
Sports	1
Physics	1
Gender	1
Environment	1
Business	1
Psychology	1
Chemistry	1
Services	1

Source: Internal Evaluation Committees Reports, 2019.

Also analyzed were the number of schools broken down by type of award received (Table 6.9) and granting organization (Table 6.10).

TABLE 6.9 – TYPE OF AWARD RECEIVED BY THE SCHOOLS

Type of award	Number of schools
Diploma of merit	5
Award	4
Tribute at event	3
Tribute	2
Honorary mention	2
National competition	1
Professional dedication	1
Distinction – chancellor	1
Tribute in publication	1
Medal	1
Applause award	1
Commendation award	1
Plaque	1
Appreciation for services	1
Success story award	1
Excellence award	1
Outreach congress award	1

TABLE 6.10 – TYPE OF GRANTING ORGANIZATION

Entity	Number of schools
Event commission	7
Government	6
Trade association	4
Company	3
Trade union	2
Unicamp	2
Literary society	1
Editorial board	1
Professional entities forum	1
Social movement	1
Public Interest Civil Society Organization	1

Chart 6.1 lists the faculty members awarded and outreach awards by school.

CHART 6.1 – FACULTY MEMBERS AWARDED AND OUTREACH AWARDS BY SCHOOL

schools	Awardee	Award
FCA	1. Anibal Tavares de Azevedo 2. Cristiano Morini 3. Jaime Hideo Izuka 4. Julicristie Machado de Oliveira 5. Ligiana Pires Corona 6. Luciano Mercadante 7. Márcio Barreto	1. “Simula Brasil” National Simulation Competition 2. Honorable Mention for contribution to the modernization of Brazilian foreign trade through the Aliança Procomex public-private partnership 3. Sponsorship Award for team Torque Baja FCA 4. Eliete Salomon Tudisco Award 5. Best Free Subject Award 6. Dedication and Effort to Basketball 6. Honors Degree for dedication to the Physical Education Profession 7. Applause Award by the Municipal Government of Limeira
FCM	1. Rubens Bedrikow	1. “Herbert de Souza – Betinho” Diploma of Merit – Campinas City Council 1. “Dr. Roberto Maia Rocha Brito Diploma of Merit – Campinas City Council
FE	1. Alexandro Henrique Paixão 2. Ângela Fátima Soligo 3. Antonio Carlos Dias Júnior 4. Gabriela Guarnieri de Campos Tebet 5. José Roberto Montes Heloani 6. Maria Teresa Eglér Mantoan 7. Sérgio Antônio da Silva Leite 8. Sílvia Ancizar Sánchez Gamboa	1. “Chancellor of the Brazilian Academy of Writers” 2. Tribute at the V Brazilian Psychology Congress: Science and Profession 2. “Prof. Darcy Ribeiro” Education Diploma of Merit – Campinas City Council 2. Força da Raça Medal, Grupo Força da Raça 3. Fumagalli Trophy for Academic Research, Aldeia Movimento Pró-Cultura 4. Book Commendation Award for the book Memórias da Educação Infantil: histórias das primeiras creches municipais de São Carlos, (Early Education Memories: Stories of the first municipal nursery schools of São Carlos), São Carlos City Council 5. Resistance and Struggle Plaque, Post and Telegraph Workers Union of Ceará 6. Tribute at the “Women: Science, Technology and Society” event, Renato Archer Center for Information Technology 6. Tribute as Transforming Woman of the City of Campinas, Renato Archer Center for Information Technology 7. Sergio: “Prof. Darcy Ribeiro” Education Diploma of Merit – Campinas City Council 7. Tribute at the V Brazilian Psychology Congress: Science and Profession 8. Honorary Mention at the Iberian-American Congress of Qualitative Research 8. Tribute by Motrivência journal
FEAGRI	1. Irenilza A. Nääs	1. Tribute as Outstanding Engineer, First Woman to Chair SBEA (Brazilian Association of Agricultural Engineering), ALIA (American Association of Agricultural Engineering) and CIGR 1. American Society of Agricultural and Biological Engineers (ASABE) Award 1. International Commission of Agricultural and Biosystems Engineering (CIGR) Award
FEC	1. Ana Regina Mizrahy 2. Regina Coeli Ruschel	1. 8th Cinfotec Unicamp Success Stories – 2nd Place 2. 2nd BIM SindusCon-SP Excellence Award by Unicamp
FEM	1. Celso Kazuyuki Morooka	1. OMAE Conference Appreciation Award in 2017, ASME – American Society of Mechanical Engineers
FEQ	1. Melissa G. A. Vieira 2. Rubens Maciel Filho 3. Propeq Empresa Júnior	1. Diploma of Merit in recognition of relevant services rendered to engineering, architecture and agronomy in the State of São Paulo, Brazilian Association of Women Engineers and Architects of the State of São Paulo – ABEA-SP 12. James Y. Oldshue Lecture Award for contributions in chemical engineering of the Inter-American Confederation of Chemical Engineering (CIIQ/IACChE) 3. Title of High-Growth Junior Enterprise
FT	1. Simone Pozza 2. Jaime Portugues 3. Lubienska Ribeiro	1. Best poster award at the I Projeto Rondon Congress 2. Tribute for contributions to and support of the Brazilian Telecommunications Society 3. Citizenship Without Borders Award – National Edition

CHART 6.1 – FACULTY MEMBERS AWARDED AND OUTREACH AWARDS BY SCHOOL

continued

schools	Awardee	Award
IA	1. Sylvia Helena Furegatti 2. Marcelo Ramos Lazzaratto 3. Grácia Maria Navarro 4. Selma Machado Simão 5. Tamiris Duarte Carpin 6. Paulo Adriano Ronqui 7. Produção – Trueque	1. Cultural Action Program – Visual Arts Projects Support Competition – Artworks and Exhibits in the State of São Paulo 2. São Paulo Children's Theater Award 3. Audience favorite for co-direction of the film A Mulher da Casa Arco-íris (The Rainbow House Woman) 4. Benchmarking of Art 5. Honorable Mention at SIMPOM 6. Commemorative Series of the 30th anniversary of ANPPOM 6. Campinas Municipal Culture School Award 7. Cultural gathering of Lume actors residing in Manaus and Oriximiná – PA
IB	1. Grupo Lepac	1. Recognition by SEDUMA (City of Paraty) and INEA (State Environment Institute)
IFGW	1. André Saugo Mazzari (student)	1. Bronze medal at the Latin-American Physics University Olympiad

Source: Internal Evaluation Committees Reports (2019).

During the period of this survey, one clearly notes institutional and governmental support for the outreach activities offered by Interdisciplinary Research Centers, including supporting grants. There is also strong interaction with companies from different segments promoting and funding research in Interdisciplinary Research Centers such as CBMEG, CPQBA, CEPETRO and NIED.

Regarding ProEC calls for projects, one notes the recurring presence of Interdisciplinary Research Centers in this support format over the evaluated period, mainly due to the cultural performances of the three permanent musical ensembles managed by CIDDIC – Unicamp Symphony Orchestra, Unicamp Zíper na Boca Choir and Campinas Contemporary Choir. However, due to the nature of the calls, these projects focus on the execution of cultural programs or activities, so service provision and staff training are not always reported as resulting from this kind of ProEC support.

Unicamp and ProEC have already implemented a few initiatives to support and appreciate outreach, the main ones being:

- Creation of the Outreach Board (Conex) – 1994
- Creation of the ProEC Faculty Award – 2019
- Creation of the Outreach Grant Program – 2019
- Funding, venues and publicizing

The value of outreach and culture are part of the ProEC strategies, resulting in the creation of the Outreach Faculty Award in 2019, outreach grants for undergraduate and graduate students and formal setting up of the role of outreach manager within the schools, including recompense for faculty members appointed to the position.

Every year ProEC encourages outreach through direct and indirect means. Direct means include: calls for outreach grants, faculty award, support to specific initiatives or complementary funding, and support to outreach activities.



The grants to support community outreach projects (PEC, now called PEX) show a more comprehensive view of the concept of outreach that allows a wider range of activities. Besides the call for outreach projects, a specific grant for cultural activities was created for faculty, staff and students. The PEC grant were created in 2007 and have since funded about 250 outreach projects.

The calls for projects are a means of encouraging outreach activities within the schools, although they fall short when compared to incentive for teaching and research, not only in financial terms, but also in academic credit of faculty and students.

Besides the grants, other support strategies include ProEC sponsorship for specific outreach activities required by the schools, such as the participation of faculty and students in events, or even occasional short-term initiatives inside and outside academia.

Another way ProEC contributes to encourage outreach is by providing specific venues for activities such as events, courses, fairs, sports events and other initiatives. The CDC Convention Center offers to the community three conference rooms with an average of 250 seats. The multidisciplinary gymnasium seats 2,000 spectators and has a multi-sport court for matches and artistic performances. Casa do Lago, another ProEC facility, hosts cultural and outreach activities, with a multidisciplinary room, an exhibition area for visual art collections and a film screening room. With a similar function to Casa do Lago, the CIS-Guanabara cultural space hosts various internally or externally produced events, whose interest to the community is attested by the large audiences they attract.

In addition, ProEC helps publicize the university's outreach activities through its Communication Department. For example, the following were created in 2018 alone:

- 75 audiovisual productions, such as films, documentaries and videos;
- 27 news reports; and
- 3 radio shows.

Another initiative by ProEC is the creation of computerized systems to store information on outreach activities and manage calls and other forms of support. Some of these initiatives, such as the Outreach Activities Database and the Outreach Activities Management System, were mentioned in the section on alignment.

### 6.1.5 Outlook of Outreach at Unicamp

Although the outreach figures may seem positive, it is evident from an analysis of the activities and their possibilities that, compared to teaching and research, outreach falls short of its potentials and social benefits. This was observed in the schools and Interdisciplinary Research Centers reports of the challenges related to engagement, value and faculty overload.

It is also clear that the university's internal regulations do not encourage outreach activities in the required amount and quality, whether in terms of financial support or academic credit for faculty and students, a situation reproduced by state and federal funding agencies.

On the other hand, the reports of outreach activities suggest increased partnerships among schools and Interdisciplinary Research Centers and communities. Such growth is generally concentrated in initiatives to develop citizenship and/or technical improvement of participants, as well as increase of knowledge acquired by academia through outreach activities.

Nevertheless, important positive impacts were revealed by the institutional evaluation, as well as strategies to support and appreciate outreach activities. These include the structuring and regulation of outreach management, better financial management of resources, efforts to improve infrastructure and greater faculty commitment, among others.

Regarding Interdisciplinary Research Centers, the biggest challenge is the growth of outreach within the research centers. As a suggestion to address this issue, the central administration of the university should work more closely with Interdisciplinary Research Centers and schools, helping to clarify the concept of outreach and expanding the knowledge of the university community regarding the means of support to outreach activities and the possibilities of participation.

## 6.2 Culture at Unicamp

In the five-year period, in view of the work developed by the Unicamp Cultural Development Council (CONDEC), the Cultural Development Policy was approved in October 2016 through CONSU Resolution 019/2016. The goal of this policy is to seek and encourage the practice of a broader view of culture, fostering comprehensive human development through the creation and transformation of meanings. Its activities are based on teaching, research, outreach and management, involving academic manifestations of an artistic and cultural nature; preservation of memory and heritage (museums, libraries, archives); storage, cataloging and preservation of collections; social and sports activities; leisure; entertainment and recreation. The pillars of Unicamp's Cultural Development Policy are acknowledgment of diversity and comprehensiveness and the presence of all forms of cultural manifestation, ensuring the broad participation of all areas of knowledge and conditions of adaptation and accessibility.

Cultural activities at Unicamp guarantee the participation of all segments of society regardless of gender, race, ethnicity, sexual orientation, socioeconomic status and education. It is the duty of the entire university community to acknowledge and respect the cultural rights of citizens, valuing culture as the foundation for the development and transformation, both personal and collective, of the university community and of communities outside the institution.

The cultural policy ensures widespread access to material and immaterial cultural goods and supports cultural manifestations of all segments of society. Therefore, the university has committed itself to developing agents and means to facilitate the production of all artistic and cultural idioms and ensure qualified and diverse community participation.

In this sense, the ProEC Culture Board (DCult) was created in September 2017 with the mission of aggregating and empowering diverse processes of creation, production, exchange, spread and appreciation of knowledge and culture, which essentially define the

university's *raison d'être*. DCult views culture as a structuring element of society, encouraging unrestricted participation of all areas of knowledge and ensuring conditions for adaptation and universal accessibility. In practice, this means enhancing sensitivities through exchange and empowering, from the institutional point of view, the possibilities of creating flows and activities related to everything that surrounds, penetrates and transforms us, thus deepening our permeability regarding ourselves and what we understand as the other.

Concerning the facilities for the integrative development of cultural activities, the following venues were subordinated to the Culture Board: Casa do Lago Cultural Space; Cultural Center for Social Inclusion and Integration (CIS – Guanabara); Convention Center; Multidisciplinary Gymnasium; Exploratory Science Museum; Museum of Visual Arts; and the Permanent Forums.

#### CULTURAL PROJECT PRIMEIRA NOTA



PROEC – Unicamp (photo archive).

#### II UNICAMP PHOTOGRAPHY SHOW



Antonio Scarpinetti/SEC – Unicamp.



## ACTING WORKSHOP AT FEVERESTIVAL



Antonio Scarpinetti/SEC – Unicamp.

Regarding institutional initiatives to promote the cultural development policy, the administration committed itself to prioritizing culture across all areas of knowledge, seeking to stimulate collective, plural, diverse and creative thinking.

In 2019, the Culture Council (ConCult) was created, replacing CONDEC and including members from all segments of the university community involved with art and culture, as well as representatives of the Departments of Culture of the cities where Unicamp has campi. Its main goals are:

- I – To propose a cultural policy for Unicamp under the Office of Outreach and Culture;
- II – To supervise the execution of the designed policy with a view to coordinating the cultural initiatives and efforts for which the university is responsible, regarding both the university community and the society with whom the university interacts.

### 6.2.1 Current status of Culture at Unicamp

This section describes the current situation of culture at Unicamp by analyzing the reports of the schools and interdisciplinary research centers.

Most of the schools (84%) answered that culture provides interdisciplinarity in the institution. However, some of the answers show that the question was misunderstood or that the definition of culture is not clear, as they reported academic, social, healthcare and sports events as cultural activities, with little promotion of interdisciplinarity. Due to the greater affinity with cultural activities, culture is predominantly used to promote interdisciplinarity in the area of Humanities. In the other areas, with the exception of FENF, FCA and IFGW, there is a narrow or mistaken understanding of the concept of culture. Even among these schools it is known that there is still great potential to be explored. The schools that showed a broader understanding recognize that culture was hardly present in the activities developed over the period, whether due to the nature of the knowledge area and

its poor affinity with culture, lack of infrastructure, lack of a sector dedicated to promoting cultural activities or lack of a structured outreach and culture council. On the other hand, IFGW, despite not being from a related area, stood out for promoting theatrical activities, staging playful performances with physics experiments and supporting the “Artist Student” project, benefitting faculty and students.

Culture, understood in its different perspectives, is taken into consideration in the participatory process to design the curricula of some undergraduate and postgraduate programs, besides being a subject matter of research. In undergraduate and graduate curricula, 44% of the schools have compulsory subjects with syllabuses related to cultural themes; 16% of the schools have electives with syllabuses linked to cultural themes; 24% of the schools have culture as a secondary or transversal theme during the course; and 28% did not answer about culture as a component of undergraduate or graduate curricula.

Although there are no specific questions about culture for the Interdisciplinary Research Centers, special mention goes to the activities of CIDDIC, where the number of cultural events and other outreach activities, such as organization of forums and festivals, totaled 526 events over the period of this institutional evaluation, accounting for a significant percentage of cultural activities at Unicamp.

Cultural outreach activities account for the largest and most important share of production at CIDDIC. The fact that the center has three permanent musical ensembles – Unicamp Symphony Orchestra, Unicamp Zíper na Boca Choir and Campinas Contemporary Choir – means that even the most academic studies result in outreach activities, concerts, operas, musical theater shows, recitals and public performances. Even chamber music groups of the Free School of Music put on public performances of their training work. The figures of the center’s musical performances are significant, totaling 382 concerts, 28 performances from 13 opera productions, 18 recitals from five musical theater productions, as well as performances of individual artistic works by the center’s researchers with other events outside Unicamp.

The cultural outreach activities of the Unicamp Symphony Orchestra were performed on campus and through agreements with SESC-Campinas, Campinas Municipal Government, Paulínia Municipal Government and other cities in the Campinas metropolitan area, and partnerships with the Campinas Metropolitan Agency (Agemcamp) (this partnership in particular dates from 2017) and Agem of the Santos region.

Between 2015 and 2018 CIDDIC closed a partnership agreement with the Institute of Architects of Brazil – Campinas branch to execute the Music and Architecture Project, with concerts in historic buildings in the city of Campinas accompanied by lectures on the city’s urban heritage by architecture faculty.

In 2018 the Unicamp Symphony Orchestra took part for the first time of the Campos de Jordão Winter Festival. Its concert showed the diversity of its repertoire, featuring contemporary and classical works and the participation of a group of professors of the Unicamp popular music program. Another important cultural outreach activity in which it took part was the LUME/Unicamp PERCH project, bringing together two centers (LUME and CIDDIC) and the Campinas Symphony Orchestra in an international project with a Scottish theater group.

## UNICAMP SYMPHONY ORCHESTRA



Antonio Scarpinetti/SEC – Unicamp.

Also related to orchestral work, CIDDIC organized between 2014 and 2018 four (04) Orchestral Management Forums, bringing to the Campinas region important national and international guests to reflect on the issues of production, funding and management of orchestras. The outreach activities of the Unicamp Zíper na Boca Choir, besides contributing to the cultural education of different segments of the university, include a large number of performances on the university campus and at opening ceremonies of symposiums, congresses, seminars and institutional and commemorative events.

In terms of external performances, the Zíper na Boca choir takes part in festivals and regional, national and international choir meetings, representing Unicamp in important events of the Brazilian choir scene. Every year the choir's supervision body organizes the Unicamp Choir Festival (14 editions by 2018). Over the period of this report it held five editions of this festival, with the participation of choirs from Latin America (Argentina, Chile and Colombia). The Zíper na Boca Choir actively participates in CIDDIC's opera productions alongside OSU and the Campinas Contemporary Choir.

In 2018 the Free School of Music (ELM) started the Music at the Hospital project, in partnership with the Hospital das Clínicas of Unicamp, with the operational support of the Public Relations school and the Humanized Care Group, aiming to put on regular performances inside the hospital by the permanent ELM groups. The goal of this partnership was to benefit the hospital audience with the proven therapeutic effects of acoustic music and give the students involved a sense of insertion and social function.

The Campinas Contemporary Choir develops wide-ranging cultural outreach work, performing concerts in Campinas and many cities of the Campinas metropolitan area. The concerts are performed a cappella or accompanied by the two orchestras of the city of Campinas – Unicamp Symphony Orchestra and Campinas Symphony Orchestra – as well as orchestras from the interior of the state of São Paulo. The choir also takes part in National Choir Festivals in universities in other states such as UFMG and UFRG. Prominent



participations include the 2017 Adult Choir Festival, promoted by the Coral Paulistano and the São Paulo Municipal Theater Foundation, at the São Paulo Municipal Theater, Bach's St. John Passion produced by the São Paulo Municipal Theater, with the São Paulo Municipal Orchestra conducted by Roberto Minczuk in 2017, and in the closing concert of the USP Symphony Orchestra season in December 2018 at Sala São Paulo.

The number of cultural outreach events and other outreach activities, such as the organization of forums and festivals by CIDDIC, is surprising, totaling 526 events and accounting for a significant percentage of UNICAMP's cultural activities. The number of participants varies according to the permanent ensembles involved, ranging from 45 (OSU) to over 100 (OSU, Campinas Contemporary Choir and Unicamp Ziper na Boca Choir combined). National and international guests took part in both musical performances and workshops organized by the Free School of Music (see details in TCE2). These cultural outreach activities were basically funded as follows: internally, CIDDIC received significant support from the university administration (2014-2016), Unicamp Permanent Forum (CGU and ProEC) (2015 and 2018) and Social Benefits Steering Group (GGBS) (2016-2018). Externally, CIDDIC was supported by municipal governments of the Campinas metropolitan area through a partnership with Agencamp (2017-2018) for the performances in those cities; CIDDIC received funding through two calls for projects issued by the Campinas Cultural Investment Fund – FICC: for the production of the opera *Les Plaisirs de Versailles* by Charpentier, performed in 2014 at the Castro Mendes Municipal Theater, and for the recording of the album *Teuto Brasileiro* – contemporary works for solo trumpet with symphony orchestra and chamber groups, in 2016-2018. The funding of CIDDIC events is a sensitive issue inserted in a wider context of cultural funding in Brazil. Therefore, given this financial constraint, the scope of the center's outreach work is admirable.

Regarding outreach activities, CIDDIC's mission statement, detailed in the 2016-2020 PLANES Review, is to promote concert music focusing on 20th- and 21st-century music; to achieve cultural and artistic integration inside and outside the university; to promote the integration of the Brazilian artistic community, especially by divulging it at national and international levels; and to develop pedagogical projects linked to the artistic education of the community inside and outside Unicamp. In this sense, the center's outreach activities show great consistency. The promotion of concert music is a reality at CIDDIC and the focus on 20th- and 21st-century music is constant, with nationwide first performances of compositions by Unicamp students and Brazilian researchers and composers.

The achievement of artistic cultural integration inside and outside the university is also a reality: the activities are held not only on campus, integrating several schools, but also in the city of Campinas and metropolitan area, playing an important role of audience education and cultural dissemination in cities lacking cultural facilities. The operatic productions and editions of the Orchestral Management Forum provide significant integration of the artistic community at national level, since its participants – conductors, singers, performers, instrumentalists – come from various Brazilian regions. And pedagogical projects are also present in the development of music students in undergraduate and graduate programs through several abovementioned projects linked to professional training – concert competitions and performance projects, for example. We have not yet extended such activities to the external community due to sheer lack of staff and funding.

Cultural outreach activities are planned on an annual basis, in the period prior to project execution. The presentation, discussion and selection of projects from the various sectors and researchers are done primarily by the CIDDIC Executive Board for later approval by the Higher Board. The same boards are in charge of monitoring and evaluating the activities: first an annual evaluation report of the activities is drafted, and then this is submitted to the evaluation of the Higher Board.

Each large event organized by CIDDIC – operatic productions, festivals, forums – involves a substantial part of its internal community, as the production team is very small and organizing such events requires a task force comprising the most diverse members of the center, both administrative staff, grant holders and interns, besides the members directly involved in the production in question – orchestra and choirs. As the center’s outreach production is very large, the great effort made by the team sometimes leads to stress from overwork.

Regarding the institutional projects of UNICAMP, CIDDIC was a constant participant in the Open Doors University projects in the years of this evaluation, with performances by the Unicamp Symphony Orchestra, Zíper na Boca Choir and musical groups of the Free Music School – ELM. These activities have great impact on the community and reach a large number of students.

CIDDIC developed several cooperative research/outreach activities, especially with the Interdisciplinary Center for Studies on Sound Communication – NICS, LUME and the Arts Institute. In these joint efforts, CIDDIC both contributed to the activities of those schools and benefited from their cooperation in its own activities. Prominent among them were the production and premiere of the opera *Descoberta*, by the NICS researcher Jonas Manzolli, by the Unicamp Symphony Orchestra and Campinas Contemporary Choir, performed to celebrate Unicamp’s 50th anniversary, the joint production by CIDDIC-LUME of the show *Concertado*, the participation of OSU in the LUME PERCH project and the orchestra’s various contributions in projects by faculty members of the Arts Institute, such as the FICC project, with the recording of the abovementioned *Teuto Brasileiro* album. These partnerships are extremely positive and enriching, definitely justifying the outreach activities of these centers.

The counseling activities of CIDDIC researchers, faculty and staff are provided in the academic area, mostly to national scientific associations (ANPPOM, ABEM, ENCOM, SIMA, TeMA), the São Paulo Research Foundation (FAPESP) and national scientific journals in the field of music (VORTEX and OPUS), and are of a scientific nature. Such services are routine academic activities, no doubt important for the operation of those organizations, but we do not know how to measure their impact other than their contribution to the organization of congresses in the area of music, the publication of journals and the production of artistic contests and festivals.

CIDDIC provides musical services through musical performances by the Zíper na Boca Choir, Unicamp Symphony Orchestra and ELM music groups, internally to scientific events of different Unicamp teaching schools, to the university hospital and to external segments such as municipal governments. The impact of these activities is always very positive, contributing culturally to events and, in the case of the hospital, to the treatment of patients. Other important impacts in terms of cultural education in the cities of the

Campinas metropolitan area have already been mentioned above. The Free School of Music offers free instrument and music theory courses to the community, attended by about 150 students/year. Many of these students go on to pursue careers in music after this initial training. The Zíper na Boca Choir also offers musical training through choral singing to the choir members, who are Unicamp staff, students and faculty.

Since 2015 CIDDIC has offered greater accessibility to its cultural events through a project devised by the staff member Nicole Somera. The project enables people with special needs and reduced mobility to participate with dignity by providing image description and special attendance areas. This work is developed especially at the opera recitals performed in the Paulínia Municipal Theater. This project has the support and cooperation of the Unicamp Accessibility Laboratory, whose staff is in charge of the audio description work.

*DESCOBERTA: MULTIMODAL OPERA IN 4 ACTS, BY*  
JÔNATAS MANZOLLI IN CELEBRATION OF UNICAMP'S 50<sup>TH</sup> ANNIVERSARY



NICS – Unicamp (photo archive).

Given this diagnosis, it is up to the university to divulge and value the cultural activities developed across the teaching, research and outreach axes. In this sense, ProEC has played an important role, expanding through seminars and symposiums the debate on the comprehensive concept of culture in its multiple manifestations and potential for transformation and integration. An example was the May 2019 seminar “Challenges of Culture and Outreach in the University,” with guest speakers such as Danilo Miranda (director of SESC SP) and Ricardo Ohtake (president of the Tomie Ohtake Institute). In addition, current efforts should be continued to divulge to the university community the cultural facilities managed by the Culture Board, such as museums and cultural spaces, with the aim of expanding the range of interdisciplinary cultural initiatives among the different schools.

## 6.2.2 Alignment of cultural activities

The goal of this section is to analyze whether the cultural activities are aligned with PLANES and can be described as inclusive, transformative, dialogic and relevant to society and the university.

In the Arts Institute, culture is a component of the curriculum of all undergraduate and graduate programs. The Music course includes disciplines focused on cultural production and theory and analysis of 20th-century cultural industry. In the Dance course, the disciplines under the theme of Brazilian Dances investigate how different Brazilian cultural traditions spark creative processes and even technical training, a distinctive feature of this course in Brazil. The Visual Arts curriculum includes the discipline Popular Culture, which introduces and discusses popular and urban cultures from a viewpoint of anthropology and their application in education. In addition, numerous curricular disciplines address culture as a key topic in undergraduate and graduate learning.

In the School of Applied Sciences, the common core of the courses includes two disciplines whose syllabuses address culture in its symbolic, citizen and economic dimensions: Film and Public Perception of Science; and Society and Culture in the Contemporary World. In the School of Education, culture is a key concept in 10 lines of research and in the discipline School and Culture.

In the School of Nursing, two disciplines show students the relationship between culture, health, disease, cure and education, and between health, society and nursing, as well the social, cultural and diversity issues involved in the development of citizenship. The graduate program features common and robust transversal discussions and the 2020 catalog will include a discipline designed to address culture.

The undergraduate program in architecture and urbanism includes the compulsory discipline Daytime Field Studies, with outings to historical sites, residential areas, urban centers, construction sites, buildings, monuments, public spaces and art exhibitions, plus film screenings and debates.

FEA has included the compulsory discipline Food and Society, which addresses socio-cultural, political, economic, technological, legal and environmental aspects that historically impact the relationship between food and society, influencing food production and consumption chains in Brazil and worldwide.

In the Humanities field in general, schools such as IFCH and IEL, the following subjects are part of undergraduate programs and also several graduate programs: Religion and Spirituality, Heritage, Politics and Practices of Memory, Narratives, Orthographies and Images, Amerindian Studies, Afro-Asian Studies, Afro-American and Quilombo Studies, Modern and Contemporary Art, Non-European Art, History of Culture, Literary Studies, Literary Theory and History.

Prominent in the field of Exact and Earth Sciences is IFGW, where culture is part of the curriculum in disciplines such as Scientific and Cultural Activities and Topics of the History of Physics. In IG, the curricula of undergraduate and graduate programs aim to train professionals with a solid cultural grounding in geosciences, geography, teaching and scientific and technological policies. Culture is a key component thanks to a participatory

process in the school. In IMECC there is a discipline of the mathematics teaching degree that involves the participation of students in cultural activities related to mathematics.

Regarding encouragement for students to carry out educational and community-oriented cultural activities (besides those included in the regular curricula), only four schools reported initiatives in this sense. All schools that reported integrated strategies of cultural production and appreciation come from the area of Humanities. However, it is important to note that most of the Exact and Earth Sciences, Biological and Health Sciences programs acknowledge culture as an opportunity for educational development. An example of such recognition is observed in the FENF report, which highlights: “Culture is of great importance for students’ development, not only regarding their field of study, but also in a comprehensive way, including the emotional and psychosocial dimensions, with potential to contribute to various aspects such as course satisfaction, improved leadership skills, enhanced interpersonal relationships and development of altruistic values, besides enriching the formal curriculum, offering students an identity.”

In addition, the schools’ libraries often hold sociocultural events open to the whole community, such as exhibitions, social and educational campaigns, debates, cultural and artistic performances, etc., usually in partnership with other university schools and projects. Prominent projects carried out over the period include:

- “IFGW Among Writers” which invited faculty members who wrote books to discuss the writing process;
- “The Book of My Life” consisting of a talk about a book chosen by guest lecturer from any segment of the FCA community;
- Fun During Vacations Program – FEF;
- Participation in UPA – FEF – BCCL, BAE and also other libraries;
- Guided visits to the Special Collection Hall – FEF;
- Monthly (IMECC) and thematic (IG) exhibitions;
- Literature contest for engineering students (BAE);
- “Reading Letters” which provides debates on current books (BAE).

However, some libraries reported challenges in this regard: FT, IA and FOP, due to limited space and IEL, due to the 2013 fire, which resulted in staff taking over the room used for soirées.

Most schools, despite recognizing the educational potential of cultural activities, admit that both the production and appreciation of culture occurred as leisure activities, detached from the educational process. A case in point is the report by at least four schools of traditional festivities or sports tournaments as examples of cultural activities encouraged over the period. Therefore, it is still a challenge for the university to stimulate diversified views and senses in order to incorporate new educational paths.

Analyzing the strategies proposed in the Planes reviews of the schools participating in the 2009-2013 evaluation, we noted that under the item Outreach and Technical-Scientific and Cultural Cooperation, only five of the 24 schools included culture among their goals for the next period (2014-2018). The vast majority detailed in this item projects



related to outreach or technical-scientific cooperation that did not include cultural activities. Three schools (FCA, IB and COTUCA) mention among their goals the “definition and implementation of cultural policy.” FCM proposed to adapt its auditorium to receive more artistic performances and IA proposed to enhance events already happening at the institute and encourage cultural diffusion courses.

Given this scenario, and considering that Unicamp’s Cultural Policy was only implemented in the current period, the non-inclusion of culture activities in the previous strategic plans is understandable. On the other hand, it was ascertained that the inclusion of such activities in the schools’ PLANES reviews after the 2009-2013 evaluation directly reflected the greater number of interdisciplinary cultural activities and their presence in the curricula. A good example of such integration is given by FCA, in which culture was present in both subjects and events related to cinema, theater, music, popular culture and exhibitions.

Although they did not include culture in the PLANES review after the 2009-2013 evaluation, several schools ended up providing relevant cultural activities, in line with the proposals of Unicamp’s Cultural Policy. This fact shows there is growing awareness in several schools of the educational and integrative potential of such activities. It is expected that the inclusion of specific culture-related questions in this evaluation will result in a growth of these activities in the planning for the next period.

### 6.2.3 Impact of cultural activities

The goal of this section is to analyze the impact of cultural activities on (i) all missions within the university and ii) all spheres of society. The impact, relevance and benefits of cultural activities were presented in a diversified manner among the different knowledge areas.

FCA, an interdisciplinary school, considered that integrating cultural activities in people’s lives encourages bonding and the development of human potential, so that individuals may develop skills not used in ordinary curricular activities; IFGW identified that theatrical activities, playful shows with physics experiments and the Artist Student project brought about benefits such as socialization and enhanced identity of the institute’s faculty and staff; IG identified as local and regional impact the display in schools of an exhibition of dinosaur models and a play about the Guarani Aquifer; IMECC, through its internal and external cultural activities, revealed the connection between mathematics and other expressions of the human intellect in art, science and technology; IQ recognized that the cultural activities were directed exclusively to internal audiences and that it must expand them to better reach the community.

Among the Biological and Health Sciences schools, FCF considered spreading knowledge to the external community as the greatest benefit; FCM stressed that its activities provide social transformation at local and global levels in disease prevention campaigns; FEF presents as the major impact at local level and for undergraduate and graduate students initiatives such as the Gymnastics for All forum, with activities that aim to promote reflection and debate about the body and its culture, benefiting and expanding the outlook of the internal and external community; FENF emphasized the regional impact of coordinating the cultural issues of a particular community to help it face the struggle of



educating and learning about the health-disease process: “The experiences of health care and illness and the ways in which individuals deal with these issues permeate the cultural context in which society is inserted.”

Among the Arts and Humanities schools, FE cited the social and cultural activities it develops such as projects related to entrance exam courses, digital inclusion and agroecology, but stresses the need to expand them; IA considered as positive the impact on the local, regional and national community, but recognizes the importance of “going outside the campus and divulging our activities more widely and effectively”; IE recognizes the promotion of cultural diversity, digital inclusion and “cooperation between the school and government in the Campinas metropolitan area” and understands that its role is to “develop comprehensive schooling and education strategies for the state of São Paulo”; IEL highlighted the national impact of cultural activities due to their humanizing and critical nature, so that the activities “included experiences with cultural diversity and different artistic languages and media, besides providing the discussion of different topics such as racism, discrimination, prejudice, land issues, gender issues, deaf culture, among others”; in IFCH, the impacts were on the local and regional communities and the entire country through exhibitions, courses and projects involving Amerindian and Quilombola communities that provided great exchange of knowledge and consolidation of research.

Among the schools of the fields of Engineering and Technology, FEAGRI considered the promotion of interaction as an internal and external benefit; FT considered that the main impact of its sporadic cultural activities was on the university’s community; FEC emphasized the impact on the internal community, such as the painting course offered in partnership with GGBS, by showing that “there is life beyond university studies”; the activities aimed at society could not be measured, but the school considers that they will have an impact on society as a whole in terms of performance and tolerance and common interaction; FEA emphasized the human dimension of the activities with students, with discussion circles on issues related to ethics, respect, affection and citizenship; however the external impact was not evaluated; FEQ recognized the impact on the local and regional community through activities that are still rather modest, such as “Viradinha Cultural,” in which members of the internal and external community are invited to exhibit cultural work such as musical performances, poetry recitation, handicraft and photography. Since 2015 the event has “promoted and encouraged the display of the cultural and artistic skills of our community.”

In an overview of the schools’ responses, what drew attention was the fact that six of them, all from the areas of Exact and Earth Sciences and Engineering and Technology, stated that they did not carry out significant cultural activities or that their quantity was not sufficient to impact and benefit communities within and outside the university.

On the other hand, six schools already use cultural activities as a creative tool to spread knowledge, reaching wider audiences in an accessible way and disseminating scientific production through cultural events. Highlights include the initiatives of IFGW, which uses “theatrical activities with actors representing famous scientists and playful shows with physics experiments,” and of IG, which stages a theater play about the Guarani Aquifer.

Similarly, five schools mention the importance of cultural activities for students to acquire skills beyond those developed in undergraduate programs, for their humanizing

and critical nature. Four schools mention also the contribution of these activities to greater interaction with the community and to “get out of campus.” Next, in decreasing order of occurrences, they are associated with the promotion of inclusion and social transformation (three schools).

Regarding Interdisciplinary Research Centers, besides the social results presented herein, one cannot fail to mention the direct and indirect financial impact resulting from cultural outreach activities. The more than 1,000 artistic performances by LUME suffice to determine the impact on direct income generation: resources from cultural projects and calls – such as PROAC, FAEPEX Extensão [FAEPEX Outreach], São Paulo Funding Law, Petrobrás Circulation Call – directly funded professionals with specific expertise required for the creation, production and circulation of LUME’s artistic production, such as actors, dancers, producers, assistants, technicians, light and sound operators, designers, communication professionals, video recording, lighting and sound design, playwriting, directing, among others. It is estimated that about 200 professionals were paid directly from such funds during the five-year period.

Another important field to be addressed is the impact of the academic and artistic events organized by LUME on the local economy. They included nine major events such as five editions of the International Performance and Presence Day, three theater festivals – FEVERESTIVAL, one congress held in Natal, besides 289 artistic performances organized by LUME in its facilities or in Campinas. The PERCH show alone involved 20,000 spectators, 170 actors and 20 professionals. A rough estimate of attendance at these events is around 30,000 people between audience, professionals and participants, a major part of them from other cities and states. Therefore, the direct impact on the local economy, especially the hospitality and transport sector, is significant, even more so considering the Barão Geraldo District where Unicamp is located, the main venue of most of these events.

A key concern consistently present in the cultural outreach activities of these centers is the development of affective networks. Therefore, they potentially contribute to the construction of a more comprehensive, fair, open and mindful society, especially regarding reflection and the development of national and individual identities.

#### 6.2.4 Strategies to appreciate and support cultural activities

In this section we describe and analyze the ways in which culture is appreciated at Unicamp and the current and necessary means of support. In our survey of the most important means of support suggested by the schools for the appreciation of culture, the following were cited in decreasing order of frequency:

1. Financial support (cited by 13 schools): There is a consensus on the need for funding through budget resources, calls, awards and festivals to enable the implementation of cultural action. The ProEC calls for culture projects in 2018 and 2019 and the consistent funding of short-term cultural activities introduced in the second half of 2019 have partly met the demand for financial support for cultural activities, but they should be complemented by other initiatives.

2. Publicizing of events (7 schools): These schools consider it essential to publicize the cultural events promoted in the university among both the internal and external community. At least one school proved to be unaware of the existence of Unicamp's Cultural Agenda by suggesting its implementation.
3. Joint action with ProEC (5 schools): ProEC is recognized for its work and potential as an integrating entity that promotes cultural activities, but these need to be better publicized.
4. Physical space (3 schools): For these schools, the availability of adequate physical spaces is a key element in the promotion of cultural activities. One of the schools argues that there is no clarity regarding "procedures for the use of common spaces and available resources."
5. Interdisciplinary and multicultural events (3 schools): These schools suggest promoting events involving different schools without explaining how or by whom this would be coordinated.
6. Human resources (3 schools): They stress the need for personnel dedicated to the organization of cultural actions.
7. Cultural activities as credit study (2 schools): They suggest the institutional integration of teaching, research and outreach, linking cultural activities to the curriculum.

Also mentioned is the need to coordinate with government agencies (municipal and state) and ensure safety on campus to promote cultural events (one school each). An interesting concern was expressed by a school that supports the participation of undergraduate and graduate students in cultural activities, but emphasizes that these "should not hinder their academic activities."

### 6.2.5 Outlook of Culture at Unicamp

Considering the responses of the schools regarding the inclusion of cultural activities in course curricula, culture as a promoter of interdisciplinarity, its inclusion in the strategic planning of the schools, the encouragement given to initiatives in this area and the wide-ranging impact of these activities, it is clear that the concept of culture and the awareness of its potential require further reflection and progress. In a way, such shortcomings are understandable, given that this subject was not addressed the institutional evaluation of the previous period and that Unicamp's Cultural Policy was only consolidated halfway through the current evaluation.

One of the consequences of this situation is that culture is part of the curriculum of fewer than half of the schools and is concentrated, with few exceptions, in the humanities courses. Expanding the range of subjects related to cultural issues can provide students with a more comprehensive education by promoting reflection and interconnection between different areas.

ProEC is positively recognized by the schools as a promoter of and partner in cultural activities, but part of the work it develops is still largely unknown. Some schools are

unaware of existence and role of DCult. On the other hand, the diagnosis resulting from this evaluation is very useful for planning future ProEC action, both to maintain and expand projects and programs of proven effectiveness and to create new mechanisms to foster and divulge cultural activities.

Another goal for the next period is to enhance the understanding of the potential of cultural activities as creative means to spread knowledge, provide a more comprehensive education for students and increase interaction with society. This broader understanding should reflect directly on the impact of cultural activities developed within and outside the university community. Even among schools that already offer cultural activities on a regular basis, it is clear that their contribution still falls short of what is possible and desired.

Lastly, reflection on the types of support considered as essential for the appreciation of culture inside and outside the schools indicates that several initiatives being implemented are aligned with the university's cultural policies. Examples are the calls for culture projects issued in 2018 and 2019 and the consistent funding of short-term cultural activities introduced in the second half of 2019. Both are ProEC initiatives that require expansion, greater disclosure and coordination, especially in stimulating cultural activities involving more than one school.

Great potential for growth is observed for the incorporation of cultural activities by the university as a whole. Despite its recent inclusion in the evaluation process, a consensus is already noted regarding the capacity of culture to promote interdisciplinarity, provide students with a more comprehensive education, improve integration among the sectors of the university and enable greater diffusion in society. However, most schools have not yet addressed cultural activities in their strategies and fewer than half of them have included culture in their undergraduate and graduate curricula. Consequently, there is little incentive for student involvement in these activities, often seen as mere leisure activities detached from the educational process.

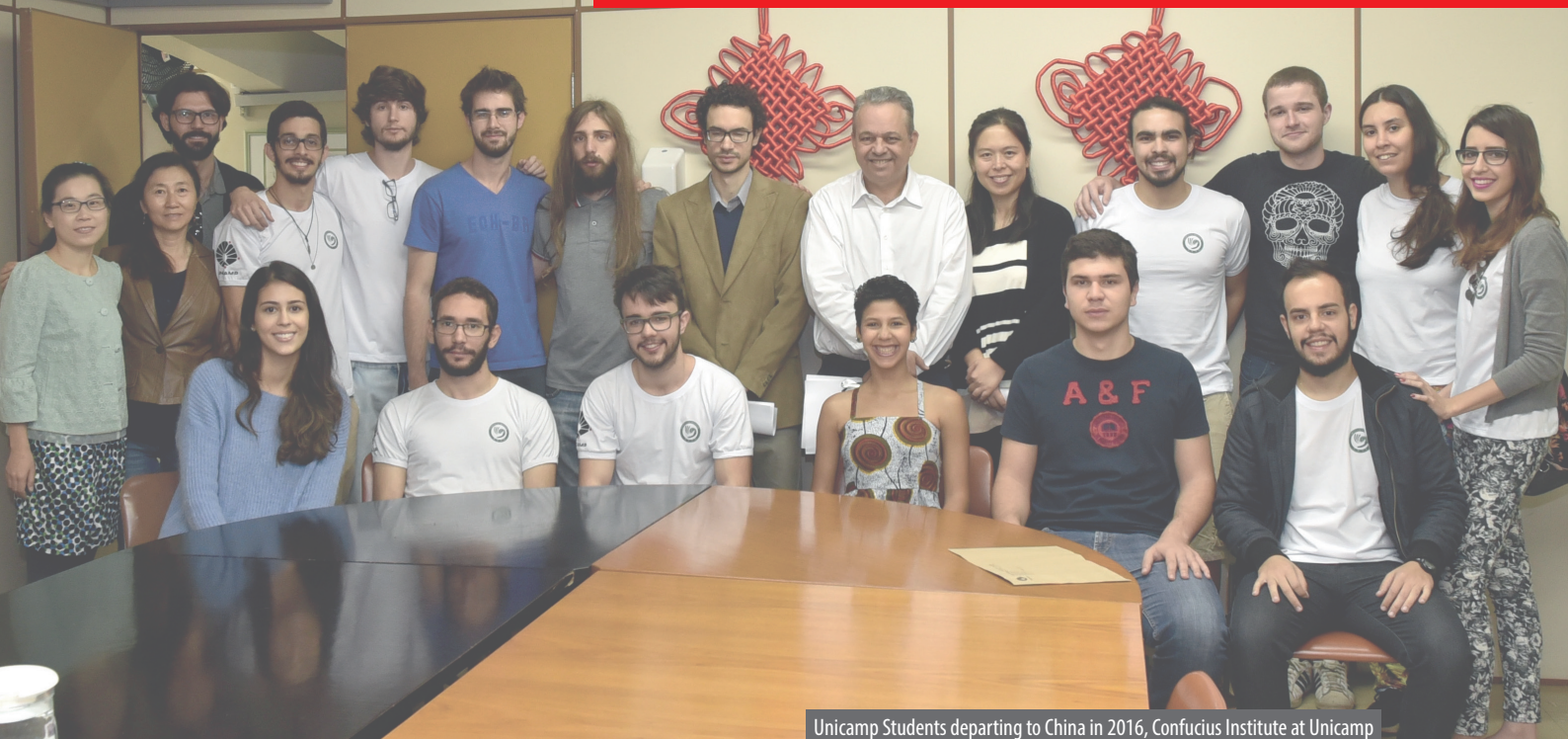
Despite the success of some attempts, the overall impact of cultural activities inside and outside the university is still limited, given their potential. The main administration has advanced the debate on these issues, one of the results being the addition of culture to the name of the office in charge of proposing and coordinating its cultural policies (ProEC). The support initiatives required for the growth of culture within the university reveal deficiencies and paths to be followed. The reflection raised by the various parties of this evaluation process is expected to effectively contribute to the preparation of the next strategic plans and result in significant quantitative and qualitative progress.





7.

## INTERNATIONALIZATION OF UNICAMP



Unicamp Students departing to China in 2016, Confucius Institute at Unicamp



International students at Unicamp





This chapter presents an evaluation of the internationalization of Unicamp in the 2014-2018 period, discussing the main results achieved within this scope over the last few years, the remaining challenges, and the actions that have been taken to face them.

Elements capable of enhancing the internationalization of Unicamp have been present since the constitution of this university, such as the inclination for research with potential for international insertion and the intense presence of professors, staff, and students of several nationalities. This characteristic has been preserved along the trajectory of the university. Currently, there are more than 100 active professors and researchers from about 30 different countries at Unicamp. Moreover, there are almost 900 foreign students regularly enrolled in undergraduate and graduate programs at Unicamp.

The relevance of internationalization is increasingly recognized as a paramount strategy of the performance of universities. When associated with teaching, research, outreach, and management, internationalization may significantly contribute to the development of the different dimensions that compose the university dynamics.

Indeed, internationalization allows the deepening and complementation of curricula and enables new academic experiences, contact with different cultures and languages as well as with new themes, methods and approaches. It can lead to new partnerships and collaborations, ensuring exchanges of knowledge and experiences. In addition, it can enable the access to other laboratories, equipment, databases, libraries, museums, etc.

The period between 2014 and 2018 represented a moment of maturation of Unicamp's internationalization actions. Like many other Brazilian and foreign universities, Unicamp has adopted an increasingly careful stance for establishing cooperation agreements with partners abroad. Moreover, it has focused efforts on approaching a restricted group of foreign universities, with which there are effective and systematic collaborations in teaching, research and outreach activities. An even more restricted group comprises the set of strategic partners, formed by universities with which Unicamp aims at developing institutional actions or programs, seeking to enhance and deepen the existing cooperation. Hence, of the approximately 500 universities that maintained agreements with Unicamp in 2018, about 50 were selected as priority partnerships and 10 as strategic partners.

This is, therefore, a transitional period, from a pattern of internationalization strongly influenced by the intensification of student mobility (mainly due to developments of the Federal Government's Program Science Without Borders, between 2012 and 2017) to another country, which seeks to adapt the new conditions of resources, less abundant than in previous years, to the demands related to the internationalization evidenced by the university. Moreover, these demands require creating conditions for the students' mobility, with a balance between the flows "from" and "to" Unicamp. However, they increasingly involve the need to create routines for identifying potential international partnerships, as well as for their appropriate development, in addition to the creation and dissemination of institutional capacities for internationalization along with different academic units of Unicamp.

The next pages will present a general framework of the internationalization of Unicamp, highlighting the main actions developed within this scope between 2014 and 2018, as well as the challenges to be faced and the potential to be developed in the

coming years. Detailed information on internationalization in undergraduate and graduate education, as well as research, can be found in the chapters specifically addressing these dimensions in this same report.

## 7.1 Internationalization Strategy of Unicamp

Internationalization has been recognized as an increasingly important dimension for the development of the university. As highlighted in the 2011-2015 Strategic Planning (Planes) of Unicamp, the university should seek to stimulate internationalization in undergraduate and graduate education, to encourage the participation of researchers in undergraduate and graduate programs of international quality, and to develop cooperation programs and agreements with international insertion.

The Planes 2016-2020 proceeds in this same direction and recognizes internationalization as one of Unicamp's corporate strategies necessarily aligned, therefore, with the institutional objectives of the university. Within this context, it was defined as a strategic guideline "The internationalization of target and support activities of Unicamp, contemplating different types of projects that qualify: the training of students, the various forms of academic production, and all groups of professionals who work at the university" (p. 9, free translation)<sup>1</sup>.

In this latest version of Planes (2016-2020), internationalization is highlighted as a dimension capable of potentiating the target activities developed by the university. In the field of education, this document highlights that internationalization "is a process aimed at qualifying the students' training, preparing them for the professional practice in the globalized world. This requires actions that not only enable student mobility, but also allow the interaction of our students with foreign students and a curriculum guideline that is the most integrated and compatible with foreign universities" (p. 30). The Planes 2016-2020 proposes the following as a priority focus of decisions on education internationalization:

- To broaden internationalization actions in undergraduate, graduate, and Technical High Schools;
- To make available the syllabus and programs of disciplines in English and Spanish;
- To increase the provision of programs/disciplines taught in the English language in the schools;
- To increase the provision of Portuguese courses for foreigners;
- To increase the provision of teaching of foreign languages.

Authors of the Planes 2016-2020 also highlight the relevance of internationalization in the field of research (p. 38): "Internationalization of research is a multipurpose process in the globalized world. Among these purposes is the qualification of research through the knowledge of results of research conducted elsewhere, together with qualified discussion with other interlocutors from the several fields of knowledge."

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1. All citations were free translated by the translator of this text.

In addition to explaining the will to advance the internationalization of research and teaching, authors of the Planes 2016-2020 also indicate the commitment to two lines of action (p. 46-7):

- “To support and adapt to the internationalization strategies of the University, preparing administrative staff to facilitate foreigners arrival and students, professors and staff going abroad.
- To intensify internationalization actions in management, educating bilingual employees and investing in mobility in foreign institutions for training.”

The Executive Board of International Relations – DERI (which until June 2017 was called Executive Assistant Dean of International Relations – VRERI) is the body responsible for supporting the preparation and implementation of actions under the internationalization strategy scope of Unicamp.

DERI has been seeking to consolidate an action plan that broadens the ability of the Board to assist Unicamp in planning, implementing, monitoring, and evaluating actions aligned with the internationalization strategy of the university. DERI has been working to provide Unicamp authorities with elements that guide decision-making related to internationalization. Moreover, it has been seeking to engage professors, researchers, students and staff in the internationalization process of the university.

## 7.2 Strategic Partnerships

Unicamp has a long history of collaborations with several foreign universities, which is manifested as agreements and cooperation agreements, joint projects and productions, and the mobility of professors, staff, and students.

Some of these collaborations have acquired an institutional dimension, being treated as strategic partnerships, understood as those in which there is broad and planned effort on the part of the involved universities, aiming at the deepening of partnerships already established, especially in research collaborations and academic exchanges. In 2017, the following foreign universities were defined as strategic partners of Unicamp:

- *Universidad de Buenos Aires (Argentina);*
- *Universidad de los Andes (Colombia);*
- *Beijing Jiaotong University (China);*
- *Ulsan University (South Korea);*
- *Cardiff University (United Kingdom);*
- *Delft University of Technology (Holland);*
- *University of Hamburg (Germany);*
- *Purdue University (USA);*
- *Washington University (USA).*

In collaboration with Higher Management institutions of the university and professors, researchers, and staff, DERI has been working to enhance these partnerships, supporting initiatives such as holding meetings, events, programs, and academic exchanges. In the context of these partnerships, it seeks to support actions that can go beyond specific collaborations in research or student exchange, but rather involving double-degree agreements, joint provision of graduate programs, and sharing institutional spaces and skills in major research themes of mutual interest.

The initiative of strategic partnerships is strengthened by the “Unicamp Ambassadors Program” (*Programa Embaixadores da Unicamp*), launched in 2018, which seeks to facilitate the contact between Unicamp and foreign institutions for higher education and research as well as to broaden the institutional representation of the university through the performance of Unicamp collaborators living abroad. Within the scope of this program, Unicamp already has ambassadors in Argentina and Portugal, developing activities that seek to bring Unicamp closer to institutions from these countries.

Finally, it is also worth highlighting the commitment of the university to stimulate the training of its professors and researchers along with prestigious foreign institutions, especially by the performance of postdoctoral studies abroad and by the maintenance and creation of new research exchange programs with foreign research institutions.

### 7.3 Participation in International Networks

2º CONGRESSO DE EXTENSÃO DA ASSOCIAÇÃO  
DE UNIVERSIDADES GRUPO MONTEVIDÉU (AUGM) 2015 [CHECAR LEGENDA]



DERI – Unicamp (photo archive).

International networks are key for the internationalization of the university, consisting in relevant spaces for interaction with international partners that allow the exchange of information, the deepening of established partnerships, and the alignment of institutional strategies between universities participating in forums of this nature.

Unicamp participates in a diverse set of networks and associations. Next, some of them are listed, in which the university has been seeking to increasingly operate in a more active way:

- *FAUBAI* – Founded in 1988, the Brazilian Association for International Education (FAUBAI) gathers 250 institutions and promotes annual meetings as well as various activities directed to the managers integration and training of the internationalization of universities and affiliated organizations. Unicamp has been regularly participating in meetings promoted by FAUBAI, which are rich spaces for discussion and exchanges of experiences with universities in Brazil and abroad;
- *AUGM* – the Montevideo Group Association of Universities, which gathers public universities in Argentina, Brazil, Bolivia, Chile, Paraguay, and Uruguay, holds regular meetings and training activities open to managers of the internationalization of associated universities. AUGM also promotes the *Escala* Program, which enables the mobility of professors, researchers, students and employees. All activities of this program follow the principle of reciprocity in providing openings for mobility between participating universities. Moreover, AUGM maintains a set of academic centers and committees, and some of which have representatives from Unicamp. It is noteworthy that AUGM annually organizes the Conference of Young Researchers, an event that has systematic participation of students from Unicamp;
- *GCUB* – the Coimbra Group of Brazilian Universities is a space for strengthening the relations between Brazilian and foreign institutions. GCUB promotes annual meetings, which have relied on the participation of Unicamp's representatives and maintains a series of programs, of which two were operationalized by Unicamp between 2014 and 2018, namely BRAMEX and BRACOL (which provide for mobility of undergraduate students between the university and partners in Mexico and Colombia, respectively). Outgoing students are granted assistance for the purchase of airline tickets, whereas financial assistance for food and lodging during the exchange period are provided to incoming students. In 2014, Unicamp also participated in Working Groups, organized by GCUB, which aimed to discuss issues related to university cooperation in regional blocs, the internationalization of Higher Education, and recognition of titles and accreditation. More recently, Unicamp has been involved with two GCUB programs: the Brazil Scholarship Program PAEC OEA-GCUB, which provides scholarship opportunities for prominent citizens of the 34 Member States of the Organization of American States (OAS), (except Brazil); and the Training Program for Higher Education Faculty of African Countries (ProAfri), which aims to support graduate programs in specialized fields for higher education professors from universities in Mozambique, through the granting of academic scholarships provided by Brazilian universities associated with GCUB for Master's and PhD programs duly recommended by the Brazilian Ministry of Education (MEC);
- *UDUAL* – the Association of Universities of Latin America and the Caribbean is a network of universities in Latin America and the Caribbean, based in the Universidad Nacional Autónoma de México, and it seeks to bring universities closer to the region and to coordinate initiatives that stimulate the progress of internationalization of Latin American higher education institutions. Unicamp participates in activities promoted by this network, particularly in the context of the Academic Program of Educational Mobility (PAME – *Programa Acadêmico de Mobilidade Educativa*), aimed at undergraduate students;



- *MACRO Network* – It brings together public universities in Latin America and the Caribbean. It currently consists of 37 universities from 20 countries. Within the context of this network, Unicamp operates regular calls for mobility of graduate students;
- *Magalhães Network* – Founded in 2005, it is a consortium of Universities in Europe, Latin America, and the Caribbean that aims at stimulating cooperation between member institutions and the exchange of students between the parties. To this end, also within the scope of the Network, the SMILE (Student Mobility in Latin America, Caribbean and Latin America), program of student mobility for the fields of architecture and engineering, was created. To join the program, it is necessary to sign bilateral agreements between institutions defining specific criteria and number of openings for exchange programs;
- *FLAUC* – The Fudan-Latin America University Consortium is a group headed by Fudan University, based in Shanghai, China, which brings together 12 other universities in Latin America. In addition to Unicamp, the consortium is composed of the University of São Paulo, in Brazil; the Universidad Nacional Mayor de San Marcos and the Universidad ESAN, in Peru; the Universidad de los Andes and the Universidad del Rosario, in Colombia; the Universidad Nacional Autónoma de México and the Technological Institute of Monterrey, in Mexico; the Universidad de Buenos Aires and the Universidad de La Plata, in Argentina; and the Universidad de Chile and the Pontificia Universidad Católica de Chile, in Chile. FLAUC has been an important space in which possibilities for cooperation in research have been developed and, more recently, for the mobility of professors, researchers, and graduate students;
- *CINDA* – the *Centro Interuniversitario de Desarrollo* (Interuniversity Development Center), an organization based in Santiago, Chile, coordinates a network that brings together higher education institutions in Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Spain, Italy, Mexico, Panama, Paraguay, Dominican Republic, Uruguay, and Venezuela. In 2016, an agreement was reached for the accession to the Human Resources Development and Exchange Program (PRHI – *Programa de Desenvolvimento de Recursos Humanos e Intercâmbio*) aimed at disciplining collaborations and mobility between the institutions participating in the network.

## 7.4 Partnership with Santander Bank

The agreement with Santander Bank is the main source of resources for international mobility at Unicamp. In the mid-2018, a new agreement was under negotiation with Santander Bank, which was signed in January 2019. The agreement guarantees the resources operationalized by DERI through calls for mobility of undergraduate and graduate students, professors, researchers and employees of Unicamp.

The agreement with Santander Bank represented an important channel of resources for mobility of professors, employees and students in recent years. Between 2014 and

2018, more than BRL 10.5 million were directed to this end through projects launched by Unicamp and supported by the Santander Universities Program and the very programs of Santander Bank (such as TOP China, TOP Spain, Ibero-American Scholarship Program, and Luso-Brazilian Scholarship Program).

Through this agreement, it has been possible to carry out short missions (lasting from 07 to 15 days long), which has allowed professors to develop academic activities in universities abroad. It has also allowed employees to make technical visits to reference institutions, contributing to the training of non-teaching employees in their respective areas of activity. The agreement has also enabled to provide exchange programs financial support for undergraduate students (one semester long) and stays abroad to perform academic activities for graduate students (sojourns of up to six months).

Moreover, the agreement has enabled to carry out a significant number of missions on the part of professors, researchers and employees abroad. It has also supported the mobility of undergraduate and graduate students as well as students from the Technical High School of Campinas (COTUCA) and from the Technical High School of Limeira (COTIL).

Thus, with resources provided by an agreement with Santander Bank, Unicamp supports the mobility of students and professors from its Technical High Schools through annual calls for proposals, managed by DERI. This initiative seeks to promote international academic-scientific cooperation between the Unicamp's Technical High Schools, and educational and research institutions from any country through financial support for the arrangement of technical visits of professors, necessarily accompanied by a group of students. In the context of this action, DERI annually selects one professor and six students from each Technical High School to carry out a mission abroad, lasting from 07 to 15 days long.

The new Santander agreement, which covers the period from 2019 to 2022, includes a significant increase in resources for mobility assistance directed to Undergraduate and Graduate Students, Professors, Researchers, and Employees of schools, interdisciplinary research centers and Technical High Schools of Unicamp. In addition, resources were requested and granted by Santander Bank to enable internationalization initiatives and strategies contemplated in the Unicamp internationalization planning, among which it is worth highlighting the resources aimed at: Strategic Partnerships, International Office Structures/Technical Training of Units and Bilingual Publication. The new actions contemplated and funded via the Santander Agreement will be operationalized by DERI through specific Calls in partnership with Schools and Bodies of the Higher Management of Unicamp.

## 7.5 Capabilities for internationalization in schools and interdisciplinary research centers

Disseminating internationalization capabilities and actions among the University's Schools and Interdisciplinary Research Centers is a key condition for broadening the effectiveness of actions developed in the context of the broader strategy conceived by Unicamp. Thus, it is important to generate effective engagement of professors, researchers,

employees and students, since these are the main responsible for implementing and managing internationalization in the different spheres of the academic life.

The internal institutional evaluation committees of both teaching, research, and outreach schools (24 in total) and the interdisciplinary research centers of Unicamp (21 in total) report that they have consistently advanced their internationalization actions in the 2014-2018 period, as evidenced after consulting these schools, interdisciplinary research centers within the context of this Institutional Evaluation.

Internationalization was pointed out as a strategic element present in the planning of 21 schools and 16 Interdisciplinary Research Centers of Unicamp, which indicated that actions already carried out between 2014 and 2018 significantly contributed to the advancement of teaching, research, outreach, and management activities developed by them. They also expressed that internationalization is a fundamental dimension for initiatives to be developed in the coming years.

Among the most frequent actions described by Interdisciplinary Research Centers, it is worth to mention the search for deepening the establishment of institutional research partnerships, participation in research networks, organization of events with international guests, obtainment of resources along with international development agencies, support for the mobility of professors, researchers, staff, and students, implementation of websites in English, and the production of material aimed at broadening the dissemination of teaching and research activities. In the case of schools, such as the School of Medical Sciences, the School of Dentistry of Piracicaba and the Institute of Biology, the constitution of structures specifically focused on the support for internationalization within the context of the schools was also mentioned.

Some schools have offices for international relations aimed at promoting all Internationalization and Mobility activities related to Undergraduate, Graduate, Research and Outreach activities, whether short- or long-term. The developed activities range from the guidance of students, staff and professors interested in programs for student mobility or research, to the welcoming of foreigners or the organization of international events in the school. Internationalization strategies proposed by these institutions are in line with the Internationalization policy of Unicamp and consist of important tools for promoting the name of the program abroad.

Furthermore, it is noteworthy that, in a recent evaluation carried out by the DERI, important advances in achieving the objectives proposed in the Planes 2016-2020 were observed, as presented later in this chapter. Through this evaluation, carried out in 2017, new challenges were identified, among which the following: (i) dispersion of efforts in actions related to internationalization in the university; (ii) the occasionally insufficient articulation with/between Unicamp institutions and academic units towards actions related to internationalization; and (iii) inadequacy of management- and control-related tools to the current demands of the university associated with internationalization.

Overall, based on the answers provided by authorities of Schools and Interdisciplinary Research Centers, a growing concern with the communication of activities, opportunities and results of teaching and research activities in the English language can be verified. There has also been an increasing commitment to search for funding channels for research abroad and to attract foreign professors and researchers to short stays. However, other desirable

actions, such as the regular provision of foreign language programs and disciplines (initiative provided for in the Planes 2016-2020) or the consolidation of structures focused on supporting internationalization, are still scarce. This evaluation is shared by the Schools and Interdisciplinary Research Centers, which indicated the intention to deal with problems such as these over the coming years.

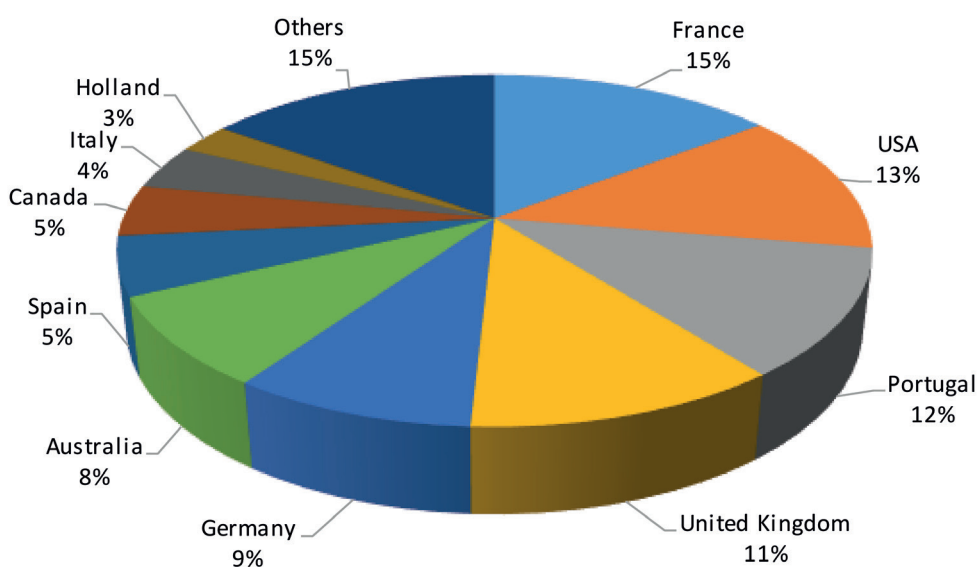
## 7.6 Internationalization of Undergraduate Programs

The period between 2014 and 2018 was marked by intense international mobility of undergraduate students, due to the implementation of the Science Without Borders, a Federal Government program aimed at encouraging part of the training of students in universities abroad.

A total of 1,869 undergraduate students from Unicamp participated in exchange programs at foreign universities. Over half (50.8%) of those students did so through the support of the Science Without Borders Program, established in July 2011 by the Federal Government. Other exchange programs took place through Unicamp and AUGM programs, most of which supported with resources from the agreement with Santander Bank.

The diversity of countries and universities of destination was considerable. Altogether, 34 countries consisted in the destination of academic exchange programs for Unicamp students. Graph 7.1 highlights the main destinations:

GRAPH 7.1 – MAIN DESTINATION COUNTRIES FOR UNICAMP UNDERGRADUATE STUDENTS (2014-2018)

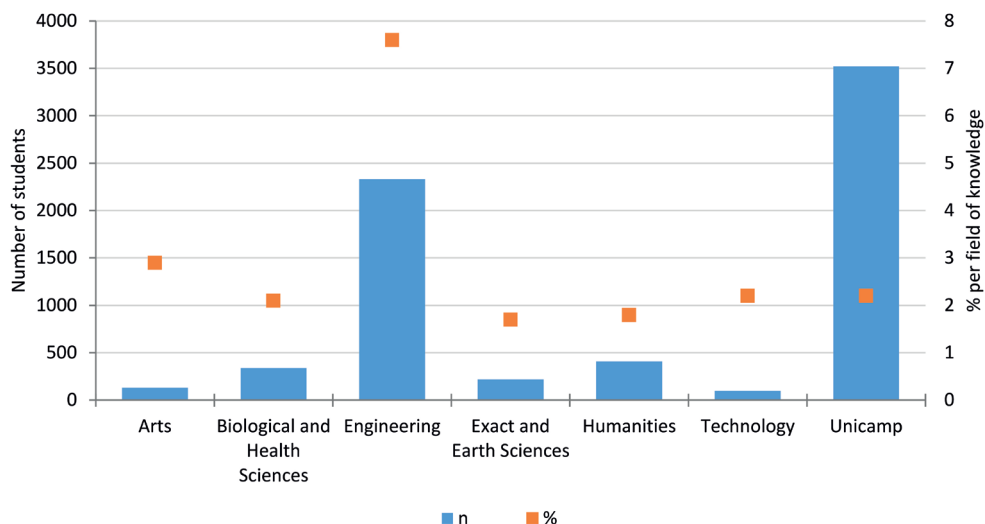


Source: prepared by the authors based on data provided by the Unicamp's Academic Office (DAC).

Graph 7.2 shows the percentage distribution of students from several fields of knowledge who took part in official exchange activities in the period. About 2/3 are students

from the field of engineering, corresponding to about 7-8% of the students in such area. Between 2 and 3% of students from other areas participated in exchange programs.

GRAPH 7.2 – NUMBER AND PERCENTAGE OF UNICAMP UNDERGRADUATE STUDENTS WHICH PARTICIPATED IN EXCHANGE PROGRAMS, PER FIELD OF KNOWLEDGE, BETWEEN 2014-2018



Source: Prepared by PRG based on DAC data.

Almost all Unicamp's undergraduate programs included students participating in international exchange programs between 2014 and 2018. In a considerable number of responses, the perception is that the number of students with mobility significantly decreased after the end of the Science Without Borders Program. However, the numbers recover since 2018, as observed.

A significant part of undergraduate programs provided information regarding the balance between the number of students who have international mobility and their relationship with the arrival of foreigners for taking the course. Overall, the number of students sent by Unicamp for exchange programs abroad is higher than the number of foreign students participating in exchange programs at the university. This trend was pointed out in 25 Unicamp programs, whereas for 7 programs there was balance in the "incoming" and "outgoing" flow of students. In only 4 programs there were more incoming than outgoing students. The Coordinators also explained that the smaller number of incoming students, in relation to outgoing students, is due to most disciplines being exclusively taught in Portuguese.

Additionally, it is noteworthy that, between 2014 and 2018, the flow of undergraduate students in the context of double-degree programs was intense. Regarding double-degree programs, particularly the institutional initiatives and contribution to the programs, it is observed that they are concentrated in the areas of Engineering and Technology. Overall, coordinators of the programs stated that they consider the internationalization of their courses as very important, and several double-degree agreements are under discussion. In the 2014-2018 five-year period, the university sent 152 students under double-degree agreements with institutions in France and Italy. There were 14 students sent to the

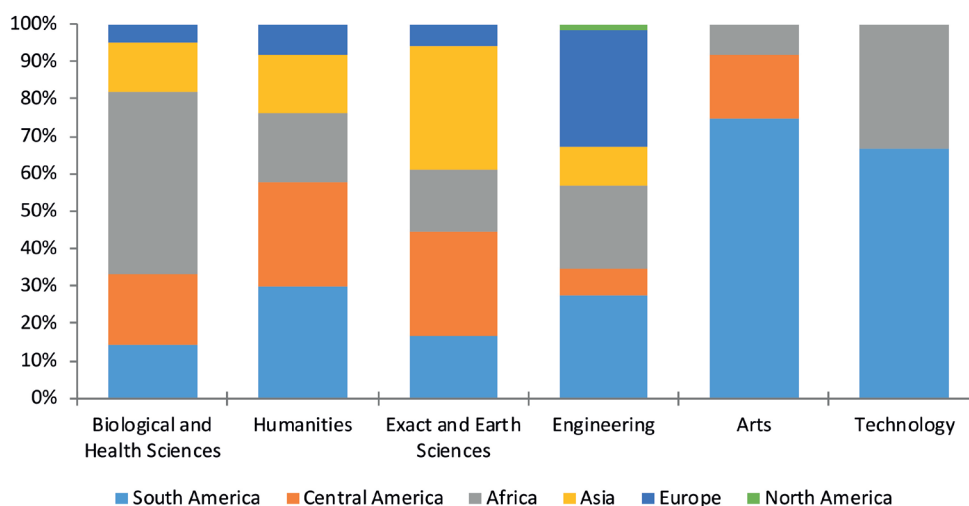
*CentraleSupélec* (until 2015, called only *Supélec*), 57 to the *École Centrales* group, 19 to the INSA (*Institut National des Sciences Appliquées*) group, 42 students to the *ParisTech*, and 20 to the *Politecnico di Milano* (POLIMI).

It is noteworthy that students from 24 programs participated in double-degree programs, and almost all of them took courses in the areas of Engineering and Technology. In the Exact and Earth Sciences area, only the chemistry program has an agreement of this nature. However, several programs report that they use university exchange programs to provide international experience to the students. In some cases, double-degree agreements are being discussed and should be implemented over the coming years.

Regarding foreign students performing exchange activities at Unicamp between 2014 and 2018, the results are also significant. The university has welcomed about 90 foreign exchange students per semester, most of them coming from Latin American countries. More recently, China has become one of the main countries of origin of exchange students at Unicamp. Japan, South Korea, Spain, Germany, France, and Italy are also frequent origins.

In the reference period of this report, Unicamp registered 162 foreign students regularly enrolled in undergraduate programs. Of these, about 50% come from South America and Central America, followed by Africa (23%), Europe (15%) and Asia (14%). Graph 3 presents the percentage distribution of students among the fields of knowledge.

GRAPH 7.3 – PERCENTAGE DISTRIBUTION OF FOREIGN STUDENTS IN UNDERGRADUATE PROGRAMS, PER ORIGIN AND FIELD OF KNOWLEDGE



Source: Prepared by PRG based on DAC data.

Particularly within the scope of the Exchange Program for Undergraduate Students (PEC-G), aimed at training of students from developing countries who wish to enroll in an undergraduate program in Brazil, Unicamp welcomed a total of 84 students, 29 from South America, 25 from Central America, 29 from Africa, and 1 from Asia. Regarding the fields of knowledge, the arts mostly ( $\approx 75\%$ ) accounted for students from South America and Central America. For Biological and Health Sciences, most came from the African continent (about 69%). For Engineering, 60% come from South America and Central America, and



40% from Africa. For Exact and Earth Sciences, about 66% come from South America and Central America and about 33% from Africa. For the Humanities, about 73% are students from South America and Central America, 23% from Africa, and 4% of Asia.

Moreover, it is noteworthy that Unicamp welcomed, between 2014 and 2018, 9 refugee students from African countries (5 students, 1 in the area of Biological and Health Sciences; 1 in the area of Engineering; and 3 in the area of Humanities) and Asia (4 students, of whom 2 in the area of Biological and Health Sciences; 1 in Engineering; and 1 in Humanities).

Table 7.1 summarizes information regarding foreign students, students linked to PEC-G and refugees.

TABLE 7.1 – DISTRIBUTION OF FOREIGN STUDENTS PER CONTINENT AND FIELD OF KNOWLEDGE, ENROLLED IN UNDERGRADUATE PROGRAMS AT UNICAMP, IN THE PERIOD BETWEEN 2014 AND 2018

Fields of Knowledge	Continent	Foreign	PECG	Refugee
Arts	Africa	1	1	0
	Central America	2	2	0
	South America	9	8	0
	Brazil	0	0	0
	Total	12	11	0
Biological and Health Sciences	Africa	10	9	1
	Central America	4	3	0
	South America	3	1	0
	Asia	3	0	2
	Brazil	0	0	0
	Europe	1	0	0
	Total	21	13	3
Engineering and Technology	Africa	13	10	1
	Central America	4	4	0
	North America	1	0	0
	South America	16	11	0
	Asia	6	0	1
	Brazil	0	0	0
	Europe	18	0	0
	Total	58	25	2
Exact and Earth Sciences	Africa	3	3	0
	Central America	5	4	0
	South America	3	2	0
	Asia	6	0	0
	Brazil	0	0	0
	Europe	1	0	0
	Total	18	9	0

TABLE 7.1 – DISTRIBUTION OF FOREIGN STUDENTS PER CONTINENT AND FIELD OF KNOWLEDGE, ENROLLED IN UNDERGRADUATE PROGRAMS AT UNICAMP, IN THE PERIOD BETWEEN 2014 AND 2018

Continued

Fields of Knowledge	Continent	Foreign	PECG	Refugee
Humanities	Africa	9	6	3
	Central America	14	12	0
	South America	15	7	0
	Asia	8	1	1
	Brazil	0	0	0
	Europe	4	0	0
	Total	50	26	4
Technology	Africa	1	0	0
	South America	2	0	0
	Brazil	0	0	0
	Total	3	0	0
Total		162	84	9

Source: Prepared by PRG based on DAC data.

The results presented in the previous pages reflect a growing institutional commitment to the internationalization management within the context of undergraduate programs. An important recent action related to the management of student mobility refers to the development of the system through which foreign exchange students are enrolled at Unicamp nowadays. In partnership with the Academic Board and in the context of Strategic Projects established by the university in 2017, DERI has made adjustments in academic processes for these students to facilitate communication and reduce the need for face-to-face assistance after their arrival at Unicamp.

The project sought to solve the difficulties of access to information in other languages and facilitate and streamline the process of student mobility, previously focused on face-to-face assistance. The main gain obtained from the system was the decrease in the time of assistance provided to students before and after their arrival. Nowadays, foreign exchange students even have at their disposal the student card as soon as they arrive at Unicamp. The system was created aiming at facilitating the communication with foreign students, in such a way they can navigate through a friendly interface and directly insert information required for the exchange feasibility. Thus, it was possible to eliminate a considerable time that was intended to meet individual demands.

The project shall continue in a new cycle, in which adjustments will be made in the procedures used to operationalize the international exchange program of regular students from Unicamp. These adjustments will allow to operationalize the outgoing mobility of undergraduate (or graduate) students more efficiently and in a decentralized way.

Overall, Unicamp presents relatively well-consolidated processes that guarantee the systematic exchange of undergraduate students with several partner institutions abroad. Some challenges, however, remain. In particular, it is noteworthy the importance

of further expanding the possibilities of exchange programs so as to reflect the interests of undergraduate programs; the need for increasing the volume of resources to support outgoing mobility in order to ensure that undergraduate students are able to participate in exchange programs abroad; and the need for achieving a greater balance in exchange flows with some partner institutions. Especially concerning the relationship with universities in English-speaking countries, the scarce provision of disciplines taught in English is a factor that hinders the arrival of exchange undergraduate students to Unicamp, which leads foreign partner institutions to not provide openings, since the agreements presuppose parity in the exchange of students between signatory institutions.

Also within the scope of schools and programs, there has been a continuous effort to stimulate internationalization.

In the field of arts, coordinators of the courses reported having their own policies and initiatives related to the broadening of programs in international agreements of the schools/programs (music, Visual Arts, dance), or even regarding initiatives of research projects or individual ones on the part of professors. Other programs (Performing Arts and Social Communication – Medialogy) used the very Calls of Unicamp, managed by DERI. Coordinators of the Media Studies program highlight that, although there are exchange programs, there is no institutionalized validation on the part of the course of the experiences acquired by the student outside the country, an obstacle that must be overcome.

There is also an understanding that the technical enhancement from the international experience can contribute to the training of students, which could be useful for restructuring the programs. In addition, for the Media Studies program, it is observed that the departure of students, from the Calls of internationalization, is important for their intellectual and professional training. Nevertheless, it draws attention to a vision of internationalization that focuses only on Europe and on the USA. They suggest that an internationalization policy should exist in order to include Africa, the East, and Latin America.

Coordinators of programs in the Biological and Health Sciences area report the positive impacts of exchange programs, resulting from the experience of Unicamp students traveling abroad as well as the benefits brought by the presence of international students in the provided programs. They also report the negative impact of the reduction of resources for mobility that has occurred in recent years, and the need for seeking solutions. Some courses use, in addition to the Calls of students, those of internationalization aimed at professors; authorities report that they are seeking cooperation and highlight the possibility of double degree (Sports Sciences, pharmacy, and nutrition). Coordinators of some programs within this area detail that there are specific internationalization coordinators or departments to provide paramount support to these exchange programs (Biological Sciences, medicine, and nursing).

Those responsible for programs in such field emphasize that interactions for both Unicamp students and for coming foreigners are extremely rich and productive. Some aspects are highlighted in programs in clinical specificities, for instance, differences in the curricular structures and, hence, the creation of opportunities for complementary training and exchanges that can be transferred to other undergraduate students, such as those from the fields of Speech Therapy, nursing, dentistry, and medicine.

Moreover, the importance of investments and calls are highlighted, both for students and for professors and coordinators, who, when visiting other foreign institutions, or welcoming exchange students or visiting professors, may allow the formation of networks, establishment of contacts, and the socialization of learning. They also discussed about encouraging the improvement of technical-administrative staff through language teaching for better communication with foreigners.

In the field of Engineering, there is a vast tradition of exchange programs, both to send students and to welcome foreign students from different parts of the world, including double-degree calls (Civil Engineering, Food Engineering, Computer Engineering, Control and Automation Engineering, Manufacturing Engineering, Production Engineering, Electrical, Mechanical, and Chemical Engineering). However, difficulties are reported after the Science Without Borders Program was closed. For some, this reduction has impaired the established internationalization goals, since they are part of the strategic planning of schools such as FEAGRI, FEA and FEEC. Some schools accounted for a reduction in the proportion of students who participated in exchange programs, from 20% to 5% in recent years.

Despite this decrease, coordinators of programs in such area deem the impacts on students participating in exchange programs as excellent, contributing to their personal and academic maturation, in addition to allowing comparative evaluation between the content of their course and those taken by students who participate in such exchange programs abroad, and increase their competitiveness in the labor market. Several of the Engineering courses provide double-degree programs, which promote greater reflection and comparison regarding the curricular structures existing in Brazil and abroad. Concerning Telecommunications Engineering, those responsible highlight the impact of exchanges and visits on the quality of the program through the experience gained by students and professors. For one of the Engineering programs, they reported not having evaluated the impact of these exchange programs on students' training (Computer Engineering).

Coordinators of the School of Electrical and Computer Engineering (FEEC) report many double-degree agreements with international universities, managed by several professors and by the BRAFITEC (*Brasil France Ingénieur Technologie*) program, recognizing the impact on students' training and on the quality of the program, and how the reports on the operationalization of undergraduate studies abroad contribute to discussions on the modernization of the program. The School of Food Engineering (FEA) organized an event of the São Paulo School of Advanced Sciences that, in September 2017, had 100 participants, including undergraduate students, and 12 speakers from several parts of the world, thus broadening internationalization.

Coordinators of programs in Manufacturing Engineering and Production Engineering, of the School of Applied Sciences (FCA), highlighted limits regarding the lack of disciplines taught in English in undergraduate studies, which restricts the participation of foreign students in such programs. As for the Computer Engineering program, it is reported that there has never been an analysis of the quality of training of students participating in exchange programs to better evaluate their benefit.

In the area of Exact and Earth Sciences, virtually all coordinators of the programs highlighted the importance of internationalization for the development and maturation of professionals-to-be as well as the impacts of reducing scholarship programs. According

to them, exchange programs have a very positive impact on both the students' training for teamwork, decision-making, and initiative, and on the influence positively and indirectly exerted on their colleagues. In turn, for the Teaching Course Degree in mathematics, the perception that the exchange program little contributes to the students' training is reported.

The "Gleb Wataghin" Institute of Physics (IFGW) has formed a working group on the general policy of internationalization of the school. Elective disciplines can be taught in English as well as reports and the final projects (TCCs). Furthermore, there is a collaboration agreement for mobility with the Americampus Program, together with Universidad de Zaragoza, in Spain, and the University Collaboration and Integration Program of Latin America and the Caribbean (PCIU-UDUAL), for degree validation.

As for the Institute of Geosciences (IG), coordinators mention that internationalization is also part of the Strategic Planning, and students participate in the "Student Chapters" of international geoscience associations (IEEE-GRSS, linked to the Geoscience and Remote Sensing Society, and AAPG, linked to the Advancing the World of Petroleum Geosciences). Exchange students, when returning to Brazil, worked as PAD monitors (of the Didactic Support Program – PAD) in undergraduate disciplines equivalent to those they have taken when studying abroad, enabling the comparison and discussion of the taught contents.

The Institute of Chemistry (IQ) implemented a process of support for the preparation of study planning and the opening to establish partnerships for exchange programs and double degree with foreign universities. Reports and assessments of recent alumni are very positive in the sense that exchange programs represent an important contribution to students' training. IQ programs are accredited by the Royal Society of Chemistry since 2013, which internationally qualifies these courses, enhancing the professional insertion of alumni.

The Computer Science program report that there has never been an analysis of the quality of the training of students participating in exchange programs to evaluate their benefit. For the Teaching Course Degree in mathematics, the internationalization policy is secondary.

Technology programs have low participation in exchange programs, and those responsible also report reduction in opportunities for scholarships and calls, in addition to the socioeconomic profile (low family income and need to work to supplement the income). There is consensus among courses in the area that the participation of undergraduate students in international exchange programs is beneficial. But the coming of foreigners in these courses is reduced.

Finally, in the field of Humanities, coordinators of all programs reported valuing internationalization initiatives and highlight the decrease in the number of exchange programs in recent years due to the reduction of specific resources for this purpose. Internationalization is deemed as an important opportunity for international circulation of professors, the coming of foreign professors, possibility of students' internships in foreign universities, and the arrival of foreign students for taking courses. They report the importance of these activities, which include innovations in teaching (resulting from technical visits) and comparisons between Curricular Pedagogical Projects (PPCs). These international experiences validate the program as a teaching reference and place it in academic connections.

The coordinator of Administration programs describe important reflections on internationalization regarding the quality of training and the program as a whole. Double-degree agreements have been negotiated and have sought to develop new partnerships. In 2018, the FCA Undergraduate Commission announced a call to support the participation of students in scientific and academic events, both national and international, with increasing demand.

Programs of the Institute of Language Studies (IEL) have mandatory language disciplines. Students of Literary Studies also have the frequent opportunity to attend lectures and participate in short courses taught by professors from foreign universities in activities and events.

Those responsible for the Pedagogy program point out they are undergoing an extensive curricular reform, aiming at a more contemporary education. Even without an explicit policy, coordinators of the school have been seeking to respond to demands to send students abroad and recognize the impact of internationalization on the education of undergraduate students.

Regarding the accreditation of activities carried out abroad, it is worth highlighting that validation of studies is not a requirement in Unicamp exchange programs. However, usually before the formalization of their exchange program, the students mention the disciplines of interest to request the intended equivalences after their return. The Undergraduate Coordination pre-evaluates it. The program coordinator analyzes the study plan and verifies the compatibility of program load and syllabus, following the Institution's standards, which corresponds to 75% similarity between discipline programs. Overall, the coordinators previously monitor the going of students to exchange programs.

Authorities of all courses in the field of arts recognize the activities carried out abroad. The Performing Arts program review the program presented by the student of the selected school and compares it with the pedagogical project itself. In turn, coordinators of the Social Communication – Medialogy program guide students to take courses aligned with that of the very program concerning syllabus and course load, as well as the music program. On the other hand, the Visual Arts program analyze the activities carried out abroad through protocol requests for revalidation of degrees or validation of disciplines.

In the Biological Sciences, Physical Education (full-time or evening program), nursing, pharmacy, Speech Therapy, Teaching Course Degree in Biological Sciences and medicine programs there are no clear mechanisms for recognizing activities carried out abroad to be incorporated in the syllabus. Coordinators of programs in Sports Sciences and nutrition reported that the activities performed in exchange programs are recognized in the curriculum by the registration of the exchange program and the validation of the studied disciplines. The dentistry program stated there was no validation of disciplines studied abroad by students participating in internationalization programs, due to nonequivalence with mandatory disciplines.

Among the Engineering programs, authorities of all courses recognize activities carried out abroad based on syllabus and course load. A set of disciplines taken abroad allows the student to validate a set of mandatory and/or elective disciplines at Unicamp. Nevertheless, since recognition is achieved based on studied disciplines instead of academic



credits, usually students return to Unicamp lacking several mandatory disciplines, but with numerous recognized elective disciplines taken, which postpones the completion of the course. In cases that Physical Engineering students have taken disciplines for which there are no equivalences at Unicamp, the recognition of credits is achieved according to specific disciplines. Some Chemistry Engineering students participate in double-degree programs, which provides them the opportunity and time to take most of the course abroad, including the writing of the course completion essay and internships.

In the field of Exact and Earth Sciences, only authorities of the programs in chemistry and Technological Chemistry reported not having clear and efficient mechanisms for recognizing activities carried out abroad in this group. In the case of some programs, in the initial phase, a study plan is created to select disciplines more aligned with the technical-pedagogical plan of the course.

Within the Humanities field context, coordinators of programs in business, Public Business, Social Sciences, philosophy, history, geography, and Public Policy Management reported having clear and efficient mechanisms for recognizing the activities performed abroad by the registration of the exchange program and the validation of the studied disciplines. The coordinators support students either by seeking a better academic validation of the experience abroad or by taking advantage of credits after returning to Brazil. Coordinators of programs in Social Sciences, philosophy and history reported that the validation of disciplines can be done both for mandatory disciplines and for elective ones, although there is an incentive, on the part of the Coordination, for students to take advantage of the experience abroad to diversify their education, seeking disciplines not contemplated in the mandatory core of disciplines of their syllabus.

The Coordination of the Undergraduate Program in Economics also validates the mandatory disciplines undertaken by students, which may also request the validation of language disciplines taken at IEL/CEL or by taking proficiency tests provided by Unicamp. But the disciplines studied abroad are hardly validated due to the syllabus of programs in literature, linguistics and Literary Studies. On the other hand, the coordination of the Linguistics program has considered to recognize those disciplines, attributing elective credits to the ones taken abroad.

Students of the School of Education can participate in exchange programs and automatically obtain the validation of credits, from cooperation agreements and curricular equivalence tables (such as in the Brazil-Germany Academic Cooperation Program, UNIBRAL – from 2013 to 2018, for the pedagogy program). Students can participate in exchange programs and request the validation of credits to the Coordination of Teaching Course Degrees, submitting the documentation to DAC. In the case of programs already established, the process is more agile, since there are indications of equivalence between the European Credit Transfer System (ECTS) of Bologna process and the credit system of Unicamp. In the specific case of the Integrated Teaching Degree in Chemistry and Physics, international mobility is low. The creation of an exchange program regulation in the Central Committee of Undergraduate Studies (CCG) is suggested.

In the field of technology, some programs were restructured, resulting in reduction of on-site course loads and completion period, which may benefit the participation in exchange programs, which are unusual. Coordinators emphasize that there is the possibility

for students to request equivalence for the disciplines studied with similar course load and syllabus.

Overall, authorities of all programs consider the provision of disciplines taught in English very important. However, there are difficulties in enabling initiatives of this nature, since it is necessary to taught, in parallel, the same discipline in Portuguese. A recent and singular initiative was the provision of the discipline AM072 – Debates on Environmental Issues. In addition, the programs in physics, Teaching Course Degree in Physics, mathematics, Applied Mathematics, and Computer Mathematics have also provided elective disciplines: 2015 – F 015 – The Physics of the Rare Earth Element; 2017 – F 013 – Scientific Writing in English; 2018 – F 013 – Scientific Writing in English. The program in Social Sciences also provided an elective discipline in 2018: HZ259 – Sociology of Stratification and Inequality in the BRICS Countries. The linguistics program provided the discipline HL091 – Academic Writing in English. In 2014, there was provision of an elective discipline in French: HL092-A. Other programs did not provide disciplines in English.

## 7.7 Internationalization of Graduate Programs

Many universities worldwide have been seeking greater openness of their teaching and research activities through the training of their students abroad. Unicamp, within the scope of graduate studies, has been acting more and more in this direction.

Based on the results concerning internationalization carried out in the last institutional evaluation (2009-2013), two strategies were proposed to operationalize the internationalization of graduate studies: to broaden “sandwich” scholarship PhD programs and co-tutorship agreements in graduate programs. Results achieved in the last five-year period indicate that Unicamp has succeeded in the implementation of these strategies.

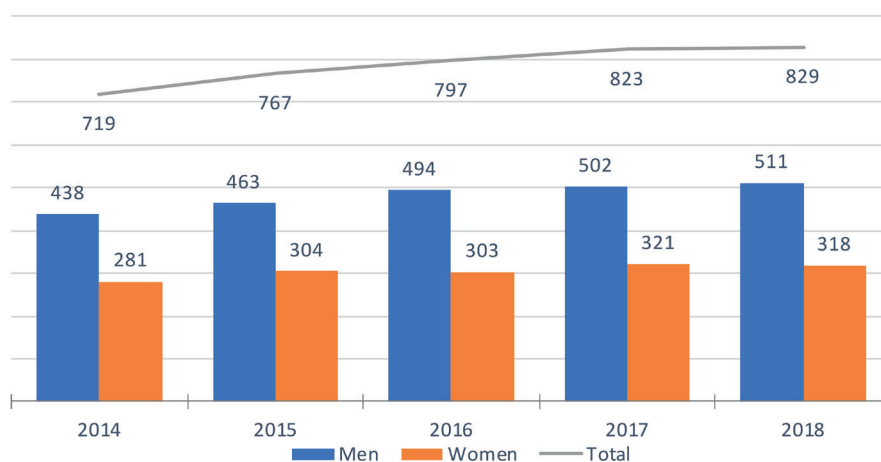
Thus, authorities of the university understand that mobility of graduate students is paramount for the training of new researchers and for the advancement of university research. Devices created for the internationalization of graduate studies enable students, in general:

- To gain a different perspective of their research;
- To make contact with the supervisor abroad, who paves the way for them to improve their research;
- To be inserted into collaboration and research networks in an articulated way with researchers of different traditions;
- To experience academic cultures close to or distinct from ours (for instance, many programs abroad do not have regular disciplines, and study sessions can be individually organized by each student, seeking seminars, free courses, and participating in research groups);
- The deepening of their research project from the thematic or theoretical focus of the research group/university in which they worked in their internship;
- The possibility of coexistence and exchange of experiences and knowledge with more internationalized groups and universities (from the point of view,

- especially, of the presence of students from many countries from different parts of the world);
- The theoretical and methodological deepening with bibliographic material and bibliographic references.

Considering this perspective, Unicamp has sought to foster mobility and the constitution of an internationalized environment in graduate studies. In this sense, it is noteworthy that the university has continuously attracted foreign students to its graduate programs. Graph 4 shows the number of foreign students at the university between 2014 and 2018. The total number of students increased with a 15.2% variation in the considered period.

GRAPH 7.4 – NUMBER OF STUDENTS, DIVIDED PER GENDER, FROM OTHER NATIONS, ENROLLED IN GRADUATE PROGRAMS AT UNICAMP, 2014-2018

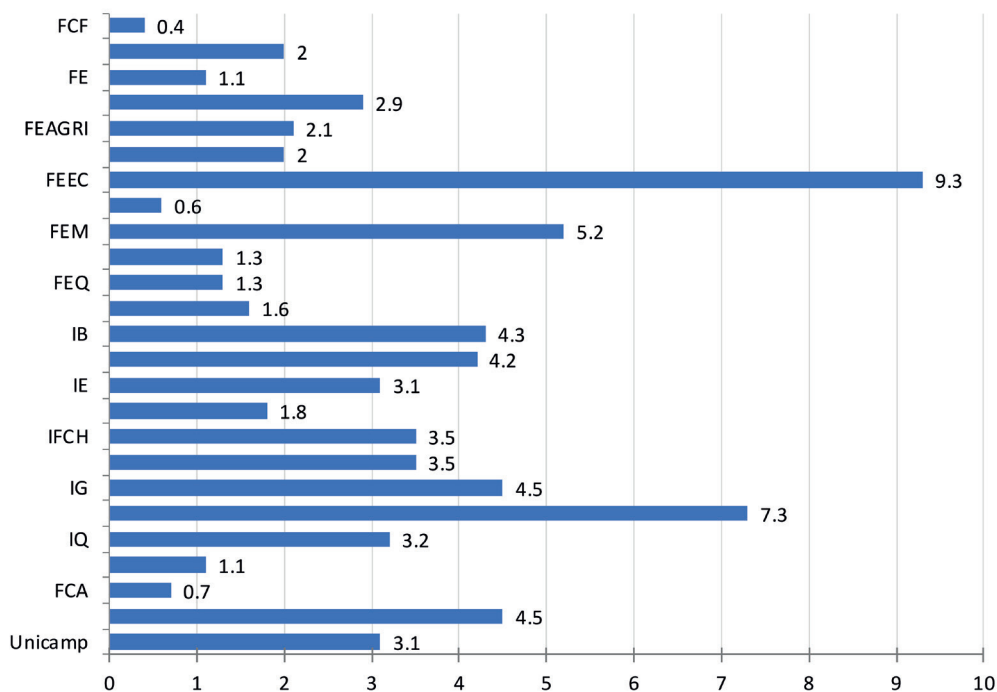


Source: PRPG Statistical Yearbook (2019).

It is worth noting the number of countries that compose the framework for the years 2014 to 2018: 52, 53, 60, 58, and again 60 countries, respectively, which highlights the diverse origin of foreign students enrolled in graduate studies at the university. Colombia and Peru (from Latin America) and Iran and Portugal (outside this set) are the origin countries that outstand in the general calculation, in all years of the analysis.

Complementing this information, Graph 7.5 presents the participation of foreign students in the schools of Unicamp in 2017. Altogether, there is room for greater foreign participation in graduate studies at Unicamp.

GRAPH 7.5 – PARTICIPATION (%) OF FOREIGN STUDENTS  
IN THE THE SCHOOLS OF UNICAMP



Source: PRP 2017.

Students' internship programs abroad have always been (and continue to be) key to the qualification of our students as researchers. It is noticeable, for any advisor or member of the examination board, the maturation provided by full-time dedication to research along with collections, databases, and other complementary or more qualified repositories than those of Unicamp. It is also evident the gain resulting from the access to research laboratories, equipment and infrastructures available at many universities abroad.

Performing part of the PhD studies abroad has been encouraged at the university over the last five years through several calls from different funding agencies. In this sense, it is worth highlighting the PDSE ("Sandwich" PhD Program Abroad), of the Coordination for the Improvement of Higher Education Personnel (CAPES), which offers the possibility of complementing the training of the PhD student with a foreign institution, as well as the Scholarships for Research Internship Abroad (BEPE), provided by the São Paulo Research Foundation (FAPESP) – at UNICAMP, authorities of FCF, FEF, IQ, AI, IB, and FEA reported having had researchers whose exchange programs were funded by the BEPE program. There is also the assistance granted by the International Mobility Program in Graduate Studies, supported by the Santander Universities program (previously mentioned).

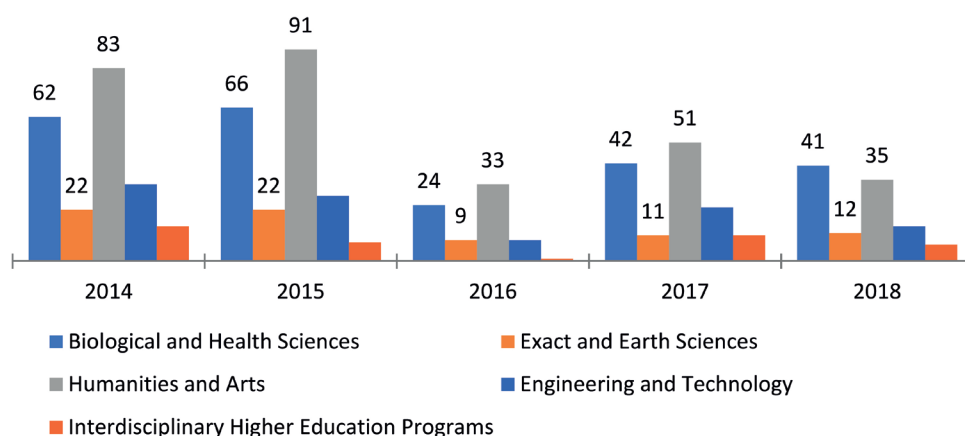
PDSE has been particularly important to stimulate student mobility in graduate studies. It is a program developed by CAPES aimed at PhD students, with a purpose similar to the BEPE program, which has assisted dozens of Unicamp students, such as those studying at FEQ, FEA, FEF and AI institutions, who have gone to different institutions worldwide. Moreover, it is also emphasize that in the five-year period under analysis, hundreds of students took advantage of the Science Without Borders Program at all levels, including

undergraduate students. Initiatives that bring funding from abroad for the qualification of our students and postdoctoral students are also very interesting. The Institute of Economics, for example, participates in an international interinstitutional master's degree proposal, the Erasmus Mundus, which involves 12 international universities for the master's degree to be taken in exchange programs. The School of Mechanical Engineering and the Institute of Computings have also adopted a similar strategy when investing in double-degree programs and co-tutorship of their students with foreign universities. These movements qualify our students and postdoctoral students, improving the perspectives of the Brazilian science in the medium- and long-term.

Scholarship-related and financial assistance opportunities provided within the scope of networks and associations of which Unicamp takes part are also being developed, such as the MACRO Network and the BRAFITEC group for cooperation between universities in Brazil and France. Binational programs mediated by CAPES, such as cooperations with Germany (through the DAAD – *Deutscher Akademischer Austauschdienst*), Canada (CAPES/DFATD Program), and Sweden (in partnership with the Swedish Foundation for International Cooperation in Research and Higher Education), also provide mobility opportunities for the benefit of graduate students from Unicamp. Bilateral partnerships with foreign universities have also been ensuring, eventually, visits and internships in institutions abroad.

Graduate students from Unicamp also seek a more complete and diverse education with internships abroad. Graph 6 shows the number of students linked to PDSE between 2014 and 2018, according to the 5 large fields of knowledge (remembering that there are other funding sources for internship abroad such as CNPq, Fapesp, Fulbright and Santander). One of the important aspects is the decrease in the number of students benefiting from the PDSE Program from 215 in 2014 and 2015, falling sharply to 76 in 2016 alone (when Capes suspended the Program), increasing to 138 in 2017, and decreasing again to 110 in 2018. Perhaps one of the major problems for this context is the students' difficulty in reaching the required levels in the proficiency exams. The end of the Language Without Borders Program, of Capes, which was linked to the Science Without Borders Program, will certainly aggravate this problem.

GRAPH 7.6 – NUMBER OF STUDENTS CONTEMPLATED BY PDSE, PER PPG, IN THE 5 FIELDS OF KNOWLEDGE, 2018

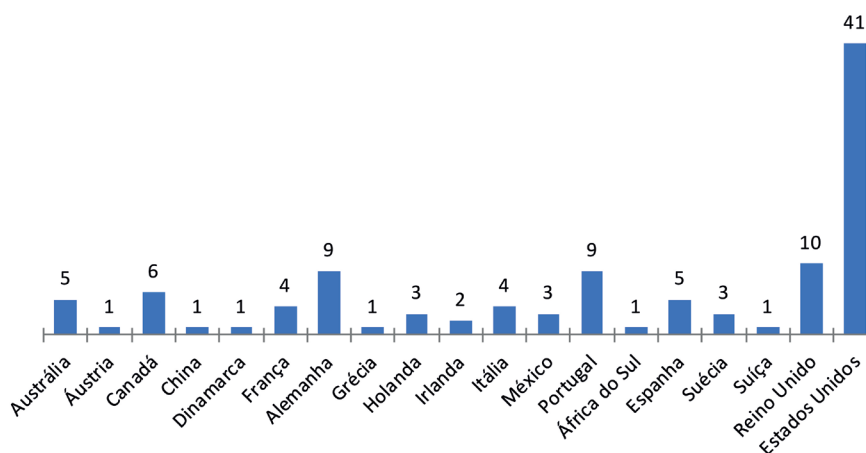


Source: PRPG Statistical Yearbook (2019).

In 2018, 110 students from Unicamp participated in the Capes' PDSE Program, according to the distribution presented in the previous graph. In the same year, Unicamp accounted for a total of 829 foreign students in Graduate Studies as well as 87 researchers from other nationalities performing postdoctoral internships at the university.

The United States of America was the main destination of graduate students from Unicamp in 2018, followed by the United Kingdom, Portugal, Germany, Canada, Australia, and Spain, among the most target countries. Graph 7 shows all the destination countries of PDSE-Capes scholarship students from Unicamp in 2018.

GRAPH 7.7 – STUDENTS LINKED TO PDSE PER COUNTRY OF DESTINATION, 2018



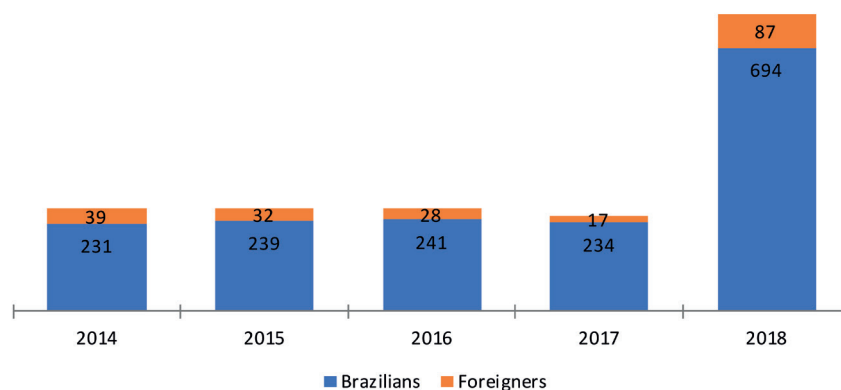
Source: PRPG Statistical Yearbook (2019).

Concerning one of the questions about internationalization presented in this endeavor of Institutional Evaluation ("24. What measures are taken by the program or by the school to increase the internationalization of the program?"), those responsible for Graduate Programs of Unicamp presented answers such as: "The program regularly seeks to establish partnerships with former students and external researchers to attract foreign students; it provides information in Spanish and English; it establishes partnerships with researchers from several countries, in research projects or via technical visits and internships. Our most successful way of bringing foreigners has been the participation in international programs and projects, with funding from international agencies"; "... it has encouraged the provision of courses (disciplines) in English, the performance of 'sandwich' internships abroad (although it is hard to obtain scholarships), and international exchange programs (including double-degree programs). It is noteworthy that the graduate program receives a good number of students from neighboring countries (mainly Peru, Colombia, Ecuador, Bolivia), which by itself confers an international quality to it." These answers illustrate some of the main actions and concerns of the programs regarding their strategies for international insertion.

Coordinators of the programs have also been seeking to attract foreign researchers to conduct postdoctoral internships at Unicamp, as observed in the next graph. It is verified that the number of postdoctoral students of other nationalities at Unicamp ranged from 39 (2014) to 32 (2015), 28 (2016), 17 (2017), and reached 87 in 2018, when considering Schools and Interdisciplinary Research Centers.



GRAPH 7.8 – NUMBER OF FOREIGN AND BRAZILIAN POSTDOCTORAL STUDENTS, IN SCHOOLS AND INTERDISCIPLINARY RESEARCH CENTERS, 2014-2018



Source: PRPG Statistical Yearbook (2019).

The international expansion and consolidation also comprises the incentive to increase the circulation and participation of professors in foreign institutions, as visiting researchers, postdoctoral students, or specifically for the presentation of studies resulting from their research, and as participants of international research groups. The coming of visiting researchers in long stays, which allow them to teach disciplines, propose research projects, and provide guidance to students, or short stays, in order to participate in events or specific activities of research groups, have been more frequently performed. This participation has undoubtedly been paramount to consolidate the international articulation of research laboratories and centers to which PPGs professors and students are linked.

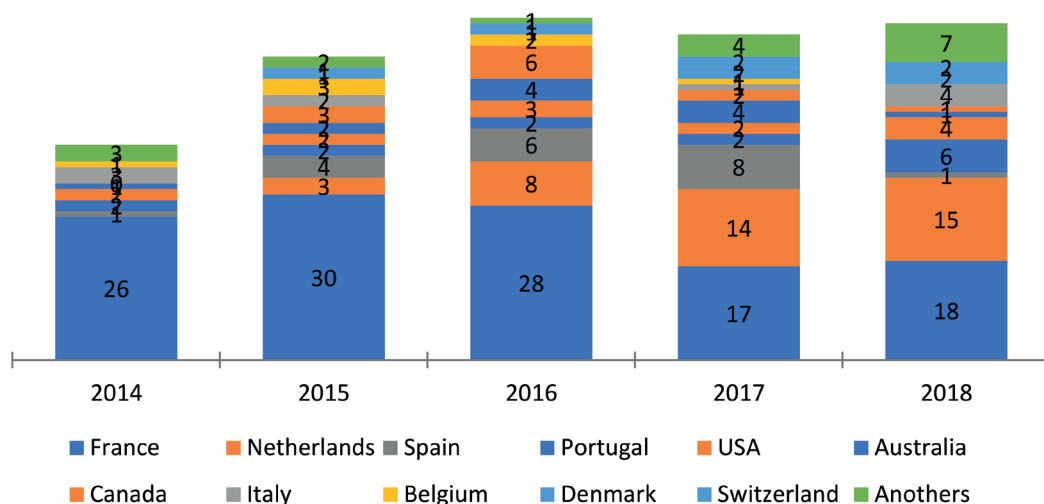
The attraction of postdoctoral students from abroad is a desirable movement for the qualification of Brazilian science, but it still consists in a timid initiative in the University as a whole. It sporadically happens, on the part of professors' initiative, and is more frequent in some schools than in others. On the other hand, some schools outstand in this endeavor. Once again, it is worth highlighting that FAPESP has been assisting in this sense, by demanding postdoctoral openings to be filled by scholarships granted as a budget item and being at least disseminated in international research channels.

Another important mechanism for internationalization of Graduate Studies is the formalization of Co-tutorship Agreements. Although there is greater incentive for its accomplishment, they do not reflect the reality for many Graduate Programs yet. Co-tutorship is a partnership signed by international academic agreements between Unicamp and a foreign educational and research institution whose main objective is the training of the master's degree or PhD student to hold a valid and recognized degree in the two convening institutions. This form of agreement provides for a common study program, in which study activities carried out in a program are validated by the partner Higher Education Institution (HEI). The thesis or dissertation is developed under the responsibility of at least two advisors: one from Unicamp and another from the convening university. The thesis/dissertation is presented only once, at Unicamp or at the other University. The co-tutorship PhD program always begins as a traditional PhD, and throughout its course the student chooses to perform it in co-tutorship.

In addition to the important aspect of the degree being recognized by the two partner institutions and the creation of an individual common program, which is specific for the student, other possible benefits of a co-tutorship PhD program comprise: access to infrastructure and complementary resources from different universities; exposure to two or more differentiated cultures; the increasingly valued academic mobility; acquisition of abilities not directly linked to the research, such as negotiation, adaptability, and management of remote projects; the provision, on the part of HEIs, of a differentiated education; and the insertion of PhD candidates into an increasingly globalized labor market.

Co-tutorship agreements also increased in the period under analysis. Nevertheless, the occurrence of co-tutorship programs is restricted to 16 of the schools with room for broadening it. Numbers ranged from 39 agreements in force in 2014 to 61 in 2018 — which does not mean new agreements per year, but the number of agreements that were reached in the aforementioned years. These agreements involve institutions from different countries, with an important representation of Europe, as Graph 9 shows.

GRAPH 7.9 – NUMBER OF CO-TUTORSHIP AGREEMENTS IN FORCE PER COUNTRY, 2014-2018



Source: PRPG Statistical Yearbook (2019).

When demanded to answer the question on co-tutorship in the 2019 Institutional Evaluation. To assess the importance of the participation of master's degree and PhD students in co-tutorship programs. If there is no co-tutorship, why is that happening? What would it take to increase the number of participants?), most of respondents focused on the procedures and bureaucracy of the processes. The following five comments depict such situation at the university:

- Electrical Engineering: Simplifying the procedures and texts regarding co-tutorship agreement would certainly be a measure for increasing the number of participants;
- Plant Biology: Co-tutorship programs allow a very effective collaboration between the program and institutions of excellence abroad. These co-tutorship programs

- are quite interesting, but still in small numbers in our program due to the required bureaucratic procedures;
- **Computer Science:** The participation of students in co-tutorship programs is very important both for students' training and for strengthening collaboration links in research. Despite all bureaucratic difficulty and scarcity of resources in general, IC (Institute of Computings) has consistently kept co-tutorship students. It is interesting to note that IC has also received students in co-tutorship programs;
  - **Applied Linguistics:** The Graduate Program in Applied Linguistics is considered to provide few co-tutorship programs, although most international agreements signed by PPG-LA professors provide for this type of exchange program. Among the main reasons for not obtaining co-tutorship programs in the period are considered: (1) difficulty in obtaining information and excessive bureaucracy in interinstitutional procedures; (2) lack of interest of partner institutions because there is, in their universities, an authorization policy excessively demanding and based on international rankings of universities according to Brazilian standards; (3) difficulty in obtaining the dispensation of annuities and fees in international universities; (4) incompatibility between the requirements and deadlines of international programs and those of PPG-LA; (5) lack, before the implementation of the PrInt program, of financing mechanisms for carrying out research missions of this type of agreement; and (6) international inexperience on a considerable part of the Program's faculty. In order to minimize the aforementioned difficulties, it would be necessary, first, to increase investments in this type of strategy on the part of Unicamp and funding agencies; second, the most affected fields of Unicamp should provide consulting/advisory services in such a way the Program adopts more effective strategies and encourages professors to deal with bureaucratic procedures; third, to define priority areas of competence in the Program focused on this type of partnership, for instance, Portuguese language teaching in emerging countries, especially China; and, finally, teaching evaluations and hiring of new professors for international experience and performance of this type of activity should be more relevant;
  - **Physics:** Although Unicamp has accounted for co-tutorship students during this period, the existing overly bureaucratic procedures make students disinterested in such possibility. There are situations in which students give up either on the request for co-tutorship, or on the enrollment in the program, deciding to exclusively undertake the program at the institution abroad. Unicamp must optimize and facilitate the co-tutorship program if it really aims at a greater impact on the Internationalization of the University.

Among the main reasons for failure in co-tutorship agreements can be mentioned: (1) difficulty in obtaining information and excessive bureaucracy in interinstitutional procedures; (2) lack of interest of partner institutions because there is, in their universities, an authorization policy excessively demanding and based on international rankings of universities according to Brazilian standards; (3) difficulty in obtaining the dispensation of annuities and fees in international universities; (4) incompatibility between requirements and deadlines of international programs; (5) lack, before the implementation of the PrInt program,

of financing mechanisms for carrying out research missions of this type of agreement; and (6) international inexperience on a considerable part of the Programs' faculty. Despite difficulties, Unicamp shows a growing interest in developing agreements of this nature.

The mobility and permanence of students and postdoctoral students, and the development of specific agreements are key elements for the advancement of the internationalization of graduate studies. In addition, the set of endeavors previously described are complemented by the participation of Unicamp in the PrInt program, the Capes Institutional Internationalization Program. PrInt was conceived by Capes in 2017 and launched in 2018, aiming at fostering the creation, implementation and consolidation of strategic plans for internationalization of Brazilian universities. According to Capes, for the first time, Brazilian Higher Education Institutions would strategically operate in their international actions, abandoning a pattern of previous interaction based on individual and often personalized initiatives, thus seeking the achievement of institutional interests.

The overall objectives of the Program are:

1. To promote the construction, implementation and consolidation of strategic plans for internationalization of contemplated institutions within the fields of knowledge prioritized by them;
2. To stimulate the formation of international research networks aiming at improving the quality of academic production linked to graduate studies;
3. To broaden actions to support internationalization in the graduate studies of the contemplated institutions;
4. To promote the mobility of professors and students, with emphasis on PhD students, postdoctoral students, and professors abroad and from foreign institutions to Brazil, linked to graduate programs in specialized fields with international cooperation;
5. To promote the transformation of participating institutions into an international environment;
6. To integrate other Capes development actions into the internationalization endeavor.

The Financing Items within the scope of the Program are:

- Assistance for Work Missions Abroad;
- Resources for Project Maintenance;
- Scholarships Abroad: "Sandwich" PhD program, Senior and Junior Visiting Professor, Training in short courses (Summer/Winter schools);
- Scholarships in the country: Visiting Professor in the Country, Young Talent with Experience Abroad, Postdoctoral Studies with Experience Abroad.

At Unicamp, 22 Priority Themes were defined. Coordinators of graduate programs developed projects within the Priority Themes and indicated the countries, partner universities, and the staff involved in the projects. The result was the organization of PrInt in *5 Thematic Fields, 22 Priority Themes, and 117 Projects*, involving *71 PPGs, 23 schools, and 60 countries*, as observed in Table 7.1.

TABLE 7.2 – PRINT UNICAMP – THEMATIC FIELDS AND PRIORITY THEMES

Thematic Fields	Priority Themes
1. Biodiversity, energy and sustainability: Challenges of the XXI Century	Study on and use of Biodiversity Energy Sources and Energy Matrix: Development, Integration, Sustainability and Technological Innovations Innovation and Sustainability Global Environmental Changes / Climate Changes and Landscape Dynamics
2. Complex, natural and artificial systems: from basics to applications	Research on Complex, Natural and Artificial Systems Information Sciences and Technology Genomics, Metabolomics and Proteomics Project and Development of Products and Processes
3. Democracy and Economic, Cultural and Social Development	Democracy challenges Difference, Diversity and Inequality Methodology, Epistemology and Language State, Policies and Education Economic and Social Development, Sociodemographic and Territorial Dynamics: Challenges in the face of Transformations of the XXI Century Challenges in Teaching of the XXI Century Transversal dialogues: Arts, Language, Knowledge
4. Health and Society: Global challenge	Food, Health and Society Studies on Healthcare Systems, Prevention, Healthcare Promotion, and Surveillance Chronic, Emerging and Pharmacological Diseases Ageing: a global challenge
5. Boundaries between Mathematics, Natural Sciences and Engineering	Nanotechnology Boundaries between Mathematics, Natural Sciences and Engineering: challenges of the XXI Century

Source: PRPG.

For the Priority Themes, actions and expected results were defined. In short, new high-level cooperations (especially through projects and research networks), invitations to lectures and courses abroad, co-organization of events abroad, co-guidance of students, training of professors and students abroad, performance of study missions and postdoctoral studies abroad, participation in international congresses, workshops, and fairs, in addition to the expansion of exchange programs with foreign research institutions, among others.

The recent approval of the Unicamp project in PrInt — which has comprised several fields, countries, and graduated projects and programs — will certainly assist in surveying more detailed analyses of the internationalization information collected for the internationalization planning of graduate studies and the discussion mainly about international partnerships and the formulation of strategies for target partnerships. The approval of the project provides for “Sandwich” PhD scholarships, coming from visiting professors, post-doctoral degree holders with experience abroad, junior and senior visiting professors, and training grants offered to professors, students and technical-administrative staff.

As a result of this project, graduate programs expect to have new high-level cooperations; invitations to lectures and courses abroad; co-organization of events abroad; co-orientation of students; training of professors abroad, in their respective fields; performance of study mission and postdoctoral studies abroad; to participate in international congresses, workshops and fairs.

Unicamp accounts for, among its faculty, a proportion of 5% professors and researchers from different countries. Most of these professionals have a permanent employment relationship. For graduate studies, the adopted strategy consists in broadening the percentage of visiting foreign professors in graduate programs, especially through calls linked to Capes PrInt or PRPG programs, other programs of development agencies or DERI itself. The postdoctoral program is an important channel to attract foreign researchers who can work in graduate programs, since these researchers are very active both in research and teaching activities. However, nowadays, the proportion of foreign postdoctoral degree holders is approximately 10% in the schools of Unicamp. For these professionals, who in most cases receive local funding, the strategy is to increasingly encourage a wide dissemination of calls abroad in order to attract foreign candidates. Furthermore, Unicamp has been seeking to attract professors and researchers of other nationalities to its faculty. The selection calls have been internationally disseminated, public tenders gradually begin to consider international insertion and knowledge of foreign languages, which has allowed to attract a greater number of candidates from other countries. Hence, the number of foreign professors with employment relationship with Unicamp increased from 68 to 131 from 2012 to 2017, which is a significant growth.

A challenge posed to the internationalization of graduate studies is the need for broadening the provision of disciplines taught in English, which is also the case within the context of undergraduate studies. The lack of mastery of the English language by a significant portion of the faculty, and especially students, consists in an important obstacle to the greater dissemination of disciplines provided in foreign languages. Nowadays, there is only one academic PhD program that is exclusively provided in English.

On this matter, the most coordinators of graduate programs of Unicamp deem as insufficient (or even non-existent outside the Campinas campus) the structure for meeting language teaching needs, as highlighted in the following comments: “Regarding graduate teaching, specifically the PPG..., the Language Teaching Center (CEL – *Centro de Ensino de Línguas*) of Unicamp has no purpose, since its courses are focused on undergraduate teaching. Certainly, it would be extremely useful for the Program if its students could take foreign language disciplines focused on the writing of international articles and oral presentations at international events of good reputation. Currently, it only provides the instrument for proficiency evaluation of the selection process as an attempt to ensure that students have such competence”; “No, among students who feel partially skilled in a foreign language, many state they have sought language courses at Unicamp, and part of them did not fill an opening”; “Students of the program do not take advantage of CEL resources. The demand of the students of the schools is generally higher than the provision of courses at CEL. Thus, students have sought to take English language courses in schools in the city of Limeira and neighboring regions”; “I do not believe that CEL can meet all the demand, but I have no objective data. I notice many students waiting for a vacancy in CEL, but many of them resort to other means in order to meet this demand.”

But there are programs whose authorities believe that CEL meets their needs, as illustrated by this comment: “Yes. The Program adopts the proficiency exam of CEL for students’ admission to master’s degree and/or PhD programs. CEL outreach courses also meet the demands of PPG students.”



Thus, it is noteworthy, as the challenge for advancing the internationalization of graduate studies, the fact that the provision of programs taught in the English language for both professors and graduate students is still limited and does not fully meet the demands of the internal community. A desirable action, in this sense, is the search for mechanisms that enable a more comprehensive and continuous provision of foreign language courses.

## 7.8 Internationalization of Research

2015 LATIN AMERICAN SYMPOSIUM OF FOOD SCIENCE (SLACA) AT UNICAMP



Antoninho Perri/SEC – Unicamp.

Brazil is, in numbers, among the world's largest producers of science: in 2018, the country accounted for more than half of the scientific production (considering all types of academic production) in Latin America (52.5%), which corresponds to 2.63% of worldwide science based on data from the Scopus database. However, increasing the impact of scientific production is still a challenge to be overcome. Science management, access (import) and production of inputs, and the qualification of the workforce are some of the challenges to be faced. These challenges can be addressed more appropriately through internationalization, which will increase the impact of the Brazilian scientific production. In addition, the exchange of ideas also enriches the scientific environment, strengthening and solidifying the Brazilian science. Unicamp has strategically invested in internationalizing its research activities in order to support these expected results.

Actions aimed at promoting research internationalization—whether specific, through the effort of professors and researchers, or institutional agencies, through a planning of the schools and agencies of the central administration, such as the Dean's Office of Research and the Executive Board of International Relations—have been happening throughout Unicamp. Fundraising has been a significant result of the internationalization endeavors of this University. Although research efforts at the university are still fundamentally supported by resources coming from national agencies, research projects enabled by resources raised along with international sources have been increasingly frequent, and the university has been

operating to stimulate the search for these funding channels, through the dissemination of opportunities and efforts to create funding alternatives with international partners.

There are, however, some highlights of international agreements with fundraising coming from foreign sources. For instance, it is worth mentioning the participation of the Institute of Biology in two multinational international networks of cooperation and funding to research: the Structural Genomics Consortium (SGC) and the Singapore Immunology Network. Similarly, the Arts Institute (IA) has raised funds from the Leverhulme Trust to fund the *Reimagining Italianità* research project, which also involves other institutions such as University College London UCL, University of Cambridge, and Brown University. The agreement promoted by the School of Education with the University of Siegen, in Germany is also highlighted, funded by the DAAD (German Academic Exchange Service), precisely together with CAPES.

Almost all schools of Unicamp have been taking advantage of internationalization actions promoted by CAPES, CNPq, and FAPESP. One of the most disseminated programs at the University is the aforementioned PrInt-CAPES, which allows the establishment of agreements with foreign Universities and Research Institutes. Through this program, the School of Chemical Engineering, for example, has engaged in 4 international projects that will allow to integrate it with more than 20 different universities worldwide, including the Massachusetts Institute of Technology (MIT – USA), Imperial College London (United Kingdom), Universitat Autònoma de Barcelona (Spain), and the University of Lyon (France), among many others. The general evaluation of coordinators of Unicamp schools is that projects developed under PrInt are relevant for deepening and consolidating networks for international relations.

Unicamp takes great advantage of internationalization actions on the part of FAPESP, through the funding of several activities in this regard. The São Paulo Schools of Advanced Sciences (SPSAS), of FAPESP, promote internationalization within Brazil by providing short courses in different fields of knowledge. During the period (2014-2018), Unicamp hosted 11 SPSAS. It is worth highlighting that bringing international science to Brazil is a rich way to promote internationalization when sending students and professionals abroad. In this respect, some activities carried out between 2014 and 2018 may be mentioned. There were two FAPESP SPSAS at the IFGW, one with 7 speakers and 49 foreign participants, and the other with 13 speakers and 64 foreign participants. The School of Food Engineering also organized one of these schools, with 4 speakers and 50 foreign participants, as well as the Institute of Human Sciences and the Humanities, with the “São Paulo School of Advanced Science in Methodology for Humanities”.

A more recent action on the part of FAPESP to internalize international science, and which has also been performed at Unicamp, is the São Paulo Excellence Chair (SPEC). In this program, foreign researchers work as visiting professors, having their research funded at a university or research institution in São Paulo. Unicamp awarded 4 of these projects in the period, which corresponds to the welcoming of four researchers from U.S. universities – George Washington University, University of Georgia, Colorado State University, and Michigan State University – to the Institute of Geosciences, School of Medical Sciences, School of Agricultural Engineering, and to the Environmental Studies and Research Center, respectively. This program will certainly be expanded throughout Unicamp, considering the new projects already proposed in 2019.

There have been several international events organized or co-organized by Unicamp professors and researchers with the participation of foreign researchers. This has been the main strategy of formal approximation with foreigners. Moreover, there have been several international congresses held at Unicamp or organized by its researchers, in partnership with foreign researchers: *XXVII Congresso da ANPPOM – Associação Nacional de Pesquisa e Pós-Graduação em Música* [XXVII ANPPOM Congress – National Association of Research and Graduate Studies in Music] (Arts Institute); *I Congresso Internacional da Rede Brasileira de Enfermagem e Segurança do Paciente* [I International Congress of the Brazilian Network of Nursing and Patient Safety] (School of Nursing); *A hermenêutica Crítica de Paul Ricoeur* [Paul Ricoeur's Critical Hermeneutics] (Institute of Language Studies); *XXVI Congresso Brasileiro de Virologia e X encontro de virologia do Mercosul* [XXVI Brazilian Congress of Virology and X Mercosur Virology Congress] (Institute of Biology); Latin American Symposium of Food Science (SLACA) (School of Food Engineering). Four international congresses were also hosted at the IFGW. The following workshops also outstand: V Workshop on Male Reproductive Biology and 1st and 2nd Babraham Institute and São Paulo's Universities (BISPU) Workshop, organized by professors of the Institute of Biology; New Historical Linguistics and the Use of Annotated Corpora, organized by the Institute of Language Studies; the Workshop on Dynamical Systems, organized by the Institute of Mathematics, Statistics and Scientific Computing of Unicamp; 15th IEEE International Workshop on Advanced Motion Control and U4C Workshop: Sustainable Systems and Societies: Energy, Environment and Policy Frameworks, and 4 others organized by the School of Mechanical Engineering; 14th Workshop On Semiconductors and Micro & Nano Technology, organized by the School of Electrical and Computer Engineering, among others. Thus, it is noteworthy that the organization of academic events of international scope has been frequent at Unicamp, as indicated by the aforementioned examples.

In some schools, there is an institutional organization that assists in internationalization initiatives, focusing on research activities. At the Institute of Biology, for example, there is a dedicated office that deals with international collaborations and student mobility. Likewise, the IFGW established in 2018 a permanent internationalization committee, whose purpose is to promote actions, such as providing undergraduate and graduate disciplines taught in English, consolidating itself as an international research hub of Latin America and attracting foreign students besides Latin Americans. Departments were also established at the School of Dentistry of Piracicaba and at the School of Agricultural Engineering. Authorities of other schools indicated that the importance of internationalization has been increasingly recognized, and they have been taking actions to consolidate structures and support mechanisms dedicated to the matter.

Authorities of almost all schools have encouraged professors and students to participate in mobility calls promoted by national development agencies, such as CAPES—with PrInt and PDSE—, and state programs, such as FAPESP—with BEPE—, as well as programs such as those provided by Santander and eventually CNPq. Some Interdisciplinary Research Centers have no clear institutional strategies to encourage the internationalization of research, but they rely on specific studies based on initiatives of researchers and professors who understand the importance of this movement.

There is a movement towards international integration throughout Unicamp. Nevertheless, the insertion of internationalization policies into the different Schools and

Interdisciplinary Research Centers considerably varies. Some schools are already more structured in this sense, having internationalization offices and dedicated employees. These, indeed, have already benefited from their actions. On the other hand, some schools have only recently started their movement towards internationalization actions.

Scientific publications with partner foreign institutions consist in one of the main noteworthy indicators of the internationalization movement and were verified in all schools of Unicamp. Most of these are still specific collaborations, whereas the remaining results from a greater integration, involving the training of students and postdoctoral students, funding projects in partnership, the visit of foreign researchers to Brazil, among other actions. The increase in the number of published articles co-authored by foreign researchers and in the number of disciplines provided in English at the University reflects the increase in activities related to internationalization, which has qualified Unicamp and its set of professors and students in search of greater impact on research.

An interesting aspect worth mentioning is that many of Unicamp professors hired in recent years have spent some time abroad, thus connecting people from their old workplaces to their current projects, increasing internationalization among schools and, therefore, of the University. On the other hand, Unicamp professors who had their training in Brazil have sought research internship and postdoctoral studies abroad in order to qualify and eventually meet the new research funding policies of FAPESP, which has been demanding international experience on the part of professors, thus encouraging researchers to temporarily leave the country. Coordinators of the Institute of Chemistry point to a significant increase of professors performing internship abroad in the last five-year period, an average of 3.2 professors/year compared with the previous five-year period, which accounted for 1.2 professors/year. The School of Applied Sciences, in which many professors are launching their careers, invested in this direction and granted leave permits to 37 professors for postdoctoral studies abroad. Similarly, in the five-year period in question, the following schools sent professors to institutions abroad: the Institute of Language Studies (13 professors), the Institute of Computing (12 professors), and the School of Electrical and Computer Engineering (9 professors). Authorities of other schools also recognize the relevance of the international experience of the faculty as an element of academic qualification. Overall, Schools and Interdisciplinary Research Centers are committed to ensure this possibility to professors and researchers, although there is also, in the case of some schools, some difficulty in doing so due to the relatively small number of personnel.

In addition, an increase in the flow of foreign researchers to Unicamp was verified. For instance, it is worth mentioning the case of the School of Chemical Engineering, which welcomed 14 foreign professors in the period. The School of Nursing brought 8 international speakers; the School of Education was able to attract, in the five-year period, 216 researchers from 32 different countries for academic visits, exchange programs, study/research mission, or at the invitation of research groups. Similarly, many of the professors and researchers throughout Unicamp schools have been speakers at international events, corroborating the quality of research developed at this University.

The largest flow of foreign scientists to Brazil takes place through seminars and short-term visits, which are very significant for the student and teaching community. The visits, however, should be longer, which has been promoted by FAPESP, for example, through the SPEC program, still growing at Unicamp.

In a few cases, specific strategies for attracting foreign researchers were noticed. Accordingly, the IFGW created, in 2018, its permanent internationalization committee, whose objectives demonstrate to be a strategic planning for internationalization, attracting researchers and non-Latin students to Unicamp.

The internationalization research activities in Interdisciplinary Research Centers were mostly based on bilateral agreements, possibly with funding from federal and state agencies. These agreements have been signed with dozens of institutions worldwide that are references in their fields. The performance of Interdisciplinary Research Centers of Unicamp, overall, is similar when compared with international equivalent institutions, although its interdisciplinary quality must be considered. Internationalization is one of the strategies sought by centers, aiming at increasing the quantity and quality of their academic production. Furthermore, internationalization initiatives can assist in the formation of new groups, in the broadening of research lines, in the hiring of new researchers, etc. Some of the observed internationalization actions can be mentioned: participation of researchers in the editorial board of journals and international organizations in the field; organization of large international events; exchange programs of visiting professors; courses, seminars, and lectures provided by and/or with the participation of foreign professionals; exchange programs of researchers, students and postdoctoral degree holders in research centers abroad.

The indication that internationalization is increasingly present in the strategy of Interdisciplinary Research Centers indicates a very positive change, from a people-centered pattern (professors and researchers) to an approach of institutional nature, from which it is possible to align actions and strategies with the perspective of each school and of Unicamp as a whole.

## 7.9 Evaluation and challenges

The five-year period between 2014 and 2018 was certainly marked by important advances in internationalization. The issue has been gradually inserted into the university's agenda, its Schools and Interdisciplinary Research Centers, being explicitly present in the Strategic Planning of the University, Schools and Interdisciplinary Research Centers. Unicamp has been actively participating in international networks and forums and events on internationalization. Institutional partnerships have been established based on increasingly clear and relevant criteria. The mobility of professors, researchers, and employees has been constant. And also, the students' mobility—although the volume of resources in recent years, much lower than that made available in the early years of the Science Without Borders Program—has somehow limited the ability of the university in ensuring financial assistance to students who leave for exchange programs abroad.

Challenges, however, remain. The effective engagement of Schools and Interdisciplinary Research Centers requires the consolidation of capacities for internationalization in these university academic units, ensuring greater effectiveness of actions to support mobility and the management of agreements. The constitution of structures, whether formal or not, in Schools and Interdisciplinary Research Centers can be an important action in this sense.



Moreover, the broadening and improvement of communication instruments are also important to expand the visibility of teaching, research and outreach activities developed at Unicamp, as well as increasing the quality of information available in foreign languages, mainly in English and Spanish.

Another challenge also involves the expansion of the provision of undergraduate and graduate disciplines taught in English. There are already some initiatives of this nature in the university, which are still scarce and restricted to a few courses and programs. Such provision must be broadened to move forward in the constitution of an international environment at Unicamp itself, in addition to seeking balance in the students' exchange programs performed at certain foreign universities.

It is worth highlighting that these challenges have been faced by Unicamp, both within the scope of the higher management of the university and its Schools and Interdisciplinary Research Centers. Hence, Unicamp is expected to remain an institution of excellence, a reference in teaching, research and outreach activities, and internationally recognized.

Therefore, it is noteworthy that the effective internationalization of the university depends, fundamentally, on the engagement of students, employees, professors and researchers. Partnerships, agreements and collaborations are structured based on them. Overcoming the emerging challenges requires the consolidation of internationalization management strategies that have already been implemented. From them, it is possible to reconcile individual initiatives with the institutional perspective towards internationalization.

To deepen the infrastructure to support cooperation and mobility, to educate the internal community for internationalization, to improve the communication of results and opportunities, to adjust processes and to establish routines: these are the tasks that may enable achieving the objectives proposed by Unicamp in its internationalization strategy. The fundamental conditions for doing so have been already described and were strengthened in the 2014-2018 period. It is up to the university to continue dedicating efforts in this direction and thus continuing this movement.





8.

## SOCIAL AND TECHNOLOGICAL INNOVATION AT UNICAMP



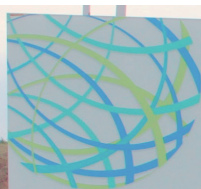
Surgery at University Hospital



Agricultural Cooperative incubated at ITCP



Eixo Público – junior company – Public Administration undergraduate students



PARQUE CIENTÍFICO  
E TECNOLÓGICO  
DA UNICAMP

Unicamp's Science and Technology Complex



Surgery at University Hospital e Agricultural Cooperative incubated at ITCP: Antonio Scarpinetti/SEC – Unicamp.  
Eixo Público – junior company – Public Administration undergraduate students FCA – Unicamp (photo archive).  
Unicamp's Science and Technology Complex: Kátia Kishi – Inova Unicamp.



The region of Campinas, in the countryside of the state of São Paulo, is recognized as an area that favors the production of knowledge and technologies. ‘Innovation’ and ‘entrepreneurship’ are words often associated with the description of competences developed by educational and research institutions and with companies operating in different sectors located in the region, several of which resulting from an initiative of Unicamp alumni, as detailed below.

The impact of Unicamp’s presence can be illustrated with some examples, starting with the effects of its campi. The timeline pictures of the School of Applied Sciences clearly show the campus deployment was a development vector in the region of Limeira where it is located. In less than 10 years, the campus was populated, and by 2018 the population density of this area had a huge transformation. A similar process was observed with the implementation of the Barão Geraldo campus 50 years ago (see pictures below). The area where Unicamp was built radically changed from a completely rural region and transformed its surroundings. Therefore, the deployment of a public multi-campus university has a strong impact on the development of cities, not only as knowledge producers, but also as engines of development.

Unicamp’s contribution to the economic development of the Campinas macroregion is remarkable and growing. By training highly qualified professionals, developing technical scientific infrastructure and conducting research on themes at the frontier of knowledge, the university has contributed to the consolidation of innovative capacities in the region. For instance, CIATEC 2 (a high-tech hub, as defined in the master plan of the city of Campinas) has developed around Unicamp, as well as several research centers and technology companies, including electron accelerator Sirius (the only one in the Southern Hemisphere), *Laboratório Nacional de Luz Síncrotron* (Brazilian Synchrotron Light Laboratory), *Instituto Nacional de Pesquisas em Materiais* – CNPeM (Brazilian Center for Research in Energy and Materials), Santander Data Processing Center, the Eldorado Institute, Pontifical Catholic University of Campinas (PUC-Campinas), *Centro de Tecnologia da Informação Renato Archer* (Information Technology Center Renato Archer), among others. Therefore, Unicamp has contributed to making the Campinas macroregion a national reference center for technological innovation. In addition, the new area acquired by Unicamp in 2015 will house the Hub *Internacional de Desenvolvimento Sustentável* – HIGS (International Hub for Sustainable Development), a project that has been discussed since 2018.

Besides technological innovation, the university conducts many innovative activities that can be understood as social innovation. These actions involve the formulation and implementation of new organizational, management, governance, relationship products, processes, services or models specifically focused on meeting needs and addressing social problems. However, as they are not activities with clearly defined indicators in Brazil, social innovation at Unicamp is not measured through structured quantitative indicators like technological innovation. The absence of a good and comprehensive definition does not allow a more systematic report of Unicamp’s performance in this area, as it overlaps its outreach activities. Thus, this chapter seeks to illustrate this performance through exemplary cases, describing three dimensions of this area of innovation: social innovation, technology innovations of Unicamp, and Unicamp Technology Complex, with a history of achievements from 2014 to 2018.

### AERIAL PICTURES OF THE BARÃO GERALDO CAMPUS, UNICAMP, FROM 1966 TO 2016



SIARQ – Unicamp (photo archive).

## 8.1 Social innovation

The importance of social innovation in the academic context has been reinforced as higher education and research institutions have gradually recognized the need to consider the results of their activities beyond traditional products and indicators such as number of publications, citations and patents. Graduate employability, the reach of relationships with non-academic actors and the socioeconomic impact of teaching, research and outreach activities around universities are examples of increasingly valued indicators associated with the performance of these institutions.

In June 2019, Unicamp became a member of the Hanseatic League of Universities, an international network of universities committed to initiatives that generate effective social and economic impact beyond the traditional academic results. This adhesion has strengthened its commitment to actions of social impact through teaching, research, outreach and management initiatives. Actions of this nature have been recurrently performed by Unicamp through institutional projects or initiatives of professors, researchers, staff and students. Examples include new student admission systems, development of innovative pedagogical methodologies and approaches, curriculum innovations, introduction of new systems for process monitoring and management, etc. Some of these experiences have been discussed in other chapters of this report, so they will only be mentioned here.

In order to illustrate the university's potential for generating social innovation, this report will present some initiatives developed within Unicamp focusing on actions related to projects that promote social impact around the university campi in Campinas, Limeira and Piracicaba, and at the regional and national levels. These initiatives are associated with teaching, research and outreach activities and present potential for generating social impact from innovative perspectives.

Then, this report presents institutional innovations, social innovations resulting from research, innovations in the health area, actions of student entities and popular cooperatives.

### 8.1.1 Institutional innovation

The period covered in this report presented several institutional innovations at Unicamp related to its mission of social responsibility and social impact. Two examples are provided below which illustrate such innovations.

In the 1980s, the University of Campinas (Unicamp) had a “Special Committee to deliberate on foreign students, refugees or asylum seekers” (CONSU 005/1987 of April 30, 1987), which was responsible for analyzing and forwarding requests of foreign students, refugees or asylum seekers who applied to the university. This committee shows Unicamp’s leading role in welcoming refugees. Between 1980 and 2018, 45 refugees were enrolled according to a study conducted by the Academic Board of the university.

#### THE ACT OF JOINING THE SÉRGIO VIEIRA DE MELLO CHAIR AND HUMAN RIGHTS EDUCATION PACT



Antoninho Perri/SEC – Unicamp.

In 2018, a large atlas was published showing the distribution of refugees in the country, particularly in the state of São Paulo, in a project that analyzed population studies conducted by Unicamp’s professors and researchers. With this project and the current management program that started in 2017, an important institutional advance was made in this process with the implementation of the Sérgio Vieira de Mello Chair (CSVM) in July 2019 as a result of a partnership between UNICAMP and United Nations High Commissioner for Refugees (UNHCR)<sup>1</sup>. The Chair is part of the Human Rights Executive Board and has an Advisory Committee comprised of professors, researchers, representatives of the rectories, administrative bodies of UNICAMP, the Campinas City Hall and the Campinas Metropolitan Agency (ministerial directive GR47/2019). Under this Committee, subcommittees were created to act in the areas of teaching, research and outreach. The teaching subcommittee is focused



on student reception and retention and Portuguese courses; the research subcommittee is focused on supporting researchers and research groups that study refugees and promoting national and international partnerships. Finally, the outreach subcommittee organizes academic seminars, workshops, courses and sporting events. In general, the activities aim to contribute to an effective insertion of refugees in Brazilian society by ensuring the access to higher education, retention policies and university outreach activities.

Following a discussion process that included public hearings, in November 2017 the University Council approved several measures that increased student admission systems based on affirmative action at Unicamp. Besides the two existing programs — *Programa de Ação Afirmativa e Inclusão Social* – PAAIS (Affirmative Action and Social Inclusion Program) and *Programa de Formação Interdisciplinar Superior* – ProFis (Higher Education Interdisciplinary Program)—, the following systems were included:

- Ethnic racial quotas at the Unicamp admission exam and Enem-Unicamp, with 25% of available seats for self-declared black and brown candidates;
- 20% of the total seats by Enem-Unicamp system;
- Seats, without admission exam, through the Olympic Vacancy system, based on the performance in scientific and knowledge competitions;
- Indigenous admission exam.

#### UFSCAR INDIGENOUS STUDENTS CELEBRATE THE APPROVAL OF THE INDIGENOUS ADMISSION EXAM WITH TYPICAL DANCING AND SINGING



Antoninho Perri/SEC – Unicamp.

### 8.1.2 Social innovations resulting from research and outreach programs

The report discussed the developments in research and outreach activities with an impact on broader society. Some examples are provided below which illustrate some impacts on public and cultural policies.

In terms of public policy, several research projects have resulted in support to small

producers. In addition, NEPA has supported the creation of regulations for small dairy farmers who produce cheese at the municipal, state and federal levels. Through outreach work developed with the Angatuba City Hall, in partnership with the Federal University of São Carlos – UFSCar, regulations for the production of Porungo artisanal cheese were developed and implemented and the municipal inspection service was implemented, which favored many cheese producers of the municipality, allowing them to become formal producers. At the state level, NEPA has worked with *Associação Paulista do Queijo Artesanal* – APQA (Artisanal Cheese Association of São Paulo ) and *Coordenadoria de Defesa Agropecuária* – CDA (Agricultural Defense Coordination) to promote the creation of state regulations for small producers in line with the *Selo Arte* created by the Ministry of Agriculture, Livestock and Food Supply in 2018. At the federal level, NEPA and *Associação Brasileira de Criadores de Ovinos Leiteiros* – ABCOL (Brazilian Association of Dairy Sheep Breeders) proposed regulations for *in natura* sheep milk, involving legal requirements for dairy sheep farming in Brazil, mostly practiced by small producers.

Also regarding the development of municipal policies, the collaboration of NUDECRI researchers, linked with Latin American Network of Surveillance, Technology and Society Studies Latin American Network of Surveillance, Technology and Society Studies – Lavits, is cited in the development of a municipal law proposal to regulate the responsibility of the municipality for the collection, processing, storage and use of information produced by citizens and possessed by direct and indirect public administration bodies. Lavits, in contact with municipal legislative authorities, identified the possibility of collaboration for the development of studies on a law proposal to improve the management and regulation of personal data of citizens at the local level. The federal legislative context already had studies for the law that would become the General Data Protection Law, and the entity considered that a complementary local project could contribute to the approval of a project at national level and fulfill the primary role to provide citizens with more protection in terms of data management by local public authorities. The first law proposal was developed for the municipality of Campinas and submitted to the City Council. Other projects were created from this model for other municipalities, with some adaptations by the legislators. A public campaign was created with other partners, such as Intervozes, focused on this idea<sup>2</sup>.

In education, IEL played an important role in writing the National Curriculum Base for Elementary and High School, approved by the National Council of Education in 2017-2018. Besides the participation of IEL professors in the development of parts of the document for Portuguese language in the early and late years of elementary school and high school, an IEL professor was the coordinator of the language area for high school. In addition, in 2018, IEL professors participated in training meetings organized by the Ministry of Education and Culture (MEC) in partnership with CONSED and UNDIME for educators and technical staff of state and municipal divisions from across the country to support the development of state curricula.

In the health area, NEPP has acted in the Metropolitan Region of Campinas (RMC) on the production of soft technologies, such as the structuring of Care Services for Pregnant and Post-Partum Women and Diabetes Mellitus patients. It also supports the organization of

2. A website was developed by Lavits to show historical facts and present the context and partners of the campaign: <http://dadospessoais.lavits.org>.

the Regulatory Complex of the Metropolitan Region of Campinas and the implementation of Permanent Education Initiatives for Primary Care in the RMC, both foreseen in the plan approved by the Health Chamber, validated by the RMC Development Council. Going beyond the RMC, it has supported the implementation of a care service for pregnant, parturient and post-partum women via SUS (Brazilian Health System) in the state of São Paulo.

Also, in health care, FEF has conducted research on adapted physical activity and adapted sports, including outreach projects. Cerebral palsy (CP), also called chronic pediatric encephalopathy, is defined as a non-progressive movement disorder affecting the central nervous system (CNS) that occurs before, during or after birth. Sports practiced by people with CP include CP football, which follows FIFA rules for conventional football, with some adaptations made by the Cerebral Palsy International Sports and Recreation Association (CP-ISRA) considering the effects of this disorder. In football or other team sports requiring a more intensive practice, physiological and functional aspects of players should be evaluated, so from 2014 to 2018, assessments were performed in different moments, with monitoring of bio-motor and anthropometric variables of athletes from the CP Brazil national football team. These assessments were performed at the School of Physical Education at Unicamp and in the places where the Brazil national team was practicing, through Laboratory of Physical Evaluation in Exercise and Sports Adapted (LAFEA – *Avaliação Física no Exercício e Esportes Adaptados*), contributing to a better development of these people with disabilities, specifically with cerebral palsy. Several undergraduate and graduate students are involved in these activities.

#### WHEELCHAIR FENCING PROJECT



Antonio Scarpinetti/SEC – Unicamp.

In the area of public policies focused on biodiversity, IB has acted on the creation of widely applied guidelines and methodologies for biodiversity monitoring in state and federal protected areas throughout Brazil and abroad and data collection for public policies.

During this period, public policy observatories were created and/or strengthened. A partnership between NEPO and IFCH allowed the Migration Observatory in São Paulo to expand its research on international migration, refuge, human trafficking and slave



SUMMARY

labor, with the support of the Labor Court, Immigration Museum of the State of São Paulo, *Missão Paz*, United Nations Population Fund, Ministry of Justice and Campinas City Hall. In the metropolitan region, the group has developed studies on governance of international migration at the local level, social policies and human rights, supporting the creation of an office for the National Refugee Committee in Campinas, a project of technical scientific cooperation with *Serviço de Referência ao Imigrante, Refugiado e Apátrida* (Reference Service for Immigrants, Refugees and Stateless Persons) of Campinas and the creation of discipline AM076 – Humanitarian internship: an unprecedented initiative at the University. In the countryside, with the support of Araraquara Labor Court, the group created new migration spaces in the country, structured at the interface with agribusiness. When analyzing the different internal and international migration processes, the Migration Observatory in São Paulo articulated local transformations in population dynamics with global changes, combining teaching, research and outreach programs.

Also, at the IFCH, *Centro de Estudos Rurais – CERES* (Center of Rural Studies) created the Rural Conflicts Observatory in 2014, as a result of an initiative of graduate students and professors. It brought together researchers from several universities in São Paulo, such as USP, UNESP-Araraquara and UFSCar. Acting as a tool for interface and dialogue with rural social and trade union movements in the state of São Paulo, the Rural Conflicts Observatory has promoted reflections on the diversity of actors involved, violation of rights and conflict-triggering dynamics. It seeks to map the diversity and number of social conflicts in the state of São Paulo (quantitative aspect), also discussing them qualitatively. Then, actual cases of conflicts acted as triggers allowing discussions on references and conceptions of rural social subjects in the social dynamics where they were involved. The group also promoted the visibility of conflict dynamics and violations of rights, and supported the development of strategies by the organizations, movements and official institutions whose objective is to defend the rights of rural people. The work had a focus on social and conflict dynamics associated with the conflicts resulting from sugarcane and orange crop reconfiguration in Alta Mogiana/Ribeirão Preto region; the traditional, indigenous and *quilombola* communities of Vale do Ribeira region and the northern coast of the state of São Paulo; small properties in the west region of the state of São Paulo, and land reform areas in the southwest of the state of São Paulo. Trustful relationships built through actions with partner organizations for the creation of the Rural Conflicts Observatory were initially controversial aspects, but over time, they proved to be powerful from an analytical perspective. After all, how to produce valid knowledge about the social subjects we took as partners and co-producers of the desired knowledge? In this discussion about an “epistemic identity” as a group and in relation to research themes, we assumed concerns closely related to the participating studies. Over time, practice within the Rural Conflicts Observatory has shown that closer links between researchers and the social subjects/processes to be investigated do not constitute a limiting factor of/related to research. On the contrary, they are an opportunity to capture voices and reports that would hardly be accessible to anyone in a neutral place.

Finally, the Human Rights Observatory should be highlighted, it is the result of the university's adhesion to the University Pact for Promoting Respect for Diversity, a Culture of Peace and Human Rights in October 2017. Its reflections led to the creation of the Human Rights Executive Board in March 2019 to promote tolerance, citizenship, inclusion,



diversity, plurality and equity among Unicamp members. In addition to the Human Rights Observatory, the Board of Directors included the Sérgio Vieira de Mello Chair for Refugees presented above, the Advisory Committee for Ethnic-Racial Diversity, the Advisory Committee for the Fight Against Gender and/or Sexual Orientation Discrimination and Sexual Violence, and the Accessibility Advisory Board.

As a result of theater research, three editions of the show *PERCH – uma celebração de voos e quedas* (PERCH – a celebration of flights and falls, free translation) were performed in October and July 2014 with a mixture of physical, aerial and street theater, circus, dance, music and multimedia projections. It was the result of an international partnership created in January 2012 involving three theater companies from different continents: LUME Teatro from Brazil, Conflux from Scotland, and Legs on the Wall from Australia; as well as Irish composer Stephen Deazley. The show had more than 170 artists, including actors, dancers, musicians, trapeze and aerial artists, and had a significant impact on the daily activity in the central region of Campinas, gathering more than 22,000 people at artistic events held on the street, on building balconies, roofs, windows, stairs, and treetops. The shows also had 20 producers and live participation of orchestras of Campinas and Unicamp playing together, simultaneously with the show performed in Scotland, with interaction between both shows through live video internet broadcast to the public.

### 8.1.3 Innovation in health care

As mentioned above, besides its actions in teaching, research and outreach programs, Unicamp plays an important role in health care in the macroregion of Campinas and other cities beyond its coverage area, as well as in other states. Unicamp's health area includes a Hospital Complex, comprised of the University Hospital, Woman's Hospital Prof. Dr. José Aristodemo Pinotti, the Center for Hematology and Hemotherapy, Center for Diagnosis of Digestive System Diseases, and the Community Health Center (CECOM – *Centro de Saúde da Comunidade*). Unicamp works in partnership with the São Paulo State Government in the management of the Sumaré State Hospital and Piracicaba Regional Hospital, as well as the Outpatient clinics of Specialties (AMEs – *Ambulatórios Médicos de Especialidades*) in Amparo, Limeira, Mogi Guaçu, Piracicaba, Rio Claro, Santa Bárbara D'Oeste, São João da Boa Vista. With the expansion of the health area, the current management created the Executive Board for Unicamp Health Area to combine and consolidate strategic actions for the university's hospital complex. Of note, the AMEs managed by Unicamp were recognized as the best in the state, as evaluated by the State Department of Health.

## HOSPITALS AND AMES MANAGED BY UNICAMP



AME Santa Bárbara D'Oeste

AME Amparo



AME Piracicaba

Hospital Regional de Piracicaba

AME São João da Boa Vista



AME Limeira

AME Mogi Guaçu

AME Rio Claro

Hospital Estadual de Sumaré, AME Santa Bárbara D'Oeste, AME Amparo, Hospital Regional de Piracicaba e AME Rio Claro: DEAS Unicamp Archive. AME Mogi Guaçu, AME Piracicaba, AME Limeira: Antonio Scarpinetti/SEC - Unicamp. AME S.J. da Boa Vista: Antoninho Perri/SEC – Unicamp.

Three decades after its deployment in the campus of the University of Campinas (Unicamp), the University Hospital is today the most visible link in Unicamp's chain of relations with society. Its care capillarity of high complexity is a reference service for the municipality of Campinas and the macroregion that covers 86 municipalities and about 6.5 million inhabitants, as well as patients from 512 municipalities of São Paulo and other states. During the period covered in this report, intense hospital equipment modernization was observed and the implementation of the hospital management system and electronic medical records at the University, through an agreement with the University Hospital in Porto Alegre at the Federal University of Rio Grande do Sul.

Among many good examples, during this period, the Referenced Urgency and Emergency (UER – *Urgência e Emergência Referenciada*) unit of University Hospital adopted the Manchester Protocol for Risk Classification, leading to a 40% reduction in the number of consultations in the unit when compared to the historical average. Also in the UER, a computer system was implemented to manage requests for laboratory tests, the Sepsis Protocol was



deployed, the UER wound prevention and treatment group was created to improve the nursing care provided to patients with different injuries, and the Internal Regulation Center (NIR – *Núcleo Interno de Regulação*) of University Hospital was created. In addition, the first Tissue Banking and Cell Therapy was inaugurated in the region and the second in the state. This new area has allowed the processing, storage and availability of biologically safe tissues – bones, cartilages, tendons, ligaments, menisci and fascias – to be used in orthopedic surgery, neurosurgery, otorhinolaryngology surgery, plastic surgery, dental surgery, among others. In this sense, the first endovascular hybrid room in a surgical center of a SUS hospital in the country was installed at the HC. This hemodynamic intervention room is part of a new concept of intelligent hybrid rooms in operating rooms equipped with high-definition imaging equipment designed to optimize the surgery duration and patient recovery.

In this period, CAISM was certified by the Ministry of Health as a national reference center for Kangaroo care, a technique created in Colombia and used in the division of neonatology since 2012 and which acts as a model for other services to train professionals and replicate the method. According to this technique, a preterm baby is kept skin-to-skin with a parent – mother or father – to keep the baby warm. Skin-to-skin contact with parents also strengthens babies, thus eliminating the use of incubators. This practice helps control the baby's temperature; reduces the risk of regurgitation; favors weight gain; reduces the hospitalization time, the risk of infections and mortality, and promotes breastfeeding and attachment and bonding with the parents.

#### 8.1.4 Actions of student entities: integration, social responsibility and entrepreneurship

In addition to regular curricular activities, the involvement of students in different academic dimensions is an element that can contribute to their education. Participating in student organizations allows students to apply the knowledge acquired in training, learn about interesting issues and different aspects of the university, and contribute to a living university environment.

In general, Unicamp student entities conduct important activities, such as: (i) academic representation and political organization; (ii) development of projects linked with courses; (iii) community outreach; and (iv) volunteer actions.

Unicamp has many student entities, including two student academic unions (the *Diretório Central dos Estudantes*, responsible for representing all university students, and the *Diretório Acadêmico* of FCA – School of Applied Sciences, which represents the students from the FCA); 32 academic centers; 27 athlete groups and leagues, which promote student integration through sports and cultural activities; 24 junior companies; and 52 other initiatives and groups working with the community to generate social impact<sup>3</sup>.

Academic centers are important reference spaces to help students organize their academic life, promoting reflection and relationships with the university. Athlete groups are structures that actively help students experience an university environment that is full of life.

Junior companies are organizations that place students in contact with market issues while they are still taking their respective courses. So, they represent important elements of an

3. A complete list is provided here: [www.calourada.prg.unicamp.br/#alemdasala](http://www.calourada.prg.unicamp.br/#alemdasala)

ecosystem that favors entrepreneurship and innovation. The results obtained by Unicamp in these dimensions, as mentioned before, are also linked with strengthening of an entrepreneurial culture among students, which is practiced and reinforced by junior companies.

Organized student groups are privileged spaces for applying knowledge and developing skills and competences. At Unicamp, several student groups promote initiatives that allow this type of experience in the university context. Examples include *Equipe Torque Baja* and *Equipe BAJA Unicamp*, which develop prototypes of mini Baja off-road vehicles to participate in competitions promoted by the Society of Automotive Engineers (SAE); the *Equipe Fórmula SAE*, which also develops vehicles for SAE competitions; *E-Racing*, a group of engineering students who build prototypes of high-performance electric cars; and the *Equipe Phoenix de Robótica*, which develops robots for student competition.

#### MECHANICAL ENGINEERING STUDENTS PRESENT ELECTRIC CAR PROTOTYPE E2018



Antonio Scarpinetti/SEC – Unicamp.

Some student organizations of Unicamp have been committed to important issues, such as machismo and racism. The IEEE Women in Engineering, *Frente Feminista Limeira*, *Las Chicas do IE*, MUDA – *Coletivo de Mulheres Medicina Unicamp*, and MIA – *Núcleo de Mulheres do Instituto de Artes* discuss gender issues in the environment of Unicamp student organizations. Also important is *Núcleo de Consciência Negra*, a group of black youth from Unicamp against racism.

Student organizations allow students to conduct extracurricular activities that significantly contribute to their training, with effects on the development of the university environment and its surroundings.

Unicamp also has a relevant number of student organizations committed to practices focused on generating social impact in different areas. Organized student groups are involved in projects to collect books for public school libraries or receive donations of clothes and foods that are transferred to charity. Other groups, through community courses, offer educational support activities to prepare students for university admission.

In addition, entities linked with projects such as Engineers Without Borders (EWB) and ENACTUS have been established at the university, which seek to work with the community addressing their socioeconomic problems, disseminating knowledge, strengthening cooperation and solidarity, and generating empowerment of vulnerable groups.

### 8.1.5 Knowledge for employment and income generation: the Program of Technology Incubators for Popular Cooperatives

Poverty, exclusion and inequality are major problems in Brazilian society. The complexity of these issues requires an effective engagement of different actors, including universities, which are responsible for training professionals to act on these problems, conducting research and developing intervention strategies, producing knowledge and technologies to address social problems, developing and implementing university outreach projects, etc.

Unicamp's Program of Technology Incubators for Popular Cooperatives (ITCP – *Programa de Incubadoras Tecnológicas de Cooperativas Populares*), linked with PROEC, articulates these tasks, combining academic practices with solidarity interventions, work cooperatives and communities, based on a dialogue of knowledge exchange between university and society. The ITCPs seek to support the establishment and development of solidarity projects with a focus on generating employment and income, in line with the principles of self-management and cooperatives, and the effective engagement of undergraduate and graduate professors and students.

Today Unicamp has two incubation teams operating under the ITCP Program: one in Campinas and one in Limeira. The ITCP Program was created in 2002, when an incubator was established in Campinas. Later, in 2013, a team was also established in Limeira, under the same program. The teams have worked with solidarity projects, producer groups and urban and rural communities seeking to develop and implement, through a dialogue with these actors, technological, and work process management and organization solutions to improve the economic results of projects, strengthen personal relationships, and promote empowerment of groups involved in incubation projects. In addition to themes related to project management, issues such as worker health, gender relations and the dynamics of human relations in the workplace are addressed in the context of these projects.

Professors and students work with the teams, developing training and research activities, as well as intervention actions with incubated projects, seeking to ensure their autonomy and financial sustainability. Then, it is a rich process that generates social impact while providing students with a unique training experience, so within the ITCP, they are able to complement, expand and apply the knowledge acquired in their associated courses.

Unicamp's ITCP methodology is based on the actions of the incubation teams, which usually have 3 to 6 people each. Teams supervise the groups that seek to create cooperatives, enterprises or associations. The incubation process has three stages: pre-incubation, incubation and post-incubation. The first stage of pre-incubation studies the reality and the history of the project to be incubated based on a diagnosis. This diagnosis is achieved after observing the daily life of the groups and conducting workshops to detect problems, needs, strengths and drivers for the incubation work.

From this initial diagnosis, an Incubation Plan is developed with the workers for each project. The plan includes objectives, deadlines, description of continuous activities to support the projects and specific activities (workshops and seminars), as well as the identification of aspects on which the team will act collectively and areas where each educator will perform specific actions.

The second stage, when the incubation per se occurs, refers to the deployment of the Incubation Plan and, therefore, has a longer duration. It involves intense dialogue between the teams with the incubation groups and ITCP team training activities, seeking to build connections between the observed reality and the content developed in the context of the training activities performed by the team. In this stage, the academic knowledge is put to the test, that is, it is applied, evaluated and adjusted to the specific conditions of each project.

The last stage of post-incubation refers to process completion, indicating goals and objectives set during the incubation process have been achieved. In this phase, the project should ensure financial sustainability and become stronger with the guarantee of financial and management autonomy.

The incubation projects developed by Unicamp's ITCP have been conducted mainly with resources obtained from CNPq and MEC. Between 2014 and 2018, five projects supported by these sources were concluded, totaling more than BRL1 million, with the additional amount of BRL70,000 from complementary sources obtained by the Extension and Culture Department of Unicamp through specific programs to support Community Outreach Projects (PEC – *Projetos de Extensão Comunitária*).

As mentioned above, the ITCP program is an important space for student education. In the context of the Program, professors have provided outreach courses and promoted events, such as the *Fórum Permanente: Extensão e Economia Solidária: os (des)caminhos da atuação da universidade para a geração de trabalho e renda* (Permanent Forum: Extension and Solidarity Economy: the paths of the university's performance for the generation of work and income), a forum held in 2017. Between 2014 and 2018, around 40 students from Campinas and Limeira were linked with the ITCP, working in incubation projects and other activities developed under the Program.

## 8.2 Technological innovation

This section presents the technological innovations developed in the period and resulting intellectual property protection activities, technology transfers, promotion of entrepreneurship and innovation ecosystem.

### 8.2.1 Technological innovations resulting from research

This report has presented examples of technological innovations resulting from research and the mechanisms and implications for the university's missions. This section shows the diversity of technologies in terms of fields of application and types of impact.

In agrometeorology research, CEPAGRI has developed a software application that calculates and assesses the climate risk management for small farmers to handle climate change. The main idea of this new software named "Brazilian Mapping for Agricultural Zoning System" (BRAMAZOS) (INPI registration: BR512019001756-0) is to turn scientific

knowledge into useful information for the climate risk management of crops, indicating the risk of crop failure and the limiting meteorological element related to the site inadequacy. This software development was funded by CNPQ; it was based on user experience, with a focus on user facilities, offering a user-friendly interface.

In health, at least nine examples should be highlighted. The IFGW worked with a group from the University of Oxford's Department of Oncology in preliminary studies on new radiopharmaceuticals to treat early stage brain metastases through the targeted radionuclide therapy. In this treatment, a molecule is labeled with a radioisotope so it can carry radiation directly to cancer cells. During the treatment, radiological imaging can be obtained of the irradiated region, thanks to the same radiation produced by the radiopharmaceutical drug. This new strategy is called Theranostics, as it combines therapy and diagnostics. The results of these studies were published in *Theranostics*, a high impact journal.

The CEB, with support from FEEC and FCM, has developed a device called urethral connector, a new minimally invasive system to measure vesical pressure (urinary bladder pressure) without requiring a bladder catheter, which is important for the diagnosis of urethral obstruction caused by enlarged prostate. Pressure may be important for clinical decision regarding the need for prostate surgery. The product resulting from this study has been industrialized and may lead to royalties for the university; besides, it has inspired the work of undergraduates and master's and doctor's students.

With the cooperation of several institutions in the country (USP, UTFPR, UFSCar, Incor, among others), the CEB has developed a functional prototype of a diagnostic ultrasound device, which has been tested and introduced publicly. The equipment presents a development level close to the desirable level for commercial production. Within the project, a platform was built for studies and developments in the area of ultrasound. Undergraduate, master's and doctor's students have been trained in this project.

Ventricular fibrillation is a cardiovascular diseases and an important cause of death. In interaction with other Unicamp schools and bodies (FCM, FEEC, Biofabris) and performing a multidisciplinary work, CEB has created a new defibrillation method—rapidly-switching multidirectional defibrillation—which is as effective as the best modern conventional defibrillators but offering about half the power consumed by conventional devices. It means less injury caused by electric shock. A multidirectional defibrillator has been built, tested in pre-clinical experiments, patented by Unicamp, and is now available for industrialization. The project includes student training—from technical level to doctoral degree.

The IC developed the Automated Diagnosis of Intestinal Parasites (DAPI – *Diagnóstico Automatizado de Parasitos Intestinais*), a method for automated diagnosis of intestinal parasites through stool exam with over 90% efficiency in the evaluation for 15 most prevalent species of parasites in the human digestive system. This technology was developed with the help of ImmunoCamp Ciência e Tecnologia and Venort Indústria de Máquinas e Equipamentos. Also, in production line is a software application for data-driven automated diabetic retinopathy screening, which gathers information from available data to create a more effective and unified—and less human-dependent—classification system for early detection of diabetic retinopathy, the main cause of blindness among adults.



Finally, also in health, FEnf developed the Fuzzy Kitten software, an educational tool that evaluates the accuracy of nursing students in the identification of the Nursing Diagnosis (ND) which is a clinical judgment about individual, family, or community responses to actual or potential health problems/life processes. ND is one of the stages of the Nursing Process, fostering the nurse's independent practice. ND is complex and offers a high risk of low accuracy as it depends on the interpretation of human behavior related to health. In education, the fuzzy logic, based on the fuzzy set theory, can help develop ways to show students how to direct thinking and propose an accurate diagnosis. It proposes using degrees of pertinence, so an element may partially belong to one or more sets, enabling the use of a natural language when handling inaccuracy, more related to human intuition. Then, it has been used to help specialists explain how their decisions are made and this understanding can be transferred from professors to students. This software used a model based on fuzzy logic for evaluating nursing diagnostic accuracy of students, generating student performance scores and assessing their diagnostic decision process; so, this tool seeks to facilitate student understanding of how their decisions are made in the diagnostic process. In the traditional method, the professor evaluates the student's diagnostic accuracy using case studies and evaluation criteria that may be subjective. However, Fuzzy Kitten allows an objective and comprehensive student evaluation, as it compares student's decision to that of a group of specialists (gold standard), generating student performance scores at different stages of the process. The activity proposed in Fuzzy Kitten encourages the student's metacognition ability, causing students to reflect on the steps that led to a particular diagnostic decision, and it is known that reflecting on performance leads to investigation and critical thinking. The software also helps nursing professors, as it is an objective method of student assessment.

In the area of petroleum research, at the FEQ Unicamp has the Petroleum Valuation Laboratory (VALPET – *Laboratório de Valoração de Petróleos*) in partnership with CENPES/PETROBRAS. Research involves characterization and processing of petroleum, oil and related products for their valuation, with strong focus on new products and related technologies. Of note, VALPET has activities in the area of process intensification. Facilities are also used for the development of lubricants and other products from renewable sources. Then, research conducted at VALPET contributes to oil refining and activities including pre-salt, CO<sub>2</sub> abatement and treatment of wastewater from oil extraction and processing and desalination. Equipment and parts of process equipment are also developed using additive manufacturing (3-D printing). This laboratory has a pilot plant area dedicated to the development of new products and processes, including a water purification unit for the oil industry with characteristics of multiple effects, a centrifugal molecular reactor, a multiple-effect molecular falling film distiller, a horizontal film evaporator, molecular distiller for oil and biolubricant characterization (for Williams team – Formula 1), and pre-salt oils, as well as two fractional distillation units of products of large ranges of volatility, from lightweight components to those of high viscosity that provide charge to the molecular distiller. Finally, it has a supercritical extraction unit for petroleum, diesel and paraffin studies and a high-performance 3-D printing machine dedicated to additive manufacturing processes of metals and metal alloys. A pilot unit of electrostatic desalination is currently under development. This development work has been conducted since mid-1990s. It is a CENPES/PETROBRAS reference laboratory, with unprecedented technological activities, also at global level.



Also, in the energy area, NIPE (Interdisciplinary Center of Energy Planning) participates in several innovation projects. The “System for the agro-energy monitoring of coffee crops, within Cooxupé (*Cooperativa Regional de Cafeicultores em Guaxupé Ltda*)” is a partnership between NIPE/Unicamp and Cooxupé (partners involved: Unesp/Jaboticabal, CNPTia/Embrapa, Feagri/Unicamp) funded by Fapesp and based on the PITE model, which aimed to contribute to crop estimation protocols and energy saving through waste utilization. The effects, which were highly positive, had direct impacts on the cooperative chain, from the presidency and advisers to the technical staff and producers. The cooperative has 14,000 producers, 80% of them are small family producers. This project helped reduce cost through crop actions that ensured higher accuracy in crop estimation, lowering transportation and storage costs and, when comparing these with other data, it enabled higher efficiency in technical support to producers.

Nipe, IC, Feagri, CNPTia/Embrapa and Cirad/France, among others, have conducted studies to model crop growth and establish connections with carbon balance, crop forecasting and remote sensing. This project has a short-term impact with improved growth estimates of the two crops studied and, therefore, improved carbon estimation, water consumption and fertilizer requirements. These are very important results that can help understand how these two crops can impact climate change, water consumption and soil structure. In the long and medium term, they provide a better understanding of the crop cycle in a context that can become very dynamic.

During the period, CEMIB implemented new protocols for the detection of emerging and re-emerging infectious agents that affect laboratory animals. Initiatives to increase experimental reproducibility and universality are increasingly present in biological medical research worldwide. In this sense, accepting the recommendations described in the ARRIVE (Animal Research: Reporting of *In Vivo* Experiments) guide by the most impactful scientific journals is the most important example. This guide has suggestions that demonstrate a new phase of scientific research, in which the standardization of laboratory animals has become a requirement. However, in order to achieve universality and reproducibility in laboratory animal experiments, using certified models free from disease-causing agents is critical. For this reason, CEMIB is continually modernizing its pathogen identification protocols, which are essential for maintaining the laboratory's international accreditation and enable the search for new agents. Using them in RT-PCR and PCR reaction routine contributes to the identification of several pathogens (TMEV-GDVII; Sendai virus; pneumonia virus of mice (PVM); Reovirus-3; Rotavirus; Tyzzer, KRV, Toolan H -1 and Parvovirus), and allows the standardization of the semi-nested RT-PCR methodology for the detection of Norovirus in rats. This is the first report of the presence of this agent in laboratory rats (*Rattus norvegicus*), unpublished in Latin America. This finding allowed the deposition of partial gene sequence of this agent to an international database, widely known by the scientific community (GenBank KU169124.1: Rat Norovirus isolate LCQS Unicamp capsid protein gene, partial cds), allowing the use of this sequence for detection of Norovirus in rats in animal houses around the world.

NICS, together with IA, developed two relevant technologies for visually impaired people in the report period. The first technology was a computer device for fast input of computational data in Braille. It was named ‘Braille Handles’ as it has two independent

cylinders, each with three buttons that allow a blind user (or a Braille user) to quickly enter Braille characters. This interface was initially developed for use in Braille music system – a Braille code for musical notation. Patent protection has been requested for this invention. The other technology resulted from a project named *Realidade Aumentada de Paisagens Sonoras* (Extended Reality of Sound Landscapes), which has the potential to create real applications of visual accessibility to guide visually impaired people in urban environments.

#### RESEARCHERS ASSESS SAFETY IN THE BRAZILIAN ELETRONIC VOTING SYSTEM



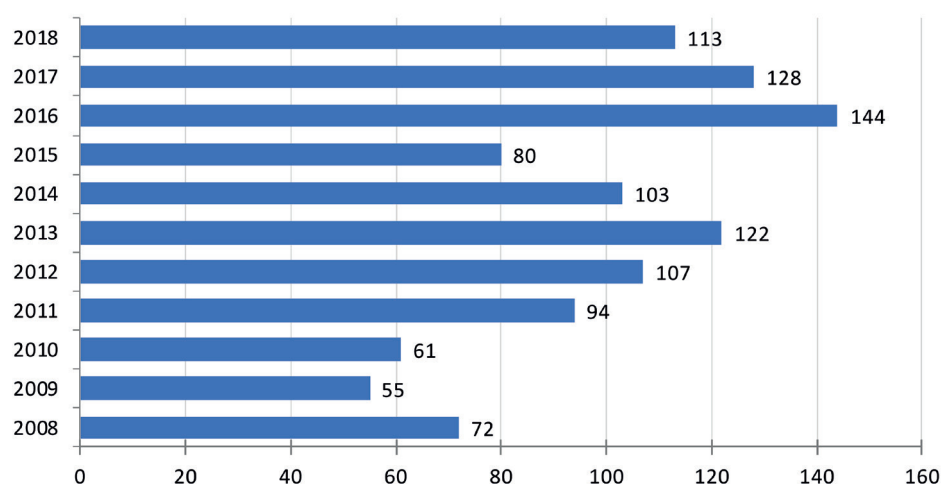
Antoninho Perri/SEC – Unicamp.

The IC supports the Superior Electoral Court with public security testing to improve the safety in the electronic voting system. Brazil is one of the few countries in the world with electronic voting, ensuring fast voting and vote counting, safe and reliable results, despite the huge national territory.

### 8.2.2 Intellectual property protection

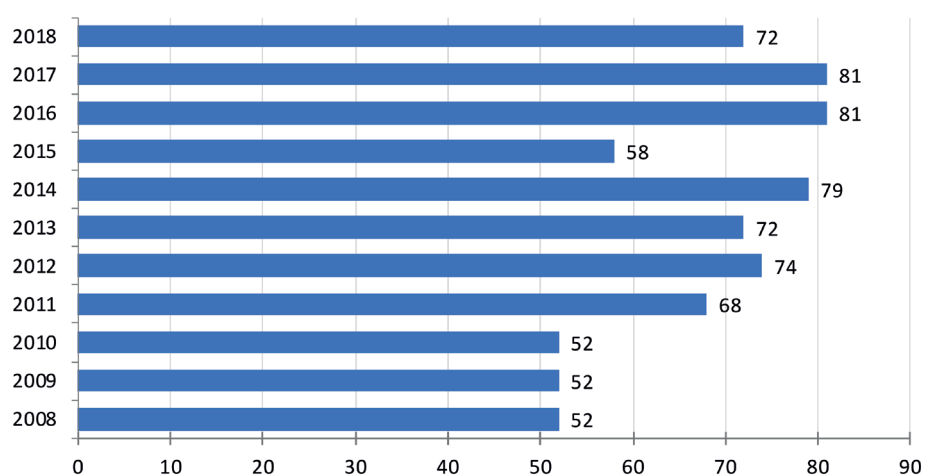
Unicamp has encouraged the protection of research results through intellectual property since the 1980s. In 2003, these activities were conducted by the Inova Unicamp Innovation Agency (Agência de Inovação Inova Unicamp), which represents the Technology Transfer Office (TTO) of the university. Between 2008 and 2018, a culture of intellectual property protection was consolidated among researchers and professors at the university, resulting in an increase in the number of Invention disclosures—from 77 to over 100 (Graph 8.1), in the number of patent applications filed at the National Institute of Industrial Property (INPI – *Instituto Nacional de Propriedade Industrial*): from an average of 50 to 70 applications (Graph 8.2), and in the number of licensed patents.

GRAPH 8.1 – NUMBER OF INVENTIONS DISCLOSURES



Source: Inova/Unicamp.

GRAPH 8.2 – PATENT APPLICATIONS FILED AT INPI



Source: Inova/Unicamp.

Unicamp leads the actions of intellectual property protection of its research results as observed in the INPI ranking of patent applications. Published since 2013, the ranking has presented Unicamp among the top four applicants; in 2017, the university led the ranking even considering the business sector (Table 1).

TABLE 8.1 – UNICAMP'S PLACE IN THE RANKING OF PATENT APPLICANTS

Ano	Place in ranking
2017	1st place
2016	2nd place
2015	3rd place
2014	4th place
2013	4th place

Source: INPI.

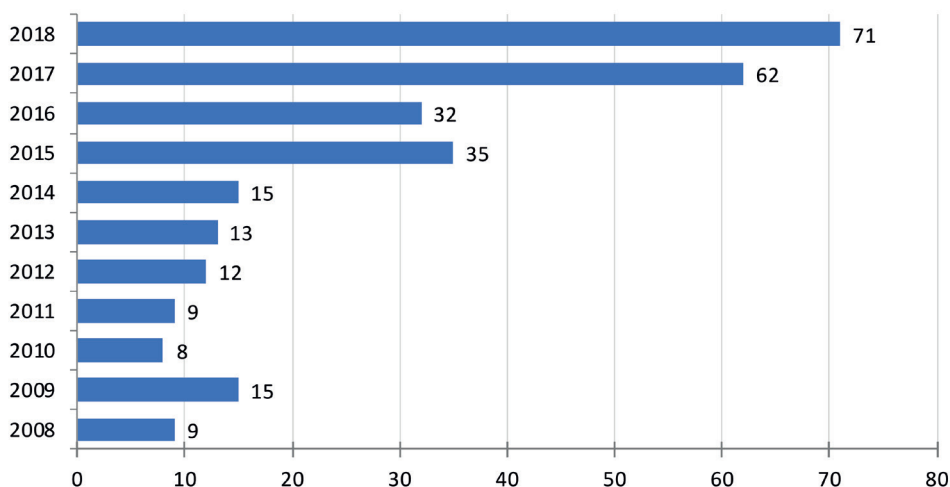
In 2018, an evaluation of Unicamp's portfolio highlighted its actions in the pharmaceutical sector, appearing as the university's area of expertise, with the highest number of active patents: 12.4% of its total portfolio. The university's pharmaceutical technologies were developed in several Unicamp education and research units, such as the Institute of Chemistry, the Institute of Biology, the CPQBA and the School of Medical Sciences. Many of these units are the result of multidisciplinary research with very clear social impact, such as the Zika virus vaccine, whose patent was filed in 2016.

The Zika virus vaccine is the result of a joint project conducted with the Rede Zika, which was created to develop a scientific and operational plan to fight against the virus. At Unicamp alone, four schools and 32 research groups were part of the initiative. The patented technology does not require the use of recombinant DNA technique and uses nanotechnology as the primary focus to fight against the Zika virus, with effectiveness demonstrated *in vivo*.

Although at Unicamp filed patents are already offered to companies interested in expanding their portfolio, granting a patent ensures safer negotiation and increases the chances of transferring technology to a company, providing benefits to society. Therefore, an increase in the number of patents granted to Unicamp starting in 2015 is a positive fact, a result of the university's effort and Inova's dedicated work in preparing patent documents (Graph 8.3).

The patents granted in 2018 include a process for creating a biodegradable sensor that quickly detects food that is not suitable for consumption, developed by researchers from Unicamp School of Chemical Engineering (FEQ). Consumption of food that is not suitable for consumption is still a common problem around the world, especially in regions of high temperatures, and this is why technology contributes to quality assurance in the food industry, with benefits for general population, as the process produces a portable biodegradable low-cost and easy-to-use sensor.

GRAPH 8.3 – PATENTS GRANTED



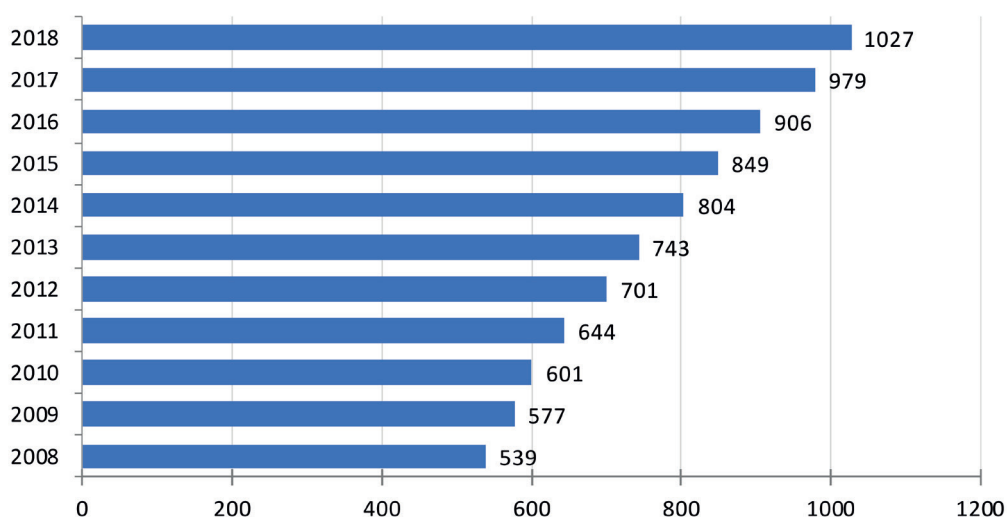
Source: Inova/Unicamp.

In 2016, at its 50th anniversary, Unicamp reached the milestone of 1,000 active patents after filing at INPI the technology "Industrial yeast LVY127 genetically modified via the oxy-reductive xylose conversion pathway, genetic expression cartridges, method for

obtaining ethanol 2G and use of the yeast LVY127". This technology refers to genetically modified yeast that can use more sugar for the production of second generation ethanol.

Protecting academic research results through intellectual property complies with the Legal Framework for Science, Technology and Innovation, and it is the mechanism to support new technologies in the market through licensing agreements.

GRAPH 8.4 – ACTIVE PATENT FAMILIES



Source: Inova/Unicamp.

### 8.2.3 Technology transfer

With 13% of its portfolio corresponding to licensed technologies, Unicamp occupies a noticeable position among universities in terms of technology transfer strategy; however, over the last ten years, its patent portfolio has doubled – from 539 patent families in 2008 to 1,027 patent families in 2018. Due to costs related to maintaining a portfolio with more than 1,000 active patents, the technology protection strategy has been a theme of reflection and should be reviewed over the next years, prioritizing technologies for which patent application is essential for the transfer strategy and absorption by society.

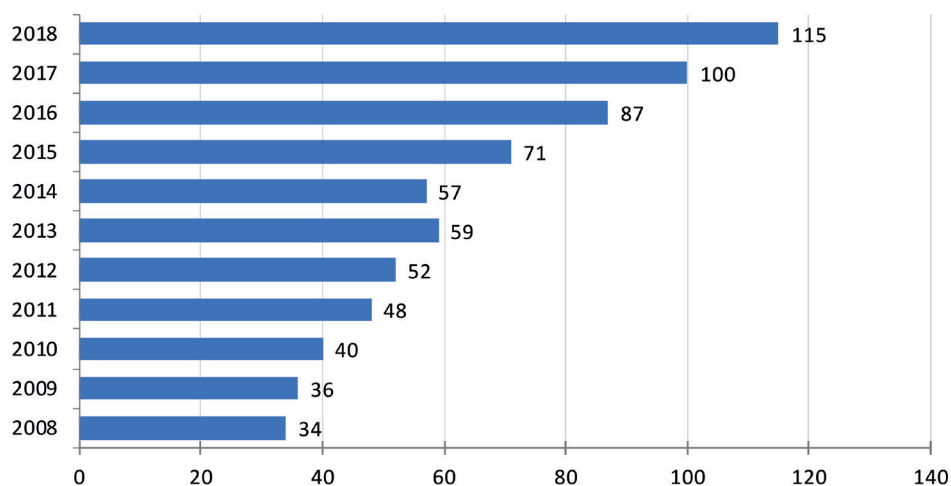
Technology transfer<sup>4</sup> is a responsibility of Inova Unicamp. It is a more complex process and complements the protection of intellectual property in the university context. Most TTOs of Brazilian universities, for being relatively young, are more focused on protection than technology transfer. In the case of Unicamp, Inova was a pioneering initiative, as it was created even before the Law of Innovation required the existence of TTOs in Institutions of Science, Technology and Innovation, placing the university in a leading position and making it a reference university in this area for other institutions in Latin America.

This practice was consolidated at Unicamp from 2008 to 2018, when the university more than tripled the number of active licensing agreements, especially in 2017, and reached the milestone of 100 active licensing agreements (Graph 8.5).

4. Technology transfer involves negotiation and formalization, predominantly with the business sector, of technology licensing, grant and supply agreements, such as patents, know-how, computer programs and cultivars.

One of these cases is the set of prefabricated flexible dental arches of adjustable teeth for the production of dental prostheses and implants, developed by researchers from the Piracicaba School of Dentistry (FOP) and the School of Chemical Engineering (FEQ) of Unicamp. With a social function – offering reduced time and cost for the production of prostheses – this technology was applied in 2018, to the benefit of Aldeia Velha, an indigenous village in Arraial D'Ajuda, Bahia, and licensed to São Leopoldo Mandic.

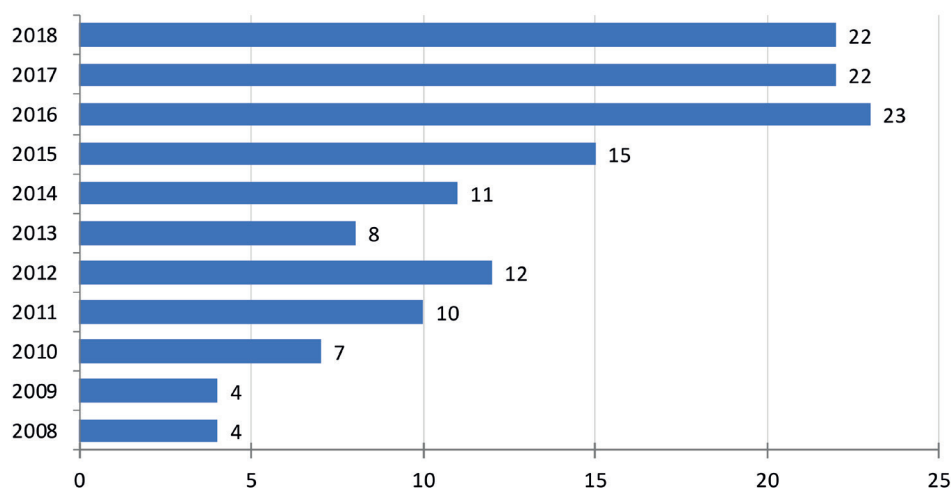
GRAPH 8.5 – ACTIVE INTELLECTUAL PROPERTY LICENSING AGREEMENTS



Source: Inova/Unicamp.

In the last three years, the university has made more than 20 licensing agreements every year (Graph 8.6). This maturity is also the result of a broader business vision, which includes not only traditional patent licensing but also other types of technology transfer, such as know-how and computer programs. The computer program licenses include GETS software developed by researchers from the Center for Biomedical Engineering (CEB) for medical-hospital equipment management, which was licensed to seven hospitals between 2013 and 2018.

GRAPH 8.6 – INTELLECTUAL PROPERTY LICENSING AGREEMENTS (SIGNED IN THE RESPECTIVE YEAR)

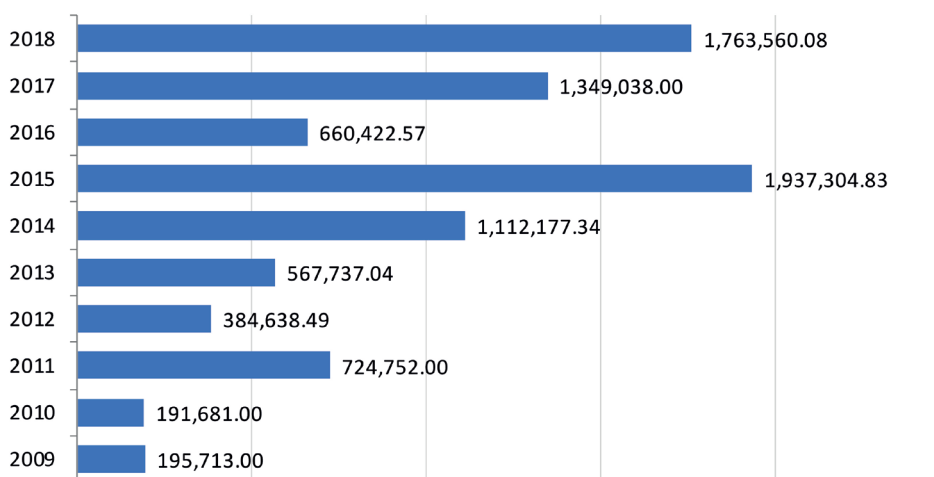


Source: Inova/Unicamp.



Unicamp is one of the few universities in Brazil with revenue from intellectual property licensing. According to FORTEC, in 2017 only 22 universities reported revenues from this activity. Despite the positive progress—from BRL195,000 in 2009 to BRL1.7 million in 2018—these resources are still relatively small when compared to the university's budget. However, this trend is seen in most universities worldwide, even among the top universities in the world belonging to more mature innovation ecosystems than Campinas.

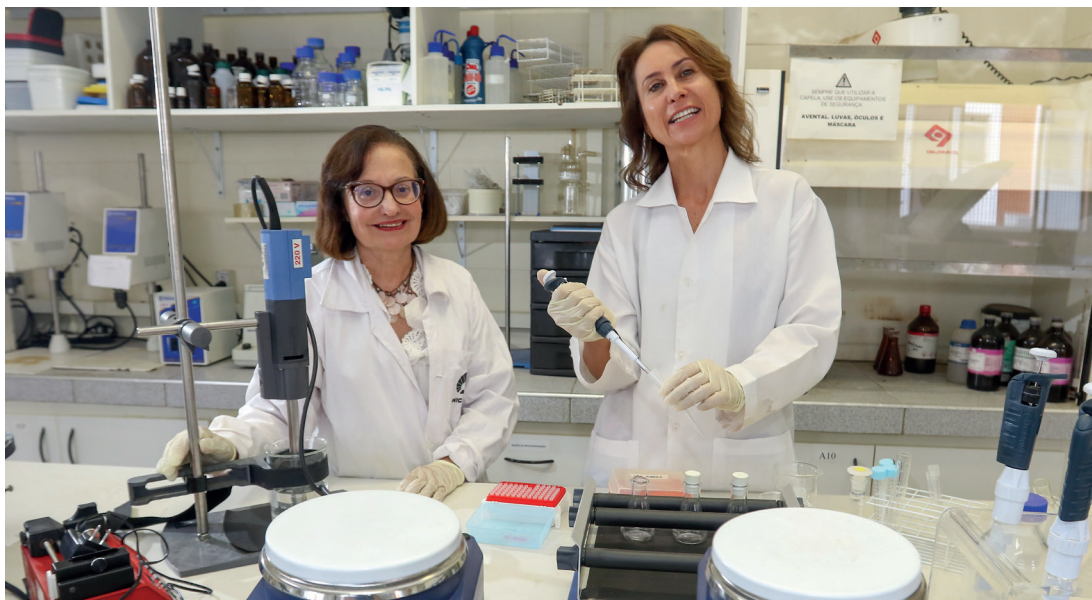
GRAPH 8.7 – ECONOMIC GAINS (INCLUDING ROYALTIES)



Source: Inova/Unicamp.

However, besides the financial benefits, results of technology transfer and research in partnership with the business sector represent another way for the university to impact society. The technologies licensed in 2018 include an ophthalmic medication for the prevention and treatment of diabetic retinopathy, developed by researchers from the School of Medical Sciences (FCM) in partnership with the School of Chemical Engineering (FEQ). Currently, the therapeutic options for this disease are retinal laser photocoagulation, intraocular injections and even surgery. But, unlike the pharmaceutical composition developed by Unicamp, all these methods are invasive and expensive, often providing unsatisfactory visual results.

#### FEQ AND FCM RESEARCHERS RESPONSIBLE FOR THE DEVELOPMENT OF THE OPHTHALMIC MEDICATION FOR DIABETIC RETINOPATHY



Pedro Amatuzzi/Inova Unicamp.

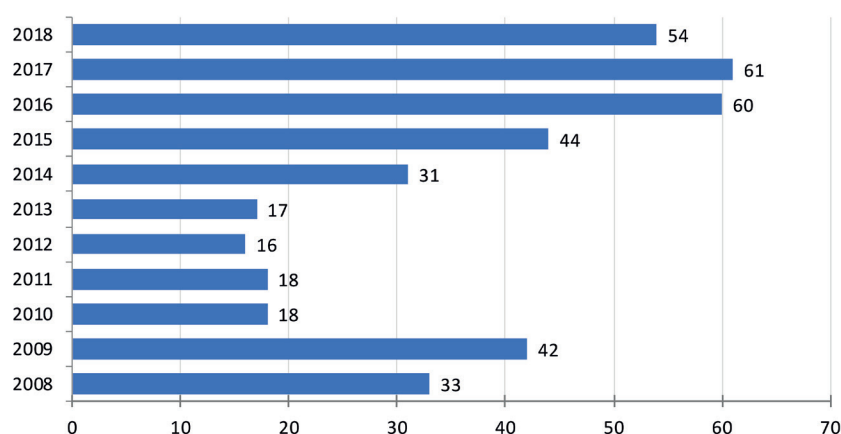
In addition, these results also helped Unicamp to become in 2017 a leader in the Times Higher Education (THE) ranking among other Latin American universities. The ranking highlighted the university's engagement in innovation projects, emphasizing the increasing investment of companies in research at Unicamp as a decisive factor allowing it to become a leader.

#### 8.2.4 Culture of innovation and entrepreneurship

Offering extracurricular courses and activities focused on entrepreneurship and innovation themes is part of the university's move to become increasingly entrepreneurial, progressively broadening its support to students who consider entrepreneurship for their professional career.

The university has no unified mapping focused on these activities. However, Inova Unicamp alone has held 394 events in the last ten years with a focus on raising awareness, training and disseminating a culture of innovation and entrepreneurship. When considering the entire university, including initiatives of professors and students, these numbers are certainly higher.

GRAPH 8.8 – NUMBER OF ENTREPRENEURSHIP AND INNOVATION EVENTS

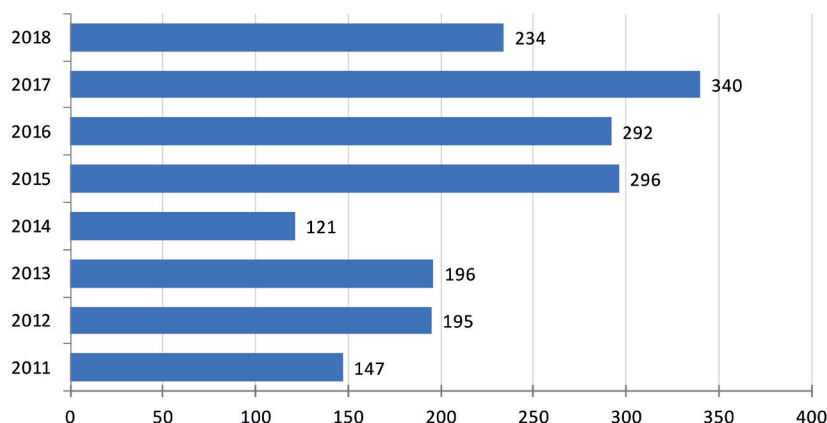


Source: Inova/Unicamp.

The most impactful events include the Unicamp Challenge, a program conducted by Inova that promotes entrepreneurial training not only to university students, but also to the community members who are interested in businesses with a Unicamp technology. Recognized as the best innovation practice by junior companies in 2019 and, with the first edition in 2011, this project gathers inventors, companies, and mentors, and encourages the creation of technology companies among students and non-students who are interested in business. In total, 1,821 people signed up for the program in eight editions. At least seven companies were created by participants of the Unicamp Challenge in this period.

One situation that has been very usual is exactly this: students and alumni participate in the Unicamp Challenge, then create a company with the help of mentors and Inova, license the technology they worked with in the competition, and incubate the business in the Unicamp's Technology Company Incubator (Incamp – *Incubadora de Empresas de Base Tecnológica da Unicamp*). One example is startup Rubian Extratos, which was created in the 2014 competition and was submitted to Incamp's incubation process. Today, in addition to Rubian's licensing patents, the company has strengthened its partnership with Unicamp in the development of new technologies.

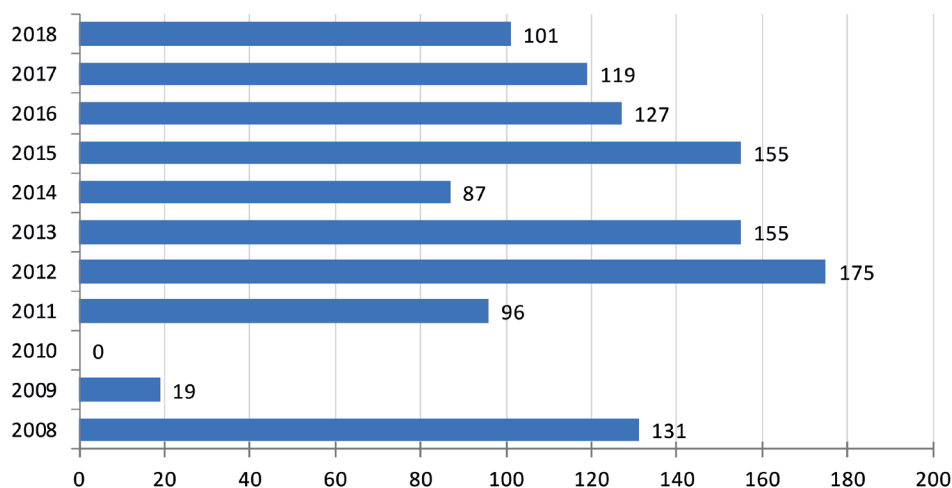
GRAPH 8.9 – NUMBER OF PARTICIPANTS IN THE UNICAMP CHALLENGE



Source: Inova/Unicamp.

Regarding formal disciplines, Inova Unicamp offers the entire community a discipline focused on discussing innovation and building entrepreneurial skills: “AM037 Intellectual Property, Innovation and Entrepreneurship: Contemporary Themes,” a discipline that gathers experts, guests and entrepreneurial alumni. In the last 10 years, 1,165 students have taken this course. Over the years, an assessment found out that more practical activities were needed in this discipline, leading to curriculum revision and inclusion of workshops on design thinking and Business Model Canvas in 2019.

GRAPH 8.10 – NUMBER OF STUDENTS ENROLLED IN AM037



Source: Inova/Unicamp.

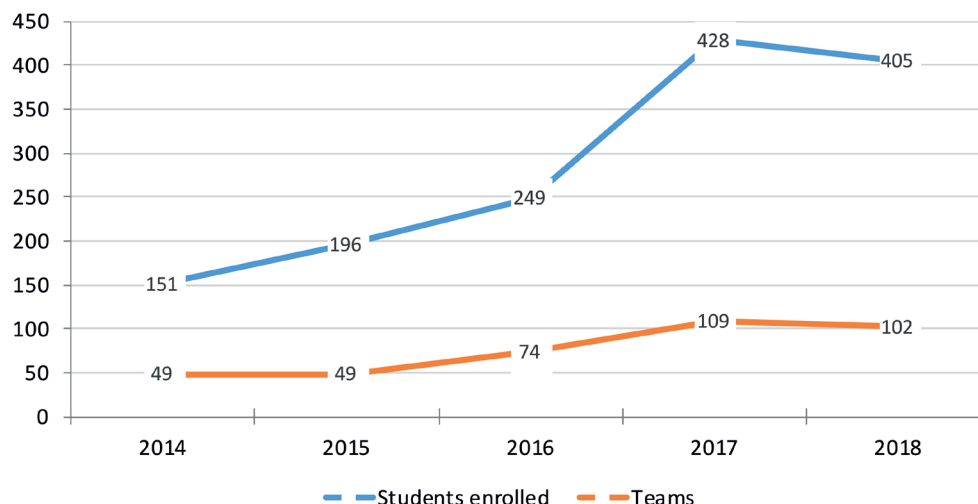
In addition, one discipline was not enough to impact the culture of the university. So, it required more visibility and better monitoring of disciplines in the various Unicamp schools with this focus. Then, in 2019, Inova started a mapping process to identify and disseminate the university's disciplines focused on these themes, seeking to increase student participation.

In addition to formal disciplines, Inova promotes culture programs inside and outside the community. In the academic environment, the Inventors Award should be highlighted. This award recognizes professors, researchers and alumni involved in intellectual property protection, technology transfer and entrepreneurship activities.

Since 2009, this award has been held annually, with 682 recognitions between 2009 and 2018. An interesting aspect is the increase in the number of professionals involved in these activities in recent years. In 2009, about a dozen professionals were awarded, and since 2016, more than 100 professionals have been recognized every year, reflecting the expansion and consolidation of such university-business interaction activities at Unicamp.

With the public of technical and regular high school, Inova performs the Programa Inova Jovem. Created in 2014, it is an entrepreneurship competition that reached almost 1,500 students from all over Brazil in five years. It is focused on disseminating entrepreneurship as a professional career, supporting participants in transforming their ideas into businesses through training and mentoring of graduates from the University.

GRAPH 8.11 – EVOLUTION OF PROGRAMA INOVA JOVEM BY  
NUMBER OF STUDENTS ENROLLED AND TEAMS

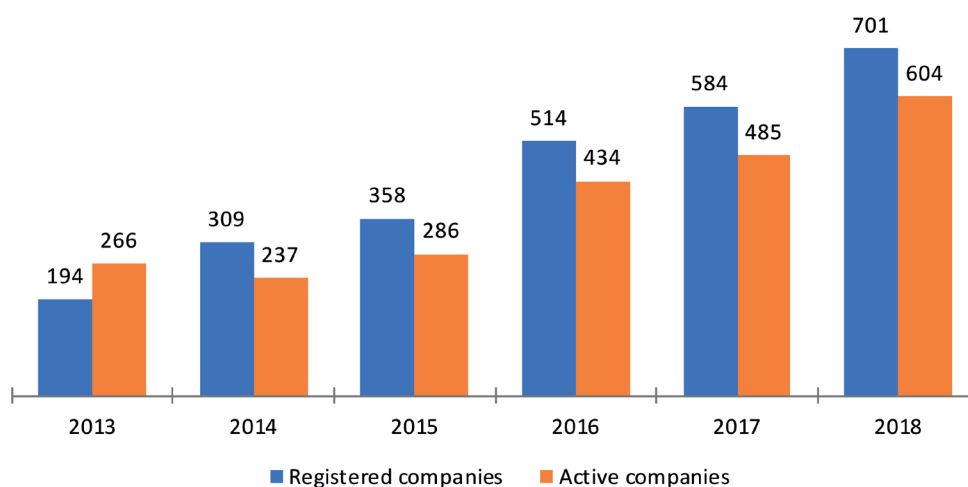


Source: Inova/Unicamp.

## 8.2.5 Unicamp's alumni companies

Unicamp performs a pioneering work in Brazil monitoring the results of companies created by its former students. This monitoring work is a benchmark in Brazil for the impact of the university, creating jobs and generating wealth from companies founded by alumni. Conducted since 2013, the monitoring is improved each year and, in 2018, it reported 701 registered alumni companies, 604 of them active companies.

GRAPH 8.12 – NUMBER OF ALUMNI COMPANIES PER YEAR



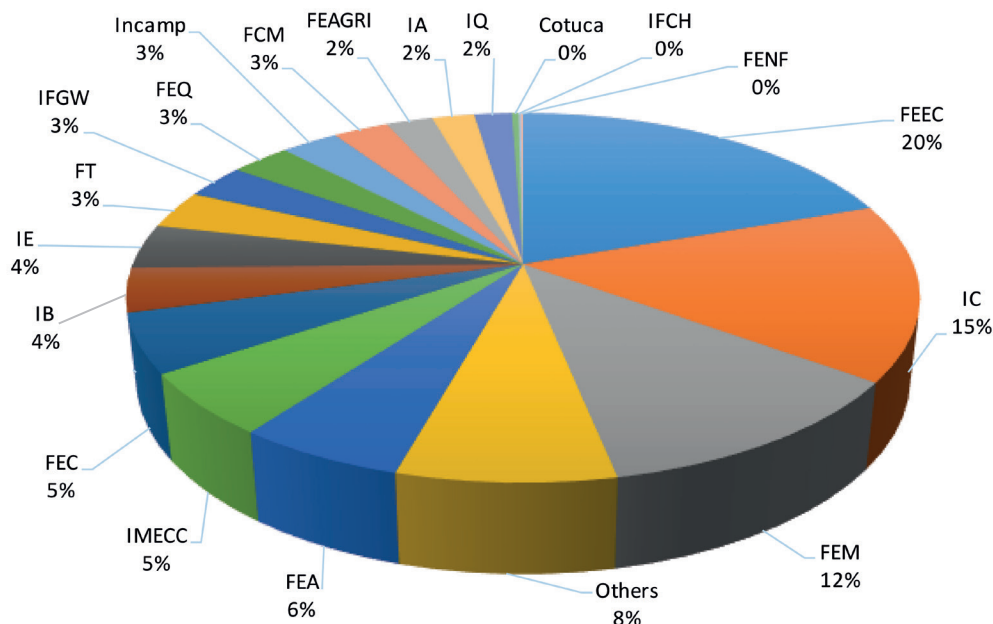
Source: Inova/Unicamp.

In 2018, these companies generated 30,000 direct jobs and revenues of BRL4.8 billion. In 2019, revenues increased 64.6% in relation to the previous year, reaching BRL7.9 billion. These companies include Movile (a group comprised of iFood and payment and

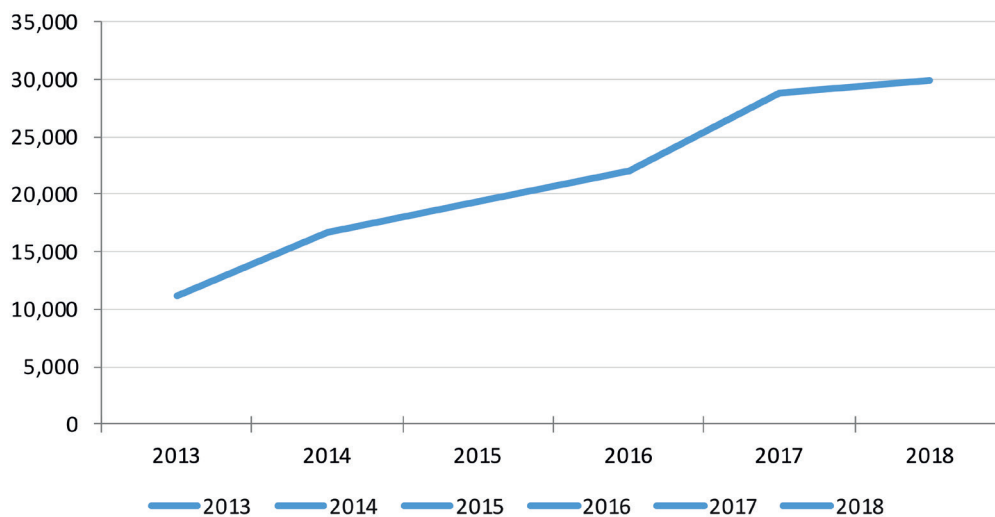
content companies) and Quinto Andar (real estate services), companies that are currently revolutionizing the technology scenario in Latin America and have been considered unicorns, that is, companies with a valuation over US\$1 billion.

Like Movel and Quinto Andar, in 2018, 49% of these companies were founded by graduates of FEEC, IC and FEM. Then, the challenges for Unicamp are not only to promote, but also encourage, a culture of entrepreneurship in schools presenting a lower prevalence of alumni companies.

GRAPH 8.13 – UNITS OF FOUNDING PARTNERS OF UNICAMP'S ALUMNI COMPANIES



GRAPH 8.14 – EVOLUTION OF THE NUMBER OF JOBS GENERATED BY UNICAMP'S ALUMNI COMPANIES



Source: Inova/Unicamp.



FIGURE 8.1 – INCUBATED COMPANIES AT INCAMP



### 8.3 Science and Technology Complex of Unicamp and Incamp

Unicamp's Science and Technology Complex is an important resource to attract and retain innovative partnerships between the university and the business sector, housing startups and research and development laboratories for large companies.

- It occupies an urbanized area of 100,000 m<sup>2</sup>, and in 2018, it had two completed buildings and two buildings under construction. In 2017, the first monitoring of indicators for the complex was conducted. In these two years the following numbers were reported:
- Its area increased from 2,700 m<sup>2</sup> in 2017 (first year of monitoring) to 3,700 m<sup>2</sup> in 2018.
- The number of laboratories of companies with research projects in partnership with Unicamp increased from 6 in 2017 to 7 in 2018.
- The biggest impact was on the number of startups in the complex, which grew from 2 to 11 in 2018.
- The complex also includes Unicamp's Technology Company Incubator (Incamp). In 2017, 22 companies were incubated at Incamp, and 21 companies in 2018.
- A small change was also observed in the number of jobs: 337 jobs generated in 2017 to 336 in 2018. Of these, 270 were in research & development (R&D) in 2018 and 240 in 2017. That is, 71.2% of the jobs generated by the companies in the complex are related to R&D.

The research labs resulting from university-company partnerships in the complex include Samsung's lab. The collaboration between the company and Unicamp has resulted in four patents jointly filed in 2017 and 2018.

## UNICAMP'S SCIENCE AND TECHNOLOGY COMPLEX



Núcleo: Acervo/Inova Unicamp.  
 Vértice: Kátia Kishi/Inova Unicamp.  
 LIB: Antonio Scarpinetti/ SEC – Unicamp.

More stable numbers in the Unicamp Science and Technology Complex, with a small variation in indicators over the two years of monitoring show the almost complete occupation of all available space. The challenge now is to expand the area to host more laboratories of companies that have joint projects with the university and promote the expansion of technology startups and an exponential growth of Unicamp's ecosystem.

## 8.4 Perspectives and challenges

As seen in this chapter, Unicamp occupies a special place in the local, regional and national context in terms of transferring the results of its activities to society, regarding social and technological innovations and promotion of entrepreneurship and partnerships with companies.

Some challenges that were evident in the analysis of the period should be highlighted. First, as discussed here and in other chapters of this report, the university has a large number of research projects with great potential for application to support public policies and actions of organized civil society institutions and for technology transfer. This fact was observed in schools from all areas of the university. For example, the School of Education indicated the unit could have actions closer to initiatives that seek to develop research in education, with relevance and social impact based on innovation. Resources recently obtained from federal funds and initiatives in progress in the state of São Paulo, led by Unicamp's GGTE and UNIVESP, could be fields for prospecting and a leading role for the unit in technological innovation in education. In addition, offering technology-related disciplines could constitute spaces and times of experimentation for Unicamp's professors and students in this sense or in the context of creating of innovative educational technologies with social and economic impact in the state of São Paulo.

Going beyond the walls of the university requires joint and organized actions of those responsible for research in Unicamp's bodies that can act as connections with the demands of society, including Inova and PROEC.



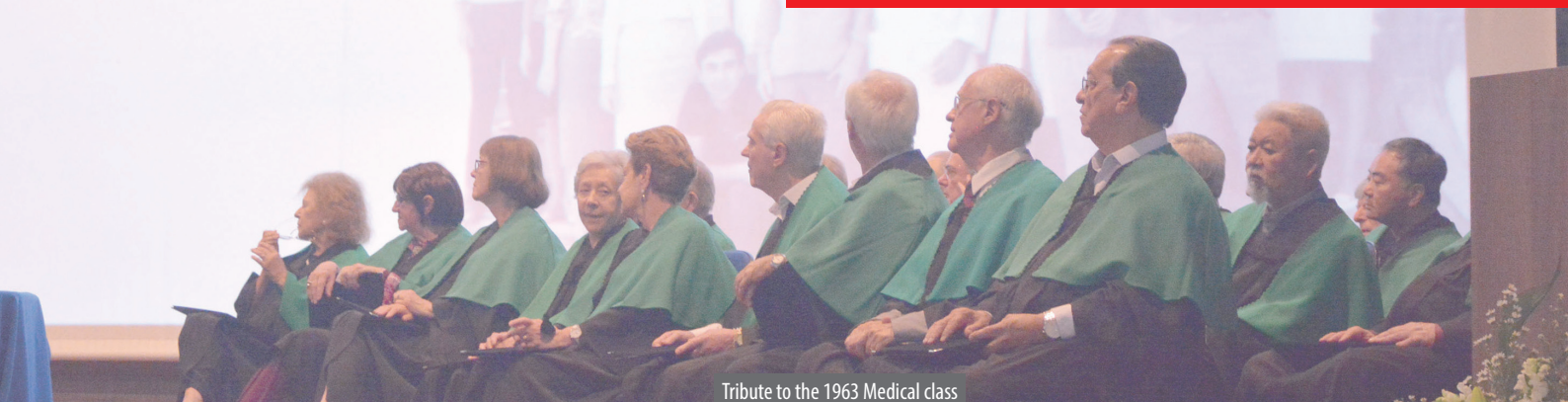
Second, a systematic impact evaluation of the university's actions should be performed beyond traditional academic indicators, including social, economic and environmental impacts. It involves discussions and definition of suitable impact evaluation methodologies for Unicamp's context, with monitoring of quantitative indicators and case studies.



50 anos da  
primeira  
turma

9.

## UNICAMP ALUMNI



Tribute to the 1963 Medical class



Meeting of the 1967, 1968 and 1969 Mechanical Engineering classes



Interdisciplinary Higher Education Program 2015 Graduation

Tribute to the 1963 Medical class: Communication Office – School of Medical Sciences (photo archive).  
Meeting of the 1967, 1968 and 1969 Mechanical Engineering classes: Antonio Scarpinetti/SEC – Unicamp.



Knowing the continuity of studies and the professional performance of Unicamp alumni is both information on the impact of the university on society and relevant data for planning and learning of programs. Thus, it is important to learn where students who have completed programs at many levels of education (technical high school; undergraduate education – bachelor's, teaching training, and technology degree; lato sensu graduate studies – improvement, specialization, and residency; and stricto sensu graduate studies – academic master degree, professional master degree, and doctorate) are and what they are doing.

As reported in previous chapters, Unicamp does not have a history of systematically approaching and monitoring its alumni, thus, this is an unprecedented initiative showing the professional and academic path of Unicamp alumni using of secondary data. For this, data were gathered from Unicamp's internal and external sources. The methodology involved the following steps:

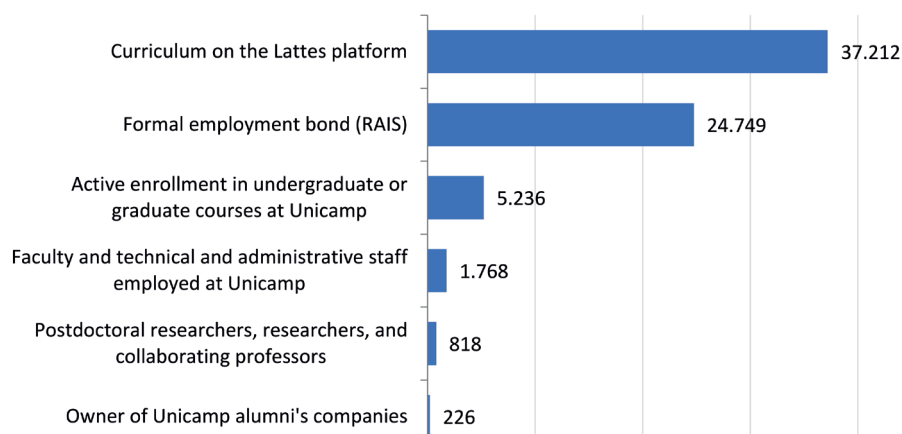
1. DAC (Unicamp Academic Office) provided a list of graduates from 2009 to 2018 at Unicamp's undergraduate and graduate programs;
2. The COTUCA and COTIL Secretariats provided the list of graduates from the same period at the technical courses;
3. Both alumni lists included each former student's Natural Persons Register (CPF – *Cadastro de Pessoas Físicas*, similar to the Social Security Number) to allow the analysis of study paths and avoid double counting. In the period, 46,515 students earned their undergraduate and graduate degrees and 8,867 completed technical courses in the technical high schools;
4. Based on the unified list of CPFs, formal employment information was sought from the Annual Report on Social Information (RAIS) database<sup>1</sup>; entrepreneurship information, from the Inova database called *Filhas da Unicamp* (Unicamp Alumni Companies); and supplementary information, from the curriculum vitae Lattes Platform<sup>2</sup>;
5. Also based on the unified list of CPFs, information was found on active relationships with Unicamp, whether they are academic (students, researchers, and collaborating and postdoctorate professors), with DAC and DGRH (Unicamp Human Resources Office); or professional with DGRH (faculty and technical and administrative staff). To complete the study paths, pre-2009 and post-2018 enrollments were also sought at DAC.
6. Based on the data available at RAIS, the maximum degree of the alumni was updated, in cases where the education available at RAIS was higher than that of Unicamp.
7. Data from all sources were then consolidated, cleared, and edited.

Graph 9.1 presents the results of searches for former undergraduate and graduate students without excluding repetitions. About 80% alumni have a curriculum on the Lattes platform, 53% had formal employment relationship in 2017 (last year available at RAIS), and 11% have active enrollment in undergraduate or graduate programs at Unicamp in 2019. In addition, 3.8% are faculty and technical and administrative staff employed and 2% had temporary academic relationships with Unicamp (postdoctoral, researchers, and assistant professors).

- 
1. RAIS is a database made up with mandatory information provided by employer organization of the former Ministry of Labor, currently in the Ministry of Economy. Microdata was accessed in the database available at the Unicamp Institute of Economics, result of an institutional agreement.
  2. Lattes data were collected using the lattes script developed by Jesús Mena-Chalco.



GRAPH 9.1 – NUMBER OF UNDERGRADUATE AND GRADUATE ALUMNI BY TYPE OF RELATIONSHIP



Source: Prepared by the authors based on data from DAC, RAIS, DGRH, and Inova-Unicamp alumni's companies.

There are some data limitations that need to be mentioned. First, because RAIS data only deal with formal employment and there is no similar source of data on the work of entrepreneurs and self-employed workers, this type of professional activity is underestimated in this chapter's analysis. There is also no systematic information about alumni working abroad.

The second limitation concerns current study paths in higher education institutions other than Unicamp. These two limitations may explain why some alumni paths were not found. The others may not be studying or working or may be working in the informal market.

Thirdly, the data for the two technical high schools are different for two reasons: COTUCA graduates are students of technical courses who have completed internship, high school, and technical education. Thus, students who have only completed high school do not appear. Regarding COTIL, data were reported both for those who completed only high school and for those who completed also the technical course. In addition, COTIL did not request students' CPFs until 2012 and there are also missing CPF values for COTUCA students. Therefore, the consolidated analysis, including the RAIS search, was restricted to 2,718 COTIL alumni from 2012 to 2018 and 3,324 COTUCA alumni, totaling 6,040 alumni. Operationally, we decided to separate the data of the technical high schools from those of undergraduate and graduate programs.

The main highlights of the analysis are:

- There have been about 46,000 higher education graduates and about 9,000 high school graduates in the past 10 years;
- 19% of graduates from technical high schools continued to study in undergraduate and graduate programs at Unicamp;
- There is diversity in undergraduate education: Engineering and Technology (37%), Arts and Humanities (30%), Biological and Health Sciences (21%), Exact and Earth Sciences (10%);
- There is a focus on graduate research: 43% of the graduates earned master's or doctoral degrees;

- In 2017, about 25,000 undergraduate and graduate alumni (53%) and 1,990 technical school alumni (33%) were in the formal labor market;
- The average income of graduates ranges between BRL 3,700 (US\$ 894<sup>3</sup>) monthly (high school level), BRL 7,200 (US\$ 1,739) monthly (undergraduate degree), and BRL 12,400 (US\$ 2,995) (doctorate);
- By field of knowledge (all undergraduate and graduate levels), the average monthly income is as follows: Exact and Earth Sciences (BRL 10,400; US\$ 2,512); Engineering and Technology (BRL 10,100; US\$ 2,440), Biological and Health Sciences (BRL 7,700; US\$ 1,860), and Arts and Humanities (BRL 7,200; US\$ 1,739);
- Unicamp has contributed to gender equality: women represent 55% of graduates in the formal market;
- Unicamp has trained students for both the private sector (38% of graduates in the formal market) and the public sector (48%);
- Unicamp has also contributed to the dissemination of knowledge: 44% of graduates in the formal market k-12 or higher education teachers;
- Unicamp has trained highly professional workers: another 38% of graduates in the formal market are in positions that require high professional qualifications;
- Unicamp has contributed to the education of new professionals: 22% of graduates in the formal market work in higher education institutions.

The chapter consists of two more sections. The first one presents the data of technical school alumni. The second discusses the path of undergraduate and graduate alumni.

## 9.1 Technical High School Alumni

PEDRO AUGUSTO, 1998 COTUCA FOOD CLASS,  
FORMER COTUCA TEACHER AND CURRENTLY ESALQ/USP PROFESSOR



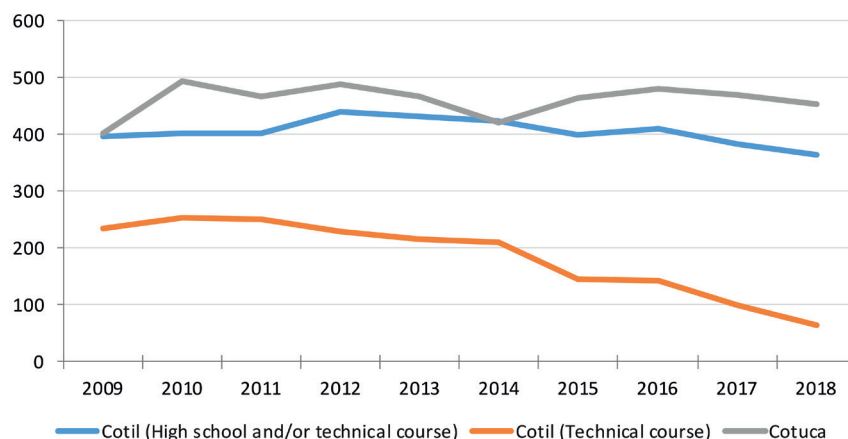
Gerhard Waller – ACOM/ESALQ.

Between 2009 and 2018, 8,667 technical high school students graduated from COTIL and COTUCA. The annual number of COTUCA graduates was in average 460 per

3. Values of September 2019. Dollar Exchange rate in real was US\$1 to BRL4,1387.

year, ranging from 402 to 488 graduates. COTIL had an annual average of 405 high school graduates (regardless of having completed the internship of the technical course), ranging from 365 to 441 (Graph 9.2).

GRAPH 9.2 – NUMBER OF GRADUATES ACCORDING TO SCHOOL PER YEAR, 2009-2018

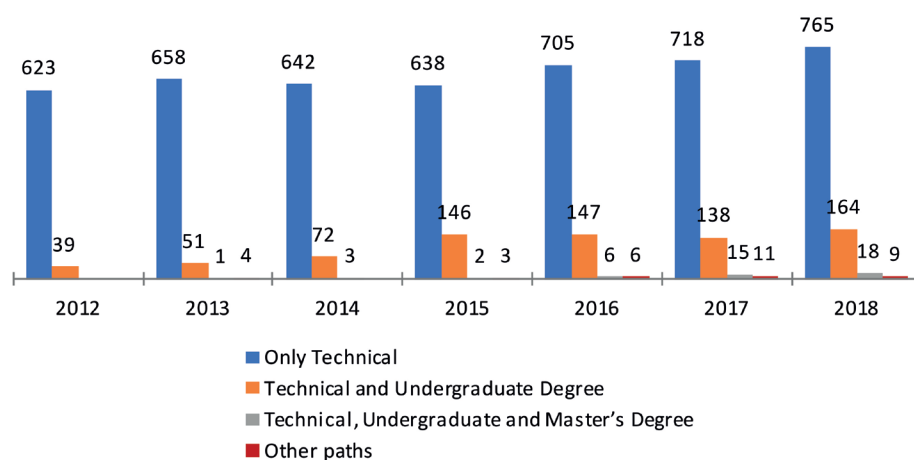


Note: Cotil (technical course) informs the completion of the internship of the technical course in the same year of completion or later, which explains the decrease in the last years of the series.

### 9.1.1 Study path

The next analyses consider only the graduates whose CPFs were informed. Graph 9.3 presents the study paths at Unicamp. As expected, the main path is to attend only the high school/technical course. However, there are also paths including the technical course and undergraduate degree (in about 17% of cases from 2015) and some other paths, such as the completion of the technical course, undergraduate, and master's degree in this period. In addition, in 2019, 866 graduates from technical schools were active in undergraduate and graduate programs at Unicamp.

GRAPH 9.3 – STUDY PATHS AT UNICAMP FOR TECHNICAL HIGH SCHOOL GRADUATES, 2012-2018

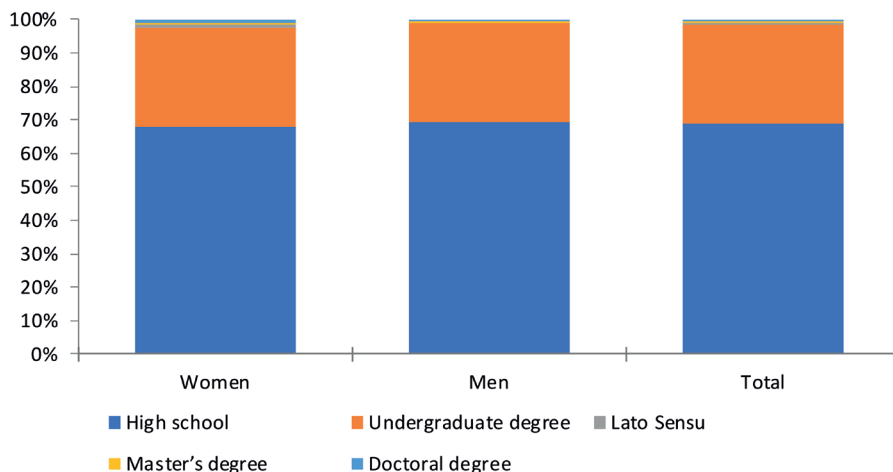


Source: Technical schools' secretariat.

Note: Data for 2009-2011 are not presented due to the large absence of CPFs in both COTIL and COTUCA, which made integration with DAC data impossible.

About 30% of the graduates had completed higher education, according to data available from DAC and RAIS (Graph 9.4).

GRAPH 9.4 – PERCENTAGE DISTRIBUTION OF GRADUATES WITH UPDATED EDUCATION LEVEL ACCORDING TO RAIS DATA

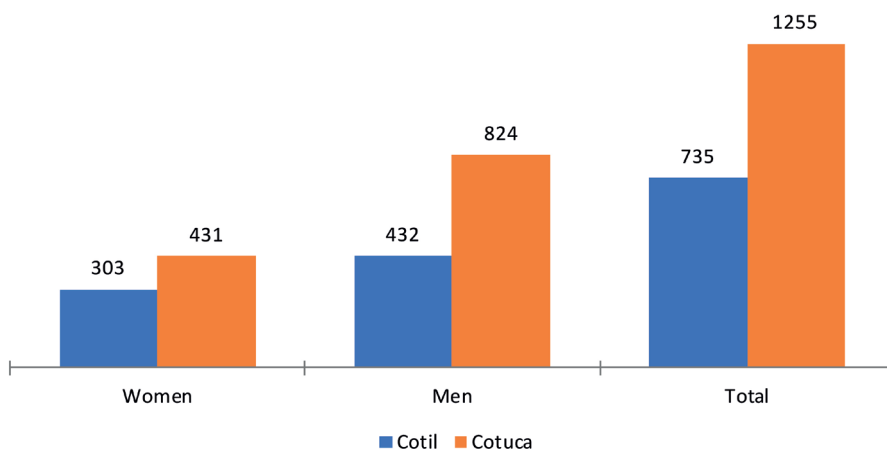


Source: Prepared by the authors based on the integration of data from the Schools' Secretariats, DAC, and RAIS.

### 9.1.2 Employment relationships

From the total of 6,040 school graduates whose CPFs were provided, it was possible to locate 1,990 alumni with formal employment relationship at RAIS (33% of the total). Graph 9.5 presents graduates with employment relationships at RAIS by sex and school of origin. As in other types of training, because they focus on STEM (science, technology, Exact and Earth Sciences, and mathematics) courses, the schools tend to have a male predominance, which is also revealed in employment relationships, especially among COTUCA graduates.

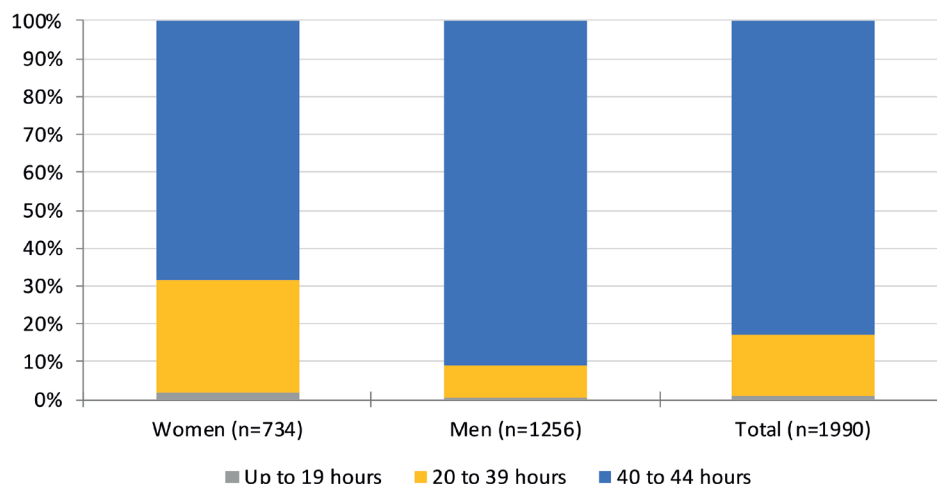
GRAPH 9.5 – NUMBER OF TECHNICAL HIGH SCHOOL GRADUATES BETWEEN 2009-2018 BY SEX (BASED ON INFORMATION FROM RAIS 2017)



Source: Prepared by the authors based on the integration of data from the Schools' Secretariats and RAIS.

Regarding working hours, 83% of graduates work 40 to 44 hours weekly, most frequent among men (Graph 9.6).

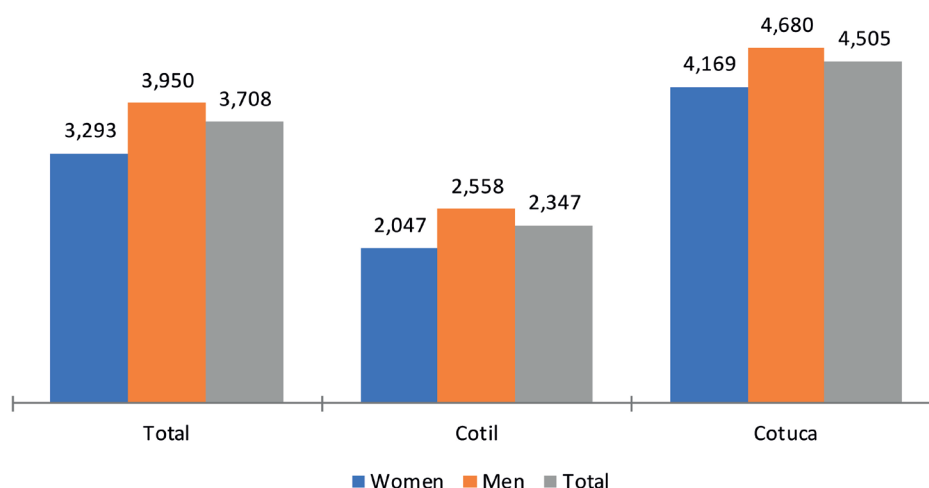
GRAPH 9.6 – PERCENTAGE DISTRIBUTION OF TECHNICAL HIGH SCHOOL GRADUATES FOR THE PERIOD 2009-2018 BY SEX AND WEEKLY HOURS OF WORK (BASED ON RAIS 2017 INFORMATION)



Source: Prepared by the authors based on the integration of data from the Schools' Secretariats and RAIS.

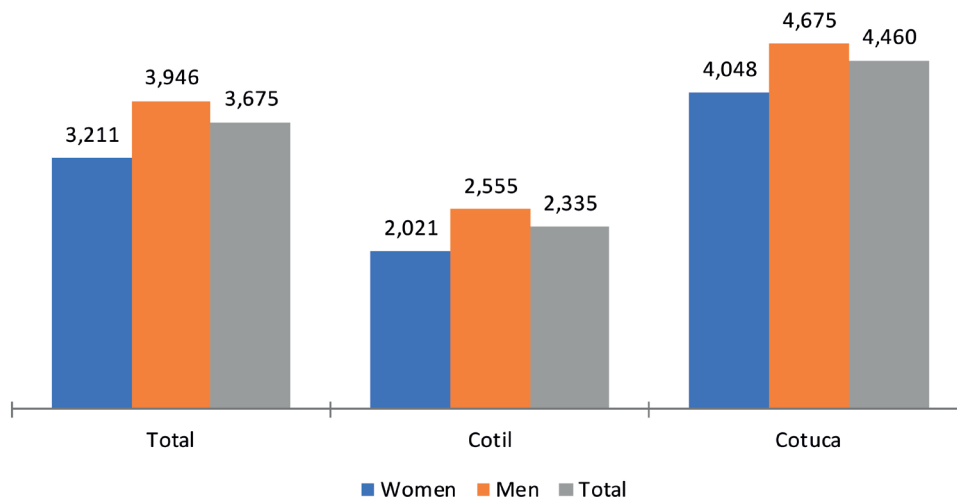
Regarding monthly average earnings, two analyzes were performed with their updated values for September 2019. The first deals with the average earnings of all employment relationships registered in RAIS (active and inactive) in 2017 (Graph 9.7). Average earnings tend to be higher among men and among COTUCA graduates. The second analysis was restricted to the average earnings of the longest working bond on 12/31/2017 (Graph 9.8). The values and trends are similar to the first analysis.

GRAPH 9.7 – AVERAGE MONTHLY EARNINGS OF ALL TECHNICAL SCHOOL GRADUATE RELATIONSHIPS FOR THE PERIOD 2009-2018 BY SEX, ACCORDING TO SCHOOL AND TOTAL (BASED ON RAIS 2017 INFORMATION)



Source: Prepared by the authors based on the integration of data from the Schools' Secretariats and RAIS.  
Note: Values updated for September 2019.

GRAPH 9.8 – AVERAGE MONTHLY EARNINGS OF THE LONGEST EMPLOYMENT BOND ON 12/31 FOR TECHNICAL SCHOOL GRADUATES IN THE PERIOD 2009-2018 BY SEX, ACCORDING TO SCHOOL AND TOTAL (BASED ON RAIS 2017 INFORMATION)



Source: Prepared by the authors based on the integration of data from the Schools' Secretariats and RAIS.  
Note: Values updated for September 2019.

Regarding occupation, Table 9.1 presents occupations by school and sex, according to the categories of the Brazilian Classification of Occupations (CBO, 2002)<sup>4</sup>. Most graduates are acting as technical level professionals (43% of the total, 40% among men and 48% among women), which includes subgroup occupations such as multipurpose technicians; high school-level technicians in the physical, chemical, engineering, and related sciences; high school-level technicians in the biological, biochemical, health, and related sciences; lay and high school-level teachers; high school-level technicians in transport services; high school-level technicians in the administrative sciences; high school-level technicians in cultural, communications, and sports services; and other high school-level technicians. Among women, we also highlight the occupations of administrative services (22%), with a dispersion in the other categories. Among men, 17% work in the production of Industrial Goods and Services, 12% as Exact, Physical Sciences, and Engineering Professionals, and 11% in administrative services.

4. The categories were organized by a large group (Members of the Armed Forces, Police and Military Firefighters; Senior Members of Government, Managers of Public Interest Organizations and Companies, Managers; High School-level Technicians (highlighting High School-level Teachers); Administrative Workers; Third Sector Workers, Trade and Market Vendors; Agricultural, Forestry, and Fishery Workers; Industrial Goods and Services Workers; Repair and Maintenance Workers), except for Science and Arts Professionals, which was separated by main subgroup (Poly-scientific Researchers and Professionals; Exact, Physical Sciences, and Engineering Professionals; Biological, Health, and Related Sciences Professionals; Teaching Professionals; Legal Sciences Professionals; Social and Human Sciences Professionals; Communicators, Artists, and Religious Professionals; Gastronomy Professionals). Finally, the main subgroup (Teaching Professionals) was separated by subgroup (Higher Education-Level Teachers in Preschool and Primary Education; Higher Education-Level High School Teachers; Higher Education-Level Vocational Teachers and Instructors; Higher Education Professors; Other Non-Classified Professionals).



TABLE 9.1 – NUMBER OF UNICAMP GRADUATES FOR THE PERIOD 2009-2018  
ACCORDING TO TECHNICAL HIGH SCHOOL AND OCCUPATION (CBO)

Occupation		Technical High School		Total
		Cotil	Cotuca	
WOMEN	Farming, Forest, and Fishing Sciences	0	0	0
	Biological and Health Sciences	1	14	15
	Exact and Earth Sciences	8	32	40
	Law Sciences	0	2	2
	Social and Human Sciences	3	15	18
	Artistic and Religious Communicators	1	3	4
	Senior Members and Officers	3	7	10
	Other teaching professionals	0	4	4
	Poly-scientific Researchers and Professionals	0	2	2
	Service Providers	22	23	45
	Production of Industrial Goods and Services	10	17	27
	High School-level Teachers	16	17	33
	Higher Education-Level Teachers in Preschool and Primary Education	0	2	2
	Higher Education-Level Higher Education-Level High school teachers	0	2	2
	Higher Education-Level Vocational education teachers	0	1	1
	Higher education professors	0	4	4
	Administrative Services	101	57	158
	Repair and Maintenance Services	1	4	5
	High school-level technicians	136	218	354
	Occupation unknown	1	7	8
	<b>Total</b>	<b>303</b>	<b>431</b>	<b>734</b>
MEN	Farming, Forest, and Fishing Sciences	2	1	3
	Biological and Health Sciences	2	2	4
	Exact and Earth Sciences	24	132	156
	Law Sciences	0	1	1
	Social and Human Sciences	3	19	22
	Artistic and Religious Communicators	2	8	10
	Senior Members and Officers	6	16	22
	Other teaching professionals	0	2	2
	Poly-scientific Researchers and Professionals	1	12	13
	Service Providers	29	32	61
	Production of Industrial Goods and Services	95	122	217
	High School-level Teachers	5	1	6
	Higher Education-Level Teachers in Preschool and Primary Education	1	2	3
	Higher Education-Level High school teachers	0	2	2
	Higher Education-Level Vocational education teachers	0	3	3
	Higher education professors	0	2	2
	Administrative Services	68	71	139
	Repair and Maintenance Services	30	34	64
	High school-level technicians	154	349	503
	Occupation unknown	10	13	23
	<b>Total</b>	<b>432</b>	<b>824</b>	<b>1,256</b>

TABLE 9.1 – NUMBER OF UNICAMP GRADUATES FOR THE PERIOD 2009-2018  
ACCORDING TO TECHNICAL HIGH SCHOOL AND OCCUPATION (CBO)

continued

Occupation		Technical High School		Total
		Cotil	Cotuca	
TOTAL	Farming, Forest, and Fishing Sciences	2	1	3
	Biological and Health Sciences	3	16	19
	Exact and Earth Sciences	32	164	196
	Law Sciences	0	3	3
	Social and Human Sciences	6	34	40
	Artistic and Religious Communicators	3	11	14
	Senior Members and Officers	9	23	32
	Other teaching professionals	0	6	6
	Poly-scientific Researchers and Professionals	1	14	15
	Service Providers	51	55	106
	Production of Industrial Goods and Services	105	139	244
	High School-level Teachers	21	18	39
	Higher Education-Level Teachers in Preschool and Primary Education	1	4	5
	Higher Education-Level High school teachers	0	4	4
	Higher Education-Level Vocational education teachers	0	4	4
	Higher education professors	0	6	6
	Administrative Services	169	128	297
	Repair and Maintenance Services	31	38	69
	High school-level technicians	290	567	857
	Occupation unknown	11	20	31
	Total	735	12,55	1,990

Source: Prepared by the authors based on the integration of data from the Schools' Secretariats and RAIS.

Regarding the legal nature<sup>5</sup> of the organization in which graduates are employed, most (77%) work in companies, most often among men (84%) (Table 9.2). Among women, besides working in companies (64%), 17% work in non-profit entities and 15% in public administration.

5. Legal categories include Public Administration (Public Agency of the Federal, State, or Federal District and Municipal Executive Branch; Public Agency of the Federal, State, or Federal District and Municipal Legislative Branch; Public Agency of the Federal or State Judiciary Branch; Autonomous Public Agency of the Federal, State, or Federal District and Municipal Power; Federal, State or Federal District and Municipal Autarchies; Federal, State or Federal and Municipal Foundations), Business Entities (Public Company; Joint-stock Company, Public Corporation among others)), Non-Profit Entities (Notary and Registry Service; Social Organization; Civil Society Organization of Public Interest (Oscip); Other Foundations Maintained with Private Resources; Autonomous Social Work; Condominium in Buildings; Executing Unit (Direct Money in School Program); Prior Conciliation Commission; Mediation and Arbitration Entity; Political Party; Union Entity; Branch, in Brazil, of a Foreign Foundation or Association; Foundation or Association Domiciliated Abroad; Other Forms of Association), Natural Persons (Individual Real Estate Company; Specially Insured Person; Individual Taxpayer), and International Organizations and Other Extraterritorial Institutions (International Organization and Other Extraterritorial Institutions).

TABLE 9.2 – NUMBER OF UNICAMP GRADUATES IN THE PERIOD 2009-2018  
ACCORDING TO THEIR EDUCATION AND THE LEGAL NATURE OF THEIR OCCUPATION

Legal Nature of the Organization		Education level					Total
		High school	Undergraduate degree	Lato Sensu degree	Master degree	Doctorate degree	
WOMEN	Public Administration	68	36	2	1	5	112
	Business Entities	313	154	3	1	2	473
	Nonprofit Entities	99	23	0	3	0	125
	Natural Persons	3	0	0	0	0	3
	Nature unknown	14	7	0	0	0	21
	Total	497	220	5	5	7	734
MEN	Public Administration	41	29	0	0	5	75
	Business Entities	747	297	2	4	2	1,052
	Nonprofit Entities	55	33	0	2	0	90
	Natural Persons	1	0	0	0	0	1
	Nature unknown	29	9	0	0	0	38
	Total	873	368	2	6	7	1,256
TOTAL	Public Administration	109	65	2	1	10	187
	Business Entities	1060	451	5	5	4	1,525
	Nonprofit Entities	154	56	0	5	0	215
	Natural Persons	4	0	0	0	0	4
	Nature unknown	43	16	0	0	0	59
	Total	1,370	588	7	11	14	1,990

Source: Prepared by the authors based on the integration of data from the Schools' Secretariats and RAIS.

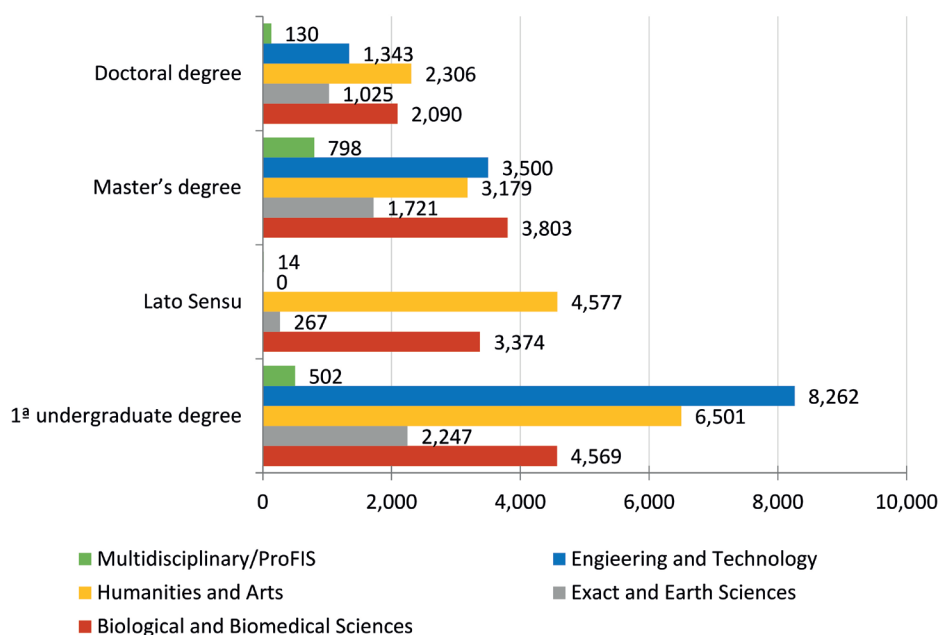
## 9.2 Undergraduate and graduate alumni

Between 2009 and 2018, 46,515 students graduated from undergraduate and graduate programs. Of these, 10,635 had already entered and completed a course at Unicamp prior to this period and 5,235 rejoined after completion and were still active in 2019.

### 9.2.1 Study path

Observing the levels of education, 22,081 students completed undergraduate programs; 8,232 completed lato sensu graduate programs (improvement, specialization, and residency); 13,001 completed a master's degree (academic or professional); and 6,894 completed a doctoral degree (Graph 9.9). In the period, Unicamp was responsible for granting about 3% of master's and 4% of doctoral degrees in the country. Considering all graduation completions, Unicamp was responsible for about 11% of graduates of undergraduate programs among the public universities in the state of São Paulo.

GRAPH 9.9 – NUMBER OF GRADUATES BY LEVEL ACCORDING TO FIELD OF KNOWLEDGE



Source: Prepared by the authors based on DAC data.

Note: the multidisciplinary area refers to multidisciplinary courses and also to graduates who have completed more than one course of the same level in different areas.

Table 9.3 presents the study paths in undergraduate and graduate programs for last year of graduation (excluding repetitions).

TABLE 9.3 – NUMBER OF UNICAMP GRADUATES BY PATH FOR LAST YEAR OF GRADUATION

Variable	Year										Period
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2009-2018
Only Undergraduate Degree	1,295	1,377	1,553	1,835	1,675	573	3,138	1,930	1,980	2,469	17,825
Only Master's Degree	743	791	886	786	804	691	625	505	485	604	6,920
Only Lato Sensu	253	259	1864	287	2855	200	310	261	217	234	6,740
Undergraduate Degree and Master's Degree	377	365	376	293	315	264	424	384	516	557	3,871
Only Doctoral Degree	296	298	338	348	344	343	379	387	396	399	3,528
Master's and Doctoral Degrees	325	332	312	310	248	233	296	405	386	341	3,188
Undergraduate, Master's, and Doctoral Degrees	193	162	136	161	133	112	187	251	324	294	1,953
Undergraduate Degree and Lato Sensu	85	94	124	65	83	65	108	106	126	96	952
Undergraduate and Doctoral Degrees	42	42	42	42	45	38	71	91	68	49	530
Other paths	58	69	82	90	103	92	127	123	142	122	1,008
Total number of graduates (for last year of graduation)	3,667	3,789	5,713	4,217	6,605	2,611	5,665	4,443	4,640	5,165	46,515

Source: Prepared by the authors based on DAC data.

Note: The decrease in undergraduate graduates between 2014 and 2015 is due to the 2014 strike that postponed the completion of the courses from December 2014 to January 2015.

It is worth emphasizing that the areas of undergraduate graduates refer to the first degree in cases where there was more than one completion. As can be seen in Table 9.4, by the average number of graduations, more than 87% of graduates completed only one undergraduate program at Unicamp between 2009 and 2018.

TABLE 9.4 – NUMBER OF UNICAMP GRADUATES PER YEAR/PERIOD  
ACCORDING TO NUMBER OF GRADUATIONS COMPLETED

Variable	Year										Period 2009-2018
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
One	1,663	1,661	1,847	2,057	1,854	645	3,295	1,914	1,986	2,393	19,315
Two	252	265	259	294	315	75	473	316	237	129	2,615
Three or more	29	21	23	26	14	3	21	7	6	1	151

Source: Prepared by the authors based on DAC data.

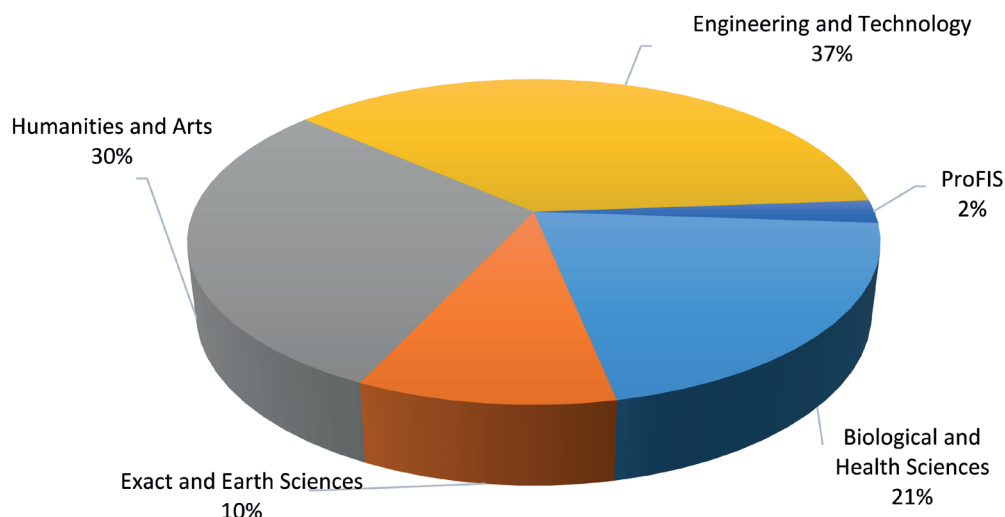
More than a third of graduates are in the fields of Engineering and Technology (37%), followed by Arts and Humanities (30%) and Biological and Health Sciences (21%) (Graph 9.10). Table 9.5 presents the distribution of graduates per year and field of knowledge.

CRISTIANO AMON, 1998 ELECTRICAL ENGINEERING  
CLASS, PRESIDENT OF QUALCOMM INCORPORATED



Pedro Amatuzzi – Inova Unicamp.

GRAPH 9.10 – PERCENTAGE DISTRIBUTION OF UNDERGRADUATE GRADUATES BY FIELD OF FIRST DEGREE



Source: Prepared by the authors based on DAC data.

TABLE 9.5 – NUMBER OF UNICAMP GRADUATES PER YEAR/PERIOD ACCORDING TO FIELD OF KNOWLEDGE OF FIRST DEGREE ON UNDERGRADUATE PROGRAMS

Variable	Year										Period 2009-2018
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
Biological and Health Sciences	417	421	417	521	530	148	716	465	433	501	4,569
Exact and Earth Sciences	235	227	244	269	186	81	355	199	217	234	2,247
Arts and Humanities	555	548	594	668	633	201	1,172	685	687	758	6,501
Engineering and Technology	737	751	874	874	769	291	1,400	820	814	932	8,262
ProFIS	0	0	0	45	65	2	146	68	78	98	502

Source: Prepared by the authors based on DAC data.

Note: The decrease in undergraduate graduates between 2014 and 2015 is due to the 2014 strike that postponed the completion of the courses from December 2014 to January 2015.

Regarding lato sensu courses, 56% of the graduates were in the field of Arts and Humanities, largely due to specialization programs offered in the period for teachers<sup>6</sup>, and 41% completed courses in the field of Biological and Health Sciences, mainly health improvement and residency programs (Table 9.6).

6. 4,733 students completed the specialization programs Portuguese Language for Middle and High School Teachers, Mathematics for Middle and High School Teachers, History for Middle and High School Teachers, Physical Education for Middle and High School Teachers, Educational and Physical Management for High School Teachers.



TABLE 9.6 – NUMBER OF UNICAMP GRADUATES PER YEAR/PERIOD  
ACCORDING TO FIELD OF KNOWLEDGE OF THE LATO SENSU GRADUATE PROGRAM

Field of knowledge of the Lato Sensu course	Year										Period 2009-2018
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
Biological and Health Sciences	180	271	468	287	601	299	306	340	330	292	3,374
Exact and Earth Sciences	0	2	79	61	91	0	34	0	0	0	267
Arts and Humanities	244	158	1,529	94	2,319	2	134	51	0	46	4,577
Engineering and Technology	0	0	0	0	0	0	0	0	0	0	0
Multidisciplinary	0	0	0	0	14	0	0	0	0	0	14
Total	424	431	2,076	442	3,025	301	474	391	330	338	8,232

Source: Prepared by the authors based on DAC data.

Note: The classification of multidisciplinary was used when more than one course was completed in different fields of knowledge.

Regarding master's degree graduates, there is a more balanced distribution between three fields – 29% in Biological and Health Sciences, 27% in Engineering and Technology, 25% in Arts and Humanities, and less in Exact and Earth Sciences (13%) and Multidisciplinary (6%) (Table 9.7).

TABLE 9.7 – NUMBER OF UNICAMP GRADUATES PER YEAR/PERIOD ACCORDING TO  
FIELD OF KNOWLEDGE OF THE MASTER'S DEGREE

Area	Year										Period 2009-2018
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
Biological and Health Sciences	340	350	389	355	436	412	391	401	357	372	3,803
Exact and Earth Sciences	156	169	180	141	156	143	222	198	187	169	1,721
Arts and Humanities	320	294	303	329	326	314	343	295	329	326	3,179
Engineering and Technology	324	361	422	343	338	305	317	323	348	419	3,500
Multidisciplinary	38	38	65	85	83	73	89	98	120	109	798
Total	3,187	3,222	3,370	3,265	3,352	3,261	3,377	3,331	3,358	3,413	13,001

Source: Prepared by the authors based on DAC data.

At the doctoral level, there is a higher concentration of graduates from the areas of Arts and Humanities (33%) and Biological and Health Sciences (30%), and lower in Engineering and Technology (20%), Exact and Earth Sciences (15%) and Interdisciplinary (2%) (Table 9.8).

TABLE 9.8 – NUMBER OF UNICAMP GRADUATES PER YEAR/PERIOD ACCORDING TO  
THE FIELD OF KNOWLEDGE OF THE DOCTORATE DEGREE

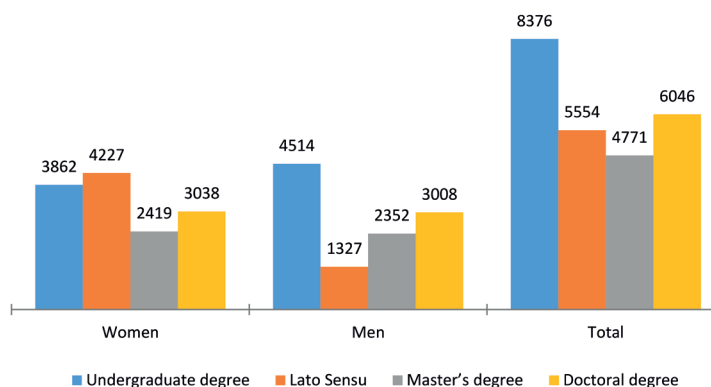
Field of knowledge of Doctorate	Year										Period 2009-2018
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
Biological and Health Sciences	257	267	257	256	193	176	169	175	167	173	2,090
Exact and Earth Sciences	129	107	119	119	99	91	72	86	111	92	1,025
Arts and Humanities	267	261	237	244	254	204	218	199	217	205	2,306
Engineering and Technology	170	172	171	168	136	103	101	100	101	121	1,343
Multidisciplinary	23	6	10	16	15	5	12	11	10	22	130
Total	846	813	794	803	697	579	572	571	606	613	6,894

Source: Prepared by the authors based on DAC data.

## 9.2.2 Employment relationships

Of the total of 46,615 graduates, it was possible to locate 24,747 with formal employment relationships at RAIS in 2017 (53%). Women represent 55% of the total, which contributes to gender equality in the formal labor market. Levels of employability vary according to education level: 38% among undergraduate alumni, 67% among lato sensu graduate alumni, 37% among masters, and 88% among doctors. Taking data from the Employment Panel of the HR Information Service for CT&I of CGEE<sup>7</sup>, the employment rates of doctors are higher than those who are registered in São Paulo.

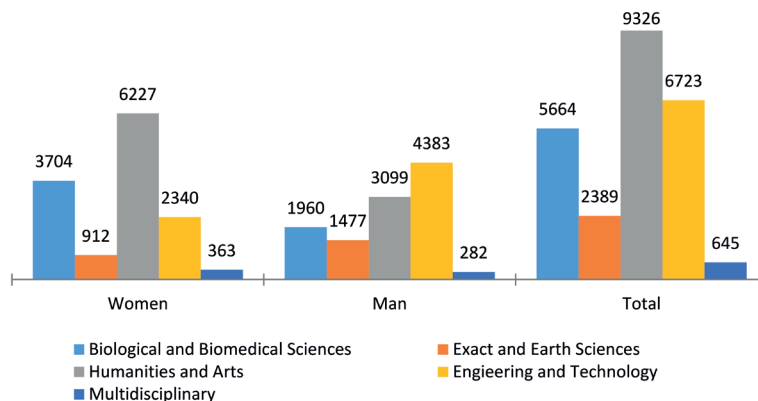
GRAPH 9.11 – NUMBER OF UNICAMP GRADUATES WITH FORMAL EMPLOYMENT RELATIONSHIPS IN THE PERIOD 2009-2018 ACCORDING TO THE UPDATED EDUCATIONAL LEVEL (BASED ON RAIS 2017 INFORMATION) – WOMEN, MEN, AND TOTAL



Source: Prepared by the authors based on DAC and RAIS data.

Observing the field of knowledge from the education obtained at Unicamp, graduates with employment relationships are more frequently in the area of Arts and Humanities (38%), mainly among women, followed by the area of Engineering and Technology (27%) and Biological and Health Sciences (23%) (Graph 9.12).

GRAPH 9.12 – NUMBER OF UNICAMP GRADUATES WITH FORMAL EMPLOYMENT RELATIONSHIPS IN THE PERIOD 2009-2018 ACCORDING TO THE FIELD OF KNOWLEDGE (BASED ON RAIS 2017 INFORMATION) – WOMEN, MEN, AND TOTAL

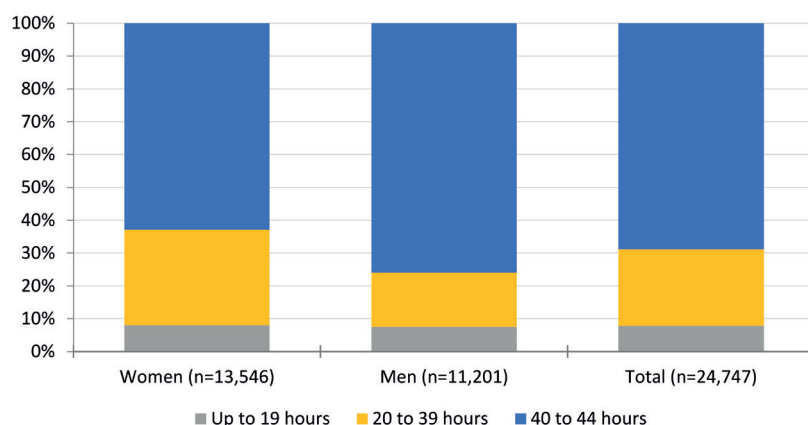


Source: Prepared by the authors based on DAC and RAIS data.

7. <https://www.cgee.org.br/web/rhcti/emprego-ano-emprego>

Regarding working hours, about 70% work full time (40-44 hours per week), and longer working hours are more frequent among men than women (Graph 9.13).

GRAPH 9.13 – PERCENTAGE DISTRIBUTION OF UNICAMP GRADUATES WITH FORMAL EMPLOYMENT RELATIONSHIPS IN THE PERIOD 2009-2018 ACCORDING TO WORKING HOURS (BASED ON RAIS 2017 INFORMATION) – WOMEN, MEN, AND TOTAL



Source: Prepared by the authors based on DAC and RAIS data.

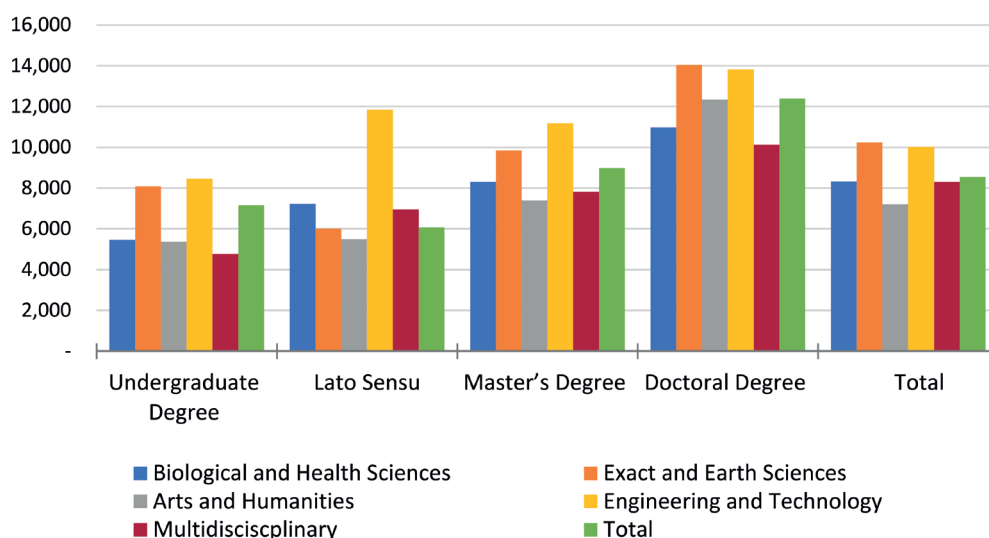
As in technical schools, the average income was analyzed according to the active relationship on 12/31/2017 of longest journey (Table 9.9 and Graph 9.14) and of all relationships (Table 9.10). Wages increase according to the educational level (Table 9.9), except for the lato sensu graduate program, probably due to insertion in low-paid jobs (teachers and public health professionals). Regarding the fields of knowledge, the earnings are decreasing considering the fields in this order: Exact and Earth Sciences, Engineering and Technological, Biological and Health Sciences, and Arts and Humanities. Comparing with the data from the CGEE's Employment Panel, taking as a basis graduates from 2014, the remuneration of masters and doctors is higher than the average for the state of São Paulo.

KIZZY ANTUALPA, 2002 PHYSICAL EDUCATION CLASS,  
PROFESSOR AT FEDERAL UNIVERSITY OF BAHIA



Pedro Amatuzzi – Inova Unicamp.

GRAPH 9.14 – AVERAGE MONTHLY INCOME OF ACTIVE EMPLOYMENT AT RAIS WITH LONGEST WORKING HOURS (IN BRL, SEP. 2019) FOR UNICAMP GRADUATES IN THE PERIOD 2009-2018 ACCORDING TO EDUCATION LEVEL AND FIELD OF KNOWLEDGE



Source: Prepared by the authors based on DAC and RAIS data.

TABLE 9.9 – AVERAGE MONTHLY INCOME OF ACTIVE EMPLOYMENT AT RAIS WITH THE LONGEST WORKING HOURS (IN BRL, SEP. 2019)

Variable	Women	Men	Total
Total	7,427.72	9,902.60	8,547.90
By education level:			
Undergraduate degree	5,961.42	8,181.55	7,157.89
Lato Sensu	5,807.25	6,944.33	6,078.93
Master's degree	7,670.41	10,329.67	8,981.37
Doctoral degree	11,353.18	13,456.43	12,399.59
By field of knowledge:			
Biological and Health Sciences	7,674.04	9,541.78	8,320.36
Exact and Earth Sciences	8,997.18	11,005.45	10,238.79
Arts and Humanities	6,558.96	8,491.37	7,201.10
Engineering and Technology	8,784.93	10,696.21	10,030.97
Multidisciplinary <sup>1</sup>	7,125.23	9,807.82	8,298.08

Source: Prepared by the authors based on DAC and RAIS data.

Note: the multidisciplinary area refers to multidisciplinary courses and also to graduates who have completed more than one course of the same level in different areas.

TABLE 9.10 – TOTAL AVERAGE MONTHLY INCOME AT RAIS (IN BRL, SEP. 2019)

Variable	Women	Men	Total
Total	7,831.07	10,289.80	8,943.94
By education level:			
Undergraduate degree	6,026.21	8,249.60	7,224.44
Lato Sensu	6,537.04	7,991.75	6,884.61
Master's degree	8,123.13	10,870.62	9,477.58
Doctoral degree	11,693.37	13,911.11	12,796.74
By field of knowledge:			
Biological and Health Sciences	8,269.48	10,532.48	9,052.58
Exact and Earth Sciences	9,135.70	11,237.65	10,435.23
Arts and Humanities	7,021.84	8,928.58	7,655.45
Engineering and Technology	8,859.08	10,830.58	10,144.39
Multidisciplinary <sup>1</sup>	7,334.65	10,192.38	8,584.07

Source: Prepared by the authors based on DAC and RAIS data.

Note: the multidisciplinary area refers to multidisciplinary courses and also to graduates who have completed more than one course of the same level in different areas.

Regarding occupation, 45% of the graduates were working as teachers of early childhood education, Primary and high school, vocational and higher education (Table 9.11). Of these, 65% were women. In addition, another 38% of graduates in the formal market were in positions that require high professional qualifications.

TABLE 9.11 – NUMBER OF GRADUATES FROM UNICAMP IN THE PERIOD 2009-2018  
ACCORDING TO OCCUPATION AND FIELD OF KNOWLEDGE

Occupation		Field of Knowledge					Total
		Biological and Health Sciences	Exact and Earth Sciences	Arts and Humanities	Engineering and Technology	Multidisciplinary <sup>1</sup>	
WOMEN	Farming, Forest, and Fishing Sciences	0	0	1	1	0	2
	Biological and Health Sciences	1,613	6	19	57	60	1,755
	Exact and Earth Sciences	21	123	36	451	32	663
	Law Sciences	0	1	10	1	1	13
	Social and Human Sciences	225	72	279	243	28	847
	Artistic and Religious Communicators	8	5	111	12	16	152
	Senior Members and Officers	64	63	306	272	17	722
	Other teaching professionals	32	11	204	16	12	275
	Poly-scientific Researchers and Professionals	90	58	33	87	9	277
	Service Providers	44	10	55	39	7	155
	Production of Industrial Goods and Services	11	16	7	34	1	69
	High School-level Teachers	267	114	2,709	21	26	3,137
	Higher Education-Level Teachers in Preschool and Primary Education	200	69	938	72	24	1,303

TABLE 9.11 – NUMBER OF GRADUATES FROM UNICAMP IN THE PERIOD 2009-2018  
ACCORDING TO OCCUPATION AND FIELD OF KNOWLEDGE

continued

Occupation		Field of Knowledge					Total
		Biological and Health Sciences	Exact and Earth Sciences	Arts and Humanities	Engineering and Technology	Multidisciplinary <sup>1</sup>	
WOMEN	Higher Education-Level High school teachers	49	45	193	46	14	347
	Higher Education-Level Vocational education teachers	25	14	60	20	4	123
	Higher education professors	600	112	653	329	51	1,745
	Administrative Services	147	51	333	208	24	763
	Repair and Maintenance Services	0	2	0	4	0	6
	High school-level technicians	217	123	203	382	21	946
	Occupation unknown	91	17	77	45	16	246
	<b>Total</b>	<b>3,704</b>	<b>912</b>	<b>6,227</b>	<b>2340</b>	<b>363</b>	<b>13,546</b>
MEN	Farming, Forest, and Fishing Sciences	1	0	2	7	0	10
	Biological and Health Sciences	749	6	9	29	11	804
	Exact and Earth Sciences	20	291	57	1,351	48	1,767
	Law Sciences	2	5	9	5	1	22
	Social and Human Sciences	39	64	277	473	14	867
	Artistic and Religious Communicators	8	4	73	14	14	113
	Senior Members and Officers	53	96	160	528	22	859
	Other teaching professionals	18	6	43	17	5	89
	Poly-scientific Researchers and Professionals	45	64	23	173	12	317
	Service Providers	17	8	45	66	1	137
	Production of Industrial Goods and Services	7	33	11	91	4	146
	High School-level Teachers	176	118	648	36	12	990
	Higher Education-Level Teachers in Preschool and Primary Education	126	126	403	109	10	774
	Higher Education-Level High school teachers	37	122	191	92	18	460
	Higher Education-Level Vocational education teachers	9	13	29	34	5	90
	Higher education professors	440	298	565	557	62	1,922
	Administrative Services	65	54	278	276	17	690
	Repair and Maintenance Services	1	0	2	12	1	16
	High school-level technicians	92	135	188	463	20	898
	Occupation unknown	55	34	86	50	5	230
	<b>Total</b>	<b>1,960</b>	<b>1,477</b>	<b>3,099</b>	<b>4,383</b>	<b>282</b>	<b>11,201</b>
TOTAL	Farming, Forest, and Fishing Sciences	1	0	3	8	0	12
	Biological and Health Sciences	2,362	12	28	86	71	2,559
	Exact and Earth Sciences	41	414	93	1,802	80	2,430



TABLE 9.11 – NUMBER OF GRADUATES FROM UNICAMP IN THE PERIOD 2009-2018  
ACCORDING TO OCCUPATION AND FIELD OF KNOWLEDGE

continued

	Occupation	Field of Knowledge					Total
		Biological and Health Sciences	Exact and Earth Sciences	Arts and Humanities	Engineering and Technology	Multidisciplinary <sup>1</sup>	
TOTAL	Law Sciences	2	6	19	6	2	35
	Social and Human Sciences	264	136	556	716	42	1,714
	Artistic and Religious Communicators	16	9	184	26	30	265
	Senior Members and Officers	117	159	466	800	39	1,581
	Other teaching professionals	50	17	247	33	17	364
	Poly-scientific Researchers and Professionals	135	122	56	260	21	594
	Service Providers	61	18	100	105	8	292
	Production of Industrial Goods and Services	18	49	18	125	5	215
	High School-level Teachers	443	232	3,357	57	38	4,127
	Higher Education-Level Teachers in Preschool and Primary Education	326	195	1341	181	34	2,077
	Higher Education-Level High school teachers	86	167	384	138	32	807
	Higher Education-Level Vocational education teachers	34	27	89	54	9	213
	Higher education professors	1,040	410	1,218	886	113	3,667
	Administrative Services	212	105	611	484	41	1453
	Repair and Maintenance Services	1	2	2	16	1	22
	High school-level technicians	309	258	391	845	41	1,844
	Occupation unknown	146	51	163	95	21	476
	Total	5,664	2,389	9,326	6,723	645	24,747

Source: Prepared by the authors based on DAC and RAIS data.

Note: the multidisciplinary area refers to multidisciplinary courses and also to graduates who have completed more than one course of the same level in different areas.

Regarding the legal nature of the employing establishment, about half of the graduates work in public administration, which includes education and health establishments, and another 38% in business entities (Table 9.12). This distribution varies by educational level. Among undergraduate alumni, more than 80% worked in companies, while 80% of graduates from *lato sensu* courses worked in public administration. In the case of masters and doctors, the work in non-profit entities also includes private higher education institutions.

TABLE 9.12 – NUMBER OF UNICAMP GRADUATES IN THE PERIOD 2009-2018 ACCORDING TO EDUCATIONAL LEVEL AND THE LEGAL NATURE OF THE EMPLOYING ESTABLISHMENT

Legal Nature of Occupation		Educational level				Total
		Undergraduate degree	Lato Sensu degree	Master degree	Doctorate degree	
WOMEN	Public Administration	747	3,465	1,155	1,908	7,275
	Business Entities	2,658	289	709	536	4,192
	Nonprofit Entities	382	434	519	579	1,914
	Natural Persons	5	2	1	0	8
	Nature unknown	70	37	35	15	157
	Total	3,862	4,227	2,419	3,038	13,546
MEN	Public Administration	602	980	953	2,067	4,602
	Business Entities	3,551	147	947	469	5,114
	Nonprofit Entities	303	188	430	465	1,386
	Natural Persons	8	0	2	1	11
	Nature unknown	50	12	20	6	88
	Total	4,514	1,327	2,352	3,008	11,201
TOTAL	Public Administration	1,349	4,445	2,108	3,975	11,877
	Business Entities	6,209	436	1,656	1,005	9,306
	Nonprofit Entities	685	622	949	1,044	3,300
	Natural Persons	13	2	3	1	19
	Nature unknown	120	49	55	21	245
	Total	8,376	5,554	4,771	6,046	24,747

Source: Prepared by the authors based on DAC and RAIS data.

The graduates were distributed in 404 different categories of the Classification of All Economic Activities (CNAE),<sup>8</sup> which were grouped into 39 interest categories. 29% of graduates are in general public administration establishments, which includes executive and legislative activities, exercised by public authorities, in the three spheres of government (federal, state, and municipal), and at the level of direct and indirect administration, as well as in administration and supervision of tax matters. Another 22% work in higher education entities, training new professionals (Table 9.13).

#### HERCULES GOMES, 2000 POPULAR MUSIC CLASS, COMPOSER AND PIANIST



Pedro Amatuzy – Inova Unicamp..

8. Based on the International Standard Industrial Classification of All Economic Activities Revision 4 from United Nations.

TABLE 9.13 – NUMBER OF UNICAMP GRADUATES IN THE PERIOD 2009-2018  
ACCORDING TO EDUCATIONAL LEVEL AND ECONOMIC ACTIVITY (CNAE)

Economic Activity of Occupation		Educational level				Total
		Undergraduate degree	Lato Sensu degree	Master degree	Doctorate degree	
WOMEN	General public administration activities	561	3,350	711	447	5,069
	Sports activities	53	0	8	6	67
	Management consultancy activities	103	75	60	36	274
	Architectural and engineering activities and related technical consultancy	41	0	21	3	65
	Other business support service activities n.e.c.	334	13	71	28	446
	Hospital activities	67	167	58	41	333
	Medical and dental practice activities	32	23	22	10	87
	Other human health activities	55	117	45	28	245
	Computer programming, consultancy and related activities	126	4	31	7	168
	Activities of business, employers and professional membership organizations	55	47	59	28	189
	Other monetary intermediation (Multiple Banks With Commercial Portfolio)	199	7	15	4	225
	Other monetary intermediation (Saving Banks)	27	3	6	0	36
	Water collection, treatment and supply	20	1	9	3	33
	Wholesale trade	148	6	33	14	201
	Retail trade	157	14	29	18	218
	Electric power generation, transmission and distribution	24	1	3	2	30
	Construction	24	3	8	13	48
	Pre-primary and primary education	61	24	25	14	124
	Higher education (vocational degree)	5	5	49	82	141
	Technical and vocational secondary education	4	4	34	53	95
	Higher education (undergraduate degree)	42	24	181	724	971
	Higher education (undergraduate and graduate degree)	157	79	343	1,064	1,643
	Higher education (graduate degree and outreach)	1	6	13	55	75
	Primary education	122	73	94	57	346
	Secondary education	52	25	55	24	156
	Other education	121	32	63	40	256
	Extraction of crude petroleum and natural gas	5	0	7	1	13
	Manufacture of malt liquors and malt	38	0	2	0	40
	Manufacture of pharmaceuticals, medicinal chemical and botanical products	76	6	18	15	115
	Manufacture of basic chemicals, fertilizers and nitrogen compounds, plastics and synthetic rubber in primary forms	51	0	11	6	68
	Manufacture of other chemical products n.e.c.	191	4	41	23	259
	Manufacture of parts and accessories for motor vehicles	46	1	5	0	52
	Provision of services to the community as a whole (Foreign affairs, Defence activities, Public order and safety activities)	28	13	46	31	118
	Research and experimental development on natural sciences and engineering	53	4	52	88	197
	Manufacture of refined petroleum products	11	1	10	5	27
	Social work activities without accommodation	54	48	39	18	159

TABLE 9.13 – NUMBER OF UNICAMP GRADUATES IN THE PERIOD 2009-2018  
ACCORDING TO EDUCATION LEVEL AND ECONOMIC ACTIVITY (CNAE)

continued

Economic Activity of Occupation		Educational level				Total
		Undergraduate degree	Lato Sensu degree	Master degree	Doctorate degree	
WOMEN	Transportation and storage	28	3	4	0	35
	Manufacture of other food products	45	0	4	2	51
	Other Economic Activities	645	44	134	48	871
	Total	3,862	4,227	2,419	3,038	13,546
MEN	General public administration activities	407	895	445	341	2,088
	Sports activities	66	3	18	9	96
	Management consultancy activities	190	47	51	48	336
	Architectural and engineering activities and related technical consultancy	61	1	23	4	89
	Other business support service activities n.e.c.	343	8	62	26	439
	Hospital activities	15	75	26	9	125
	Medical and dental practice activities	13	8	11	4	36
	Other human health activities	25	40	21	16	102
	Computer programming, consultancy and related activities	395	5	55	20	475
	Activities of business, employers and professional membership organizations	31	11	38	26	106
	Other monetary intermediation (Multiple Banks With Commercial Portfolio)	333	12	30	11	386
	Other monetary intermediation (Saving Banks)	39	0	5	0	44
	Water collection, treatment and supply	21	1	22	5	49
	Wholesale trade	212	4	46	15	277
	Retail trade	166	0	30	12	208
	Electric power generation, transmission and distribution	42	0	10	4	56
	Construction	53	1	5	7	66
	Pre-primary and primary education	25	9	11	2	47
	Higher education (vocational degree)	6	11	105	132	254
	Technical and vocational secondary education	3	1	51	60	115
	Higher education (undergraduate degree)	20	21	189	731	961
	Higher education (undergraduate and graduate degree)	123	40	311	1,113	1,587
	Higher education (graduate degree and outreach)	1	7	30	65	103
	Primary education	71	19	62	37	189
	Secondary education	50	16	36	19	121
	Other education	86	15	51	34	186
	Extraction of crude petroleum and natural gas	43	1	30	12	86
	Manufacture of malt liquors and malt	39	0	1	0	40
	Manufacture of pharmaceuticals, medicinal chemical and botanical products	24	1	9	11	45
	Manufacture of basic chemicals, fertilizers and nitrogen compounds, plastics and synthetic rubber in primary forms	55	0	14	5	74
	Manufacture of other chemical products n.e.c.	150	3	38	19	210
	Manufacture of parts and accessories for motor vehicles	81	0	17	2	100
	Provision of services to the community as a whole (Foreign affairs, Defence activities, Public order and safety activities)	71	18	45	25	159

TABLE 9.13 – NUMBER OF UNICAMP GRADUATES IN THE PERIOD 2009-2018  
ACCORDING TO EDUCATION LEVEL AND ECONOMIC ACTIVITY (CNAE)

continued

Economic Activity of Occupation		Educational level				Total
		Undergraduate degree	Lato Sensu degree	Master degree	Doctorate degree	
MEN	Research and experimental development on natural sciences and engineering	133	5	116	88	342
	Manufacture of refined petroleum products	81	4	36	8	129
	Social work activities without accommodation	24	4	15	5	48
	Transportation and storage	35	0	14	2	51
	Manufacture of other food products	43	1	6	1	51
	Other Economic Activities	938	40	267	80	1325
	<b>Total</b>	<b>4,514</b>	<b>1,327</b>	<b>2,352</b>	<b>3,008</b>	<b>11,201</b>
TOTAL	General public administration activities	968	4,245	1,156	788	7,157
	Sports activities	119	3	26	15	163
	Management consultancy activities	293	122	111	84	610
	Architectural and engineering activities and related technical consultancy	102	1	44	7	154
	Other business support service activities n.e.c.	677	21	133	54	885
	Hospital activities	82	242	84	50	458
	Medical and dental practice activities	45	31	33	14	123
	Other human health activities	80	157	66	44	347
	Computer programming, consultancy and related activities	521	9	86	27	643
	Activities of business, employers and professional membership organizations	86	58	97	54	295
	Other monetary intermediation (Multiple Banks With Commercial Portfolio)	532	19	45	15	611
	Other monetary intermediation (Saving Banks)	66	3	11	0	80
	Water collection, treatment and supply	41	2	31	8	82
	Wholesale trade	360	10	79	29	478
	Retail trade	323	14	59	30	426
	Electric power generation, transmission and distribution	66	1	13	6	86
	Construction	77	4	13	20	114
	Pre-primary and primary education	86	33	36	16	171
	Higher education (vocational degree)	11	16	154	214	395
	Technical and vocational secondary education	7	5	85	113	210
	Higher education (undergraduate degree)	62	45	370	1,455	1,932
	Higher education (undergraduate and graduate degree)	280	119	654	2,177	3,230
	Higher education (graduate degree and outreach)	2	13	43	120	178
	Primary education	193	92	156	94	535
	Secondary education	102	41	91	43	277
	Other education	207	47	114	74	442
	Extraction of crude petroleum and natural gas	48	1	37	13	99
	Manufacture of malt liquors and malt	77	0	3	0	80
	Manufacture of pharmaceuticals, medicinal chemical and botanical products	100	7	27	26	160

TABLE 9.13 – NUMBER OF UNICAMP GRADUATES IN THE PERIOD 2009-2018  
ACCORDING TO EDUCATION LEVEL AND ECONOMIC ACTIVITY (CNAE)

continued

Economic Activity of Occupation		Educational level				Total
		Undergraduate degree	Lato Sensu degree	Master degree	Doctorate degree	
	Manufacture of basic chemicals, fertilizers and nitrogen compounds, plastics and synthetic rubber in primary forms	106	0	25	11	142
	Manufacture of other chemical products n.e.c.	341	7	79	42	469
	Manufacture of parts and accessories for motor vehicles	127	1	22	2	152
	Provision of services to the community as a whole (Foreign affairs, Defence activities, Public order and safety activities)	99	31	91	56	277
	Research and experimental development on natural sciences and engineering	186	9	168	176	539
TOTAL	Manufacture of refined petroleum products	92	5	46	13	156
	Social work activities without accommodation	78	52	54	23	207
	Transportation and storage	63	3	18	2	86
	Manufacture of other food products	88	1	10	3	102
	Other Economic Activities	1,583	84	401	128	2,196
	Total	8,376	5,554	4,771	6,046	24,747

Source: Prepared by the authors based on DAC and RAIS data.

Note: The male and female graduates classified in Other Economic Activities are distributed in 254 different activities.

Concerning the 226 graduates owners of Unicamp Alumni Companies, the most common path is to have just graduated (46%), but 42% also completed master and 20%, doctorate (Table 9.14). In addition, there is a concentration of graduates from the Engineering and Technology area (52%) and males (78%) (Table 9.15).

ANDRÉ PENHA, 1998 UNICAMP COMPUTING  
ENGINEERING CLASS AND QUINTOANDAR COFOUNDER



Pedro Amatuzzi – Inova Unicamp.



TABLE 9.14 – PATH OF THE OWNERS OF UNICAMP ALUMNI COMPANIES WHO GRADUATED BETWEEN 2009-2018

Path	Number
Only Undergraduate Degree	105
Only Master's Degree	33
Only Lato Sensu	3
Undergraduate Degree and Master's Degree	33
Only Doctoral Degree	11
Master's and Doctoral Degrees	19
Undergraduate, Master's, and Doctoral Degrees	11
Undergraduate Degree and Lato Sensu	3
Undergraduate and Doctoral Degrees	5
Other paths	3
Total	226

Source: Prepared by the authors based on Inova, DAC and RAIS Data.

TABLE 9.15 – UNICAMP ALUMNI COMPANIES: NUMBER OF UNICAMP GRADUATES IN THE PERIOD 2009-2018 ACCORDING TO FIELDS OF KNOWLEDGE – WOMEN, MEN, AND TOTAL

Knowledge Area	Women	Men	Total
Biological and Health Sciences	19	29	48
Exact and Earth Sciences	3	27	30
Arts and Humanities	9	12	21
Engineering and Technology	16	102	118
Multidisciplinary	2	7	9

Source: Prepared by the authors based on Inova, DAC and RAIS Data.

RENATA TONON, 2002 FOOD ENGINEERING CLASS,  
RESEARCHER AT EMBRAPA FOOD AGROINDUSTRY



Pedro Amatuzzi – Inova Unicamp.

### 9.2.3 Employment and collaboration relationships at Unicamp

In addition to student relationships, graduates also maintained other types of bonds with Unicamp. Table 9.16 presents the relationships with Unicamp between 2017 and 2019 by type. Among non-teaching staff, most of them work as technicians, including professional in administrative affairs; professional in university affairs; professional in technical support of services; professional in art, culture, and communication; and professional in information and communication technology. Most residents are physicians. Among teachers, there are teachers from all careers at Unicamp (Language Teaching Teacher, MS, MA, MTS, and MST).

TABLE 9.16 – RELATIONSHIPS WITH UNICAMP BETWEEN 2017  
AND 2019 FOR GRADUATES FROM THE PERIOD 2009-2018

Type of bond	N
Non teaching staff (PAEPE and Pq)	1302
Resident (physician/multi-professional)	768
Researcher/collaborating professor/visitor	539
Professor with employment bond	409
Postdoctoral researcher	358
Intern	273
Other employees without employment bond	179

Source: Prepared by the authors based on DAC and DGRH data.





# 10.

## UNICAMP MANAGEMENT



University Consil (CONSU) meeting



Strategic Planning meeting





## 10.1 Introduction

This chapter provides an overview of the activities carried out about university management in the 2014-2018 period. Critical analysis of institutional data and activities executed to fulfill the university's mission statement affords valuable input, allowing university management to redesign or enhance its performance for the following period.

The chapter comprises a brief description of Unicamp's organizational structure, a description of the cycle of Strategic Management, Strategic Planning and Institutional Evaluation; the customary forms of communication at the university; IT governance and the development of corporate systems and work process efficiency; efficiency of work processes with technological support; initiatives related to personal and professional development; budgetary and financial sustainability; infrastructure status and sustainable development and an analysis of the university's repositories and collections. Part of the information comes from the internal evaluation of Schools and part is supplementary information generated within the administrative bodies.

It is noteworthy that during the evaluated period the university faced hard budget constraints due to the drop in its main funding source (the state government ICMS tax), which greatly affected the implementation of measures and investments in the subjects covered in this chapter.

## 10.2 Structure, Strategic Planning and Institutional Evaluation

This item is divided into four sub-items. The first one describes the structure of Unicamp, which comprises the teaching and research Schools (henceforth called Schools), the interdisciplinary research centers, the technical high schools and the main administrative bodies. The second and third sub-items describe the strategic management cycle, which aims to structure the strategic planning, that in turn unfolds into strategic projects based on the diagnosis from the institutional evaluation. The last sub-item presents a report of the Schools' engagement in the strategic planning and institutional evaluation process. The important thing is that the practice of strategic planning has been adopted by the Schools, Interdisciplinary research centers and technical high schools.

### 10.2.1 Organizational structure of Unicamp

Officially founded in October 1966, Unicamp is a public institution with administrative, political, teaching and scientific autonomy linked to the São Paulo State Government. Its main campus is located in the city of Campinas-SP, and it also has campuses in Limeira-SP (School of Applied Sciences, Technical High School of Limeira and School of Technology), Piracicaba-SP (School of Dentistry) and Paulínia (CPQBA).



To fulfill its mission statement, Unicamp's teaching, research, administrative and political organization "comprises institutes and schools defined by their departments, the University Hospital and supplementary bodies."<sup>1</sup>

In total, there are 24 institutes and schools responsible for teaching, research and outreach at Unicamp, namely: Institute of Biology (IB); "Gleb Wataghin" Institute of Physics (IFGW); Institute of Chemistry (IQ); Institute of Mathematics, Statistics and Scientific Computing (IMECC); Institute of Human Sciences and the Humanities (IFCH); Arts Institute (IA); Institute of Language Studies (IEL); Institute of Geosciences (IG); Institute of Economics (IE); Institute of Computing (IC); School of Medical Sciences (FCM); School of Food Engineering (FEA); School of Education (FE); School of Dentistry of Piracicaba (FOP); School of Civil Engineering, Architecture and Urbanism (FEC); School of Physical Education (FEF); School of Agricultural Engineering (FEAGRI); School of Electrical and Computer Engineering (FEEC); School of Chemical Engineering (FEQ); School of Mechanical Engineering (FEM); School of Applied Sciences (FCA); School of Technology (FT); School of Nursing (FENF); Faculty of Pharmaceutical Sciences (FCF).

The academic framework also comprises 21 interdisciplinary research centers, coordinated by the Coordination Office for Interdisciplinary Research Centers (COCEN), which work in close partnership with the schools in undergraduate and graduate programs and outreach activities. They are: Center for Molecular Biology and Genetic Engineering (CBMEG); Center for Semi-conductor Components and Nanotechnology (CCSNano); Center for Biomedical Engineering (CEB); Multidisciplinary Center for Biological Investigation on Laboratory Animal Science (CEMIB); Center for Meteorological and Climatic Research Applied to Agriculture (CEPAGRI); Center for Petroleum Studies (CEPETRO); Center for Studies on Public Opinion (CESOP); Unicamp Center for Integration, Documentation and Cultural Dissemination (CIDDIC); Center for Logic, Epistemology and the History of Science (CLE); Unicamp Memory Center (CMU); Pluridisciplinary Research Center for Chemistry, Biology and Agriculture (CPQBA); Interdisciplinary Center for Theatrical Research (LUME); Center for Food Studies and Research (NEPA); Center for Environmental Studies and Research (NEPAM); Center for Public Policy Studies (NEPP); Center for Public Policy Studies (NEPO); Interdisciplinary Nucleus for Sound Studies (NICS); Nucleus of Applied Informatics to Education (NIED); Interdisciplinary Center of Energy Planning (NIPE); Creativity Development Nucleus (NUDECRI); and Center for Gender Studies (PAGU).

Additionally, there are two technical high schools: Technical High School of Campinas (COTUCA) and Technical High School of Limeira (COTIL).

The university is managed by the higher governing bodies: I. University Council (CONSU) and II. Central administration. Unicamp's highest decision and regulation body is CONSU, whose function is to "formulate Unicamp's academic, scientific and cultural policy and the highest decision-making and regulation body." The council comprises permanent members, such as the Rector, the general coordinator of the university and the vice-rectors and heads of schools, as well as representatives of the higher professorship faculty, students, staff, other faculty careers, the external community and the superintendent of the University Hospital.

1. UNICAMP-BYLAWS, 2019, p.1.

For political and administrative matters, the structure consists of the central administration, which comprises the Rector's Office (GR), General Coordination of the University (CGU), General Secretariat (SG), Attorney General (AG), Office of Economy and Planning (AEPLAN), the Offices of the Vice-Rectors (Undergraduate Studies, Graduate Studies, Research, Extension and Culture and University Development) and the General Board of Administration (DGA), General Board of Human Resources (DGRH), Office of the Registrar (DAC), Libraries (Unicamp Library System – SBU), Computing Center (CCUEC), Campus Administration, and Educorp (Corporate Education). In addition, there are two bodies in charge of spontaneous staff benefits: Community Health Care Center (Cecom) and Social Benefits Management Group (GGBS) (UNICAMP-STATUS, 2019). The administration also comprises the Executive Board of Administration (DEA), Executive Board of the Health Area (DEAS), Executive Board of Pre-University Education (DEPPU), Executive Board of International Relations (DERI), Executive Board of Human Rights (DEDH) and Executive Board of Integrated Planning (DEPI) .

While these bodies are executive, the proposition and deliberation of rules and strategic institutional policies take place in the deliberative councils, chambers and committees. The main chambers reporting to CONSU are: Administration Chamber (CAD), responsible for approving non-core and administrative activities, and Teaching, Research and Extension Chamber (CEPE), responsible for approving and proposing matters concerning core activities. There is also a number of ancillary committees, especially: Budget and Heritage Committee (COP), responsible for cooperating in the organization of the university's general budget; Committee for Analysis of Agreements and Contracts (CAAC), responsible for analyzing and advising on agreements and contracts related to research, teaching and outreach activities; Central Committee of Graduate Studies (CCG); Central Committee of Undergraduate Studies (CCPG); Central Committee of Research (CCP); Extension Council (CONEX); and Culture Council (CONCULT).

Within the schools, for example, there are several undergraduate/graduate, research and outreach committees or councils similar to the main ones, mostly comprising faculty, but also student representatives and staff members. The highest deliberative body is called the Congregation – “the highest body of the institute or school, it comprises members of the faculty, student body and technical and administrative staff” (UNICAMP-BYLAWS, 2019). The technical high schools also have a congregation as a deliberative body. In the case of the interdisciplinary research centers, the highest deliberative body is generally called the Higher Council.

In addition to teaching, research and outreach activities, Unicamp also provides healthcare services in a hospital complex formed by the University Hospital (HC), Women's Hospital “Prof. Dr. José Aristodemo Pinotti” (CAISM), the Center of Hematology and Hemotherapy (Hemocentro) and the Center for Diagnosis of Diseases of the Digestive Tract (Gastrocentro). Regarding health care to the external community, there was an increase in the provision of services (beds, hospitalizations and appointments) of about 7%. There was an increase in bed capacity from 862 to 921 beds, in hospitalizations, reaching about 39,200 hospitalizations, as well as in appointments, totaling over one million appointments in 2018. These hospitals are public and provide free healthcare services to the population. In addition, the Coordination of Social Services (CSS/CECOM) serves the internal community

only (students, staff and faculty). Regarding such health care, there was an increase of 11.3% in the last five years (from 50,805 appointments in 2014 to 56,513 in 2018).

The internal evaluation of the schools suggest that Unicamp's organizational structure is adequate to meet the needs of the administrative (non-core) activities that support the core activities. In particular, the creation of new executive boards (DEPI, DEA, DEDH etc.) from 2017 generated a more modern and functional organization chart, making university management more transparent, accountable and efficient. However, the Schools stress that internal procedures are drawn-out and need improvement, as do administrative processes involving some bodies (DGA, DEPI and CPO) that relate to construction/repair works, procurement processes, hiring services, etc. These aspects had already been emphasized in the 2009-2013 Institutional Evaluation and little progress has been made in this new period, that is, the management bodies continued resisting deeper changes in their work processes to improve their image before the community. Additionally, several Schools mention the lengthy services provided by the Attorney General (AG), which ignores the need to simplify administrative routines.

In addition to these aspects, the Schools based in Piracicaba and Limeira feel to some extent isolated from the various main administrative bodies regarding their demands and needs.

Comparing the current Evaluation period with the previous one (2009-2013), the Schools and interdisciplinary research centers report that they sought, through a new certification of their organizational structures, to review their work processes in order to simplify and merge structures, reduce hierarchical levels and increase organizational efficiency. In the last five years, most schools and interdisciplinary research centers reviewed their administrative structures, streamlining the performance of part of them. Two aspects were stressed:

1. Reduced (due to retirements) or insufficient (in new schools) staff is forcing the schools to prioritize activities, which may hinder their administrative capacity or core activities;
2. There is a need to review or assign greater responsibilities to the units in order to establish closer connections between the academic and administrative areas.

Nevertheless, even with the changes that were implemented, the units emphasize that the current structure is adequate to fulfill the university's mission statement.

### 10.2.2 Strategic Management Cycle: Strategic Planning and Institutional Evaluation

At Unicamp, the practice of formulating Strategic Planning (PLANES)<sup>2</sup> dates only from 2004 (although efforts began in 2002). In the document approved by the University Council (Resolution Consu-405/04), Unicamp's identity was spelled out more clearly in its

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2. This is a management tool that described the institution's mission statement and vocation, presenting strategic actions and therefore guiding decision making by stressing priorities.

mission statement (what we are), its principles and values and its vision statement (what we want to be). Since then, strategic planning as both method and normative document has been used by the central administration and its bodies, as well as by the academic units (schools, interdisciplinary research centers and technical high schools). Its incorporation into the institutional culture is therefore evident.

The 2016-2020 PLANES stresses excellence as an institutional commitment to be achieved by all who help implement Unicamp's mission statement. The development of this PLANES used the 2009-2013 institutional evaluation as a diagnosis of the internal situation and was structured into four strategic areas. This process is organized and managed by the Strategic Planning Committee (COPEI). Figure 10.1 shows the structure of the 2016-2020 PLANES, with special emphasis on:

- **Mission Statement:** To create and spread scientific, technological, cultural and artistic knowledge in all fields through teaching, research and outreach. To develop professionals capable of innovating and seeking solutions to the challenges of contemporary society with a view to the full exercise of citizenship.
- **Principles:** i. Autonomy in teaching, scientific production, administration and financial and heritage management; ii. Commitment to excellence; iii. Ethical behavior with strict observance of the principles of legality, impersonality, morality, public disclosure and efficiency; iv. Free public education; v. Inclusion and acceptance; vi. Inseparability between teaching, research and outreach; vii. Insertion and social responsibility; viii. Intellectual freedom; ix. Plurality of educational ideas and conceptions; x. Respect for personal dignity and basic rights, proscribing unequal treatment for prejudice of any kind; xi. Respect for the diversity of knowledge areas; xii. Appreciation of the human being.
- **Values:** To act with agility, clarity, visibility, competence, flexibility and adaptation to specificities and change; to cultivate interdisciplinary dialogue; to cultivate humanistic values; to develop leadership skills; to encourage critical and reflective skills; to exercise and encourage creativity and capacity for innovation; to promote sustainability.
- **Vision statement:** Unicamp is a public university of international leadership and recognition in all areas of knowledge that promotes sustainable development and is committed to the aspirations of society.

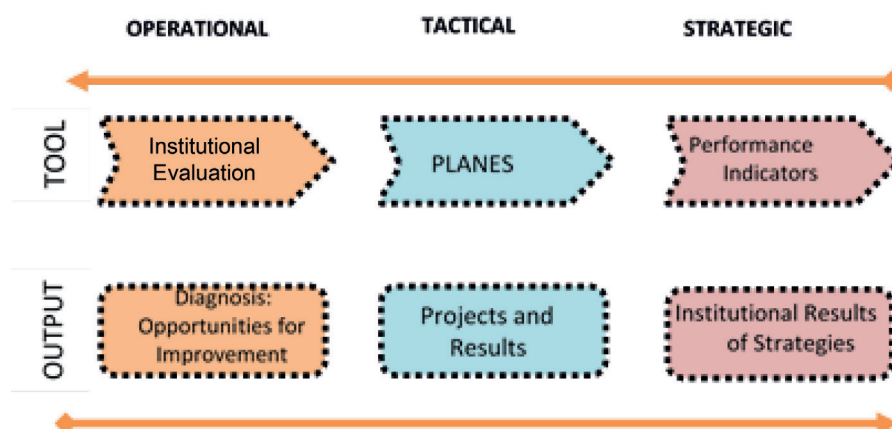
FIGURE 10.1 – RELATIONSHIP BETWEEN THE ELEMENTS OF THE 2016-2020 PLANES



Source: 2016-2020 PLANES.

As shown in Figure 10.2, since the 2009-2013 Institutional Evaluation period the aim has been to integrate these strategic processes with tactical and operational processes through project management methodologies, as well as through shared monitoring of project performance indicators capable of measuring impacts on the academic units and the university at strategic level. However, such strategic management has only been structured and executed with work methods adapted to Unicamp's reality since 2017.

FIGURE 10.2 – DESCRIPTION OF THE “EVALUATION AND PLANNING” CYCLE TO BE CONSOLIDATED AT UNICAMP BASED ON THE 2016-2020 PLANES



Source: 2016-2020 PLANES.

Following the Strategic Planning, a strategic map was designed defining 15 strategic goals within three major goals: Results for Society; Excellence in Teaching, Research and Outreach; Excellence in Management. Figure 10.3 shows Unicamp's Strategic Map.

FIGURE 10.3 – STRATEGIC MAP

## STRATEGIC MAP

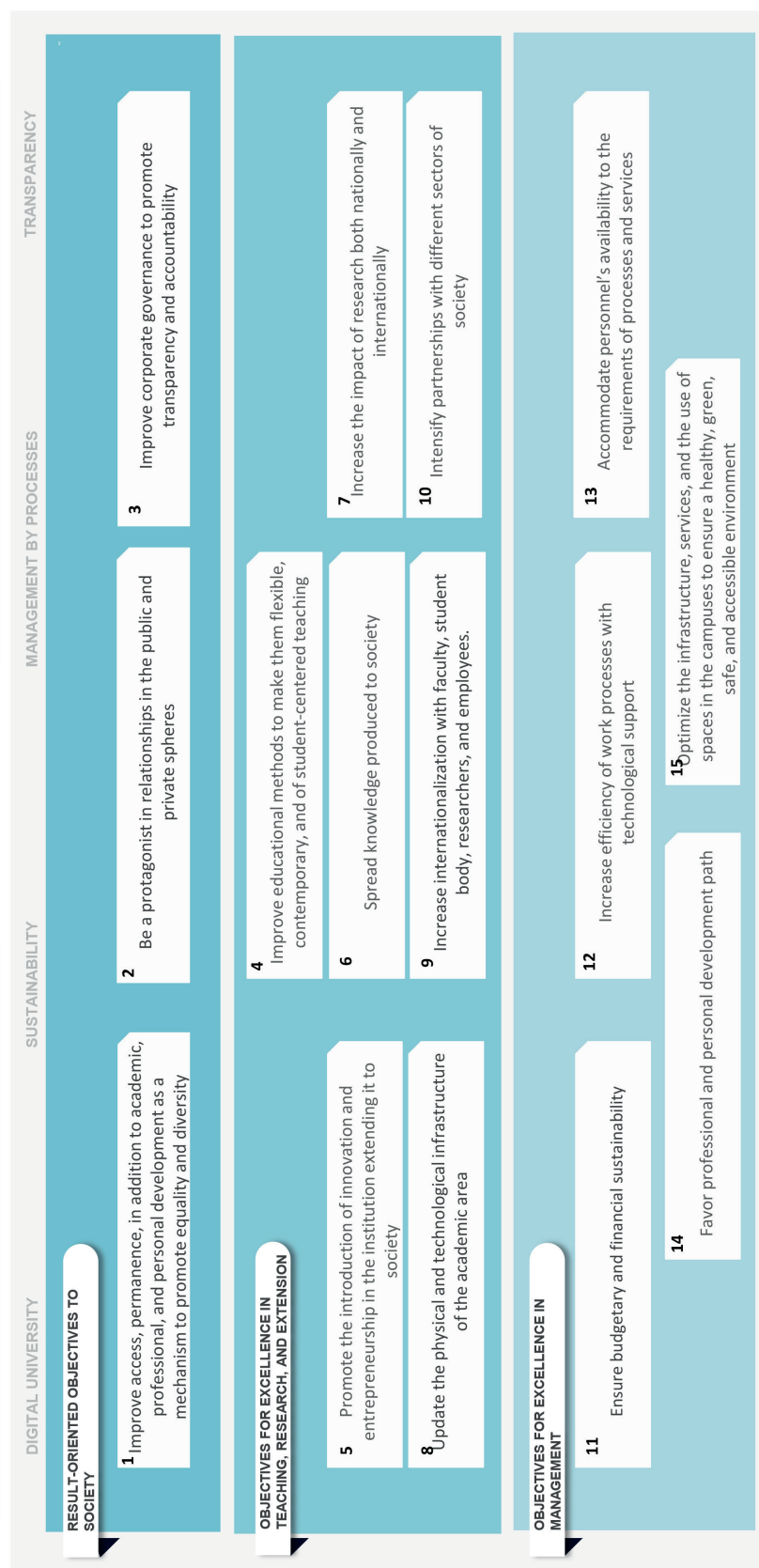


### MISSION

Create and disseminate scientific, technological, cultural, and artistic knowledge throughout all areas of knowledge through teaching, research, and extension. Train professionals capable of innovating and seeking for solutions to challenges faced by modern society for the full exercise of citizenship

### VISION

Unicamp is a top rank public university and international benchmark in all areas of knowledge, promoter of sustainable development and committed to society's aspirations.



Source: Unicamp GEPLANES, 2019.



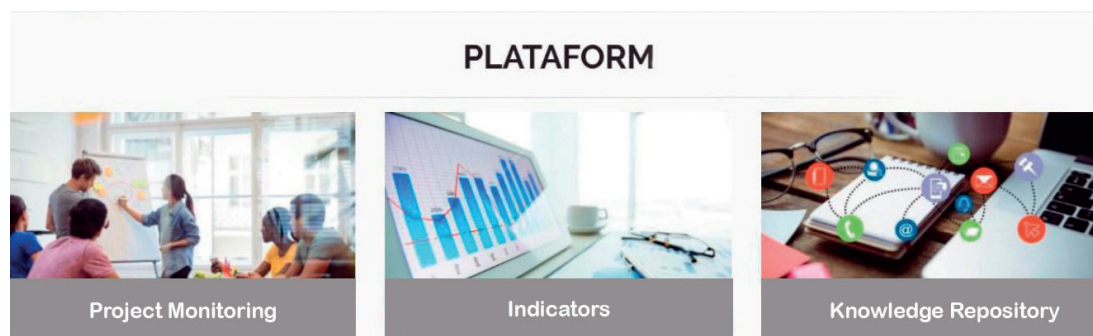
### 10.2.3 GEPLANES and Strategic Project Monitoring

To achieve these goals, strategic projects were and are being designed and executed. Management of these projects is monitored by a technical group to support Unicamp strategic, process-based and project management (GePlanes),<sup>3</sup> linked to CGU. This support group was set up based on information from the 2009-2013 institutional evaluation.

“In addition to monitoring, GePlanes promotes activities to facilitate, generate impact and streamline the university’s strategic initiatives, reporting to COPEI. This group also executes strategic projects under CGU. GePlanes has developed and runs a platform that supports the monitoring of strategic projects and the knowledge repository, a dashboard that displays the indicators of the strategic goals of the university’s Strategic Map. These indicators are derived from outcome indicators of processes that are being modified through project efforts. Thus, the results proposed by the strategic projects can be centrally monitored, enabling the identification and resolution of incidents” (BEPPU, ATVAR, SERAFIM, 2019, p. 71).<sup>4</sup>

The closing of the strategic cycle, based on the execution and incorporation of these projects in work processes and their management, allows the institution to improve conditions over the previous cycle, which has been done since 2017, implementing the strategic management cycle.

FIGURE 10.4 – PROJECT MONITORING PLATFORM



### 10.2.4 Engagement of the units in Strategic Planning and Institutional Evaluation

Strategic Planning has been incorporated in the administrative bodies, interdisciplinary research centers and schools. All of them reported having reviewed the Strategic Planning, some periodically, others at the discretion of the department’s administration. In some cases, PLANES is considered the department’s Management Plan. However, the internal evaluation shows that some schools confuse the process of reviewing/monitoring strategic projects, which occurs annually with the implementation of Pedagogical Planning, with

3. <https://www.geplanes.cgu.unicamp.br/geplanes/projetos.html?tipoConsulta=ESTRATEGICO>.

4. BEPPU, M; ATVAR, T; SERAFIM, M. Indicadores de Desempenho Acadêmico: Unicamp no Horizonte 2022. In: MARCOVITCH, J. (org). Repensar a Universidade II: Resultados e Impacto. São Paulo: COM-Arte, 2019.

the review of Strategic Planning. Due to this lack of conceptual consistency, the results of planning and improvement measures implemented by the academic units cannot be centrally monitored. This also hinders a more persistent pursuit of excellence, which is reflected in the evaluation of academic activities, such as the differences in CAPES ratings of graduate programs. In addition, few schools develop PLANES actions into projects with defined goals, indicators and accountability.

Therefore, it is evident that there is no standardization of the PLANES process in the academic units, nor any alignment with Institutional Evaluation. Therefore, the central administration needs to coordinate a discussion on the points of improvement of each department. This should be done through the following activities by May 2020:

- Alignment between Institutional Evaluation and Strategic Planning – The evaluation is not always viewed by the academic units as a step in the PLANES review. To a certain extent, this happens because the evaluation have historically been treated as final products.
- Definition of a schedule following each institutional evaluation process for the departments to review their strong points and those needing improvement and to design projects to meet those goals, thereby structuring the foundation of the strategic management cycle.
- Basic methodology standardization – GePlanes shall provide methodological support for the planning process of the departments and monitor their evolution.

Regarding the 2014-2018 Institutional Evaluation process, many academic units considered that the process and questions contained in the forms adequately addressed their needs; however, some reported the need to review the forms and reduce the number of questions to produce more objective analyses.

## 10.3 Communication

During the 2014-2018 period, the two bodies responsible for communication at Unicamp (ASCOM – Communication Office and RTV – Radio and Television), which previously worked independently, were restructured under the newly-created Executive Communication Secretariat (SEC). This followed the contemporary trend of integrating communication channels in the same platform. The initial organization of this new department is being gradually reviewed with the cultural changes of the original bodies. Among the practices defined for this purpose, the following stand out:

- Joint weekly planning meetings involving not only representatives from ASCOM and RTV, but also from partner organizations which have basic communication structures, especially: COMVEST, INOVA, LABJOR, Institute for Advanced Studies (IdEA) and PRG;

- Closer interaction with communication areas dispersed in the university through regular meetings on possible integration and workflows to disclose issues and matters of common interest;
- Deployment of a work management tool (in final commissioning phase), the Integrated Communication Support System (SACI), which aims to improve control and monitoring of activities.

SEC's functions are still being consolidated and some important roles are not well defined yet, such as internal and external communication and their respective duties. SEC, through its portal, and originally since the creation of *Jornal da Unicamp* newspaper in the 1980s, prioritizes information from the external community, contributing strategically to the relationship between university and society. Recently, the Unicamp portal (generally the university's first and foremost channel of interlocution with society and disclosure of information about it) was acknowledged as an example of a scientific dissemination outlet.<sup>5</sup>

### 10.3.1 External communication

Albeit belatedly, Unicamp has adopted communication via social media, creating its Facebook page in October 2016. The diffusion of material created exclusively for this media, rather than the mere reproduction of content created for the Unicamp portal, was an important initiative. Recent indicators point to around 75,000 Unicamp Facebook followers, with 368,000 new interactions between June and November 2019. In addition, Unicamp's Instagram page was created, and its LinkedIn page was resumed. Since its launch, the Instagram page already has 14,000 followers, with over 70,000 interactions. As for the LinkedIn page, it totals 165,000 followers with a professional profile, with over 42,000 interactions in the first few months. Moreover, in the latter platform, the Alumni Unicamp group comprises more than 80,000 former students.

Another initiative in communication was media integration in the portal. Audio and video products (radio and TV) are now directly accessible through the Unicamp portal, affording the content greater visibility and interest. Thanks to joint planning meetings, news stories are now decided based on the most appropriate language and media to reach audiences.

RTV has produced general news content, with new locally recorded programs aiming at closer interaction with the community (such as the "Fala Campus" series), related to both cultural production and dissemination of scientific results. Examples include the "Cênicas" program in partnership with the Performing Arts program of the Arts Institute, "Galeria," the first show dedicated to visual arts, and "Café com conversa", a SEC partnership with Editora Unicamp and Fundação da Unicamp (Funcamp). In addition, RTV produces live broadcasting and recording of IdEA events, such as the "Crise Brasileira" series. The strategy involves restructuring RTV and reformulating its public perception, as it is still viewed by many people as a mere provider of commissioned services. Services continue being

5. <https://revistapesquisa.fapesp.br/2019/08/30/o-desafio-dos-portais-academicos/>

provided in strategic activities such as the broadcast of meetings of main bodies such as CONSU, CEPE and CAD.

### 10.3.2 Internal communication

Internal communication is provided by special sections: Internal Community and Agenda. Innovation was also encouraged, since it affords Unicamp a highly positive image. Recently, a new and exclusive channel of scientific dissemination was introduced, reproducing new products from Unicamp's "Blogs da Ciência" platform.

Internal discussions have sought to improve the disclosure of knowledge produced and discussed at Unicamp to society, as well as the communication of issues of strategic institutional and internal interest. In this sense, the portal is being restructured to account for information hierarchy. The indicators in the current format are positive when compared with those of USP, considering the difference in size of the communities involved. The number of views of *Jornal da Unicamp* between November 1, 2018 and October 31, 2019 was 1,728,087. Considering views of the portal as a whole, which includes searches for institutional information and inquiries about events, among others, the views totaled 8,823,604 in the period, a daily average of 24,000.

The current channels of internal communication between central administration and schools for the disclosure of normative instructions, guidance regarding administrative procedures and support for academic activities were evaluated as adequate by the schools. Overall, 87.5% of the schools consider the existing channels adequate and efficient, 8.33% find them partially adequate and 4.2% find them inefficient.

A few suggestions for improvement were made:

1. Expanding the use of the Computerized Archive Management System (SIGAD) as a centralized database for access to all official documents, including Normative Instructions of the administration, academic units and administrative bodies;
2. Improving the information repository and search engines of websites by using more intuitive keywords and phrases;
3. Improving the communication language to make it simpler and more objective.

In short, communication continues being one of the important strategic goals of Unicamp and difficulties persist in the university's internal and external communication. This is one of the issues that Unicamp should seek to address with planned action and objective performance indicators.

## 10.4 ICT, corporate systems and work process efficiency

Several of Unicamp's strategic goals depend directly or indirectly on Information and Communication Technologies (ICT). One of the most significant of these technologies

and a pillar of the strategic map is the “2020 Digital University” project. The community’s perception is that our systems are insufficient and inadequate, since many of them are old and obsolete with outdated and user-unfriendly interfaces, or require excessive, redundant and sometimes unnecessary information. The few transactional systems have low integration and are business-centered, which makes integration very difficult.

Many of the symptoms perceived by the community regarding ICT stem from decentralized decision making and efforts, including teams. The decentralization of the various small ICT groups and the use of outdated technologies lead to the implementation of dispersed digitalization initiatives, producing unsafe, maintenance-heavy systems of poor scalability. This situation results in continuous work demand, with efforts replicated across various university areas, each concerned solely with solving its local problems rather than joining efforts to reach a single solution for the entire university.

Currently the university has huge problems with the need to replace the DBMS system that underpins the major corporate systems. The DB2 (commercial) database is expected to be replaced by an open-source solution within the next two years, due to the infeasibility of DB2 licensing for cloud computing, whether private (Unicamp’s) or public (commercial provider). Unicamp has only recently begun a process of identifying the annual ICT expenditure and mapping existing human resources in the dozens of bodies with IT staffs to ascertain whether such staffing is adequate for a university such as Unicamp. Both surveys are still incomplete due to lack of systematized and available data.

Another problem is the technological risk stemming from the life cycle of hardware and software solutions and their support by suppliers. Unicamp has recently experienced a dramatic situation, when DAC stopped developing new features in the academic system to address the obsolescence of the old mainframe that ran the system. The lack of constant updating is behind many of these technological accidents/risks, some with estimated and others with definite dates to happen.

To enable the transition to a digital university, Unicamp hired in 2017 the consultancy services of a specialized company that identified the need to implement new ICT Governance to centralize efforts and take charge of monitoring ICT activities. This initiative spawned and/or encouraged a number of measures to accelerate the required implementations. The most important is to focus on “Software as a Service (SaaS, or cloud computing services)” in order to balance ICT budget and costs as soon as possible.

The initiatives implemented from 2017 to deploy the Digital University project by 2020 are:

1. Use of Google Suite for Education services provided at zero cost by Google. The deployment of corporate email with “infinite” storage space, high spam rejection quality and excellent availability, both inside and outside Unicamp, has been concluded, mandating the adoption of the chosen Google corporate solution by administrative bodies, which has zero cost in equipment and requires a single small team at CCUEC to meet all service demands for the entire university. The current situation is that 100% of interdisciplinary research centers, 69% of administrative bodies and 67% of schools have already migrated to the new system. This will result in a substantial workload reduction for ICT staff in the

bodies, a substantial increase in security and the elimination of redundant work. CCUEC must now hold lectures and other activities to expand the use of this solution.

2. File sharing, which had not been previously exploited, partly due to the immaturity of the service. However, the recent availability of shared drives has expanded its potential for use in organizations such as Unicamp. A Google solution has been implemented that enables high gains in availability and service quality, but especially with zero cost of equipment and virtually zero workforce involved. The deployment of this solution is in its early stages, but several schools and administrative bodies are taking the initiative to adopt it in view of the evident benefits.
3. Other locally provided services are being centralized in the Unicamp cloud, which will enable the rationalization of costs with infrastructure and maintenance staff. In the future, a proof of concept for using container technology (using Kubernetes) will replace, along with other modern solutions, the current use of virtual machines in the Unicamp cloud. Such modernization will facilitate future integration with commercial providers to accommodate usage fluctuations in our demands or even greater concentration in external cloud computing providers.
4. Encouraged use of applications provided as service by both the Microsoft (Office365) and Google (Google Docs/Sheets/etc) agreements;
5. Purchase of Business Intelligence (BI) software to support the university's senior management.
6. Encouragement for academic units and administrative bodies to adopt the centralized Wi-Fi service (*eduroam*), currently with 70% of academic units and administrative bodies and 50% of Access Points, which will allow significant savings with the upgrading of Wi-Fi controllers in academic units and administrative bodies and reduction of service maintenance staff in academic units and administrative bodies.
7. Dissemination of the GGTE-centralized Moodle service to reduce local maintenance in the schools.
8. Dissemination of the use of Google Drive through lectures and other activities.
9. Centralization of procurement of corporate software for educational purposes to reduce costs, given the many individual purchases, especially for the use of Microsoft Azure and Office365.
10. More efficient disclosure of products procured via institutional channels.
11. Provision of IT infrastructure to academic units and administrative bodies with access to UNICAMP cloud computing.
12. Partnership between the schools and CCUEC so that possible available funds be preferably invested in CCUEC.

In short, Unicamp is making a huge institutional effort under the coordination of CGU, with a new, strategic-level centralized model, to manage and deploy new corporate systems based on new and modern methodologies, which will result in huge savings and reduced demand of ICT staff.



Alongside infrastructure-related efforts are those related to systems development, which, as stressed in the 2009-2013 Institutional Evaluation, should seek efficiency and simplicity in management systems, reducing the administrative burden on faculty. Among the results already achieved, in 2014-2018 numerous work processes were computerized under DAC, DGRH and PRDU, among them:

1. Integrated institutional data system (S-Integra), deployed in 2013 and being replaced by the Unicamp Transparency Portal;
2. Digitized system for the Teaching Activity Report (RAD);
3. Digitized system to produce undergraduate education annual reports for INEP/ MEC;
4. Integrated digitized system of Institutional Evaluation and Strategic Planning;
5. DAC schedule;
6. Electronic flow of theses and dissertations;
7. Staff career entry system;
8. Monitoring system of the probation regime of faculty and staff;
9. Digital system for issuing diplomas with electronic signature;
10. Digital system for issuing certificates with electronic signature;
11. Faculty leave system;
12. Overtime and standby control record system;
13. Faculty education registration system;
14. Development of the PD-SIGAD system to convert hardcopy administrative processes into SIGAD-SIARQ Digital Processes;
15. Deployment of Digital Agreement, PED, Non-Faculty Recruitment Committee (CVND) and Faculty Recruitment Committee (CVD) systems.
16. Stabilization of the SAE grants systems, which were in critical condition and were absorbed as a DAC operation, now running in the Unicamp cloud;
17. Development of the Unicamp Transparency Portal, currently being expanded to provide productivity data for the university's core activities and activities of interest of and consumption by the Unicamp internal and external community.
18. Development of SIAD (System for Early Payment, Materials and Services Data, Procurement, Contracts, Inventory Control, Digital Agreement, Management Data, Suppliers & Creditors, SIAFEM Management, Expense Settlement, Budget & Expense Execution, Heritage, Materials and Services Receipt, Procurement Requests);
19. Digital Process of Postdoctoral Researchers (PPDs).

According to the schools, the processes were modernized and made less bureaucratic, which enabled greater autonomy and agility. The following systems were cited as the most improved: SIGAD; DAC/SIGA Systems; S-Integra; SENIOR/RH; RAD system; Recruitment System – PAEPE; Electronic Process of Postdoctoral Researchers (PPDs); Request for miscellaneous services (Examples: Maintenance Division, Environment Division, Campus Socialization Department, CEMEQ and CCUEC).

### 10.4.1 IT support to Schools and local system initiatives

ICT support to the Schools' core activities involves: keeping the computer network up to date and available for use by authorized users; providing support to users for software installation and maintenance and related troubleshooting; developing support systems for the departments' activities.

Most Schools reported having reduced staff due to retirement. Staff training and profiles are adequate for the duties involved, but there is a pressing need for training in the new technologies that are being adopted as standard in the university.

The Schools have developed a few local systems, such as pointed in Chart 10.1.

CHART 10.1 – LOCAL SYSTEMS DEVELOPED BY SCHOOLS

Administrative	Document control system: FEC Document management system: IFGW (ongoing migration to SIGAD) Document storage system (portfolios, recordings and/or videos that cannot be stored by SIGA): IA Parking control: IQ Print quota control (reprography): FECC, FEM Meeting agenda planner: IE, IQ Online services provided by the Office of Undergraduate Studies to faculty and students for various requests: IEL Library donation procurement request: IEL Technical support request: FCA Event management: IE, FE, FCA Public examinations management: IE Administrative work order management: IE, IC and FEF (RT), FCM (heritage), FE, FCA (maintenance and helpdesk), FECC, FEM, IQ (workshops and information systems), FENF (building maintenance, information systems), FEQ (office services; infrastructure maintenance; computer and telephone maintenance), FEA, IG Student account renewal/activation: IEL, FENF Laboratory password delivery system: FEC Automatic account creation system: IFGW Electronic certificates system: IEL, FEF, FE Receipt/Forwarding: FEC Transport request system: IFGW, IC, FCM, FEAGRI, FENF, FEQ, FEA Integration module for booking classrooms with electronic access: IEL Booking of classrooms, meeting rooms, laboratories, auditoriums and equipment: IFGW, IE, IFCH, IC, FE, FCA, FECC,
Administrative	FEM, IQ, FEAGRI, FENF, FEA, FEF; Distant learning services scheduling system: FE Equipment booking: FCA Vivarium: FCA Budget control (DGA and FUNCAMP data): IC Online faculty recruitment evaluation system: FEA Outsourced cleaning services evaluation system: FEA Administrative routines: IC Online voting system: FE
Procurement and heritage	Procurement request and material and services delivery system: IEL, IB, FE, IMECC, FECC, IQ, FENF, FEQ, FEA Storeroom system, stock control: IFGW, IE, IFCH, FEQ, FCM, FEF, FE, IMEC, FCA, FECC, FEM Heritage management: IMECC Automated procedure for emergency procurement request: IFGW

CHART 10.1 – LOCAL SYSTEMS DEVELOPED BY SCHOOLS

continued

Human resources	HR and staff management: IB, FCA, FEA Leave system: FT, IEL, IE, IFGW, IA, IC, IB, IG, FEM, IQ, FENF, FEC, FCA Vacation and time off application system: FT, IEL, IA, IB Faculty attendance system: FEM Outsourced staff control system: FEC Faculty recruitment monitoring system: FENF, FEA
Undergraduate studies	Subject assessment: IQ, FE Scheduling and control of end of term papers and monographs: FEEC, FEC, FEF, IE, FEQ Undergraduate studies – alumni registration: FEA Undergraduate studies – Saver (projects): IC Undergraduate studies – Susy (programming activities): IC Student management: IE Grants and payment system: ETF Diploma recognition system: FEC Medicine program management: FCM Dinter selection process: IEL Didactic assignment system (generates CA12 for DAC): IFGW, FEQ Internship application system (LAE): FE CODESP System (half-yearly physical activity projects): ETF PAD Program: FCM, IMECC
Outreach	Partnership agreement registration: FEC
Research	Scientific production and research project access system: FEQ
Graduate studies	PED Program: FCM, IMECC Letter of recommendation system: IMECC PROEX funding control: FEEC Faculty grant awarding process for participation in events, research and field work and scientific article translation with school funding: IE Graduate student activities report: IEL and IFGW Graduate program selection process: IEL, IE (regular and special), IFGW (Portuguese, Spanish or English), IC, FEF, FE Graduate studies: thesis and dissertation registration: FEC COSMEPG (Graduate Studies Coordination Office Control) system: FEA Graduate studies management system: IFGW, IMECC, FEQ Offer of graduate studies subjects: FEEC Graduate studies special students control: FEEC

Some of these systems have improved administrative and financial management in the schools, as well as communication and disclosure of information. Other gains include agility, more effective monitoring, fewer mistakes and reduced expenses. In some schools the undergraduate programs have invested in systems that facilitate the allocation of faculty in procurement systems for practical classes, which significantly simplified the process.

The DAC systems have enabled the schools' Undergraduate Committees to address workload issues in cases of retirement or numerous leaves of absence. DAC has also decentralized the structure of catalogs, remaining places, special and foreign students, study optimization and online schedules.

In Graduate Studies, DAC has also decentralized the structure of catalogs, teacher accreditation, student enrollment, special students and online schedules. All student documentation is stored in SIGA, which affords an overview of student-related processes

while granting greater autonomy to the secretary offices involved. The Office for Graduate Studies, in turn, modernized the graduate program procedures, resulting in greater autonomy of the schools.

Another interesting element in the evaluation was the recognition that the SENIOR/RH system enabled a broader view of human resources processes and afforded autonomy to the schools.

Some improvements in information systems were suggested and are systemized below:

1. To invest in an integrated platform comprising information on teaching, research and outreach;
2. To provide information regarding collaborators and postdoctoral students to the DAC and Graduate Studies systems, avoiding the resubmission of documents to those bodies;
3. To offer a choice of interface language of the Postdoctoral Researcher Program (PPPD) in the DGRH electronic process;
4. To enable the opening and alteration of institutional accounts under the responsibility of someone from the academic units and administrative bodies and automatically approved by its head (CCUEC);
5. To reduce redundant work between PRPG and SDP (such as some activities involving DAC);
6. To review the process of external collaborators having to sign minutes of defense committees (DAC), especially in view of the growing use of video conferencing;
7. To continuously improve implemented systems, making them available to end users in more efficient and user-friendly ways;
8. To invest in the development of common systems that are compatible with the requirements of the academic units and administrative bodies, thus avoiding the need for each body to develop its own system with multiple investment and effort, in addition to the risk of inadequate interaction between them;
9. To focus on training and communication regarding the applicability of the systems;
10. To integrate the procurement and financial monitoring systems of budgets, extra-budgetary funds, Proex and AIU (Institutional Support to schools).

Therefore, one can conclude that some administrative bodies have made significant efforts to modernize and implement transactional systems. However, this has only occurred systematically since 2017, which is likely to compromise the fulfillment of the 2020 Digital University strategic goal.

#### 10.4.2 Efficiency in technology-supported work processes

The schools were asked about the efficiency of the major technology-supported work processes executed by main administrative bodies, as well as of those executed by the schools themselves. Below are their considerations which will be the object of specific action by the central administration to solve part of these problems.

Evaluation of the General Administrative Board (DGA) addressed the capacity and agility of the work processes of the central administration. About 25% of the teaching and research departments consider that the processes of procurement, bidding, services and building/renovation works are complex and very slow, and suggest improving and reviewing them with the participation of the schools.

Regarding whether DGA meets the demands of the schools, the adequacy of material or service procurement processes was evaluated as follows: 29.2%, poor; 41.7%, average; 25%, good; and 4.1% only, very good.

On the other hand, procurement of materials by the schools using the Electronic Purchase Exchange (BEC) has positively impacted the flows and agility of the processes within the schools. Most of them are clear about the importance of computerized systems that certify legal and necessary compliance in procurement processes.

Some reports mention that the procurement process, which has been systematized and computerized, still requires printed documents, so there was no substantial decrease in the flow and volume of hard copies. From the standpoint of procurement agility, procurement processes involving bidding or service provision are considered time consuming and need to be improved. The services procurement process often requires the execution of previous projects and involves other departments and university bodies (CPO, Maintenance Division, etc.), and thus is considered critical regarding deadlines, deserving greater attention and consideration from DGA, since it may hinder the progress of core activities of other departments. Another type of service that deserves attention is the outsourcing of certain kinds of computer equipment (e.g., printers, etc.) and air conditioning maintenance, as the amount and time spent with inspections and maintenance justifies the purchase of new equipment and increases waste.

It is recognized that purchases made by DGA guarantee a significant reduction in prices, but the bidding sector is considered slow.

Some improvements were suggested and are systemized below:

1. To incorporate in the procurement system the option of closing the procurement request due to the use of extra-budgetary funds;
2. To regularly update the suppliers' database (removing inactive entries);
3. To offer semiannual workshops with department managers and buyers to adjust system bugs and clarify questions about best procurement practices;
4. To improve Unicamp's catalog of materials by including images and removing duplicates;
5. To consider making changes in procurement forms (avoiding repeated descriptions) for items of activities inherent to undergraduate, graduate and outreach dentistry courses;
6. To allow greater system integration and/or complete computerization of the entire services procurement and hiring process of the university.

According to of the central administration, it is considered that this body needs to review its work processes and implement effective digital systems capable of generating

management reports in real time, with data and indicators that enable managers to make decisions based on information. This is not the case today and progress in recent years has fallen short of the institution's needs.

DGRH generally meets the needs of the schools. The hiring of interns could be improved, streamlining the process and adjusting it to the needs of the academic units and administrative bodies. Another issue that raised concerns is the need for a more focused policy on human resources development. According to the central administration, several types of procedure weaknesses were traced in this body, which had to be analyzed by specially hired external consultants. Work is in progress, but there is a need for numerous reviews of work processes.

Regarding the Attorney General (AG), approximately 37.5% of the schools expressed dissatisfaction with the work processes of this body for reasons such as: slowness, lack of response and "bureaucratization" (include most frequently asked questions in the computerized and PG process systems). Regarding the Attorney General (PG), some schools expressed dissatisfaction with the handling of cases in this body for reasons such as slowness, lack of feedback, and "bureaucratization" (registering frequently asked questions in the computerized and PG processing system). From the central administration's point of view, it is considered that this body needs to review some of its internal work processes at the university, implement digital systems effectively, and generate management reports in real-time, with data and indicators that allow managers to make decisions information-based preventive measures. Part of the reported problems was due to the lack of personnel during this evaluated period, which was supplied in part with the finalization of the tender opened in 2018 and with the inauguration of new attorneys in 2019. The advances achieved with implementing digital processes with interfaces with environments external to the university still need to occur internally due to PG systems' integration with those of other Unicamp bodies.

Many changes have clearly taken place in DAC in recent years and some processes have greatly improved. There is still room for improvement regarding information search by faculty, standardized displays in the graduate studies servers and "red tape" reduction in other processes.

Overall, the schools evaluated the adequacy of maintenance services and equipment procurement processes through CEMEQ as follows: 8.3%, very poor; 16.7%, poor; 58.3%, average; and 16.7%, good. Some schools report that some equipment maintenance and procurement services are based on a large number of regulatory standards (NR) and specificities, resulting in above-market prices and delay in the execution of services.

Some schools report that CEMEQ no longer executes services but rather serves as an intermediary between the university and service providers, extending execution time and sometimes affecting their core activities. Some report that average Service Order (OS) execution terms have increased in the last period compared to the previous one. Sometimes those in charge are restricted to this service for having no other maintenance funds, while some schools use research funds to this end, thus trying to prevent core activities from being affected.

Air conditioning maintenance seems to be the most critical service for the schools. As this is always outsourced, CEMEQ accumulates service orders to then open a bidding



process. The verification, budgeting and execution process usually exceeds three months and is costly. In other cases, even when CEMEQ is unable to meet the schools' needs, its opinion delays the hiring of requested services, such as maintenance of FCA elevators. Price registration services are more agile and ensure the procurement of quality equipment at good prices and with adequate installation time.

Some improvements were suggested and are systemized below:

1. To carry out more "aggressive" negotiations for maintenance services before submitting the budget to the schools;
2. To extend price registration processes to all ICT inputs;
3. To carry out price registration processes more frequently and avoid redoing work in the schools;
4. To carry out an improvement study on service execution processes together with the school, DGA and CEMEQ;
5. To execute a comprehensive contract with a HVAC specialized company, in which the department purchases the parts and the company provides the service, similar to the format of RP Engenharia.

Despite the number of locally developed systems that facilitate the routine of schools, few of them are integrated with university systems. Moreover, it is evident that the strategy of dispersed systems development stems from the incapacity of the central systems to meet the needs (routines and operations) of the schools. This leads to a dispersion of teams and need to support all of them with same amount of funds. This situation is inconsistent with the process of centralizing IT policies and systems.

The need to develop local systems stems from the lack of attention of the main bodies to user needs. This entails extremely high costs to the institution related to multiple development teams in the academic units and replicated in the administrative bodies, developing unique functions and systems which in many cases could be shared and made available to all. The new ICT governance is seeking to address this problem.

## 10.5 Personal and professional development

This item addressed the personal and professional development of faculty (teaching and research) and technical-administrative staff.

### 10.5.1 Faculty

Unicamp's faculty comprises several careers with roles defined according to the bodies to which they are assigned. These careers are as follows:

1. Higher Professorship (MS): faculty in schools.
2. Artistic Professorship (MA): this is an exclusive career in arts of the Arts Institute, regulated by Resolution CEPE-A-006/1996. Two careers are available in the Arts Institute: MS and MA.
3. Higher Technical Professorship (MTS): this is an exclusive career of the School of Technology, regulated by Resolution Consu-A-001/1992, as amended by Resolution Consu-A-013/1997 and Consu-A-010/2001. Two careers are available in this school: MTS and MS.
4. Language Teaching Center Career (DEL): this is an exclusive career of this center, regulated by Resolution Cepe-A-011/1993.
5. Professorship in Special Education and Rehabilitation (Deer): this is an exclusive career of Cepre, an internal center of the School of Medical Sciences, regulated by Resolution Cepe-A-007/2007, which partially amended Resolution Cepe-A012/1993. Two careers are available in this school: MS and Deer.
6. Secondary Technical Professorship (MST): this is an exclusive career of the technical high schools (COTIL and COTUCA), regulated by Resolution Cepe-A-006/2005, which partially amended Resolution Cepe-A-010/1995.

The number of faculty of these careers is defined by the Faculty Recruitment Committee (CVD), established by the University Council and currently regulated by Resolution Consu-A-018/2013. In 2013, the replacement of MS faculty due to retirement and other forms of leave started being defined by the schools, based on the number of faculty in each schools in 2000. This replacement process was discontinued in 2017 due to budget constraints in the university. CVD decides on proposals for increasing faculty members based on a diagnostic evaluation of demand and objective criteria, in relation to both MS faculty and what we call special careers (all other teaching careers in the university), respecting the programs and guidelines they follow.

The schools unanimously approve the automatic replacement of MS faculty, emphasizing that this enables faculty management and replacement due to retirement. From 2013 to 2017, while the rule was in force, replacements followed internal criteria established by the schools, through public examinations. There are specific rules for entry examinations in each career. In the case of MS careers, there are rules for entry at the initial level (assistant professor, MS3) (Resolution Consu-A-003/2003, amended by Resolution Consu-A-03/2013, later amended by Resolution Consu-A-003/2014). Public examinations for the final level (full professor, MS6) are regulated by Resolution Consu-A-026/2014, which amended Resolution Consu-A-010/2007, Consu-A-006/2007 and Consu-121/2007. Examination boards are set up for these public examinations. Notices are also published in the Official São Paulo State Gazette and there are approval processes under CEPE. From 2017, budget constraints prevented the continuity of automatic replacement.

Changes in pension rules resulting from the creation of the States Pension Fund, the constitutional reform of 1998 and the implementation of the São Paulo State Pension Fund in 2013 required new forms of personnel management.

Based on this description of faculty, it is possible to define certain strategies to solve some of the current problems already traced and propose changes in faculty management

aiming at the university's financial and academic sustainability. Therefore, it is very opportune to compare the situation of faculty in the two periods of Institutional Evaluation (2009-2013 and 2014-2018), using data from the Unicamp 2018 Statistical Yearbook.

#### *10.5.1.1 Public Examinations*

In all schools, a priority of recruitment criteria was meeting the needs of undergraduate programs. Some schools define the areas for hiring faculty through strategic plans. The priority was the replacement of faculty that retired in recent years. Few schools made replacements seeking a broader profile, targeting interdisciplinary or new research areas, in which Unicamp has little experience. This is an institutional culture that should be changed over time, aiming at the modernization of academic activities. This is strategically important for Unicamp, and new hires must concurrently cater for the areas of teaching (undergraduate and graduate studies), research and outreach.

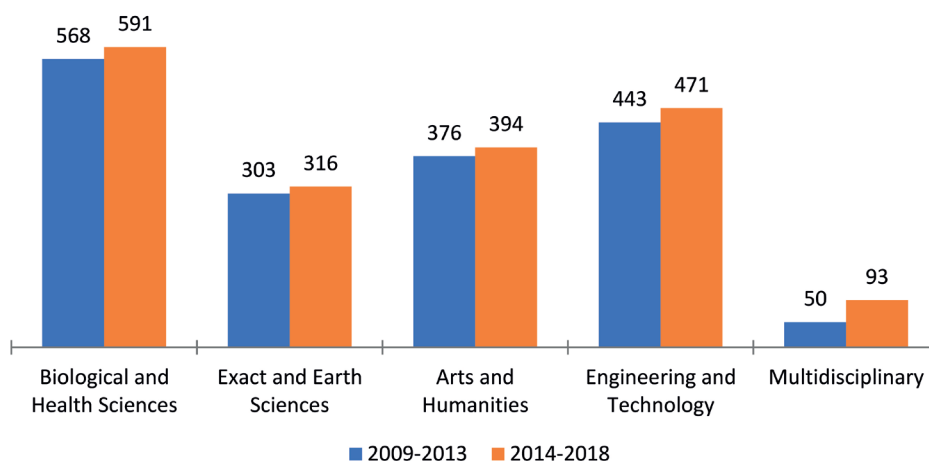
The schools and Unicamp seek to announce examinations nationally and internationally to increase competition and attract more qualified candidates, but not all examinations have been competitive. In some schools they are still endogenous, with cases of recruitment of alumni from Unicamp graduate programs. There is some heterogeneity in the analysis of this fact, as some schools do not consider endogeneity a problem. In other cases, the examinations were competitive, attracting many candidates. Therefore, in some highly demanding schools, no candidates were approved. For internationalization strategies, striving for less endogenous examinations is a necessity.

The public examinations process evaluates teaching skills, argumentation skills and educational background, with specific weights for each, according to the position and career. These examinations are conducted by the schools offering the position. There are always members from outside the school on the examination boards and in many cases members from outside Unicamp are required. The professors approved in public examinations undergo a three-year probation period, regulated by Resolution GR-034/2014.

#### *10.5.1.2 Evolution of Faculty Numbers*

Graph 10.1 shows data on the number of MS faculty by knowledge area: Biological and Health Sciences (FCM, IB, FENF, FEF, FCF, FOP), Exact and Earth Sciences (IFGW, IG, IMECC, IQ), Arts and Humanities (IFCH, IE, FE, IEL, IA), Engineering and Technology (FEA, FEEC, FEC, FEQ, FEAGRI, FT, FEM, IC) and Multidisciplinary (FCA), comparing the 2009-2013 and 2014-2018 periods. The data show that there was a slight increase in the average number per period in all areas (between 4% and 6%, depending on the area), especially in multidisciplinary studies (from 50 to 93 faculty members, +86%). However, with the interruption of the automatic replacement of retired professors from 2017, faculty numbers fell in 2017 and 2018 in several schools, such as IE, IEL, IFCH, FEC, FEEC, FEM, FEQ, as shown in Tables 10.1 through 10.6.

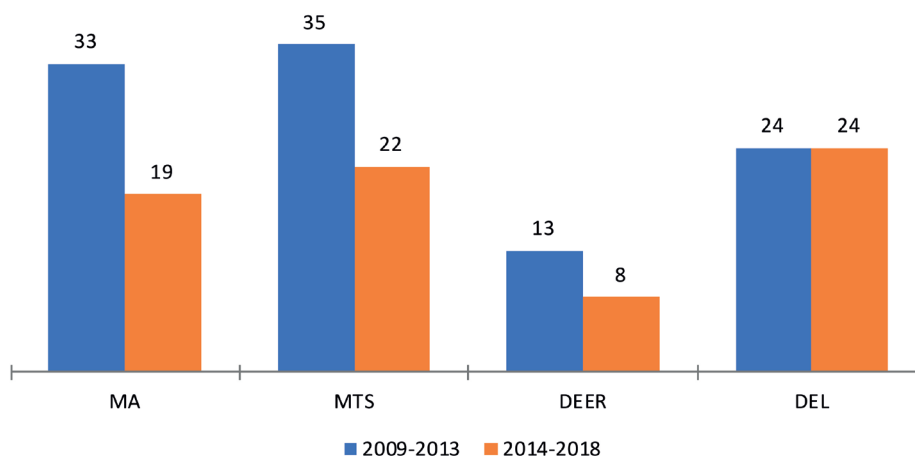
GRAPH 10.1 – AVERAGE NUMBER OF MS FACULTY BY KNOWLEDGE AREA



Source: S-Integra, DGRH.

Graph 10.2 below compares the number of faculty members in special careers between 2009-2013 and 2014-2018. A significant decrease is observed in faculty numbers in practically all careers.

GRAPH 10.2 – AVERAGE NUMBER OF FACULTY IN SPECIAL CAREERS



Source: S-Integra, DGRH.

### 10.5.1.3 Structure of Teaching Careers and Promotion Processes

Each teaching career has different levels and each level is defined by a profile approved by the University Council. Mobility between levels is due to academic merit, based on promotion criteria also defined by the University Council. Promotion can be between horizontal or vertical levels. Public examinations for vertical promotions are only held in the MS career. Horizontal promotions in all careers are decided by an internal process. In all types of promotion examining boards analyze merit based on profiles, recommending

promotions or not. Following the schools' approval, the process is reviewed by CCRH, CIDD and deliberated by CEPE. No comments regarding this matter were made by the schools.

Academic merit promotions of MS faculty are regulated by Resolution Consu-A-027/2014, which partially amended previous resolutions, especially Consu-A-006/2007, Consu-A-005/2003, Consu-A-005/2003, Consu-A-003/2011 and Consu-A-001/2012. This last resolution aimed to simplify the process, providing schools with more autonomy to conduct the process.

Progression in the Deer career is regulated by Resolutions Cepe-A-012/1993 and Cepe-A-003/1995. In the MA career, progression is regulated by Resolutions Consu-A-002/1992 and Consu-A-014/1997 and the MTS career is regulated by Resolution Consu-A-010/2001.

Tables 10.1, 10.2, 10.3, 10.4, 10.5 and 10.6 show the evolution of the total number of faculty in each school and the number of promotions in the corresponding year, alongside the corresponding percentage in relation to total faculty. In these tables, the schools are grouped by knowledge area. Overall, the number of faculty remained fairly stable, with some decrease at the end of the period.

Graph 10.2 compares the number of promotions in 2009-2013 and 2014-2018. It is evident that a smaller number of faculty were promoted in the second period in most areas, basically due to the sharp reduction in promotions in 2017 and 2018.

TABLE 10.1 – EVOLUTION OF THE NUMBER OF MS FACULTY AND PROMOTIONS IN BIOLOGY AND HEALTH SCIENCES

School		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
FCM	a	354	349	343	331	305	304	304	317	313	312
	b	7	5	9	173	9	36	17	17	12	2
	c	2%	1%	3%	52%	3%	12%	6%	5%	4%	1%
FENF	a	33	33	30	31	31	35	38	37	37	37
	b	0	1	9	8	1	5	3	3	1	0
	c	0%	3%	30%	26%	3%	14%	8%	8%	3%	0%
FOP	a	79	79	79	77	77	80	87	88	89	84
	b	0	0	1	22	3	9	8	5	1	1
	c	0%	0%	1%	29%	4%	11%	9%	6%	1%	1%
IB	a	121	123	115	112	110	114	121	121	117	118
	b	2	1	5	28	2	9	5	6	4	2
	c	2%	1%	4%	25%	2%	8%	4%	5%	3%	2%
FENF	a	0	0	0	0	27	24	30	31	30	30
	b	0	0	0	0	1	2	2	0	2	0
	c	0%	0%	0%	0%	4%	8%	7%	0%	7%	0%
FCF	a	0	0	0	0	0	1	9	16	16	16
	b						0	2	1	0	5
	c						0%	22%	6%	0%	31%

Source: DGRH.

Note: \* Number of faculty on Dec. 31 (A), Number of promotions (B), B/A ratio (C).

TABLE 10.2 – EVOLUTION OF THE NUMBER OF MS FACULTY  
AND PROMOTIONS IN ENGINEERING AND TECHNOLOGY

School		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
FEA	a	49(A)	48	47	50	54	55	53	57	57	57
	b	2(B)	1	3	11	4	2	3	0	4	1
	c	4%	2%	6%	22%	7%	4%	6%	0%	7%	2%
FEAGRI	a	39	39	38	37	36	36	41	36	36	34
	b	0	2	7	1	2	2	1	1	1	2
	c	0%	5%	18%	3%	6%	6%	2%	3%	3%	6%
FEC	a	75	71	73	72	70	69	69	70	66	66
	b	1	1	2	15	9	11	5	3	2	1
	c	1%	1%	3%	21%	13%	16%	7%	4%	3%	2%
FEEC	a	88	87	86	82	80	78	80	85	81	78
	b	2	0	2	31	4	3	15	3	2	8
	c	2%	0%	2%	38%	5%	4%	19%	4%	2%	10%
FEM	a	78	78	79	75	77	83	86	87	79	74
	b	3	0	32	6	5	5	4	3	2	3
	c	4%	0%	41%	8%	6%	6%	5%	3%	3%	4%
FEQ	a	48	50	46	45	46	46	44	48	48	45
	b	3	4	11	5	2	6	1	9	2	2
	c	6%	8%	24%	11%	4%	13%	2%	19%	4%	4%
FT	a	17	27	25	34	35	43	47	52	54	55
	b	0	0	0	7	4	14	6	6	1	8
	c	0%	0%	0%	21%	11%	33%	13%	12%	2%	15%
IC	a	43	48	46	48	49	48	51	52	55	53
	b	1	1	6	4	2	6	3	1	1	8
	c	2%	2%	13%	8%	4%	13%	6%	2%	2%	15%

Source: DGRH.

Note: \* Number of faculty on Dec. 31 (A), Number of promotions (B), B/A ratio (C).

TABLE 10.3 – EVOLUTION OF THE NUMBER OF MS  
FACULTY AND PROMOTIONS IN ARTS AND HUMANITIES

School		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
FE	a	90	87	90	84	85	91	94	91	89	87
	b	0	2	1	47	5	11	15	9	3	0
	c	0%	2%	1%	56%	6%	12%	16%	10%	3%	0%
IA	a	65	63	65	69	74	73	80	82	81	84
	b	0	1	0	22	5	4	6	2	4	1
	c	0%	1.6%	0%	31.9%	6.8%	5%	8%	2%	5%	1%
IE	a	73	74	72	71	70	69	72	68	68	64
	b	0	1	1	22	6	16	9	7	2	0
	c	0%	1%	1%	31%	9%	23%	13%	10%	3%	0%
IEL	a	63	64	63	68	66	65	67	71	68	65
	b	0	0	22	3	6	4	2	6	1	0
	c	0%	0.0%	34.9%	4.4%	9.1%	6%	3%	8%	1%	0%
IFCH	a	89	87	81	83	86	89	87	88	90	86
	b	3	2	1	27	6	5	12	1	5	1
	c	3.4%	2.3%	1.2%	32.5%	7.0%	6%	14%	1%	6%	1%

Source: DGRH.

Note: \* Number of faculty on Dec. 31 (A), Number of promotions (B), B/A ratio (C).



TABLE 10.4 – EVOLUTION OF THE NUMBER OF MS FACULTY  
AND PROMOTIONS IN EXACT AND EARTH SCIENCES

School		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
IFGW	a	86	81	85	82	88	87	86	82	87	84
	b	2	2	1	32	5	5	11	9	0	0
	c	2%	2%	1%	39%	6%	6%	13%	11%	0%	0%
IG	a	44	48	49	50	49	50	54	58	55	55
	b	1	1	2	15	0	8	0	7	3	5
	c	2%	2%	4%	30%	0%	16%	0%	12%	5%	9%
Imecc	a	98	96	91	94	94	95	101	102	101	101
	b	2	2	1	34	12	8	15	14	2	0
	c	2%	2%	1%	36%	13%	8%	15%	14%	2%	0%
IQ	a	81	79	74	73	74	76	78	74	78	78
	b	3	0	19	14	6	1	4	1	4	1
	c	4%	0%	26%	19%	8.1%	1%	5%	1%	5%	1%

Source: DGRH.

Note: \* Number of faculty on Dec. 31 (A), Number of promotions (B), B/A ratio (C).

TABLE 10.5 – EVOLUTION OF THE NUMBER OF MS  
FACULTY AND PROMOTIONS IN MULTIDISCIPLINARY

School		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
FCA	a	18	36	49	71	74	83	87	96	98	101
	b	0	0	0	4	10	18	5	12	0	0
	c	0%	0%	0%	6%	14%	22%	6%	13%	0%	0%

Source: DGRH

Note: \* Number of faculty on Dec. 31 (A), Number of promotions (B), B/A ratio (C)

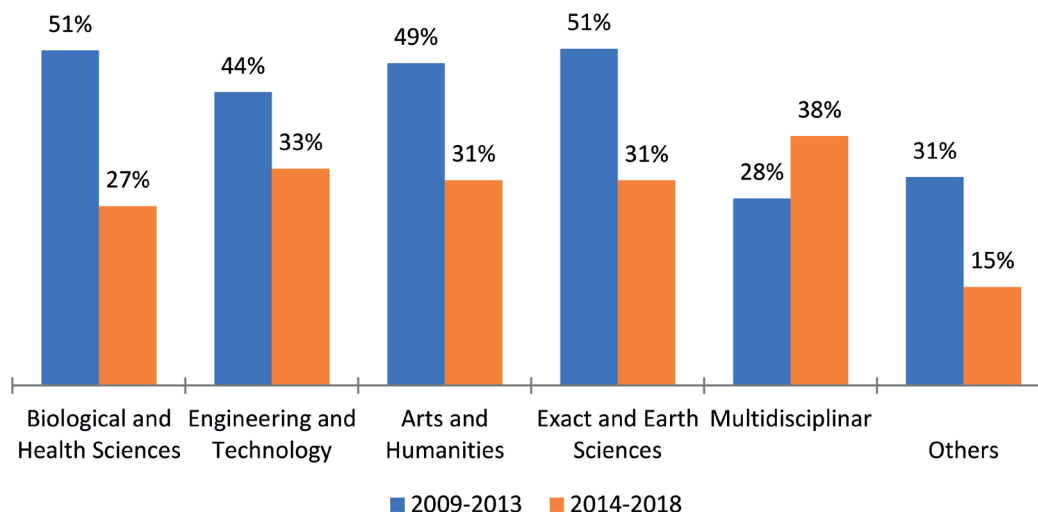
TABLE 10.6 – EVOLUTION OF THE NUMBER OF FACULTY  
OF OTHER CAREERS AND PROMOTIONS (EXCEPT MST)

Unit (Career)		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
IA (MA)	40(A)	34	32	32	28	23	22	19	17	16	
	3(B)	0	1	0	1	4	0	0	0	0	
	7.5%	0.0%	3.1%	0.0%	3.6%	17.4%	0.0%	0.0%	0.0%	0.0%	
CEPRE (DEER)	13	13	13	13	12	11	9	9	7	5	
	0	1	0	2	0	0	0	0	0	0	
	0.0%	7.7%	0.0%	15.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
CEL (DEL)	28	25	23	23	23	25	25	26	25	19	
	1	1	0	4	2	0	0	0	0	0	
	3.6%	4.0%	0.0%	17.4%	8.7%	0.0%	0.0%	0.0%	0.0%	0.0%	
FT (MTS)	50	37	32	28	26	25	26	21	20	19	
	2	4	2	7	2	4	0	2	1	0	
	4.0%	10.8%	6.3%	25.0%	7.7%	16.0%	0.0%	9.5%	5.0%	0.0%	

Source: DGRH.

Note: \* Number of faculty on Dec. 31 (A), Number of promotions (B), B/A ratio (C).

GRAPH 10.3 – NUMBER (PERIOD TOTALS) OF FACULTY PROMOTIONS BY AREA



Source: DGRH.

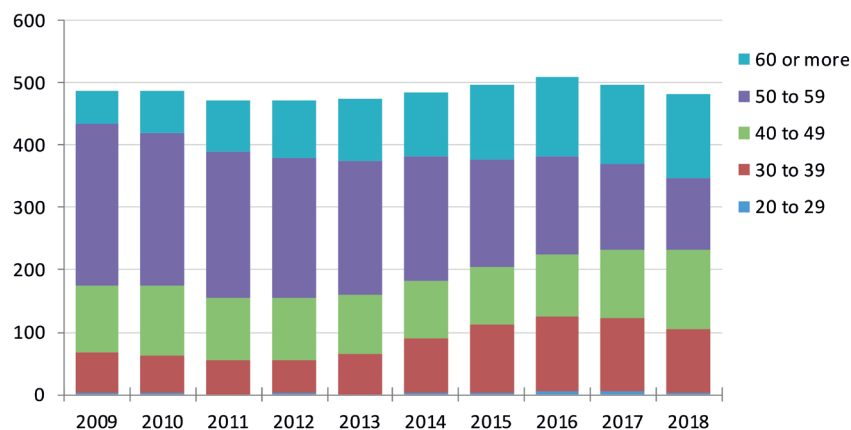
#### 10.5.1.4 Faculty Age Profile

One of the important aspects of faculty management is age profile, which, when analyzed together with length of service, enables estimating the need for replacement each year. Grouping age profiles by ten-year periods shows that most MS faculty, except for the new multidisciplinary area (FCA), is in the over 50 age group (Figures 5.4 to 5.8). However, a gradual growth of faculty in the age group up to 39 is observed, due to the replacement of retired teachers in 2013-2017. This occurs in practically all areas.

It is important to note that the over 60 group grows especially in the areas of Biological and Health Sciences and Engineering and Technology, indicating that the right to full-pay retirement does not seem to be a determining factor for the retirement of a large number of MS faculty. Regarding the possible consequences of retirement on academic output, with the entry of younger professors and lack of consolidated research groups, the schools believe there may be some negative impact on output volume and research funding, but also consider that faculty turnover may have a positive impact in the medium and long term.

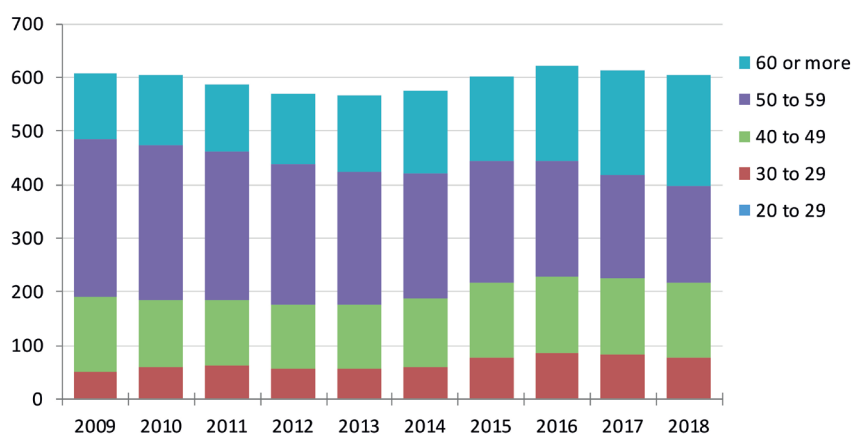
Regarding the special careers, the analysis is more difficult as many of them have no replacement, especially when they are being discontinued, like MTS. This is the case of DEER, MA and MTS. Retirees are not being replaced and there are fewer professors in the younger age groups.

GRAPH 10.4 – EVOLUTION OF MS FACULTY BY AGE GROUP –  
ENGINEERING AND TECHNOLOGY



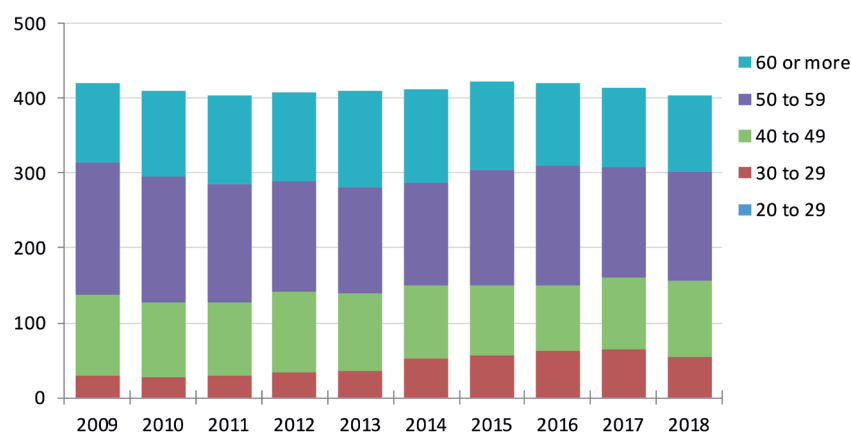
Source: S-Integra, DGRH.

GRAPH 10.5 – EVOLUTION OF MS FACULTY BY AGE GROUP – BIOLOGICAL AND HEALTH SCIENCES



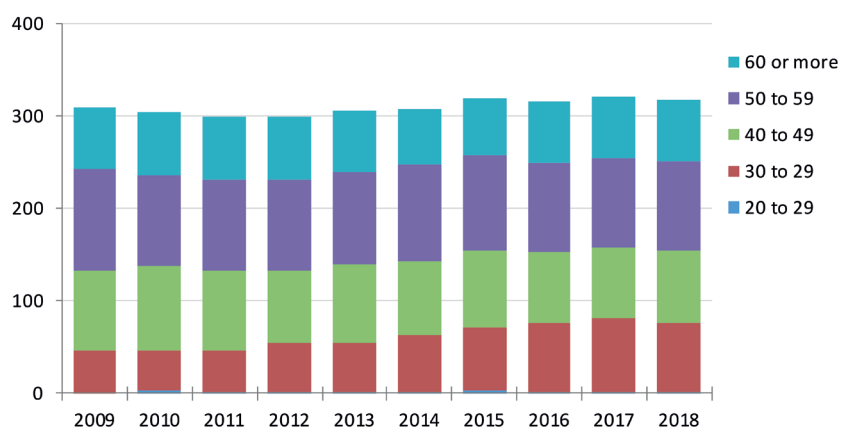
Source: S-Integra, DGRH.

GRAPH 10.6 – EVOLUTION OF MS FACULTY BY AGE GROUP – ARTS AND HUMANITIES



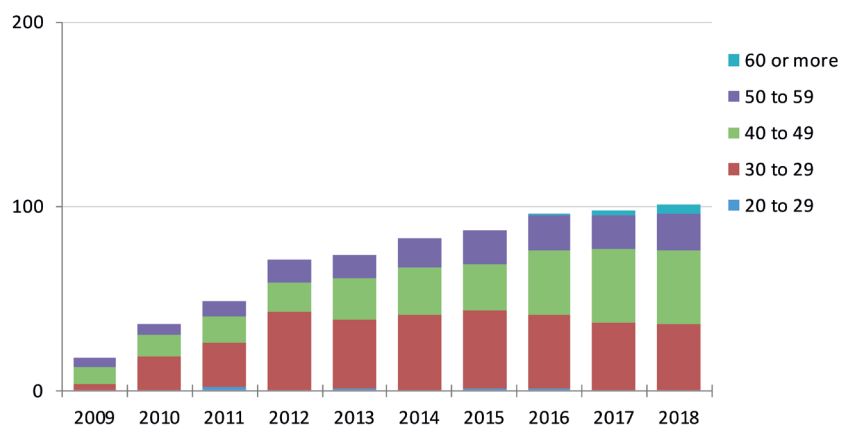
Source: S-Integra, DGRH.

GRAPH 10.7 – EVOLUTION OF MS FACULTY BY AGE GROUP – EXACT AND EARTH SCIENCES



Source: S-Integra, DGRH.

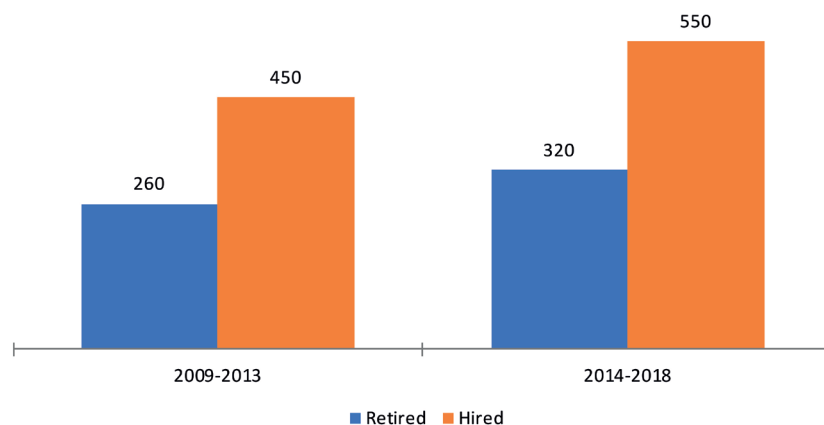
GRAPH 10.8 – EVOLUTION OF MS FACULTY BY AGE GROUP – MULTIDISCIPLINARY STUDIES (FCA)



Source: S-Integra, DGRH.

Overall, more faculty members were hired than retired in 2014-2018, confirming the trend observed in the previous period (2009-2013), as shown in Graph 10.9.

GRAPH 10.9 – COMPARISON OF HIRED AND RETIRED MS FACULTY

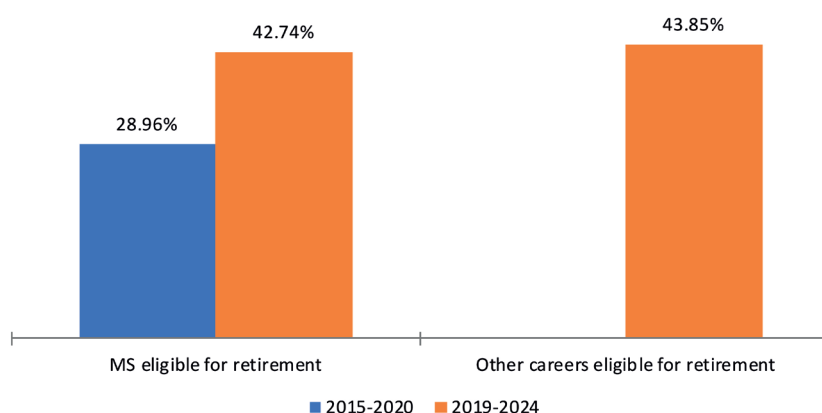


Source: S-Integra, DGRH.

### 10.5.1.5 Faculty Length of Service Profile

Retirement of MS faculty is subject to a number of rules due to the various constitutional changes and their regulations. Therefore, the percentage of MS faculty eligible for retirement shown in Graph 10.10 is based on the best rule – the length of service that yields the highest pension. In general, this rule combines age and length of service. Considering faculty numbers on December 31, 2018, Graph 10.10 shows the percentage of professors who may retire under the best rule over the next six years. This number has increased from 28.96% to 42.74% for MS faculty and 43.86% for other careers, an extremely worrying trend that shows the need for accelerated faculty renewal in the coming years in most schools.

GRAPH 10.10 – PERCENTAGE OF FACULTY IN MS AND OTHER CAREERS ELIGIBLE FOR RETIREMENT IN THE FOLLOWING SIX YEARS



Source: S-Integra, DGRH.

### 10.5.1.6 Internationalization

In recent years, internationalization indicators have been adopted as criteria by many international university ranking systems. Among such indicators, two are frequently used: number of foreign faculty and number of faculty with foreign degrees among permanent academic staff.

Table 10.7 and Graph 10.11 show the evolution of the number of foreign MS faculty (including naturalized members) in each school in 2009-2018. The figure shows that there has been a significant reduction over the decade, caused by the loss of faculty in Biological and Health Sciences and Arts and Humanities. Some hypotheses may be raised. The first is a generation transition, with the foreigners hired by Unicamp in its early years now retiring. On the other hand, as seen in Graph 10.12, there was an increase in the 40-49 age group, apparently due to the recent hiring of foreigners, which increased from 4.86% of total hiring in 2009-2013 to 6.91% in 2014-2018, as shown in Graph 10.13. Even so, such replacement is not enough to sustain the previous profile of foreign faculty. Therefore, to meet internationalization requirements, more aggressive strategies for hiring foreign faculty should be implemented.

Another commonly used internationalization indicator is degrees from foreign institutions. Since the 1990s, Unicamp has only hired doctoral faculty. Therefore, the only alternative to use this indicator is to hire faculty already possessing international degrees. Some schools exploit this strategy by announcing examination notices in various media outlets abroad, with some degree of success.

Another possibility is fellowships or visiting programs abroad. Such leaves are provided in Unicamp regulations in two situations: postdoctoral studies abroad, which may be up to one year, and special leaves (sabbatical), which may last up to six months. In international rankings, there are internationalization indicators that consider leaves or visiting programs for periods of three months or more during the year.

Unicamp has procedures in place to support faculty aiming for more consistent interaction with foreign research groups, and this point was stressed by various teams of external evaluators who consider longer-term (postdoctoral) fellowships essential for young faculty members. This recommendation was emphasized in the case of Unicamp alumni among faculty. The teams also consider it important to take part in visiting professor programs abroad, even for shorter terms, as they are excellent opportunities for internationalization of research conducted here.

TABLE 10.7 – NUMBER OF FOREIGN FACULTY AT UNICAMP

Area	School	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Biological and Health Sciences	FCM	15	17	16	15	15	15	14	13	13	13
	FEF	2	1	1	1	1	1	1	1	1	1
	FOP	0	0	0	0	0	0	0	0	0	0
	IB	10	9	7	4	4	5	6	5	5	5
	FEnf	0	0	0	0	0	0	0	0	0	0
	FCF	0	0	0	0	0	0	1	2	2	2
	Total	27	27	24	20	20	21	22	21	21	21
Engineering and Technology	FEA	8	9	7	7	7	5	5	5	4	4
	FEAGRI	4	4	4	4	3	3	3	3	2	2
	FEC	2	2	2	2	2	1	1	1	1	1
	FEEC	5	6	6	5	5	4	5	6	6	6
	FEM	2	1	2	2	2	3	4	4	3	3
	FEQ	2	2	2	2	2	2	1	2	2	2
	FT	1	2	1	1	1	1	1	1	1	1
	IC	2	3	3	3	3	3	4	5	6	6
	Total	26	29	27	26	25	22	24	27	25	25
Arts and Humanities	FE	8	8	8	7	6	5	4	4	4	4
	IA	3	3	3	3	4	4	4	4	4	4
	IE	7	7	8	6	7	7	8	8	6	5
	IEL	10	10	10	10	8	6	6	7	7	6
	IFCH	10	9	8	8	7	6	6	6	7	7
	Total	38	37	37	34	32	28	28	29	28	26



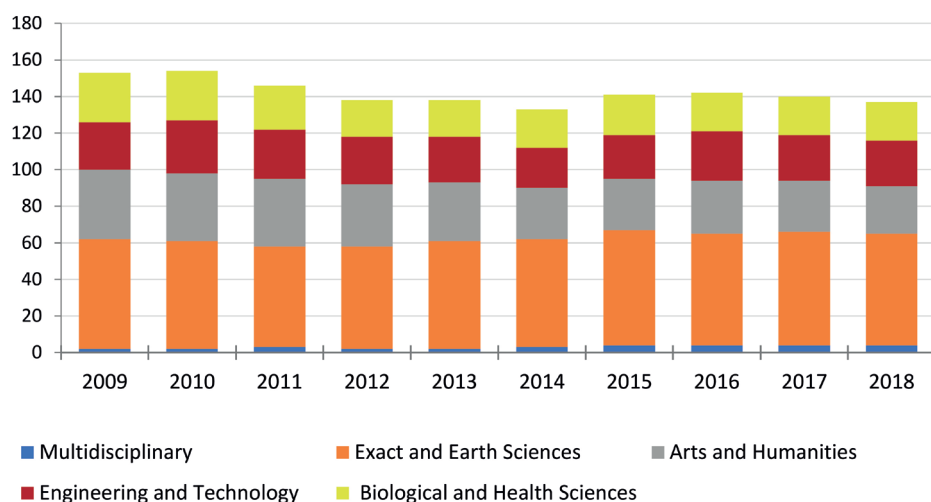
TABLE 10.7 – NUMBER OF FOREIGN FACULTY AT UNICAMP

continued

Area	School	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Exact and Earth Sciences	IFGW	19	19	17	14	15	16	16	15	16	16
	IG	2	2	2	3	3	3	5	5	5	5
	IMECC	30	29	27	31	31	30	32	32	32	31
	IQ	9	9	9	8	10	10	10	9	9	9
	Total	60	59	55	56	59	59	63	61	62	61
Multidisciplinary Studies	FCA	2	2	3	2	2	3	4	4	4	4
	Total	2	2	3	2	2	3	4	4	4	4
TOTAL		153	154	146	138	138	133	141	142	140	137

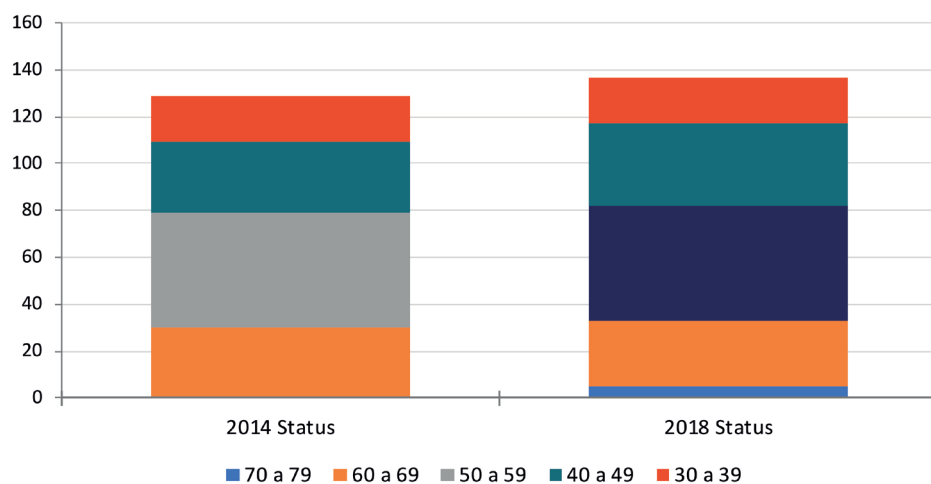
Source: DGRH, S-Integra.

GRAPH 10.11 – EVOLUTION OF FOREIGN FACULTY BY KNOWLEDGE AREA



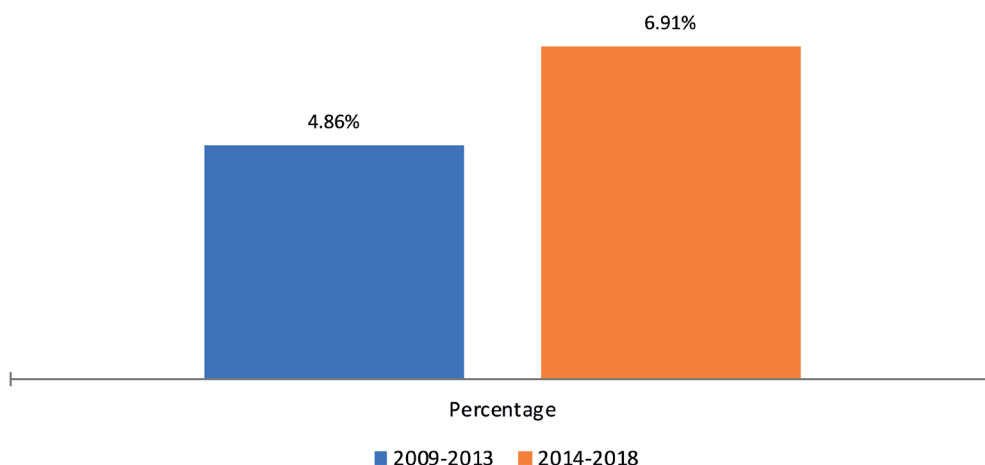
Source: DGRH, S-Integra.

GRAPH 10.12 – FOREIGN FACULTY AGE GROUPS IN 2014 AND 2018



Source: DGRH, S-Integra.

GRAPH 10.13 – PERCENTAGE OF FOREIGN FACULTY OF TOTAL HIRED FACULTY



Source: DGRH, S-Integra.

#### 10.5.1.7 Faculty Assessment

Unicamp faculty undergo regular individual evaluation periods (Resolution Consu-A-018/2005) by the Main Human Resources Committee (CCRH), created in 2013 by Resolution Consu-A-024/2013. This process takes place in the Internal Chamber of Faculty Development (CIDD). Previously, it was carried out under the Institutional Assessment and Development Committee (CADI). This committee comprised one representative from each school and included a subcommittee (CAI) that issued opinions on the activity reports of MA, MTS, MST, DEL and CEPRE faculty and the researcher career. The current composition is one representative per school.

This individual evaluation is based on activity reports filled out by the faculty members, evaluated by the schools and submitted to CCRH/CIDD. Non-approved reports are reviewed by the Committee for Full Dedication to Teaching and Research (CPDIUEC), provided in Unicamp bylaws and regulated by Articles 183 to 190 of the General Regulations. This report contains the set of activities performed by faculty members over a period ranging from three to five years. The process has already been consolidated and integrated in the institutional culture, but some improvements are made linking faculty and school performance. Presently, it also includes an evaluation to better describe the performance of faculty in the activities that best fit their skills.

Promotion requires the approval of faculty reports, but such approval does not guarantee promotion.

Unicamp has introduced two types of recognition for good performance of MS faculty. One is called *Prêmio de Reconhecimento Acadêmico "Zeferino Vaz"*, implemented by Ordinance GR-233/1990. The rules for granting this award have been amended several times and are currently regulated by Resolution Consu-A-021/2013. This award is given annually to one professor per school, chosen among those who stand out in all academic activities in the period covered by the faculty activity report. The second is called *Prêmio de Reconhecimento*

*Docente ao Ensino de Graduação*, instituted and regulated by Resolution Consu-A-034/2011 and amended by Resolution Consu-A-021/2013. It is awarded annually to one faculty member per school chosen among those who excel in undergraduate activities.

### 10.5.2 Researcher Career in Interdisciplinary Research Centers

The Researcher Career (Pq) was instituted at UNICAMP by Resolution CAD-A-002/2005. In late 2018, the total number of researchers was 94, 90 of whom were distributed among the 21 Interdisciplinary Research Centers managed by COCEN (Coordination of Interdisciplinary Research Centers), the other four being part of schools and health area (FCM, FCF, IB and Hemocentro).

Management of this career is the responsibility of CCP. The minimum background profile for the three levels of Pq Career (A, B and C) is established by CCP, through a proposal approved by the Interdisciplinary Activities Committee (CAI/CONSU).

Progression from one level to the next is based on the Progression Assessment Process. From 2015, the career underwent a renewal process due to retirements and leaves. However, this process was temporarily interrupted in 2017.

In 2017, Unicamp instituted a recognition award for good performance of research work, called *Prêmio de Reconhecimento Acadêmico para Pesquisadores da Carreira de Pesquisador* (Resolution CONSU-A-021/2016).

Researchers approved in public examinations undergo a probation period of three years. Researchers hired by Unicamp undergo individual evaluation every three years, which must be approved by the Research Development Internal Chamber (CIDP).

Although the research centers are interdisciplinary, the researchers were grouped by background knowledge area to understand how they are distributed. Table 10.8 shows that 50% of researchers have a background in Humanities, Social Sciences, Languages and Arts and 28.7% in Biological and Health Sciences, while the number of researchers from the areas of Engineering and Technology (7.5%) and Exact and Earth Sciences (13.8%) is relatively small compared with the number of faculty in corresponding schools, shown in Graph 10.1.

TABLE 10.8 – REAKDOWN OF PQ RESEARCHERS BY KNOWLEDGE AREA (2018)

Area	Human and Social Sciences	Languages and Arts	Biological and Health Sciences	Engineering and Technology	Exact and Earth Sciences
Researchers	31	16	27	7	13
Percentage	33.0%	17.0%	28.7%	7.5%	13.8%

The breakdown of researchers by level in Table 10.9 shows that most researchers (about 2/3) are level C, which clearly indicates the difficulty of career advancement for researchers. This is due to the lack of a regular budget earmarked for this purpose at the university, evidenced by comparison with the breakdown of Higher Professorship (MS) faculty by level. For each A researcher there are 2.3 B researchers and 7.1 C researchers, while the breakdown of MS faculty is much more uniform, with 1.2 MS5 and 2 MS3 professors for each MS6 professor.

Importantly, difficulties in advancement and lack of medium to long-term career prospects may lead to increasing demotivation among researchers.

TABLE 10.9 – PQ RESEARCHERS BY LEVEL, 2018

Level	Number	Percentage
Pq C	64	68.1 %
Pq B	21	22.3 %
Pq A	9	9.6 %

Source: DGRH, S-Integra.

The number of researchers is considered insufficient (below three) in nine interdisciplinary research centers (CCSNano, CEB, CMU, CEMIB, CESOP, CIDDIC, NICS, NEPP, NIED). Several other interdisciplinary research centers have a reduced number of researchers, which hinders interdisciplinary research. In this sense, the situation had deteriorated compared with 2013, when only five interdisciplinary research centers had fewer than three researchers.

It is necessary to anticipate the retirement of researchers and plan resources for their replacement, even in interdisciplinary research centers where the number is currently adequate, so as not to hinder the continuity of activities. In general, the predicted retirement of researchers is not as critical as among the teaching careers, with eight researchers (8.7%) eligible to retire over the next six years (2020-2025). However, for some interdisciplinary research centers already facing lack of research staff this can cause serious problems, leading to the interruption of research.

The number of merit promotions among researchers in 2014-2018 is shown in Table 10.10. It shows the numbers of merit promotions over the period and their corresponding percentages of total research staff. As seen, the number of promotions is low and irregular.

TABLE 10.10 – TOTAL PQ RESEARCHERS IN THE COCEN SYSTEM AND PROMOTIONS

Year	2013	2014	2015	2016	2017	2018
Researchers	83	85	87	90	90	90
Promotions	7	0	9	0	0	0
Percentage	8.4%	0.00%	10.3%	0.00%	0.00%	0.00%

The interdisciplinary research centers have a successful internationalization policy, with a significant number of foreigners (close to 10%), as seen in Table 10.11.

TABLE 10.11 – PERCENTAGE OF FOREIGN PQ RESEARCHERS IN THE COCEN SYSTEM

Ano	2013	2014	2015	2016	2017	2018
Total researchers	83	85	87	90	90	90
Foreign	9	9	9	10	8	8
Percentage	10.8%	10.6%	10.3%	11.1%	8.9%	8.9%

Overall, the interdisciplinary research centers developed clear and successful institutional incentive strategies in the last five-year period which contributed to the professional growth of researchers, a significant quantitative and qualitative increase of output and greater recognition and social impact of research production and its internationalization.

Some of the strategies used were:

- I. Increased number of permanent researchers; II. Increased number of research projects; III. Expansion of external funding for research and outreach activities; IV. Increased number of productivity, technological development and undergraduate research grants; V. Participation in graduate, undergraduate and outreach courses in cooperation with Unicamp schools; VI. Partnerships with national and international institutions and bodies; VII. Increased quality technological production in interaction with industry; VIII. Internationalization of publications, including those published by the interdisciplinary research centers, with greater cooperation by foreign researchers; X. Organization of national and international scientific events; IX. Production of artistic performances and activities with the local community and in partnership with international groups; and X. Visiting foreign academics invited to give lectures, teach subjects and supervise students.

### 10.5.3 Technical and Administrative Staff (PAEPE Career)

Unicamp non-academic staff are included in the Professional Support for Teaching, Research and Extension (PAEPE) career, regardless of the body to which they are assigned. The PAEPE career was instituted in 2003 by Resolution CAD-A-001/2003 and substantially amended in late 2010, effective from April 2011, by Resolution CAD-A-004/2010.

Given the new PAEPE career framework based on overall pillars and functions, regardless of the three segments related to educational level (elementary, secondary and higher), it was possible to perform successive evaluation processes until December 2013. From 2014 onwards, due on one hand to the worsening of the aforementioned budget crisis, which resulted in cuts in all careers in the following years, and on the other hand to the exhaustion of career progression criteria, the central administration chose to designate working groups (WG) to review both the career and the evaluation process. The proposal of two WGs advanced during 2015 and 2016, with versions approved only in late 2016 by CAD: Resolution CAD-A-001/2017 reformulated the career and Resolution CAD-A-003/2017 redefined a new evaluation process by performance management. The new university administration which took over in April 2017 decided to review the new career.

Another working group was created which addressed the subject by determination of the Rector, resumed contact with the schools and administrative bodies and their sectors (Sectoral Human Resources Monitoring Committees – CSARHs), consulting the community and debating the issue in the Internal Technical and Administrative Staff Development Chamber (CIDF), which resulted in the approved version of Resolution CAD-A-009/2018. The career was instituted with its new concept and payment structure, in a very different

format: fewer levels and larger intervals, focusing on vertical progression up to the highest salary level of each segment: three levels in the Elementary Segment (F1A to F3A); four levels in Secondary Segment (M1A to M4A); five levels in the Higher Segment (S1A to S5A). To accommodate all active staff in the corresponding salary levels, intermediate letters were adopted with up to 70 variables, which are described in the annexes of said resolution.

Once the new career payment structure was introduced, the new progression methodology was initiated, emphasizing vertical movement by level rather than horizontal by letter, resulting in a schedule for 2019 that is in progress. Regarding the evaluation process by merit or performance, the new administration has not addressed the issue so far. An internal group has been appointed by CIDF to discuss the matter, based on Resolution CAD-A-003/2017, which remains suspended by DAC itself (see A-007/2017) until further definition.

Staff numbers are defined by the Non-Faculty Recruitment Committee (CVND), established by the University Council as per Resolution Consu-A-018/2013. CVND emits opinions on the proposals for replacement and expansion of staff, submitting them to CAD, which approves the number of openings in each body and authorizes the release of funds for hiring in exceptional cases pursuant to Resolution GR-025/2017. In the terminology used at Unicamp, this means that the staff of each body is certified regarding the number of intended vacancies and its managerial structure. Since the last certification process of academic units in 2013, Unicamp's bodies are in the process of reviewing their certifications, starting a new cycle in 2018, as previously discussed. Some of the new bodies linked to the central administration were certified already in 2017 and 2018.

Staff replacement follows rules with specific flows. Its system was altered by Resolutions GR-025/2017 and GR-040/2018 to balance the high payroll expenditure persisting at Unicamp since 2014. Thus, staff that resign, retire or die and are employed under the Brazilian Labor Laws (CLT) can be replaced if the urgency is recognized by CVND, with automatic replacement restricted to the five healthcare bodies (HC, CAISM, Gastrocentro, Hemocentro and CECOM) run by DEAS. However, the replacement of retirees employed under the university labor regime depends on the appraisal of available funds (according to Resolution CONSU-A-023/2013), in line with the more objective criteria adopted by CVND after April 2017.

As of 2013, all new Unicamp permanent staff have been hired under the university labor regime, known as "new Esunicamp" for following the same ceiling of the government pension scheme, with the option of supplementary pension via SPPrevCom, with the exception of emergency staff approved in temporary selection processes, which are hired under CLT until the public examinations for the position are held. Therefore, management of these two labor regimes is paramount, especially in terms of numbers, age profile, progression and pension prospects, which has been constantly done by the central administration and its bodies.

Based on this description, it is possible to define certain strategies to solve some of the current replacement issues and propose changes in their management, aiming at the university's financial and academic sustainability. This involves comparing the status of staff in the two periods of Institutional Evaluation (2009-2013 and 2014-2018).



Figures 5.14 and 5.15 show the variation in the number of PAEPE and Funcamp (Foundation for Unicamp's Development) staff in schools and main government bodies (excluding technical high schools). These data are available in S-Integra and the Unicamp 2019 Statistical Yearbook (2018 data). Regarding staff hired by Funcamp, it is worth noting that they perform functions unrelated to core activities that could be outsourced, as they are not exclusive activities of Unicamp. Generally, these employees occupy positions in health care, hired with funds from the Brazilian Ministry of Health, or related to security, cleaning or catering services.

Analyzing the relevant overall figures, it is first noted that the relationship between the number of staff in schools and in the central administration followed an equalization trend as of 2017, reducing the historical predominance of the latter. While in 2014 there were 2,268 staff in the central administration, against 2,164 in the schools (4.58% lower), in 2018 the respective figures were 1,908 and 1,848 (3.14% lower).

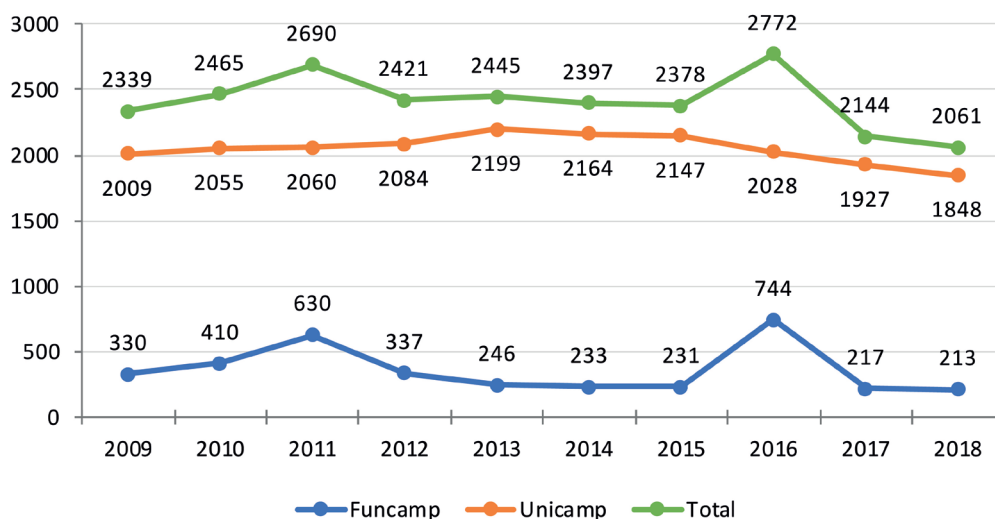
Another noteworthy fact, regardless of sector, is the negative variation in the five-year period, with a reduction in staff basically due to retirement of employees in the university labor regime. If in 2014 the schools had 2,164 active staff, in 2018 this figure dropped to 1,848, an average reduction of almost 3% per year. The trend in central administration is similar, with 2,268 active staff in 2014 and 1,908 in 2018, a yearly average reduction of 3.2%.

The issue of staff replacement in schools and administrative bodies must be completely reviewed within a more qualified view of the demands for certified staff and a minimum budget planning schedule in line with future examinations.

Given that the academic dynamics change over time, previously anticipated functions may become obsolete and other staff profiles may be required. Therefore, both staff profile and size may change in a short period of time. It is necessary to create a replacement program that can solve local shortcomings and produce a qualified analysis of such demand in CVND. For example, changes to work routines and processes, with intensive deployment of computerized procedures, may make staff replacement unnecessary in some positions. On the other hand, there may be critical situations where immediate replacement is absolutely essential, such as in certain research labs or healthcare settings. In short, the staff replacement process must be analyzed in depth, as it is currently impossible to replace staff at the required rate. In this sense, good management and optimization of work processes can be key to the necessary budget balance.

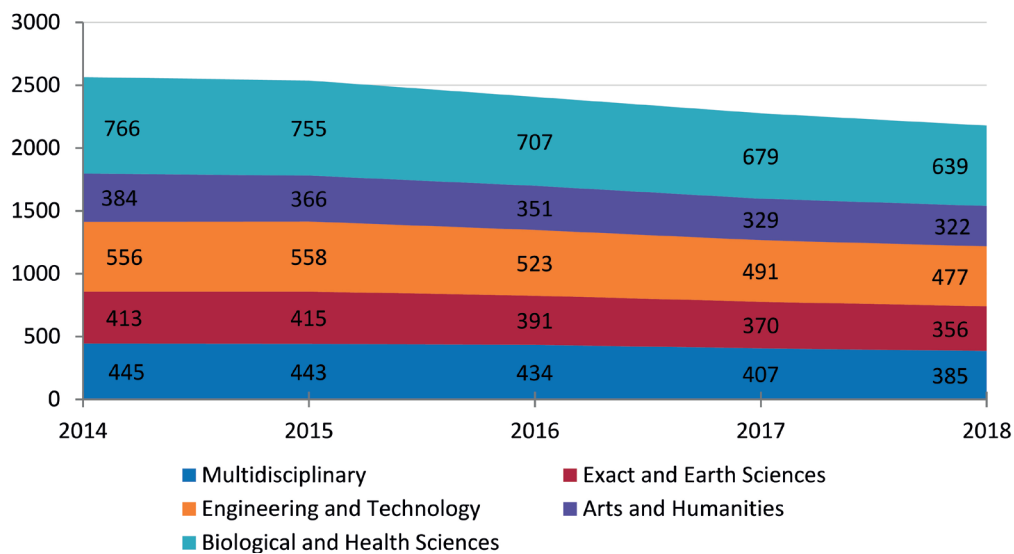
The central administration has sought different means to meet these demands considering the constraints, prioritizing critical positions via CVND. However, as of 2017, this effort has resulted in an average replacement rate of around 50% in health care and 20% in the other schools and administrative bodies. It should be noted that only certain positions in direct health care under specific situations (dismissal or death under CLT or dismissal under Esunicamp) allow full replacement.

GRAPH 10.14 – EVOLUTION OF TECHNICAL-ADMINISTRATIVE STAFF IN SCHOOLS



Source: DGRH, S-Integra.

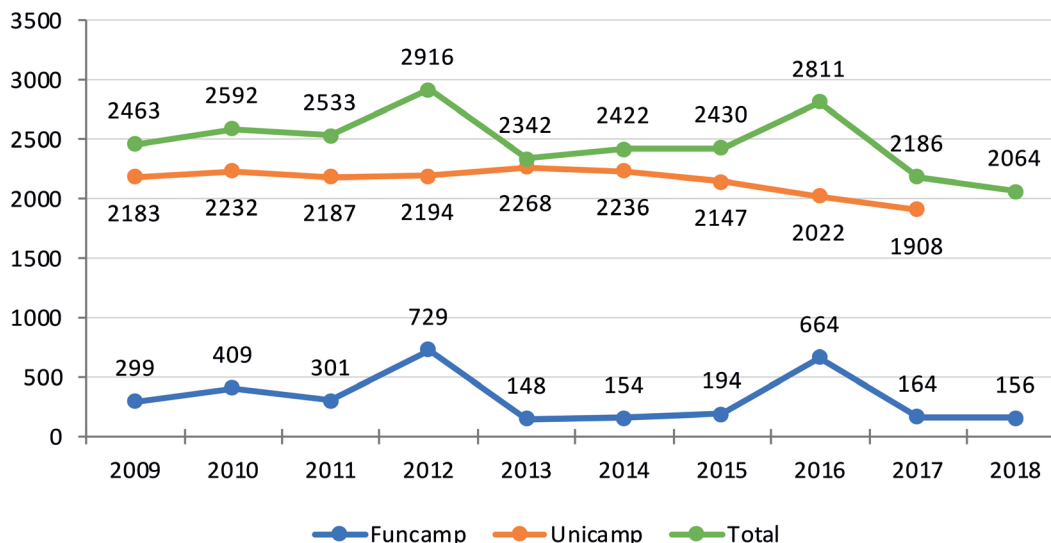
GRAPH 10.15 – EVOLUTION OF TECHNICAL-ADMINISTRATIVE STAFF IN SCHOOLS BY KNOWLEDGE AREA



Source: DGRH, S-Integra.

Note: Unicamp staff only.

GRAPH 10.16 – EVOLUTION OF TECHNICAL-ADMINISTRATIVE STAFF IN CENTRAL ADMINISTRATIVE BODIES



Source: DGRH, S-Integra.

### 10.5.3.1 Recruitment

PAEPE staff positions are filled through public examinations and their regulations are provided in resolutions CAD-A-004/2002, CAD-A-009/2018 and Consu-A-023/2013. As mentioned above, since 2013 all permanent new employees have been hired under Esunicamp, the university's specific labor regime, but from late 1989 to that date all hiring was done under the Brazilian Labor Laws (CLT), while an older group hired prior to October 1989 had the option of choosing one or the other scheme upon admission.

The profile defined in the examinations notice accords with the position and its specialty within its segment and the standards of the Brazilian Classification of Occupations (CBO), especially the initial level of education required (elementary, secondary and higher). The selection processes, especially for administrative or healthcare staff, are unified under DGRH. The selection of staff by the departments must follow the classification order of examinations and the demand. The process is coordinated and executed by DGRH, including result homologation. As the opening of examinations is approved by CAD when hiring funds are allocated, according to the CVND opinion, this is the only career in which examinations are approved by a management body rather than a CONSU deliberative chamber, although all homologations have been informed to CVND before publication in the State Official Gazette from April 2017.

Due to the great difficulty faced by DGRH in instituting examination committees, it became essential for that body to change the organization of larger public examinations. This fact, added to the legal requirements of a public examination, led to the hiring of an external specialized company. Since 2018, DGRH has coordinated and assisted in a new selection system, reserving for internal examinations only very specific regulated positions (e.g. physicians). So far two batches of examinations conducted by Vunesp for effective

hiring have been opened every nine months, which is the average time compatible with appeal terms and the budgetary-financial capacity for yearly hiring.

Even when conducted by a specialized company, the selection of professionals involves multiple-choice and essay exams and may include the optional practical test, in addition to proof of education or training up to the beginning of employment, as interviews have been abolished, as well as the previous selection by CV only. Given that qualification is directly linked to level of education, it is evident that, especially for secondary level examinations, highly qualified candidates are attracted, since the majority of approved applicants have an undergraduate or even graduate degree. The salary bracket, which is competitive with market values, including the benefits offered by the university, is an important incentive in selection processes, most of them with a large number of applicants. For example, an opening for administrative technician announced in November 2018 attracted 5,450 entries, resulting in a final list of 293 approved applicants.

In the Institutional Evaluation, the schools report that not all PAEPE administrative profiles described in the examination notices, which are quite generic, meet the specificities of the sector in question. In other cases, such as technicians and specialized professionals (examples: laboratory technicians, ICT professionals, engineers, etc.), when the schools and administrative bodies get to define the specific profiles of examinations, the qualification of applicants is higher, as reported by the schools. This correlation between work requirements and selection process appropriate to the position is probably the key to achieving the best match possible between professionals and jobs.

The departments are no longer allowed to interview applicants prior to hiring. During the three-year probation period, the immediate superior must design a good working plan and rigorously observe the evaluation of the Special Performance Evaluation Committee (CEAD) to only then approve the permanent hiring of definitely suitable employees. In other words, although the schools have reported problems related to the synergy that should exist between job requirements and the profile of successful candidates, almost all probationers end up being hired and there are very few dismissals during the probation period.

Another aspect that often appears in the reports of the schools refers to new employees, or even permanent staff, being overqualified for their positions. In these cases they have the qualification and skills to perform more complex tasks than required, but the structure of the body and career do not allow their professional advancement and the recognition of their merits at the desired rate, nor does the institution's financial capacity. This is a cause of frustration, visible in both employees nearing retirement and younger staff, which may lead to an increase in turnover among the latter.

As a way to optimize the potential of experienced personnel through their identification with working positions and also as an option for managers waiting for the approval of positions by CVND, the Server Relocation Program (PRS) was created under Resolution GR-052/2017, with two major challenges to deal with: 1) the need to address possible movements of PAEPE career staff within schools and among the administrative bodies and; 2) the severe financial crisis and budgetary constraint that required the exhaustion of internal alternatives in staff management to avoid an increase in personnel expenses.

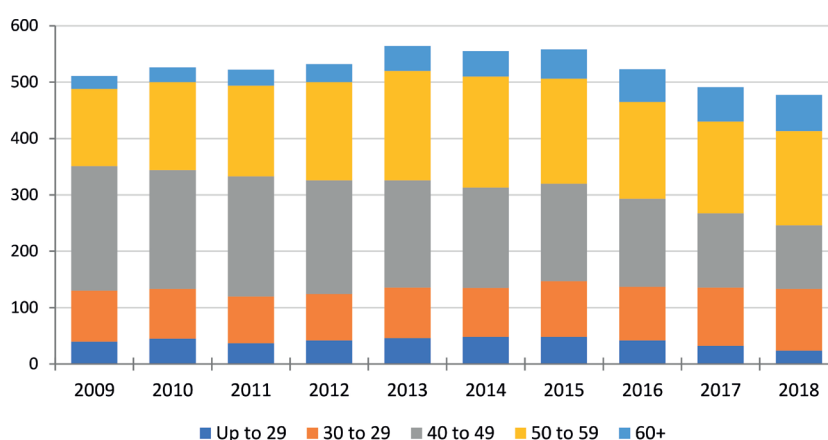
PRS has a unique electronic system in which are entered the schools' vacancy qualification cycles, registration of interested parties according to career profiles, analyses of CVs and interviews with a local committee, classifying the staff members, who then negotiate the transfer with their superiors. At the end of the first three cycles of the program, the university reached an average of 20 transfers per semester, installing several staff members in new positions whose work potential was renewed. Individual appreciation mechanisms are expected to be resumed, which can only happen when the phase of severe budget constraint and pressure on the payroll is over.

Therefore, it is important to discuss the requirements of this new career structure, the certified structure of the bodies and the possible movements in order to open up new perspectives of professional growth for promising employees committed to the institution. In other words, to make progress the investments in the PAEPE career should be continuous and lasting, avoiding oscillations in terms of concept, structure and salary brackets in each four-year management cycle.

### 10.5.3.2 Age Profile of Unicamp Staff

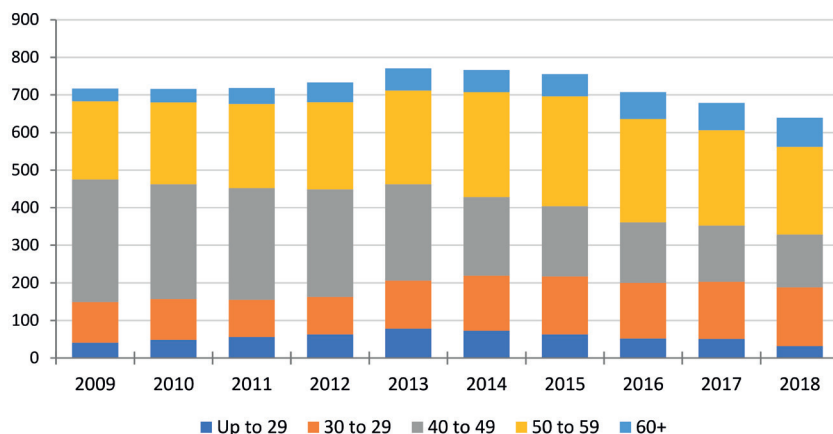
Analyzing the period in question, one notes a predominance of staff in the 40 to 59 age group, regardless of labor scheme. The trend of staff renewal with the entry of younger staff (below 30) remains the same as in the past decade; however, as the hiring rate is contained and compulsory retirement only occurs at 75 for Esunicamp staff, it will still take a long time for the Unicamp age group to transition to the range between 20 and 39, a profile that only appears in newer schools like FCA, FENF and FCF, created less than 10 years ago.

GRAPH 10.17 – AGE PROFILE OF TECHNICAL-ADMINISTRATIVE STAFF WITH UNICAMP CONTRACTS IN ENGINEERING AND TECHNOLOGY SCHOOLS



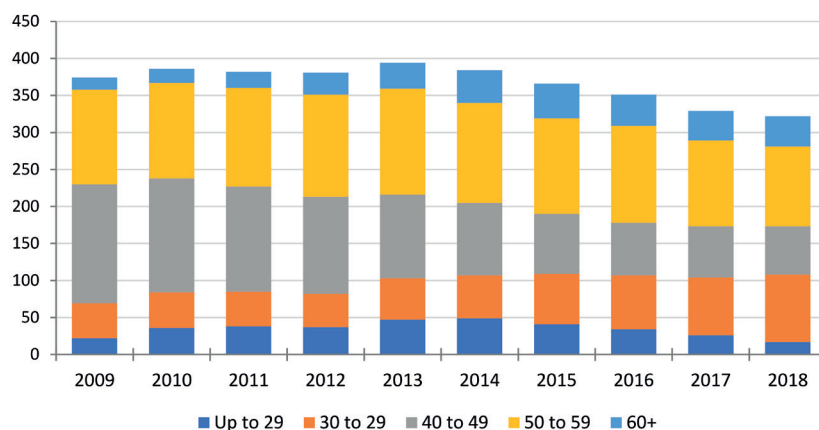
Source: DGRH, S-Integra.

GRAPH 10.18 – AGE PROFILE OF TECHNICAL-ADMINISTRATIVE STAFF WITH UNICAMP CONTRACTS IN BIOLOGICAL AND HEALTH SCIENCES SCHOOL



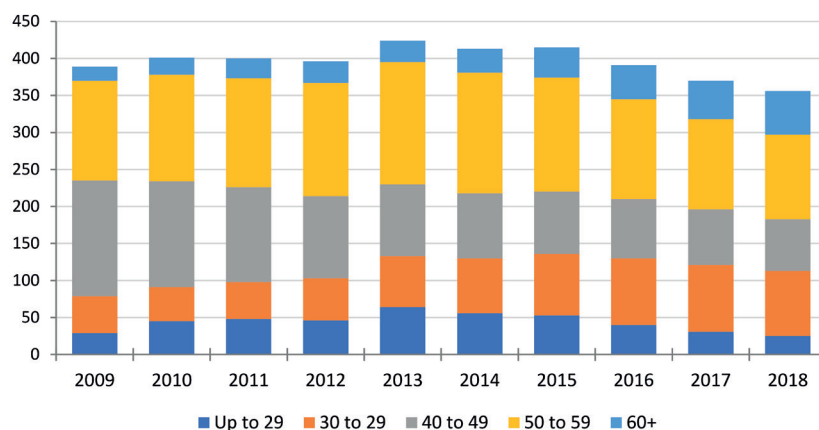
Source: DGRH, S-Integra.

GRAPH 10.19 – AGE PROFILE OF TECHNICAL-ADMINISTRATIVE STAFF WITH UNICAMP CONTRACTS IN ARTS AND HUMANITIES SCHOOLS



Source: DGRH, S-Integra.

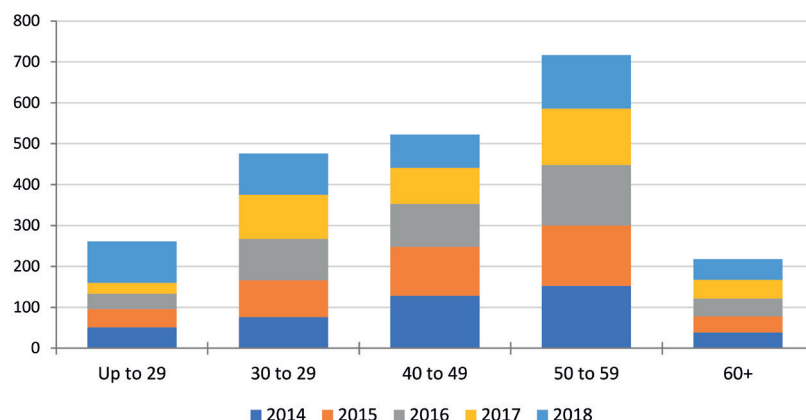
GRAPH 10.20 – AGE PROFILE OF TECHNICAL-ADMINISTRATIVE STAFF WITH UNICAMP CONTRACTS IN EXACT AND EARTH SCIENCES SCHOOLS



Source: DGRH, S-Integra.

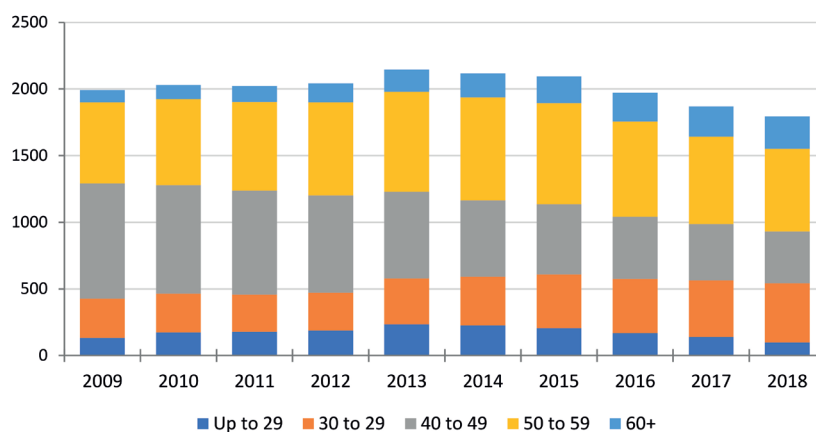


GRAPH 10.21 – AGE PROFILE OF TECHNICAL-ADMINISTRATIVE STAFF WITH UNICAMP CONTRACTS IN MULTIDISCIPLINARY STUDIES SCHOOLS



Source: DGRH, S-Integra.

GRAPH 10.22 – CONSOLIDATED AGE PROFILE OF TECHNICAL-ADMINISTRATIVE STAFF WITH UNICAMP CONTRACTS



Source: DGRH, S-Integra.

### 10.5.3.3 Length of Service and Staff Replacement

Staff retirement is subject to a different set of rules depending on the type of employment regime – CLT or Esunicamp. The latter comprises two large groups of active employees, those admitted before October 1988 and those after January 2013, the reference date of the new SPPrev regulation, when the same ceiling of the CLT pension scheme was defined for the state of São Paulo, alongside the option of a supplementary pension via SPPrevCom. Particularly at this moment there is great instability in the university due to the approval of the new CLT pension system (RGPS) and the proposed constitutional amendment specifically addressing state civil servants, which will provide new transitional rules, affecting the Esunicamp regime. In view of this situation, the anticipated length of service for staff to retire is estimated as that which yields the highest possible pension (best rule), including a bonus for services after retirement age.<sup>6</sup> Based on this, the retirement of

6. When academic or technical-administrative staff reach retirement age, a bonus is granted to encourage them to remain in service.

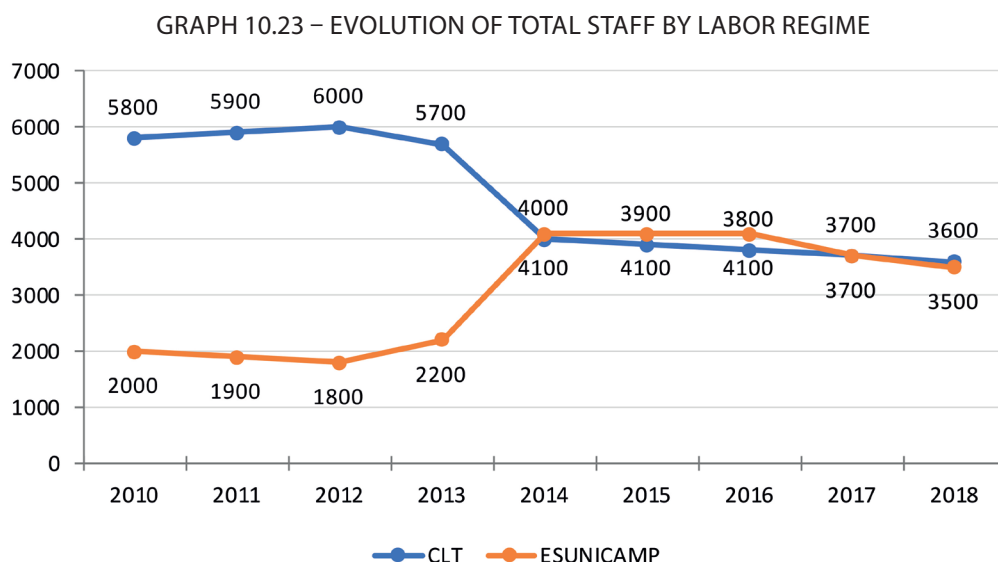
staff under the Esunicamp regime in the coming years was estimated and a coefficient was defined that expresses in each school the rate of eligible retirees per hundred employees, based on the number of staff on December 31, 2018, according to Table 10.12. This indicator measures how many staff members in each body may retire under the best rule over the next six years. These data show that some schools implemented staff replacement processes with a rate of eligible retirees per 100 employees of around 20%, while others did so with much higher rates, reaching 77%. These data should be taken into consideration when proposing any staff replacement process, which has not been done to date. Once again, optimization and good management of work processes are necessary to assist Unicamp in making decisions and setting priorities regarding staff replacement.

TABLE 10.12 – ESTIMATED NUMBER OF RETIREES IN THE NEXT EIGHT YEARS  
ACCORDING TO THE HIGHEST PENSION RULE, FOR ESUNICAMP STAFF

Areas	School	2019	2020	2021	2022	2023	2024	2025	2026	Number of potential retirees – reference year 2018	Number of staff in 2018	Retirement rate for 2019-2026 (per 100 employees)
Biological and Health Sciences	FCF	0	1	0	0	0	0	0	0	1	12	8.33
	FCM	11	10	8	11	6	9	2	4	61	282	21.63
	FEF	1	3	4	3	5	3	3	2	24	49	48.98
	FOP	0	5	4	2	0	1	0	0	12	120	10.00
	IB	7	2	4	2	14	4	2	0	35	159	22.01
Exact and Earth Sciences	IFGW	3	6	5	2	6	2	1	1	26	126	20.63
	IG	2	4	2	0	2	0	0	2	12	50	24.00
	IMECC	0	1	3	1	2	2	0	3	12	56	21.43
	IQ	3	7	1	1	2	2	0	3	19	124	15.32
Arts and Humanities	FE	0	6	3	3	1	2	1	2	18	63	28.57
	IA	4	4	3	4	6	2	2	4	29	74	39.19
	IE	0	3	1	0	1	0	1	0	6	47	12.77
	IEL	0	2	3	2	2	0	2	1	12	50	24.00
	IFCH	1	5	1	3	2	3	1	1	17	88	19.32
Engineering and Technology	FEA	0	3	1	4	6	3	2	2	21	106	19.81
	FEAGRI	4	1	1	8	7	2	0	3	26	55	47.27
	FEC	0	2	1	2	0	5	1	0	11	68	16.18
	FEEC	2	0	0	4	3	2	1	0	12	47	25.53
	FEM	3	7	1	3	4	3	2	3	26	76	34.21
	FEQ	1	2	1	1	2	2	1	1	11	50	22.00
	FT	0	1	0	3	0	2	0	1	7	41	17.07
	IC	0	0	0	2	2	1	0	1	6	34	17.65
Multidisciplinary Studies	Interdisciplinary research centers	14	10	11	15	12	7	5	11	85	331	25.68
	FCA	0	0	0	0	0	0	0	1	1	54	1.85
Schools Subtotal		56	85	58	76	85	57	27	46	490	2,162	22.66
Technical High Schools		0	1	1	2	2	0	1	0	7	60	11.67
Central Administration		52	64	69	57	38	36	32	41	389	1,908	20.39
Total		108	150	128	135	125	93	60	87	886	4,130	21.45

Source: DGRH.

The breakdown of staff numbers by labor regime is shown in Graph 10.13. One notes that the number of staff in the CLT regime is decreasing while there is an increase in the number of Esunicamp staff. This is due to the institutional decision to hire only under the Esunicamp regime after 2013, except for temporary contracts still under CLT. Unicamp will need to reflect deeply on the staff replacement system in view of the impact of retirements on the payroll of this group of additional employees remaining on the payroll after retirement, especially the group of Esunicamp employees admitted by October 1988 with full pension at current values.



Source: DGRH, S-Integra.

#### 10.5.3.4 Evaluation and Career

As previously mentioned, for different strategic and financial reasons, the last evaluation process of the PAEPE career was in December 2013, generating a large time gap.

In December 2018, the main bodies approved the new progression structure and CIDF is now debating the adoption or improvement of a methodology for performance evaluation pursuant to Resolution CAD-A-03/2017, scheduled to be implemented in 2020.

Despite this gap, a few promotions were granted under CIDF between 2014 and 2015 based on the recognition criteria of schools and administrative bodies, with or without salary change, when vacancies and funds were available (in the A to N range and by level of complexity), but preserving the original function at hiring and regardless of segment, supported by Resolution CAD-04/2010, in force at the time. They were called horizontal promotions, changing letter in the same salary bracket, or vertical promotions, moving up to the first letter of the next bracket. Table 10.13 summarizes the figures of CIDF processes by School.

TABLE 10.13 – NUMBER OF STAFF WITH VERTICAL PROMOTION  
BETWEEN 2014 AND 2015 PER SCHOOL

Area	School/Unit	Promoted	
		2014	2015
Biology and Health Sciences	FCM	1	-
	FCF	-	1
	FOP	1	-
	IB	1	-
Engineering and Technology	FEEC	2	2
	FEM	1	1
	FEQ	1	-
	IC	1	1
Arts and Humanities	IFCH	2	-
	IEL	-	8
Exact and Earth sciences	IFGW	4	-
	IQ	1	-
Multidisciplinary Studies	FCA	-	2
	Interdisciplinary research centers	3	1
Health Care		1	-
Central Administration		-	4
Total		19	20

Source: DGRH and CIDE.

#### 10.5.4 Benefits

Human resources has been one of the key points for Unicamp's success in the university scene in Latin America and worldwide. Unicamp employs about 10,000 people, between academic and technical-administrative staff. Adding retirees, this number reaches about 14,000. This select group of professionals has directly contributed over the years to consolidate the institution as one of the most outstanding teaching and interdisciplinary research centers in Brazil and earn it international respect, despite existing for a little over 50 years. It is constantly ranked among the best universities in the world.

Since the importance of the human factor in the process that led Unicamp to a leading position in the scientific scene was acknowledged, the university naturally adopted a management model that appreciated the various competences of its staff. This was the background to the introduction of the first supplementary support and incentive initiatives for staff by the Server Support Service (SAS), created in 1991, expanded with the Employee Assistance Center (CAF), opened in 1994, and finally the Council of Assistance and Benefits (DAB), created in 1998 from the unification of SAS and CAF.

The so-called Spontaneous Benefits were consolidated in November 17, 2006, with the creation of the Social Benefits Management Group (GGBS), supervised by a steering board through Resolution GR-060/2006. The steering board, appointed by the Rector and chaired by the Chief of Staff of the Office of the Rector, is responsible for planning, approving and monitoring GGBS activities. This consolidates Unicamp's institutional

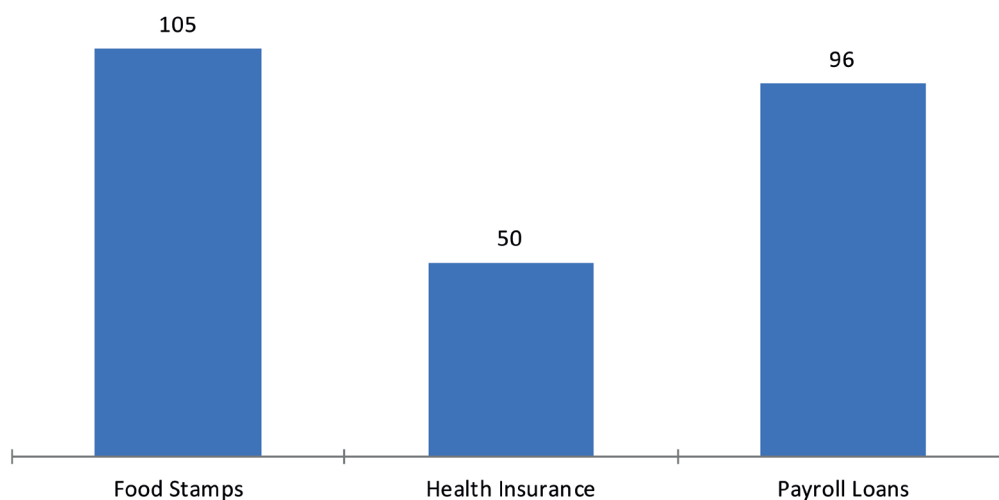
trajectory regarding actions unrelated to legal obligations, but which play an important supplementary role in improving the quality of life and work of its staff. In addition to creating and enhancing programs, the body interacts across various related areas to invest in activities guided by the principle of improving quality of life and working conditions. It is a model that not only relates activities, but above all gives them a sense of organization and congruence, benefiting not only staff and faculty but also their relatives and dependents. Thus, the benefits offered reach over 30,000 people.

The financial sustainability of the programs prioritizes external funding, basically from the so-called operating costs rate, a percentage for the defrayal of administrative activities required for managing payroll deductions. This resource comes from agreements signed mainly with financial institutions. Resources from business partnerships provide about R\$ 2 million per year (2019 data, 2018 reference year). These resources are used as benefits for PAEPE employees in basically two ways: through the various existing programs and applications made to the GGBS social service that takes into account a socioeconomic analysis of applicants; and through the GGBS calls for projects issued twice a year.

Based on data from the last five years, the service centers (main, healthcare, Limeira and Piracicaba) received 8 to 10 thousand requests per year. GGBS staff also manage a number of processes involving large amounts of funds, namely:

- Approximately 9,300 beneficiaries of food stamps worth R\$ 970.00, transferring around R\$ 105 million/year to the card provider.
- About 10,000 people in supplementary health insurance, transferring around R\$ 50 million/year to insurance companies;
- About 14,000 payroll loan agreements, transferring around 96 million/year to financial institutions.

GRAPH 10.24 – AMOUNT OF FUNDS MANAGED BY GGBS PER YEAR

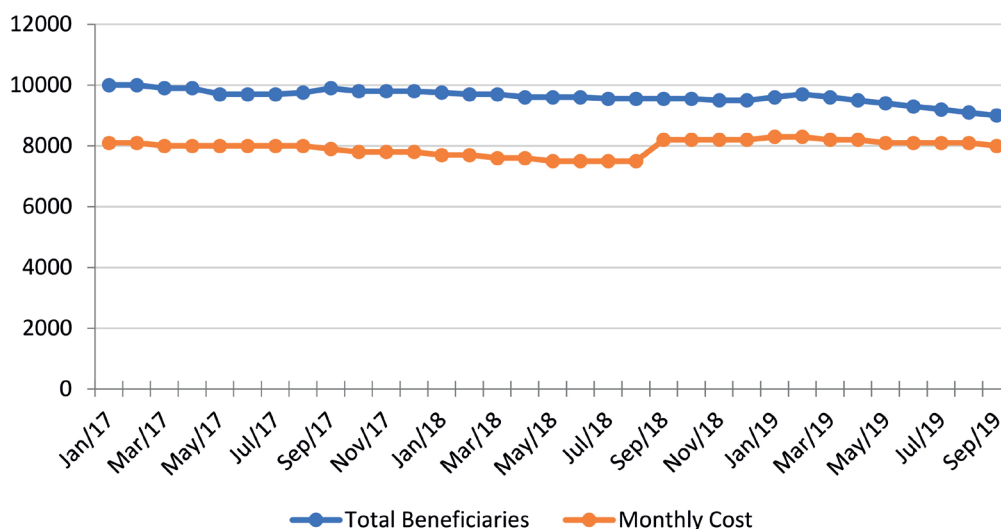


Source: GGBS.

Some notes are worth making regarding benefits managed by GGBS:

- Payroll loans are a type of loan in which the main difference is the form of payment. Every month, the loan installment is deducted from the employee's salary when the payroll is processed by DGRH. Thus, due to low delinquency (higher guarantee of debt return), payroll loans are one of the cheapest lines of credit in the market, and GGBS seems them as a benefit when used responsibly.
- Supplementary health insurance follows the regulations of the National Agency for Supplementary Health (ANS), under the Business Health Insurance category, with different values according to age group. Adhesion is optional and the monthly fee is fully paid by beneficiaries through payroll deductions managed by GGBS. Annual adjustments are provided in contract, considering inflation and claims, and negotiated between the insurer's technical staff and a committee comprising GGBS technical staff, the Chief of Staff of the Office of the Rector and a member of the GGBS Steering Board;
- The food stamp is a spontaneous benefit offered monthly by Unicamp to active staff and faculty through an electronic benefit transfer card. As it is a non-mandatory benefit, Unicamp is not required to adjust it for inflation or any other index. Graph 10.23 shows that although the number of beneficiaries has fallen over the years (largely due to retirements and non-replacement of some positions), the amount currently spent by Unicamp with food stamps is basically the same as in January 2017, which shows some adjustment in the food stamp amount. The contract with the EBT card provider follows strict procurement criteria. Accreditation of businesses is the sole responsibility of the card provider.

GRAPH 10.25 – UNICAMP EXPENDITURE WITH FOOD STAMPS FOR ACTIVE STAFF COMPARED WITH NUMBER OF BENEFICIARIES



Source: GGBS.

GGBS calls for projects granted about R\$ 750 thousand reais in the last four editions, supporting 114 benefits proposals for staff and faculty. It also supports consolidated projects such as: GGBS Soccer Cup, Unicamp Tour, Labex Athletics Team, Sunday on the Lake, Vacation Fun, Vacations in the Museum (which serves employees' children during



school vacations) and *DedicAção*. GGBS also manages around 350 business and educational partnerships that provide discounts on goods and services.

The set of achievements and their results, the positive impacts produced, are considered essential for dynamic institutional evaluation and planning aimed at improving GGBS.

#### 10.5.5. Training and Development of PAEPE and Pq Staff Careers

The development of technical and administrative staff is the responsibility of the School of Corporate Education (EDUCORP), linked to CGU. Such development underwent two major changes in 2014-2018.

The first relates to the creation of EDUCORP in 2016, linked at the time to the Office of the Rector, replacing the UNICAMP Agency for Vocational Training (AFPU), the body responsible for the matter since its creation in 1999. The second relevant change occurred in 2017, when EDUCORP came under CGU and aligned its activities with the university's PLANES.

At that time it was necessary to design and build a corporate education system to meet UNICAMP's needs. This was based on the understanding that the school's function is to develop the skills deemed necessary to enable the staff to effectively fulfil the university's strategic goals and mission statement. This entails systematic, strategic and continuous action focused on the following issues:

- Staff training conducive to the development of their skills;
- Transformation movements conducive to organizational change;
- Understanding of the university's strategy to support the execution of strategic goals set by staff.

To implement this new employee development model we started working on some important aspects to transform the prior training and development body into an effective corporate education school. The following stand out:

- Alignment of the school with the university's strategic goals;
- Mapping of the university's critical skills so that the educational activities would meet the traced needs;
- Validation of this model by the central administration, formalizing its guidelines, means, goals and expected outcomes;
- Review of courses offered and design and offer of new activities comprising learning solutions more conducive to the development of staff, aiming at meeting strategic needs;
- Definition of core areas of the school to better organize its portfolio, thereby reorganizing its internal structure.

This new context of EDUCORP required grasping and understanding new concepts and working methods, especially from mid-2017 and throughout 2018. During this

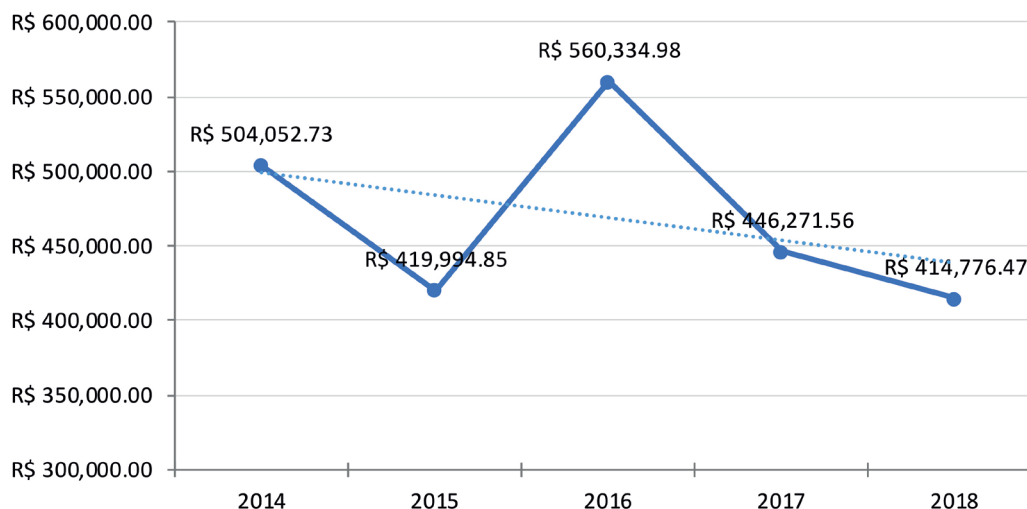
period, the school staff took specific courses in corporate education and knowledge management, exchanged information and visited the São Paulo School of Government, the National School of Administration and other schools of corporate education, conducted bibliographic research, searched for experiences and available information on the topic, and shared and discussed possible views and conceptions with internal partners. Each new understanding and possible path was aligned with the university's central administration.

Although all the steps provided in this model have not been concluded yet, some results of this process have already been noticed by the UNICAMP community in the current evaluation process.

EDUCORP has different means of supporting staff development. The main one consists in in-house training taught mostly by actual university staff, but also by hired companies or individuals with acknowledged expertise in subjects outside the capability of staff. Others trainings on specific topics are also offered upon spontaneous request from staff and acknowledgment of their need by the respective heads of Schools and administrative bodies. In partnership with the Unicamp Extension School (EXTECAMP), partial scholarships are also mediated in outreach and specialization programs offered by UNICAMP school. Finally, as a way of disclosing and disseminating knowledge produced by technical and administrative staff and updating specific knowledge, participation in national and international events is supported, with or without presentation of papers.

The school's investment in the development of technical and administrative staff (and occasionally of Pq career researchers) of all academic units and technical high schools is featured in Graph 10.26, which shows a slight downward trend over the period, although the budgetary resources allocated to such activities have remained at the same levels over the period.

GRAPH 10.26 – INVESTMENT IN THE DEVELOPMENT OF TECHNICAL AND ADMINISTRATIVE STAFF AND PQ CAREER RESEARCHERS (EXCLUDING CENTRAL ADMINISTRATION AND HEALTH CARE)

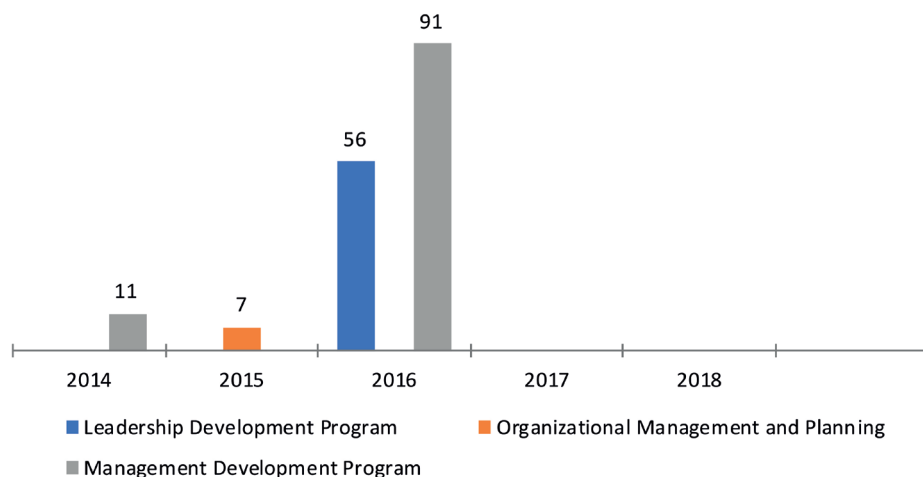


Source: EDUCORP.

This investment funded two major activity groups: one related to internal development and one related to external action.

Regarding internal development, highlights in the previous Institutional Evaluation period (2009-2013) included the Management Development Program, the Customer Service Excellence Program and the Process Management Program, attended by hundreds of staff members in managerial or strategic positions. In 2014-2018, such programs were offered in fewer numbers and discontinued from 2017, as shown in Graph 10.27. However, content that was still relevant was gradually offered in other modernized formats, more appropriate to the needs of the university considering the new staff development model introduced in the second half of the Evaluation period.

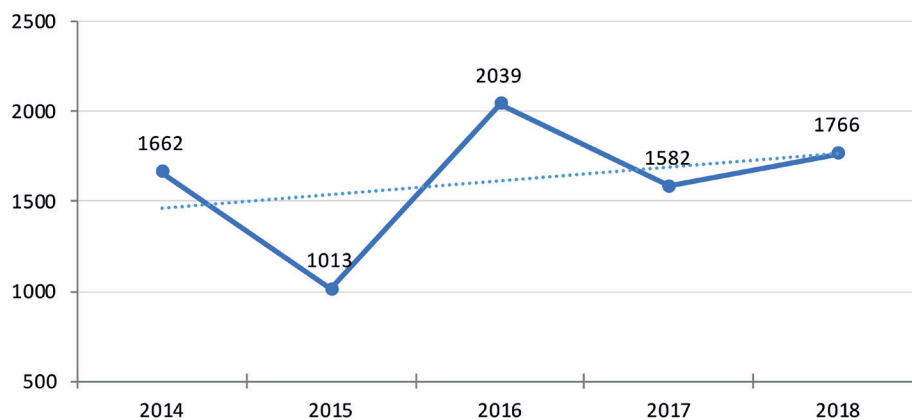
GRAPH 10.27 – PARTICIPATION IN MANAGEMENT DEVELOPMENT PROGRAMS



Source: EDUCORP.

Graph 10.28 shows the number of participants in internal activities – other than the Leadership Development Program, Organizational Planning and Management and Management Development Program – which mainly involve courses designed and offered by instructors from the actual university, training given in partnership with business areas, usually focused on incorporating new features or technologies into their processes, or outsourced in-company courses.

GRAPH 10.28 – PARTICIPATION IN INTERNAL ACTIVITIES



Source: EDUCORP.

These participants conducted activities in the areas described in Table 10.14. The highlight is the implementation of Distance Learning (DL), previously not available in staff training, adding theoretical content in this format to on-site classes. Also noteworthy is the increase in courses in leadership and management, aiming to continue offering the content previously covered in the Manager Development Programs in the new format started in 2018.

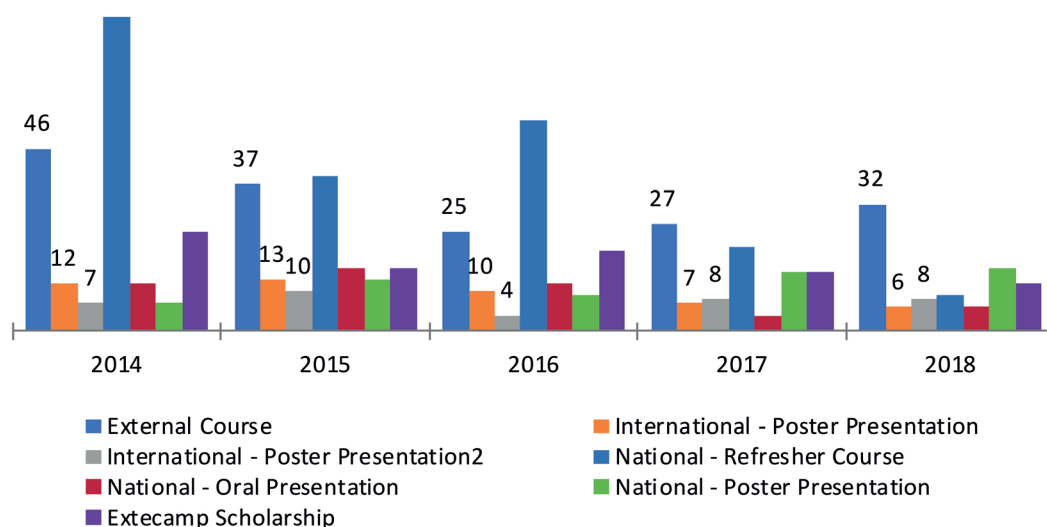
TABLE 10.14 – DEVELOPMENT ACTIVITIES BY THEME

Areas	2014	2015	2016	2017	2018
Communication	2	48	260	209	60
Personal Development	86	71	60	28	37
DL (Leadership)	0	0	0	0	215
Management Tools	44	36	0	0	118
Human Resources Management	176	92	31	92	86
Information Systems	163	86	278	163	345
Laboratories	24	9	38	134	21
Leadership	40	37	10	149	187
Language	414	284	366	427	287
Regulation Standards and Security	276	221	144	192	235
Office Work	202	53	95	18	0
Supply and Finance	144	10	751	170	74
Sustainability and Environment	91	66	6	0	101

Source: EDUCORP.

Graph 10.29, in turn, shows the number of participations in external activities in the different formats offered by Educorp to technical and administrative staff and Pq career researchers in academic units in absolute numbers.

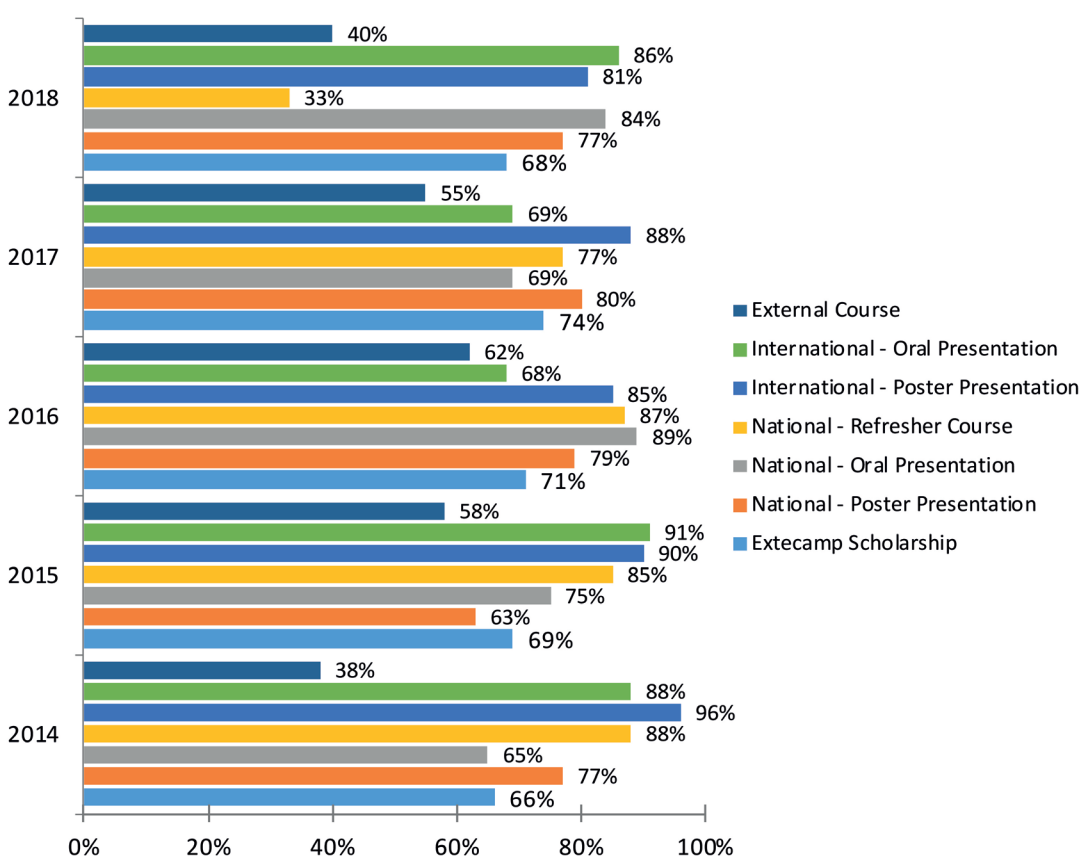
GRAPH 5.29 – PARTICIPATION IN EXTERNAL ACTIVITIES



Source: EDUCORP.

There is a decrease in the percentage of support to Refresher (external course) events starting in 2017 as a result of an internal strategy to prioritize participation in external courses or even the design of internal courses in the required areas, with greater workload and more in-depth content, and in events with the presentation of papers by participants. Regarding the other formats, there was no significant variation in the support granted in the period, as shown in Graph 10.30, which features the total requests submitted by the university as a whole. Unapproved support is basically due to late submission by applicants, no connection with the activities performed or the school's lines of support, withdrawal of application or cancellation of the event or course. In the case of EXTECAMP scholarships, the highest percentage of unfulfilled applications relates to lack of places – criteria for granting the scholarship – or cancellation of courses by those in charge.

GRAPH 10.30 – APPLICATIONS FOR PARTICIPATION IN EXTERNAL ACTIVITIES



Source: EDUCORP.

Among the development activities addressed in the previous period (2009-2013), the English courses were deemed to be falling short of the desired results. To improve the performance of these courses, an external company was hired in 2014 to offer English and Spanish lessons. The latter had a very low rate of attendance and low demand, which is why the contract was discontinued in 2017. In turn, there was great demand for the English course, with 1,076 enrollments over the period, broken down by level in Table 10.15.

TABLE 10.15 – ENGLISH COURSE ENROLLMENTS

	2014	2015	2016	2017	2018	Total
Basic I	69	0	0	0	9	78
Basic II	64	23	0	0	12	99
Basic III	37	67	0	12	13	129
Intermediate I	5	74	27	33	14	153
Intermediate II	0	40	73	12	48	173
Intermediate III	0	7	71	52	46	176
Advanced I	0	0	43	70	31	144
Advanced II	0	0	8	75	41	124
Total	175	211	222	254	214	1,076

Source: EDUCORP.

From the second half of the evaluated period, in line with the strategic goal to “Expand internationalization among professors, students, researchers and staff,” it became a priority to train staff working in service areas with greater connection with internationalization processes in which English is effectively used, such as the undergraduate, graduate and research offices of schools, as well as other areas that interact with such publics, like the interdisciplinary research centers and the main bodies related to internationalization processes.

The 2009-2013 Institutional Evaluation considered that leadership development activities also fell short of expectations, despite the offer of several classes related to the theme in previous periods. The importance of this theme for the university is evident in the 2016-2020 Strategic Planning, in strategies related to people management, especially the following: i) Human resources development and training; ii) Talent search and retention; iii) Training of managers. In addition, the university has determined the development of leadership and efficiency (process management) as one of its pillars, which requires concrete training effort based on those premises.

To address this issue, the Leadership Development Program (PDL) was offered throughout 2016, training 80 staff members in key leadership skills such as communication and feedback; interpersonal relationships; conflict and mediation; and leadership sustainability, among others. However, it was found that this model would be insufficient to meet the training requirements of the university’s acting managers at the time.

In 2018, the university had 1,127<sup>7</sup> technical and administrative staff in positions with supplementary bonus, of whom 802 had not attended any of the previous programs and 325 had attended the programs previously offered by EDUCORP.

This context and the previous diagnosis led to a reformulation of activities related to the development of UNICAMP managers, which, from the end of 2018, started being conceived through learning paths. The difference of this model compared with the previous one is that content is offered at different opportunities so that employees, together with their superiors, choose the most opportune moment for learning, in a continuous and gradual process that enables the participation of more staff over time. The subjects initially

7. Figures from the report generated on December 7, 2018 in the university’s Human Resources Management System (VetorRH)



addressed were negotiation and conflict management, time management, feedback and basic leadership concepts and techniques.

In this sense, in 2018 courses on these topics were incorporated in the EDUCORP portfolio, mainly in Lean methodology, considered appropriate for the massification of the concepts of continuous improvement at that time in the university.

As these resources were deployed at the end of the Institutional Evaluation period, it is not yet possible to measure their effectiveness in this evaluation; however, it is possible to perceive that they were well received by the target public and the academic unit. Of the latter, 83% consider that the training actions have had very positive impacts on the performance of staff activities and about 40% of them mentioned having noted a gradual and relevant improvement of the school's activities during the evaluated period, including course diversification, increased number of places and greater disclosure of development actions.

### 10.5.6 Challenges in Human Resources

Below are listed some of the challenges related to human resources development identified in the internal evaluation process by the Schools:

#### *Faculty*

1. To formulate policy for the approval of new openings aiming at the possibility of increasing the number of faculty to address the needs of expanding teaching, research and outreach activities;
2. To define minimum criteria to assess the motivations and impacts of these openings on the university's core activities;
3. To establish priorities for replacements, with clear qualification requirements that also enable the development of new lines of research, in addition to meeting the multidisciplinary demands of undergraduate studies;
4. To systematically analyze potential retirements over the following five years and the necessary strategies of the 2016-2020 PLANES of Unicamp and of each School;
5. To reduce the administrative burden of faculty;
6. To further encourage fellowships abroad so that faculty involved in such activities may multiply acquired knowledge, presenting seminars, reports and potential projects derived from these external partnerships and encouraging students to take part in foreign programs also;
7. To enhance communication mechanisms to announce examinations among faculty aiming to attract more and better Brazilian and foreign candidates, thus reducing endogeneity;
8. To ensure annual budget provisioning for the gradual expansion of faculty in the researcher career to meet the pent-up demand;

9. To ensure automatic provisioning of funds for progression in the researcher career when researchers reach the minimum production profile of each School;
10. To ensure provisioning of funds to replace retired researchers.

### *Staff*

- To review the selection processes of technical and administrative staff to better adjust profiles to current positions in the Schools, in compliance with current legislation. Staff selection processes should further focus on profiles that meet the needs of operating with smaller and more qualified staff, which requires structures with new service standards in all areas of activity;
- To enable budget-compatible staff replacement that accounts for retirement, rewarding process and system optimization initiatives focused on improving quality and productivity;
- To expand investment in modernizing management and information systems, reducing staffing demands by unifying virtual procedures for all categories in the campuses and limiting face-to-face service to the barest minimum;
- To review staff performance assessment in order to:
  - detach performance assessment from direct financial gain or career advancement;
  - clearly define job profiles so employees and managers know the requirements of each career level, consistent with the minimum standards already required in Annex III of Resolution CAD-A-09/2018;
  - eliminate subjectivity from performance assessment and progression criteria;
  - introduce objective concepts of meritocracy in both merit performance assessment and advancement (e.g., goals, achievements, actual results), in addition to aspects that indicate the need for further qualification;
- To define in the university's annual budget the amount of funds to be allocated to the career, with measurable goals and results, integrating certification, career and evaluation;
- To relate the development activities of staff to their professional growth in the university. This will require, among other aspects, the consolidation and improvement of the Staff Career, enabling the recognition and reward of individual trajectories through an integrated people management system, in addition to other factors such as the possibility of internal mobility and access to and development of more complex activities over time;
- To create the Educorp Advisory Board comprising faculty and staff with the main goal of addressing strategic decisions regarding development activities and their monitoring, thus ensuring their effectiveness;
- To increase the use of distance learning and other technological resources, scaling up the spread of knowledge, increasing interaction with external campuses and using the classroom mainly as a space for in-depth discussion and study of concepts, through differentiated learning practices other than lectures;
- To enhance the partnership with EXTECAMP to offer a greater number of scholarships for outreach and specialization programs promoted by UNICAMP;

- To improve communication and disclosure of development activities among employees and managers, promoting and facilitating access to information through a new homepage and other communication and social media channels;
- To implement the so-called learning paths related to the main non-core activities, based on the mapping of the university's strategic abilities and individual skills to be developed for the performance of duties;
- To support and expand the policy for social benefits managed by GGBS.

## 10.6 Budget and financial sustainability

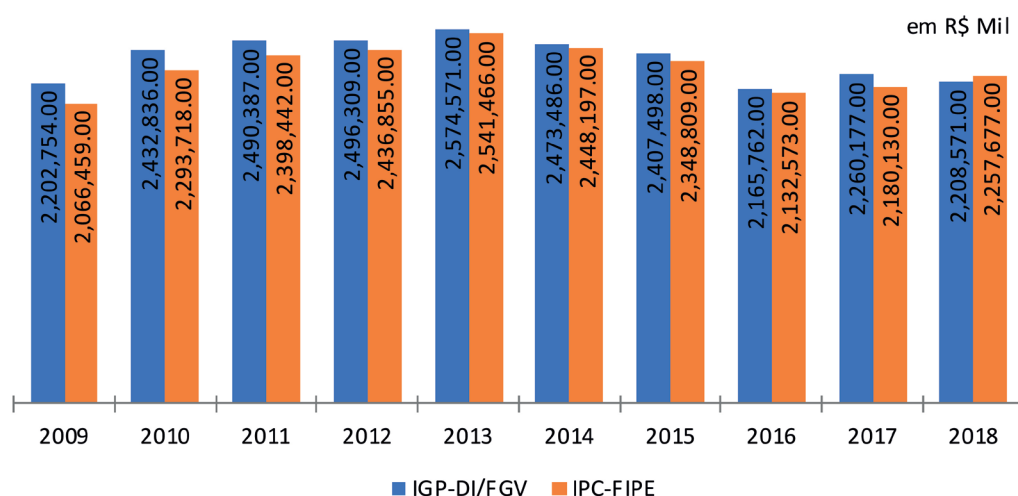
This item addresses Unicamp's financial and budget sustainability, featuring the evolution of budgetary and extra-budgetary resources and the main expenditure items (wages, operating costs and building maintenance) and investments.

### 10.6.1 Evolution of budgetary resources

Unicamp's main funding source is State Treasury (RTE) revenue from the state tax on the circulation of goods and services (ICMS). The public universities of São Paulo (USP, UNICAMP and UNESP) receive a contribution of 9.54% of levied ICMS, of which Unicamp's share is 2.1958%.

The evolution of these resources over the last 10 years is featured in Graph 10.31 in real values adjusted by the IPC-FIPE and IGP-DI-FGV inflation indices. This graph shows a continuous and substantial decrease since 2013, reaching the lowest point in 2016, after which begins a slow growth process. The decrease was approximately 12.5% in real values. Despite this decrease, current expenses continued to increase.

GRAPH 10.31 – STATE TREASURY DISBURSEMENTS – RTE TO UNICAMP – 2009-2018

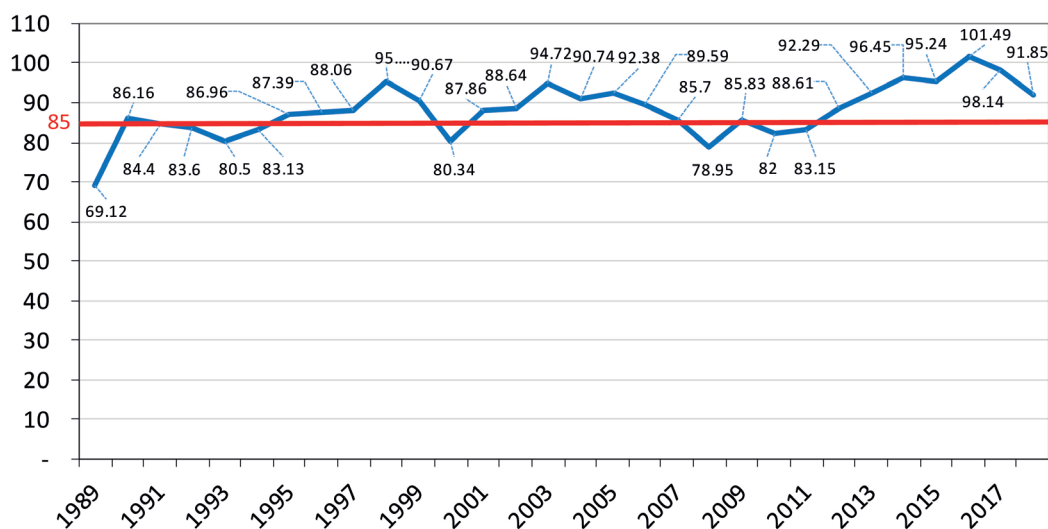


Source: AEPLAN.

The severity and persistence of the current Brazilian economic slowdown had budgetary and financial consequences for Unicamp. Tax revenue adjusted for inflation by IPCA-FIPE grows substantially until 2013, with small, localized reductions between 1990 and 2019. However, after 2013 there is a huge reduction in ICMS, with the corresponding fall in Unicamp funding. If tax revenues for 2019 confirm with estimates of the budget proposal for this year, fund transfers to universities will be at 2010 levels in real values

In other words, as of 2010 there was a budget surplus due to the increase in ICMS revenues. As a result, Unicamp built up substantial reserves (around R\$ 1.3 billion reais in 2013), which at a time of high interest and inflation rates generated substantial private income for the university. With such substantial financial reserves and the worsening of the country's economic crisis deemed as unlikely, the reserves were gradually used to weather through the period. Budgetary deficits were increasingly offset by the reserves, which were wrongly used to defray fixed costs, without the necessary adjustments. As a consequence the university gradually exhausted its reserves and payroll expenses became unsustainable. For example, the annual payroll share of revenue that ranged around 83-85% for decades increased to 98.14% in 2017, which, added to operating costs, accounted for 113.17% of RTE resources. If the crisis were transient, some of the problems related to the expansion of fixed costs would be absorbed. That is not what happened. Although the percentage of revenue spent on payroll has improved compared to 2016 and 2017, it remains a matter of concern, as shown in Table 10.16.

GRAPH 10.32 – SHARE OF FUNDING SPENT ON CUMULATIVE GROSS PAYROLL. 1989-2018



Source: AEPLAN.

TABLE 10.16 – EVOLUTION OF ANNUAL PAYROLL SPENDING

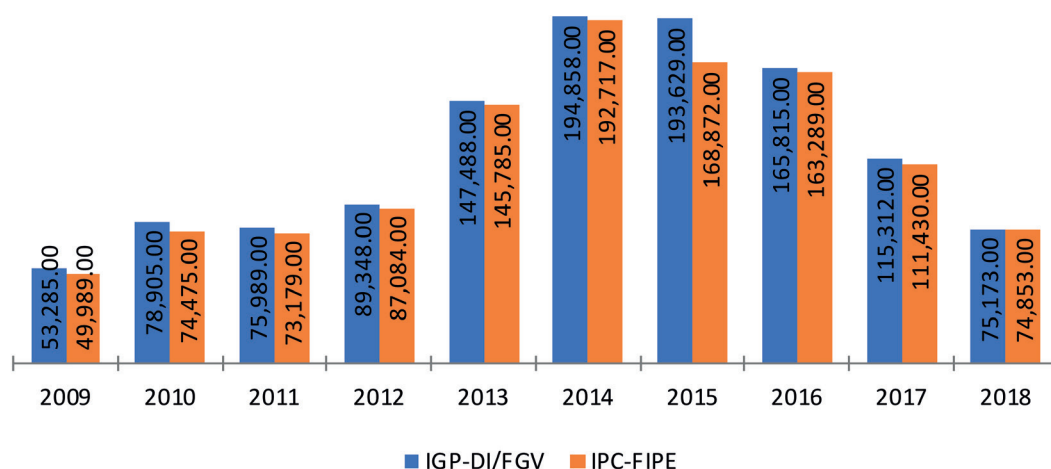
Situation in	Funding	Payroll	Cumulative share
2008	1,231,032,153	971,852,325	78.95%
2009	1,263,213,592	1,084,248,773	85.83%
2010	1,473,584,616	1,208,295,420	82.00%
2011	1,636,892,763	1,361,133,359	83.15%
2012	1,738,847,608	1,540,755,148	88.61%
2013	1,904,232,543	1,757,479,445	92.29%
2014	1,926,414,550	1,857,940,205	96.45%
2015	2,003,489,985	1,908,199,817	95.24%
2016	1,808,829,949	1,846,237,664	102.07%
2017	2,091,554,094	2,052,640,153	98.14%
2018	2,221,996,715	2,040,901,466	91.85%

Source: AEPLAN.

## 10.6.2 Other sources

In addition to RTE revenue, Unicamp has its own revenues (Graph 10.33), which comprise resources from financial investments and services and administrative fees. These revenues increased substantially between 2009 and 2014 mainly due to financial investments.

GRAPH 10.33 – OWN REVENUES – 1989-2018



Source: AEPLAN.

Unicamp also has substantial revenue of extra-budgetary resources from agreements and partnerships related to health care and research and development, which are specifically earmarked. Most extra-budgetary resources come from public bodies and funding agencies, but there are also substantial resources from agreements with companies. Of total funding between 2009 and 2018, around 31% comes from the Unified Health System.

TABLE 10.17 – EVOLUTION OF EXTRA-BUDGETARY RESOURCES, 2009-2013, NOMINAL VALUES, IN BRL

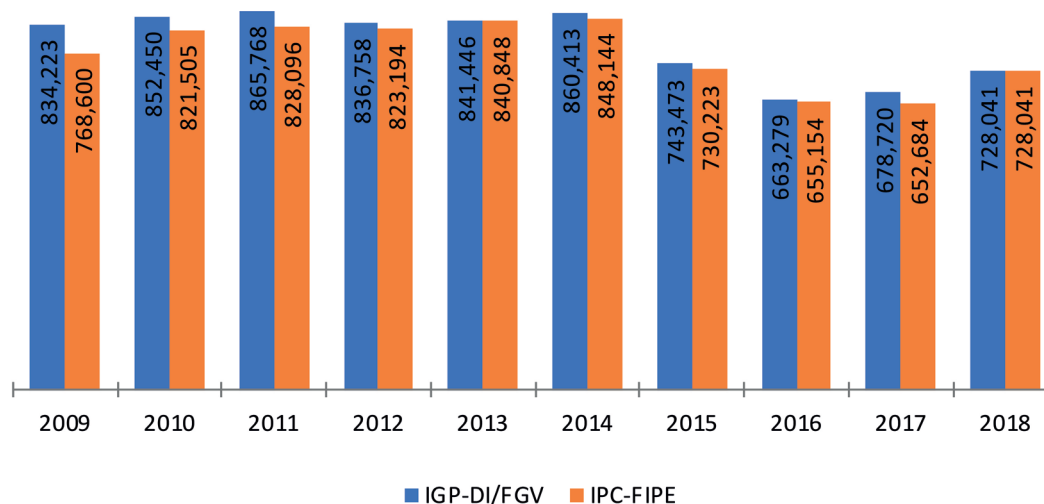
Source of Financial Resource	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Federal Public Administration	14,431,075	15,001,004	8,683,710	10,997,202	15,947,631	17,658,303	15,693,465	8,309,680	5,440,740	10,192,481
State Public Administration	4,417,277	11,836,912	15,936,488	4,772,045	10,435,100	17,574,874	27,754,612	25,494,484	24,176,019	9,590,880
City Public Administration	2,335,335	3,216,632	18,242,209	18,537,155	7,678,581	4,556,470	4,045,335	5,633,499	3,934,399	1,838,667
Federal State-Owned Company	5,686,271	7,279,132	11,640,170	28,996,443	24,349,660	25,904,126	25,399,343	37,181,465	36,227,090	20,865,175
State State-Owned Company	486,195	200,887	773,788	865,173	2,245,795	1,121,780	1,280,880	669,780	1,540,182	841,433
Municipal State-Owned Company	171,957	69,412	243,264	35,599	15,560	10,419	16,060	23,880	114,082	213,197
Private Companies	12,206,009	12,847,213	12,801,052	21,053,778	22,858,358	23,791,068	22,425,602	25,873,968	20,254,529	27,308,265
International Institutions	3,522,146	2,705,950	5,694,898	3,631,106	3,480,955	3,492,131	3,361,974	3,648,330	3,583,598	4,830,973
Occasional Services	8,949,535	9,580,189	10,892,589	10,758,099	11,820,526	11,670,639	11,982,254	12,958,089	12,225,359	12,175,880
Outreach courses	11,866,593	14,091,467	14,886,876	15,072,604	14,660,930	15,080,140	15,042,604	16,270,781	15,971,143	17,028,354
Unified Health System	96,953,234	104,048,897	101,999,214	120,182,052	127,071,855	143,715,915	155,955,711	160,224,149	176,442,782	209,605,444
CAPES	24,157,089	22,677,796	23,081,429	27,342,933	31,210,297	39,645,336	58,761,641	68,716,790	75,904,684	65,321,943
FAPESP	50,505,494	69,834,232	69,254,608	80,104,644	88,228,545	97,888,405	112,853,091	131,134,323	136,409,468	152,324,842
FINEP	6,896,539	18,652,020	8,855,222	9,462,857	11,212,032	6,583,832	11,927,806	7,446,716	6,210,422	8,847,210
CNPq	36,349,749	38,963,825	43,094,503	52,127,931	50,386,544	55,919,143	63,337,954	61,067,348	69,567,580	79,503,692
Entry Examinations	6,102,419	5,980,826	5,838,071	5,855,811	6,057,829	7,600,084	7,798,580	8,818,173	10,076,869	11,848,225
Events	1,108,548	832,846	921,251	895,539	2,591,907	1,276,377	1,253,641	1,363,332	2,260,160	1,762,575
Sale of Material	1,642,297	1,716,256	2,035,498	1,841,308	2,897,971	2,439,586	2,457,856	2,756,250	2,467,637	2,319,436
Miscellaneous Revenues	513,238	414,104	952,376	731,786	655,505	658,906	711,569	533,235	769,905	4,623,316
TOTAL	288,301,000	339,949,600	355,827,216	413,264,065	433,805,581	476,587,534	542,059,978	578,124,272	603,576,648	641,041,988

Source: AEPLAN

In 2014-2017, these resources fell due to the economic crisis, starting to grow more consistently in 2018 (Graph 10.34). With the exception of the state agency FAPESP, resources from federal funding agencies fell due to the sharp drop in federal government tax revenues.



GRAPH 10.34 – EXTRA-BUDGETARY RESOURCES, 1989-2018, IN BRL 2018



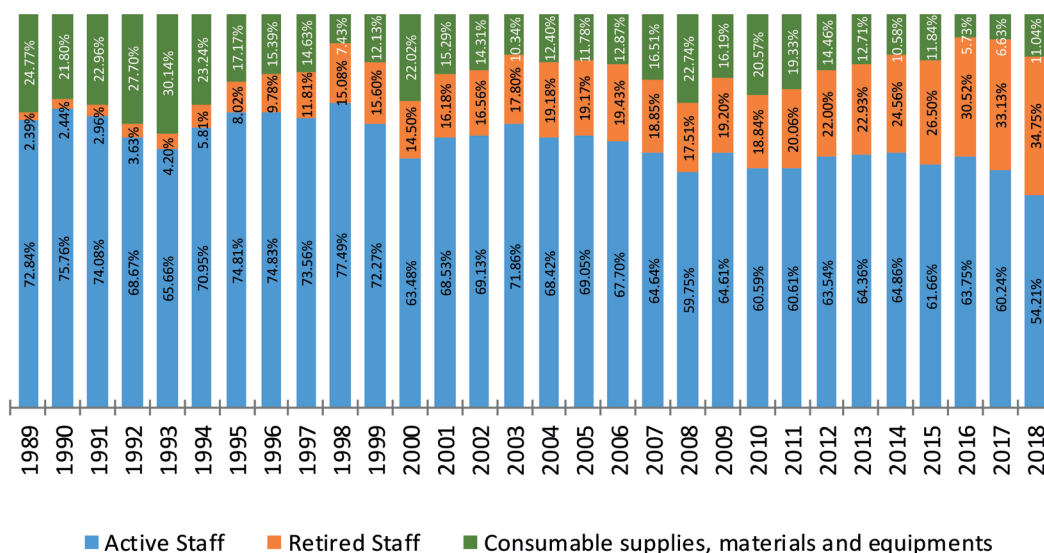
Source: AEPLAN.

### 10.6.3 Major expenditure items

The major expenditure items defrayed with RTE resources are payroll (active and inactive personnel), operating costs (which include contracts and utilities expenses – water, energy and telephone) and capital (maintenance, new building works and other investments). Graph 10.35 shows the evolution of these items between 1989 (year of financial management autonomy) and 2018. In 2014-2018 there was a clear substantial increase in expenses with inactive personnel that remain on Unicamp's payroll (orange), and that, together with the drop in revenue, led to a strong restraint in investment (green) and active staff payroll (blue).

The university's budget is annually distributed among the various budget centers through the Unicamp Budget Proposal, approved by the University Council in December of each year. This proposal is prepared by the Office of Economy and Planning, AEPLAN, and the Budget and Heritage Committee (COP). Budget execution is monitored quarterly through budget reviews that analyze the behavior of revenues and expenses for the fiscal year. Since 2017, all new expenses must be analyzed by COP and submitted to CONSU.

GRAPH 10.35 – BUDGET PERCENTAGE OF MAJOR EXPENDITURE ITEMS – 1989-2018



Source: AEPLAN.

Note: Budget is composed of State Treasury Resources and Own Resources. Resources for the Undergraduate Places Expansion Program are not included.

All academic units and major administrative bodies have their own budget centers. Therefore, it is possible to monitor the budget execution of each one, although there is no real-time online system. From 2018 the COCEN system became a budget center, with control over each interdisciplinary research center. Previously, the budgets of part of these interdisciplinary research centers and of Cocen itself came under the central administration budget center, which prevented the visibility of their revenues and expenses. Table 10.18 shows the evolution of budget allocation by knowledge area. This breakdown follows a historical series.

TABLE 10.18 – BUDGET ALLOCATION BY SCHOOL IN 2013 AND 2018, IN NOMINAL VALUES

	2013						2018						
Schools	Payroll	Consumable supplies & materials	Equipment	Total	% of Total Schools	% Total Unicamp	Payroll	Consumable supplies & materials	Equipment	Total	% of Total Schools	% Total Unicamp	
Biological and Health Sciences	FCM	163,064,409	8,560,885	-	171,625,294	16.28%	8.50%	182,028,622	11,559,872	-	193,588,494	17.2%	7.7%
	FEF	23,327,577	1,327,847	5,065,746	29,721,170	2.82%	1.47%	26,791,525	963,151	-	27,754,676	2.5%	1.1%
	FOP	58,131,769	4,061,443	504,952	62,698,164	5.95%	3.11%	61,381,269	5,012,942	-	66,394,211	5.9%	2.6%
	IB	77,816,373	1,796,797	1,998,033	81,611,203	7.74%	4.04%	83,766,838	2,056,216	16,300	85,839,354	7.6%	3.4%
	FCF							5,000,785	244,247	1,682	5,246,714	0.5%	0.2%
	FENF	11,579,029	209,918	38,827	11,827,774	1.12%	0.59%	14,085,896	245,859	41,262	14,373,017	1.3%	0.6%
	Subtotal	333,919,157	15,956,890	7,607,558	357,483,605	33.92%	17.71%	373,054,935	20,082,287	59,244	393,196,466	34.9%	15.6%
Engineering and Technology	FEA	39,602,865	1,375,150	963,741	41,941,756	3.98%	2.08%	43,861,605	2,104,496	-	45,966,101	4.1%	1.8%
	FEAGRI	23,679,594	907,707	368,088	24,955,389	2.37%	1.24%	25,525,215	1,206,945	-	26,732,160	2.4%	1.1%
	FEC	35,301,486	1,474,536	269,067	37,045,089	3.51%	1.84%	38,874,733	1,030,157	14,963	39,919,853	3.5%	1.6%
	FEEC	47,387,255	1,388,207	842,550	49,618,012	4.71%	2.46%	49,260,199	1,327,083	27,075	50,614,357	4.5%	2.0%
	FEM	42,697,898	1,322,806	445,721	44,466,425	4.22%	2.20%	45,246,626	1,271,729	-	46,518,355	4.1%	1.8%
	FEQ	24,221,951	787,651	276,965	25,286,567	2.40%	1.25%	26,923,397	1,009,940	-	27,933,337	2.5%	1.1%
	FT	16,994,035	1,440,490	287,804	18,722,329	1.78%	0.93%	23,518,307	493,897	50,545	24,062,749	2.1%	1.0%
Arts and Humanities	IC	18,020,976	686,431	197,394	18,904,801	1.79%	0.94%	21,175,907	542,955	95,553	21,814,415	1.9%	0.9%
	Subtotal	247,906,060	9,382,978	3,651,330	260,940,368	24.76%	12.93%	274,385,989	8,987,202	188,136	283,561,327	25.2%	11.2%
	FE	47,500,838	1,066,118	891,905	49,458,861	4.69%	2.45%	54,710,302	854,421	-	55,564,723	4.9%	2.2%
	IA	39,053,454	906,032	1,053,654	41,013,140	3.89%	2.03%	46,113,604	848,566	-	46,962,170	4.2%	1.9%
	IE	36,427,774	922,182	859,146	38,209,102	3.63%	1.89%	40,377,131	838,301	6,037	41,221,469	3.7%	1.6%
	IEL	37,871,738	924,490	694,460	39,490,688	3.75%	1.96%	39,832,208	775,917	10,492	40,618,617	3.6%	1.6%
	IFCH	51,963,597	1,343,020	272,833	53,579,450	5.08%	2.65%	55,083,221	975,900	10,800	56,069,921	5.0%	2.2%
Exact and Earth Sciences	Subtotal	212,817,401	5,161,842	3,771,998	221,751,241	21.04%	10.99%	236,116,466	4,293,105	27,329	240,436,900	21.3%	9.5%
	IFGW	65,766,676	1,784,609	443,661	67,994,946	6.45%	3.37%	70,759,290	1,759,007	-	72,518,297	6.4%	2.9%
	IG	23,555,853	1,018,162	76,359	24,650,374	2.34%	1.22%	28,209,790	978,274	16,839	29,204,903	2.6%	1.2%
	Imecc	46,601,923	940,764	214,150	47,756,837	4.53%	2.37%	52,729,235	865,364	-	53,594,599	4.8%	2.1%
	IQ	47,821,828	2,355,167	461,951	50,638,946	4.80%	2.51%	52,143,782	2,703,931	58,221	54,905,934	4.9%	2.2%
	Subtotal	183,746,280	6,098,702	1,196,121	191,041,103	18.13%	9.47%	203,842,097	6,306,576	75,060	210,223,733	18.6%	8.3%
	Multidisciplinary (FCA)	14,378,013	7,688,707	694,512	22,761,232	2.16%	1.13%	23,101,094	7,411,392	17,084	30,529,570	2.7%	1.2%
Total Schools	992,766,911	44,289,119	16,921,519	1,053,977,549	100.00%	52.22%	1,087,399,487	39,669,170	349,769	1,127,418,426	100.00%	44.62%	
Total Unicamp	1,614,288,117	349,437,469	54,465,253	2,018,190,839		100.00%	2,055,440,809	459,351,166	11,764,146	2,526,556,121		100.00%	

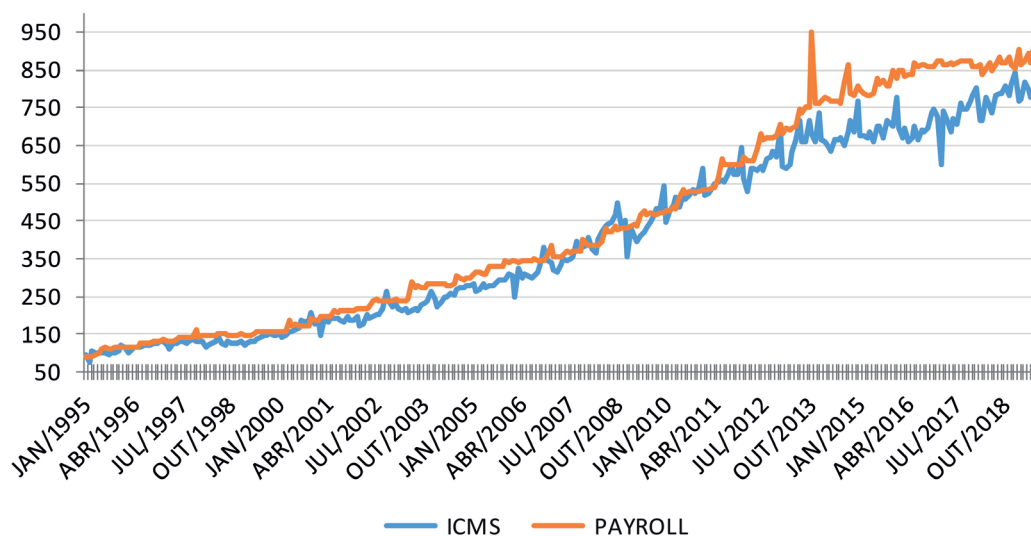
Source: AEPLAN.

### 10.6.3.1 Payroll

A few comments on the evolution of payroll expenses are in order to understand the current budgetary difficulties faced by Unicamp. The first important fact is that in 1989 the budget share of inactive staff was 2% and in 2018 this percentage increased to 34% (Graphs 6.5 and 6.6), with Esunicamp inactive staff remaining on the Unicamp payroll.

The total payroll (active and inactive staff) share varied over the post-autonomy period around 85% of RTE resources. This occurred until 2011, the year which triggered an increasing mismatch between payroll expenses and RTE revenue (Chart 10.1). It was this combination of payroll expansion (with hiring and salary expansion) and drop in RTE and own revenues that led to the current critical situation of Unicamp. The increase in payroll expenses happened for multiple reasons, including an increase in staff numbers. Active faculty increased to 2,180 in 2013, and staff numbers rose from around 7,800 in 2002 to 8,500 in 2013. About 1,700 employees moved from the CLT to the Esunicamp labor regime, increasing the burden of the inactive staff payroll, and the 30-hour work week was introduced in the healthcare sector with no salary reduction, which required an increase in staff. While payroll expenses expanded, own revenues from return on Unicamp's reserves fell. Thus, Unicamp's reserves started being used to defray fixed costs.

GRAPH 10.36 – RELATIVE EVOLUTION OF ICMS REVENUE (SÃO PAULO STATE UNIVERSITIES DATA) AND UNICAMP PAYROLL (JANUARY 1995 TO JULY 2019) – NOMINAL VALUES



Source: AEPLAN.

It is noteworthy that the expansion of payroll expenses was not due to wage increases above inflation (Table 10.19), as one might infer. The sum of wage increases in 2014-2018 was approximately 10% lower than inflation measured by IPC/FIPE. However, one cannot ignore that the payroll grew above the RTE revenue growth rate (Graphs 10.30 and 10.33).

TABLE 10.19 – INFLATION RATE AND WAGE INCREASES

Year	% IPC-FIPE inflation	% Wage increases
2014	5.21	5.21
2015	11.08	7.21
2016	6.55	3
2017	2.28	0
2018	1.28	1.5
Total	26.4	16.92

Source: AEPLAN.

### 10.6.3.2 Budgetary qualification programs – PQO

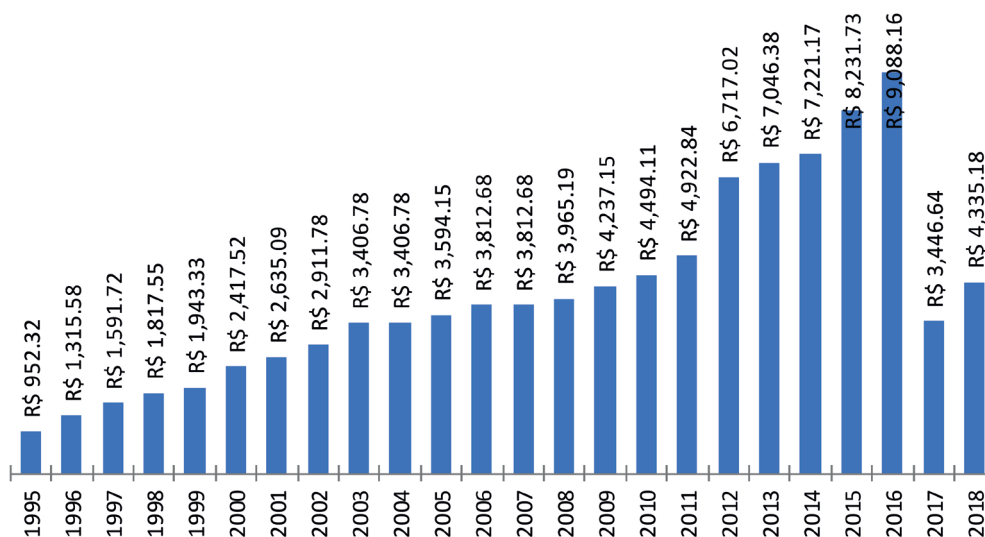
PQO is divided into two programs, each with its own indicators, using additional resources to those allocated based on historical series:

- Program of Support for Undergraduate Teaching (PAEG): created in 1993. The following indicators are used to determine the amounts allocated to each School: 1. Graduating students (weight 1); 2. Enrollment (weight 1); 3. Faculty background (weight 1); 4. Undergraduate research scholarships (weight 1). These indicators compose the Global Performance Index (GDI) and determine the share to be allocated from the total amount.
- Program of Support for Research Quality and Productivity (PAQPP): created in 1994. The following indicators are used to determine the amounts allocated to each School: 1. Master's theses defended (in relation to the number of students enrolled in the master's program and the number of PhD faculty, weighted by the program's CAPES score) (weight 3); 2. Doctoral theses defended (in relation to the number of students enrolled in the doctoral program and the number of PhD faculty, weighted by the program's CAPES score) (weight 5); 3. Faculty background (weight 4); 4. CNPq research fellows (percentage of faculty with research grants) (weight 2); 5. Publications (weight 5) (number of publications per faculty member – indexed articles (weight 1), congress papers (weight 0.5), books (weight 1.5), book chapters and others (weight 0.5), audiovisual and other productions (weight 0.5).

These programs seek to allocate resources to Schools based on performance indicators. The amount of resources has evolved, as shown in Graph 10.36. The resources of these programs increased substantially until 2016 and fell sharply in 2017 and 2018 due to the budget crisis. It is important to highlight that these programs are based on performance indicators and are geared exclusively to the schools.

These data generate the Global Performance Index (GDI), used to calculate the share of resources allocated to each School. These graphs show that, overall, PQO accounts for around 30% to 50% of the Schools' operating costs budget, as shown in Graphs 10.37 and 10.38 and in Table 10.20.

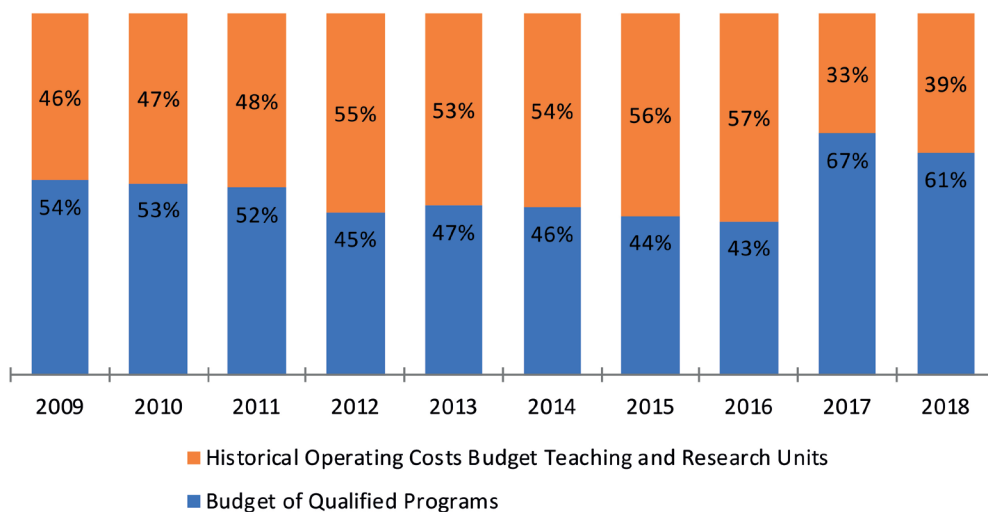
GRAPH 10.36 – BUDGETARY QUALIFICATION PROGRAM (PQO) – 1995-2018



Source: AEPLAN.

Graph 10.37 shows the share of this program of the total budget of the different schools.

GRAPH 10.37 – PQO SHARE OF OPERATING COSTS BUDGET OF SCHOOLS – 2009-2018



Source: AEPLAN.

Note: Includes Program of Support for Undergraduate Teaching (PAEG) and Program of Support for Research Quality and Productivity (PAQPP).



TABLE 10.20 – EVOLUTION OF THE BUDGETARY QUALIFICATION PROGRAM – 2004-2018

Area	School	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Biological and Health Sciences	FCM	302,632	321,903	332,763	315,191	322,761	350,984	386,656	446,021	643,185	589,960	604,129	695,889	771,439	245,456	310,390
	FEF	134,880	152,730	161,457	144,884	143,980	154,964	181,951	208,154	257,715	239,985	236,741	283,465	318,241	120,314	158,506
	FOP	154,368	159,196	178,762	180,711	181,432	193,176	203,826	226,842	339,525	340,502	314,107	362,596	397,325	112,295	152,910
	IB	238,288	242,386	243,761	227,314	254,585	293,146	327,345	369,245	480,118	455,102	432,071	486,690	559,190	202,159	264,960
	FCF	-	-	-	-	-	-	-	-	-	-	-	-	-	6,289	11,525
Engineering and Technology	FENF	-	-	-	-	-	-	-	-	-	67,177	119,104	147,389	131,530	35,241	64,648
	Subtotal	830,168	876,215	916,743	868,100	902,758	992,270	1,099,778	1,250,262	1,720,543	1,692,726	1,706,152	1,976,029	2,177,725	721,754	962,939
	FEA	151,797	153,150	155,841	175,238	168,062	181,822	207,193	226,264	307,520	289,449	272,868	304,916	340,396	117,905	155,980
	FEAGRI	80,470	91,053	103,321	105,556	104,421	102,238	104,168	104,738	152,193	155,821	143,170	143,606	152,667	51,406	67,827
	FEC	95,368	102,390	109,821	118,082	128,447	148,306	162,892	165,572	232,596	227,908	219,079	241,326	265,724	96,757	123,167
	FEEC	189,039	200,137	202,566	188,249	193,937	185,994	189,611	204,289	279,974	270,035	268,209	296,417	318,484	105,354	147,030
	FEM	155,405	165,477	177,142	173,815	194,598	209,706	220,496	263,868	369,549	331,358	319,320	359,322	385,773	140,119	177,492
	FEQ	121,480	125,662	137,950	134,892	137,821	156,421	180,468	176,723	227,635	236,561	226,584	240,333	255,517	99,097	132,631
	FT	45,864	48,387	71,902	71,902	74,778	84,752	84,752	92,549	126,672	336,382	415,170	515,223	534,474	225,825	234,283
	IC	126,831	139,241	134,884	122,520	131,553	147,949	156,317	192,393	271,108	243,744	248,681	274,395	282,952	106,610	142,511
Arts and Humanities	Subtotal	966,254	1,025,497	1,093,427	1,090,254	1,133,617	1,217,188	1,305,897	1,426,396	1,967,247	2,091,258	2,113,081	2,375,538	2,535,987	943,073	1,180,921
	FE	287,788	298,550	318,269	309,865	323,726	339,358	319,236	298,800	393,475	369,567	381,216	418,562	428,392	180,998	231,422
	IA	103,705	118,685	152,572	169,119	166,950	180,237	195,168	212,825	272,950	243,701	239,476	262,321	302,905	105,541	144,628
	IE	134,394	143,030	127,491	129,126	142,284	150,999	150,873	172,222	254,645	265,123	264,714	289,715	322,917	120,886	148,739
	IEL	157,437	157,390	163,302	151,550	149,257	157,359	172,424	190,363	255,912	242,102	232,703	262,783	278,591	86,250	118,912
	IFCH	182,849	176,249	186,330	209,936	240,612	260,038	241,963	262,156	380,260	344,502	353,337	401,363	413,709	138,348	201,378
	Subtotal	866,173	893,904	947,964	969,596	1,022,829	1,087,991	1,079,664	1,136,366	1,557,242	1,464,995	1,471,446	1,634,744	1,746,514	632,023	845,079
Exact and Earth Sciences	IFGW	216,281	227,890	234,204	221,760	224,899	240,982	249,978	265,821	359,544	325,792	292,112	339,575	421,024	147,548	202,164
	IG	96,996	113,373	119,500	136,780	157,244	159,401	173,511	190,142	251,845	248,966	254,155	269,638	277,525	98,502	128,283
	Imecc	217,638	236,473	261,301	290,827	296,891	306,979	315,466	340,106	465,092	468,763	472,471	510,591	573,383	216,799	252,900
	IQ	213,268	220,798	239,542	235,364	226,950	232,342	269,816	313,748	395,503	391,206	407,599	437,288	469,578	170,779	215,554
	Subtotal	744,183	798,534	854,547	884,731	905,984	939,704	1,008,771	1,109,817	1,471,984	1,434,727	1,426,337	1,557,092	1,741,510	633,628	798,901
Multidisciplinary (FCA)	Subtotal	-	-	-	-	-	-	-	-	-	362,672	504,152	688,324	886,425	516,163	547,336
TOTAL		3,406,778	3,594,150	3,812,681	3,812,681	3,965,188	4,237,153	4,494,110	4,922,841	6,717,016	7,046,378	7,221,168	8,231,727	9,088,161	3,446,641	4,335,176

Source: AEPLAN.

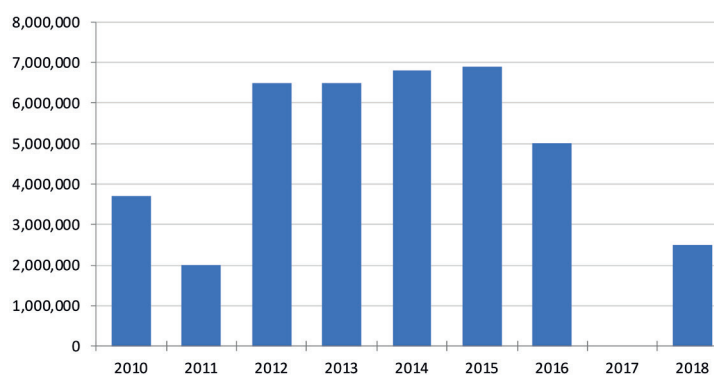
The central administration recognizes that these indicators are somewhat outdated, but has not yet managed to change them. The amount of resources of this budget item has grown substantially, but due to severe restrictions has suffered a sharp decrease since 2017 (Graph 10.34). As the indicators are outdated and some schools were created after their definition, the relative participation of these resources in the budget of each School is quite different and does not reflect the effective performance of each one. It is worth mentioning that the need to review these indicators was mentioned in the 2009-2013 Institutional Evaluation, but it was not possible to proceed with the review. The same criticism appears in the current Evaluation, so said review is mandatory.

### 10.6.3.3 Building Maintenance Program – PMP

The Building Maintenance Program (PMP) was created in 2010 and provides resources exclusively for the Schools, which can decide where to use them. The School of Applied Sciences, School of Nursing and Faculty of Pharmaceutical Sciences were included from their respective years of implementation. Regarding the interdisciplinary research centers, they now have their own budgets managed by COCEN (Coordination of Interdisciplinary Research Centers).

The university has not yet developed an adequate tool to address this issue within general guidelines for all its buildings. There is little control over expenses actually incurred related to maintenance and building work in the university as a whole, and in several situations resources were invested without objective criteria of priority. In 2017, the resources of this program were fully earmarked to try to contain the budget deficit. Only as of 2018, with the centralization of decisions under DEPI, were criteria established that have been used to manage the works. Graph 10.39 shows the evolution of resources invested in this program from 2010.

GRAPH 10.39 – BUILDING MAINTENANCE PROGRAM – 2010-2018, NOMINAL VALUES



Source: AEPLAN.

Table 10.21 shows the evolution of these resources in recent years. The resources are based on indicators, which from 2014 have been slightly altered to prioritize facilities related to undergraduate education and teaching laboratories. In these facilities, the weighting factor rose from 1.20 to 2.00. These criteria and the weighting factors are described in Table 6.7. Table 6.8 compares, as an illustration, data from 2013 and 2018, showing the growth over time.

TABLE 10.21 – EVOLUTION OF PMP RESOURCES – 2014-2018, NOMINAL VALUES

Area	Schools	2010		2011		2012		2013		2014		2015		2016		2017		2018	
		Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Technical High Schools	COTIL	124,881	3.38%	65,306	3.27%	204,101	3.14%	196,378	2.62%	201,996	2.60%	198,200	2.52%	142,709	2.55%	-	-	68,999	2.30%
	COTUCA	83,987	2.27%	43,244	2.16%	134,768	2.07%	130,034	1.73%	140,425	1.80%	137,786	1.76%	-	-	-	-	-	-
	Subtotal	208,868	5.65%	108,550	5.43%	338,869	5.21%	326,412	4.35%	342,421	4.40%	335,986	4.28%	142,709	2.55%	-	-	68,999	2.30%
Biological and Health Sciences	FCM	255,187	6.90%	139,012	6.95%	437,752	6.73%	408,900	5.45%	410,003	5.27%	404,858	5.16%	314,156	5.61%	-	-	151,470	5.05%
	FEF	229,189	6.19%	121,572	6.08%	529,662	8.15%	516,647	6.89%	519,669	6.68%	510,799	6.51%	378,840	6.77%	-	-	293,500	9.78%
	FENF	-	0.00%	-	0.00%	-	0.00%	25,580	0.34%	27,003	0.35%	26,482	0.34%	19,079	0.34%	-	-	9,381	0.31%
Biological and Health Sciences	FOP	300,973	8.13%	164,105	8.21%	511,854	7.87%	518,400	6.91%	575,931	7.40%	558,133	7.11%	402,647	7.19%	-	-	168,116	5.60%
	IB	345,310	9.33%	188,595	9.43%	602,720	9.27%	582,200	7.76%	581,240	7.47%	590,148	7.52%	439,753	7.85%	-	-	214,004	7.13%
	FCF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,069	0.14%
Engineering and Technology	Subtotal	1,130,659	30.55%	613,284	30.67%	2,081,988	32.02%	2,051,727	27.35%	2,113,846	27.16%	2,090,420	26.63%	1,554,475	27.76%	-	-	840,540	28.02%
	FEA	240,739	6.51%	125,904	6.30%	380,555	5.85%	368,289	4.91%	390,548	5.02%	393,151	5.01%	281,758	5.03%	-	-	137,565	4.59%
	FEAGRI	170,296	4.60%	94,644	4.73%	298,103	4.59%	289,872	3.86%	291,198	3.74%	282,393	3.60%	207,323	3.70%	-	-	101,312	3.38%
Engineering and Technology	FEC	107,554	2.91%	56,429	2.82%	186,071	2.86%	181,743	2.42%	192,091	2.47%	214,319	2.73%	158,843	2.84%	-	-	80,714	2.69%
	FEFC	203,364	5.50%	106,364	5.32%	357,296	5.50%	347,968	4.64%	337,740	4.34%	336,070	4.28%	242,403	4.33%	-	-	117,487	3.92%
	FEM	190,569	5.15%	105,337	5.27%	329,506	5.07%	322,357	4.30%	364,915	4.69%	380,771	4.85%	280,074	5.00%	-	-	136,216	4.54%
Engineering and Technology	FEQ	131,755	3.56%	68,957	3.45%	215,747	3.32%	211,165	2.82%	217,182	2.79%	236,487	3.01%	170,741	3.05%	-	-	83,981	2.80%
	FT	95,265	2.57%	50,063	2.50%	166,884	2.57%	160,538	2.14%	162,390	2.09%	161,859	2.06%	116,714	2.08%	-	-	56,734	1.89%
	IC	37,547	1.01%	23,231	1.16%	72,961	1.12%	70,200	0.94%	77,028	0.99%	77,079	0.98%	55,399	0.99%	-	-	26,722	0.89%
Engineering and Technology	Subtotal	1,177,089	31.81%	630,929	31.55%	2,007,123	30.88%	1,952,132	26.03%	2,033,092	26.12%	2,082,129	26.52%	1,513,255	27.02%	-	-	740,731	24.69%
	FE	92,503	2.50%	48,634	2.43%	154,510	2.38%	150,309	2.00%	148,132	1.90%	134,285	1.71%	97,233	1.74%	-	-	53,536	1.78%
	IA	107,915	2.92%	57,639	2.88%	179,733	2.77%	168,755	2.25%	178,575	2.29%	192,472	2.45%	141,892	2.53%	-	-	71,027	2.37%
Arts and Humanities	IE	102,489	2.77%	53,612	2.68%	171,764	2.64%	176,697	2.36%	160,435	2.06%	157,994	2.01%	110,695	1.98%	-	-	54,793	1.83%
	IEL	100,301	2.71%	55,630	2.78%	175,075	2.69%	168,450	2.25%	167,000	2.15%	164,660	2.10%	119,507	2.13%	-	-	58,074	1.94%
	IFCH	90,414	2.44%	56,480	2.82%	176,042	2.71%	169,380	2.26%	178,304	2.29%	175,947	2.24%	127,342	2.27%	-	-	62,151	2.07%
Arts and Humanities	Subtotal	493,622	13.34%	271,995	13.59%	857,124	13.19%	833,591	11.12%	832,446	10.69%	825,358	10.51%	596,669	10.65%	-	-	299,581	9.99%
	IFGW	260,972	7.05%	138,026	6.90%	460,678	7.09%	444,251	5.92%	461,353	5.93%	450,414	5.74%	324,774	5.80%	-	-	167,301	5.58%
	IG	37,161	1.00%	31,077	1.55%	97,298	1.50%	94,317	1.26%	96,481	1.24%	97,006	1.24%	69,494	1.24%	-	-	32,522	1.08%
Exact and Earth Sciences	Imecc	107,691	2.91%	56,444	2.82%	182,189	2.80%	173,252	2.31%	162,819	2.09%	164,716	2.10%	115,313	2.06%	-	-	57,598	1.92%
	IQ	283,938	7.67%	149,695	7.48%	474,731	7.30%	457,682	6.10%	457,542	5.88%	453,971	5.78%	329,966	5.89%	-	-	162,967	5.43%
	Subtotal	689,762	18.63%	375,242	18.75%	1,214,896	18.69%	1,169,502	15.59%	1,178,195	15.14%	1,166,107	14.85%	839,547	14.99%	-	-	420,388	14.01%
Multidisciplinary (FCA)	Subtotal	-	0.00%	-	0.00%	-	0.00%	166,636	2.22%	283,872	3.65%	350,513	4.46%	253,345	4.52%	-	-	129,761	4.33%
	Schools Total	3,700,000	100.00%	2,000,000	100.00%	6,500,000	100.00%	6,500,000	86.67%	6,783,872	87.15%	6,850,513	87.26%	4,900,000	87.50%	-	-	2,500,000	83.33%
	TOTAL	3,700,000	100.00%	2,000,000	100.00%	6,500,000	100.00%	7,500,000	100.00% (*)	7,783,872	100.00%	7,850,513	100.00%	5,600,000	100.00%	-	-	3,000,000	100.00%

Source: AEPLAN.

TABLE 10.22 – WEIGHTING FACTOR OF BUILDING AGE

Building age	Factor
Up to 5 years	1
Between 5 and 10 years	1.05
Between 10 and 15 years	1.1
Between 15 and 20 years	1.15
Between 20 and 25 years	1.2
Between 25 and 30 years	1.25
Between 30 and 35 years	1.3
Between 35 and 40 years	1.4
Between 40 and 55 years	1.5
Between 55 and 65 years	1.6
Between 65 and 75 years	1.7
Between 75 and 85 years	1.8
More than 85 years	2

TABLE 10.23 – WEIGHTING FACTOR OF BUILDING TYPE

Type	Factor
Teaching laboratories	2.00
Laboratories, vivariums, historic centers and buildings listed by the historical heritage	1.20
Classrooms and libraries	1.00
Teaching rooms	0.80
Other rooms	0.80

Source: AEPLAN.

TABLE 10.24 – INDICATORS USED IN 2013 (REFERENCE YEAR 2012) AND 2018 (REFERENCE YEAR 2017) TO ALLOCATE PMP FUNDS, NOMINAL VALUES

Area	School	2013				2018			
		Built area (m2)	Built Area Weighted (m2)	General Participation Index	Budget allocation	Built area (m2)	Built Area Weighted (m2)	General Participation Index	Budget allocation
Biological and Health Sciences		(A)	(B)	(C)	(D)	(A)	(B)	(C)	(D)
	FCM	26,129	26,823	6.29%	R\$ 408,900.00	28,781.00	31,210.00	6.06%	151,470
	FEF	30,953	33,891	7.95%	R\$ 516,647.00	32,288.00	60,475.00	11.74%	293,500
	FOP	25,462	34,006	7.98%	R\$ 518,400.00	26,260.00	34,640.00	6.72%	168,116
	IB	28,839	38,191	8.96%	R\$ 582,200.00	31,901.00	44,095.00	8.56%	214,004
	FCF	-	-	-	-	520.00	838.00	0.16%	4,069
	FENF	1,745	1,678	0.39%	R\$ 25,580.00	1,745.00	1,933.00	0.38%	9,381
	Subtotal	113,128	134,589	32%	R\$ 2,051,727.00	121,495.00	173,191.00	33.62%	R\$ 840,540.00
Engineering and Technology	FEA	17,101	24,159	5.67%	R\$ 368,289.00	19,546.00	28,345.00	5.50%	137,565
	FEAGRI	14,350	19,015	4.46%	R\$ 289,872.00	14,597.00	20,875.00	4.05%	101,312
	FEC	10,810	11,922	2.80%	R\$ 181,743.00	13,089.00	16,631.00	3.23%	80,714
	FEEC	18,041	22,826	5.35%	R\$ 347,968.00	18,041.00	24,208.00	4.70%	117,487
	FEM	19,060	21,146	4.96%	R\$ 322,357.00	24,234.00	28,067.00	5.45%	136,216
	FEQ	11,814	13,852	3.25%	R\$ 211,165.00	13,899.00	17,304.00	3.36%	83,981
	FT	7,897	10,531	2.47%	R\$ 160,538.00	7,898.00	11,690.00	2.27%	56,734
	IC	4,120	4,605	1.08%	R\$ 70,200.00	4,308.00	5,506.00	1.07%	26,722
	Subtotal	103,193	128,056	30%	R\$ 1,952,132.00	115,612.00	152,626.00	29.63%	R\$ 740,731.00

TABLE 10.24 – INDICATORS USED IN 2013 (REFERENCE YEAR 2012) AND 2018  
(REFERENCE YEAR 2017) TO ALLOCATE PMP FUNDS, NOMINAL VALUES

continued

Area	School	2013				2018			
		Built area (m2)	Built Area Weighted (m2)	General Participation Index	Budget allocation	Built area (m2)	Built Area Weighted (m2)	General Participation Index	Budget allocation
Arts and Humanities	FE	9,033	9,860	2.31%	R\$ 150,309.00	10,258.00	11,031.00	2.14%	53,536
	IA	9,489	11,070	2.60%	R\$ 168,755.00	10,490.00	14,635.00	2.84%	71,027
	IE	10,671	11,591	2.72%	R\$ 176,697.00	10,422.00	11,290.00	2.19%	54,793
	IEL	9,537	11,050	2.59%	R\$ 168,450.00	9,721.00	11,966.00	2.32%	58,074
	IFCH	9,871	11,111	2.61%	R\$ 169,380.00	11,646.00	12,806.00	2.49%	62,151
	Subtotal	48,601	54,682	13%	R\$ 833,591.00	52,537.00	61,728.00	11.98%	R\$ 299,581.00
Exact and Earth Sciences	IFGW	23,789	29,142	6.83%	R\$ 444,251.00	26,003.00	34,472.00	6.69%	167,301
	IG	5,544	6,187	1.45%	R\$ 94,317.00	6,213.00	6,701.00	1.30%	32,522
	Imecc	10,705	11,365	2.67%	R\$ 173,252.00	10,705.00	11,868.00	2.30%	57,598
	IQ	25,236	30,023	7.04%	R\$ 457,682.00	25,488.00	33,579.00	6.52%	162,967
	Subtotal	65,274	76,717	18%	R\$ 1,169,502.00	68,409.00	86,620.00	16.81%	R\$ 420,388.00
Multidisciplinary (FCA)		11,510	10,931	2.56%	R\$ 166,636.00	27,803.00	26,737.00	5.19%	R\$ 129,761.00
Schools Total (1)		341,706	404,975	95%	R\$ 6,173,588.00	385,856.00	500,902.00	97.23%	R\$ 2,431,001.00
Schools (2)		15,702	21,412	5%	R\$ 326,412.00		14,217.00	2.76%	R\$ 68,999.00
TOTAL (1+2)		357,408	426,387	100%	R\$ 6,500,000.00	395,773.00	515,119.00	100.0%	R\$ 2,500,000.00

Source: AEPLAN.

In the 2009-2013 Institutional Evaluation, the Schools stressed that the resources earmarked for building maintenance were generally adequate for small services, but that larger maintenance work required greater funds. The situation persists, partly due to the crisis, partly due to the fact that the priority criteria were only concluded in 2018 and have not yet been used. Another persisting situation reported concerns low efficiency in service execution, an aspect that is also being addressed. In addition, the central administration should shortly propose criteria for building maintenance in other academic sectors such as technical high schools, interdisciplinary research centers, healthcare bodies and common teaching areas.

## 10.6.4 Investments

In 2015 Unicamp purchased a new area adjacent to the Barão Geraldo campus known as *Fazenda Argentina*. Discussions on how to use this area started in 2017. The first initiative was to renovate the severely deteriorated farmhouse, which was achieved through a partnership with the Campinas society. The renovation was concluded in 2018 and the building was allocated to house the Unicamp innovation agency and subsidiary start-ups. This project is ongoing.

Another ongoing discussion with society since 2018 is a major project to set up an International Sustainability Hub, to which the IDB will contribute funds to define the master plan. This project is also ongoing.

### 10.6.5 Current status

Since May 2017, severe measures have been taken to address the university's huge budgetary difficulties. Proposed by the central administration, they were all approved by the University Council:

1. Regarding expenses: elimination of senior management subsidies; temporary 30% reduction in the value of representation positions (later replaced by a reduction in the number of positions); elimination of bonuses; reduction in overtime and standby time; cancellation of academic award prize money; cancellation of automatic staff replacement; interruption of building works not contracted or initiated; review of all contracts; dismissal of temporary personnel (positions of legal free appointment and dismissal); elimination of resource transfers to partner hospitals; creation of the Health Care Executive Board to coordinate hospital management agreements, etc.
2. Regarding revenues: claim to oil royalty resources to reduce the deficit with SPPREV (allocated in the Annual Budget Law – LOA since 2018); procurement of extra-budgetary resources (congressional budget amendments) for health care and other special projects; reduction of travel expenses; search for partnerships with private sectors to revitalize the campuses (the *Fazenda Argentina* farmhouse was successfully renovated together with Campinas DeCor and a new partnership was signed for the complete renovation of the COTUCA building); procurements of extra-budgetary resources for activities related to human rights; search for donations of material and equipment seized by the federal revenue service, etc.
3. Regarding management: creation of numerous rules, many by the University Council, to reduce the autonomy of the central administration to create expenses. All new expenses must now be approved by the University Council, thus fully exercising its strategic role. The Controller's Department was created with a decisive role in internal accountability. Strategic management was implemented to evaluate investments, monitor their execution and define priority projects to improve management efficiency, reducing the demand for staff replacement. Strict staff control was introduced, eliminating automatic replacement. Energy efficiency projects were implemented. Contracts were reviewed to adjust values.

As a result, the university's operating costs were reduced by almost 10%. Other initiatives are underway, such as an intensive program to review and computerize processes. The results of these initiatives are measurable. Between 2017 and 2018, there was a decrease in the share of revenue used for expenses (payroll and operating costs), falling from around 111.29% in 2017 to 103.77% in 2018. The essential elements to achieve this were planning, management, transparency and control.



## 10.7 Infrastructure and Sustainable Development

### 10.7.1 Physical Infrastructure

As already described, Unicamp's facilities are distributed over six campuses in four municipalities in the state of São Paulo, as shown in Table 10.25 below:

TABLE 10.25 – UNICAMP CAMPUSES

Campus	Occupation	Total Area (in m2)	Built-up Area (in m2)
Barão Geraldo – Campinas	Main campus housing around 85% of university activities	3,893,958.87	601,012
Centro – Campinas	COTUCA	6,580	5,790
Betel – Paulínia	CPQBA	407,563.2	13,231
Campus I – Limeira	COTIL, FT and Regional Administration Secretariat of Limeira and Piracicaba (SAR)	51,681.15	19,273
Campus II – Limeira	FCA	476,526.1	29,428
Piracicaba	FOP	88,290.18	26,260
TOTAL	-	4,924,599.50	694,944

Source: Unicamp.

CAMPUSES AREAS

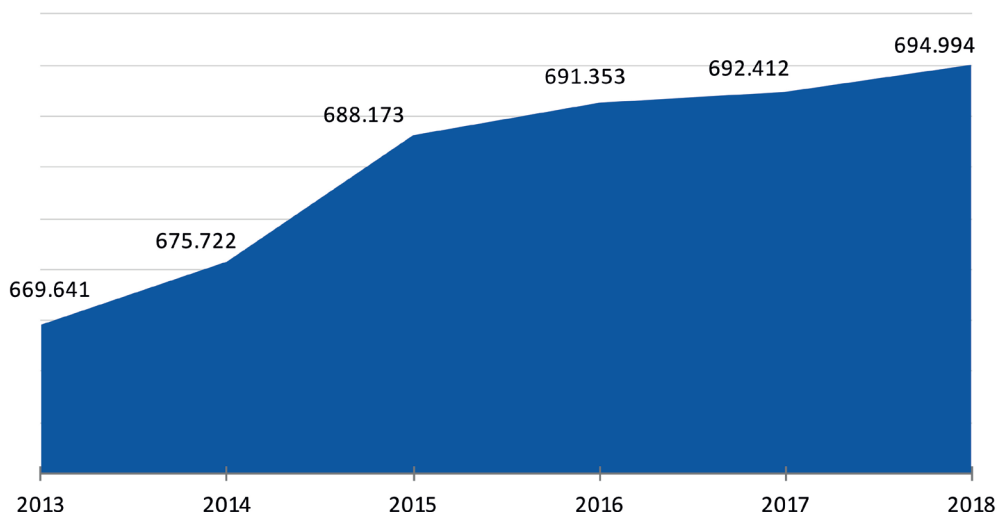


DEPI – Unicamp (photo archive).

Note: Unicamp Barão Geraldo actual campus (2.5 million m²). New expansion area (1.4 million m²). Total area: 3.9 million m²

In 2014-2018, Unicamp's built-up area grew approximately 4%, a little over 25,000 m<sup>2</sup>.

GRAPH 10.40 – EVOLUTION OF BUILT-UP AREA (IN M<sup>2</sup>)



Source: Unicamp Statistical Yearbook, 2019.

Over the Institutional Evaluation period, an extremely important and unique improvement at Unicamp was the development of the Integrated Master Plan, aiming to integrate Unicamp's management as a sustainable university with its land use and occupation planning. Such integration considers the Planes Strategic Goals and the Sustainable Development Goals of the UN 2030 Agenda, involving the participation of all social actors of Unicamp and surroundings. Its final version includes the result of cooperative workshops among the academic community (faculty, students, researchers and staff) and the guidelines for each one of the land use and occupation planning areas and their respective projects, in the form of living laboratories. The product of the development of the Integrated Master Plan is under constant review and an updated version must be published every ten years to set forth Unicamp's principles, guidelines and rules of sustainable urban planning.

Supporting the Integrated Master Plan, the Georeferencing Coordination Office aims to register, compile, map and share the georeferenced material (maps, web maps, applications, etc.) of all physical (natural and built-up) and human (social, economic, cultural, etc.) aspects of Unicamp at all scales (from local to global), in order to support management (at all levels), land use planning and transparency. Regarding built-up facilities, a database of all internal environments of the buildings is also being created, which will contribute, for example, to the management of spaces and equipment, among many other possibilities. The body is also responsible for maintaining other important databases, such as of buildings, parking lots, etc., being the university's sole and official repository of land use information.

Unicamp's research labs serve the specific needs of the knowledge areas of the schools, including testing and experiment labs, computer labs, libraries and collections, sound, image, lighting and theater labs, among others. For the School of Education, for example, the research lab is a Teacher Training Center that enables methodological experiments, teaching practices and continuing education of basic education teachers and managers.

Within this context of Unicamp schools, 60% consider their facilities to be on par with those of the best interdisciplinary research centers in Brazil and worldwide, developing high-quality, high-impact research. Regarding the humanities research labs, the wealth and quality of the collections are also excellent.

However, it is difficult to dissociate quality research from adequate infrastructure, and despite the perception of equivalence to other centers, the infrastructure is considered as deficient by 90% of the Schools, with special concern regarding maintenance over the next few years, since the decrease in research investment is inversely proportional to the speed of technological changes and investment requirements.

The most common difficulties reported by schools include lack of physical space for laboratories; challenges related to building infrastructure, such as improvement of older facilities with complete renovation; insufficient equipment and continuous need for modernization; demand for computational power and data repository; insufficient investment in improving networks, cabling and wireless connections. In these terms, continuous maintenance of the entire laboratory infrastructure is a challenge, whether in terms of technological or human resources. The infrastructure facilities must be modernized to ensure greater efficiency and safety in conducting research, keeping collections and libraries modernized, investing in specialized technical personnel and updating research-supporting software.

In terms of optimizing the use of research facilities, the multiuser labs have proved to be a solution which needs to be expanded and consolidated: 60% of schools claim to have a multiuser lab or equipment and 35% claim to offer some type of service. Being a process in its early stages, there is a need to align concepts on the theme and formulate policy for multiuser labs. In this sense, it is also necessary to advance in sharing lab support structure and investing in centralized solutions, such as the implementation of a main vivarium, since it makes no sense to keep several vivaria scattered around the campuses, given that all of them require improvement and expansion. Another alternative is to create spaces for temporary and shared labs with infrastructure for carrying out specific research projects that regularly give way to new ones. Unicamp has a consolidated leading position in Latin America and in some areas it is a prominent institution worldwide. This is the result of several years of public investment in Unicamp combined with university autonomy, which enabled the development of science and technology at a level of excellence. The present challenge is to sustain such recognition in the face of the current economic scenario and scarce investments in education and research.

There is a perception among most schools of the need of closer interaction between the university and the private sector, as they understand that the public resources are insufficient to maintain the levels of excellence and Unicamp must be open to partnerships with companies. In terms of infrastructure, this can be pursued through the creation of centers focused on innovation and entrepreneurship in various areas of interest to industry. These centers can be created with both public and private resources in order to benefit from the quality and potential of both sectors.

Given the dynamism and diversity of requirements for physical space, there is no central policy in place at Unicamp with guidelines on the distribution and allocation of physical space. Therefore, some schools (about 60%) have established their own criteria

and rules regarding this matter, in most cases jointly decided by committees, councils, departments, congregation and board. Some Schools have also developed their own Master Plan, which provides guidelines for occupying physical space and planning future adaptations and expansions.

In general, priority of space use is given to undergraduate, graduate and research activities, followed by administrative and extension needs. Not all Schools share spaces that can be used collectively, such as auditoriums and multipurpose classrooms. The most common reasons for this are lack of support staff (opening, closing, setting up equipment, etc.) and maintenance budget restrictions. In addition to these collective spaces, there is resistance in sharing other areas that might be underused, while there are reports of research projects that are hindered by lack of space.

Since 2018, changes in physical space that are relevant and involve more than one academic unit or administrative body (that is, they are not internal changes) have been evaluated by the UNICAMP Integrated Master Plan and submitted for deliberation by COPEI, observing the guidelines of campus land use and the university's strategic goals, in order to optimize and qualify the use of spaces throughout UNICAMP, which are all public.

As expected, in the evaluated period the Schools made changes aimed at optimizing the use of spaces according to their needs: renovations, layout changes, turning classrooms into study rooms and offices into classrooms, sharing faculty rooms, among many others.

In general, infrastructure improvements are related to the need to renovate physical spaces to meet the modernization requirements of teaching-research-extension creating an environment that is not only comfortable but also motivating, such as: air conditioning and comfort in classrooms; replacement of old and obsolete furniture; areas open for evening or 24-hour study; installation of more outlets; rooms for larger study groups and extra-class activities; adequate classrooms that meet accessibility requirements in the broadest sense (reduced mobility, visual, speech and hearing impairment, etc.); multipurpose and living areas with adequate infrastructure (furniture, outlets, Wi-Fi); adequate emergency exits and other elements of fire security and prevention. Some Schools that have evening courses suffer from lack of maintenance and support staff.

With the inclusion policies implemented by the university, the number of new students has increased and some classrooms do not fully meet the demand for undergraduate education, as they are small. A reassessment of the number of classrooms and their dimensions is needed to implement improvements in physical adaptations, schedule adjustments, use of shared and common rooms such as in buildings with classrooms common to all programs, arranged in spaces called Basic Cycles I and II.

Also reported are lack of rooms for master's and doctoral thesis defenses and insufficient space to set up and expand labs, especially given the frequent efforts to attract projects and resources. It is difficult to dissociate quality research from adequate infrastructure. The investments made by the Schools with their own budgets or with research funds are especially helpful for purchasing equipment and modernizing laboratories, but insufficient given the speed of changes that generate new short-term needs. Special attention should be given to Schools that do not usually obtain considerable

external funding for investments in infrastructure and equipment, such as those in Arts and Humanities, which are notably behind the other Schools in terms of infrastructure.

Between 2014 and 2018, works and initiatives to improve and expand infrastructure facilities of the campuses were concluded, totaling more than 80 building contracts performed in an area of more than 90,000 m<sup>2</sup>, worth over R\$ 60 million reais in investment. Prominent among the solutions to problems brought up in the last Evaluation and other important works are:

- Institute of Geosciences (IG) – Installed in an improvised 3,700-m<sup>2</sup> area since its creation in 1979, it reached the limit of available built-up area in 2013 due to the evolution and sharp expansion of teaching, research and extension activities, alongside the increase in faculty and student numbers. With resources from the Unicamp Strategic Plan and calls for projects by MCT/FINEP/CT-INFRA, in January 2018 the institute concluded the move to its new facilities, where work was started in 2001 and which today has a built-up area of approximately 10,402 m<sup>2</sup>. This was one of the projects deemed as a priority in the 2009-2013 Institutional Evaluation.
- Faculty of Pharmaceutical Sciences (FCF) – The school was established by the CONSU-001/2014 Resolution and up to mid-2018 did not have its own facilities, occupying classrooms and laboratories in several Schools around the campuses. Following the move of IG and the approval by COPEI for the former building of that institute to be assigned to the school, the move started in early 2018. Being one of the oldest buildings of the Barão Geraldo campus, the facilities need major adjustments to accommodate the needs of FCF, which are being provided by the School.
- School of Technology (FT) – In recent years, classrooms have been turned into research labs to solve the problem of lack of a research laboratory for faculty.
- Arts Institute (IA) – During the period the media studies building was completed and the renovation project for Paviartes was initiated, an old and extremely important requirement of the institute, estimated to be concluded in early 2021. In addition, accessibility and electrical renovation works are underway in the institute's main buildings.
- Institute of Computing (IC) – renovation of the auditorium and IT laboratory in the IC-03 building; renovation in the woods behind the IC-03 building to create an external study and living area (550 m<sup>2</sup>) with complete infrastructure (urban furniture, outlets, Wi-Fi); continuity of the IC-4 work, currently paralyzed due to contract termination; and assignment of one of the buildings at the Unicamp Technological Park to conclude the works and installation of the IC-5. These works, taken together, solve a problem mentioned in the institutional Evaluation of the previous period concerning the limited availability of spaces for this institute's activities. This was one of the Schools evaluated as having serious problems of space in the 2009-2013 Institutional Evaluation.
- Institute of Biology (IB) – The research laboratories of diabetes and obesity and pain and tropical diseases were built, the genomics and proteomics laboratory was expanded, the buildings of the undergraduate and graduate offices were



completed, the power substation was renovated, doubling its capacity, and work on the Zoology Museum and Herbarium was initiated, scheduled for conclusion by mid-2020.

- School of Dentistry of Piracicaba (FOP) – The construction of a new administrative building was concluded in 2017 to house the Undergraduate, Graduate and Extension Coordination Offices and the Research Ethics Committee.
- School of Agricultural Engineering (FEAGRI) – The construction of Building III was concluded in 2015, providing space for more classrooms and laboratories lacking physical space, a study room for graduate students and an amphitheater with greater seating capacity; projects are currently being developed to provide accessibility to two buildings and renovate nine restrooms.
- School of Civil Engineering, Architecture and Urbanism (FEA) – The undergraduate classroom laboratories building was inaugurated in 2014 with a built-up area of 1,000 m<sup>2</sup>; in 2016, a complete renovation was carried out in all undergraduate classrooms, including electrical, data, image and sound infrastructure to meet the current and future educational demand; in 2019 a major renovation was completed in the library building which provided improvement in facilities and air conditioning.
- School of Civil Engineering (FEC) – In 2015 there was an expansion of 2,100 m<sup>2</sup> in BLOCK 7, improving the administrative infrastructure, thesis defense rooms and computer sector and labs.
- School of Physical Education (FEF) – The following structures were created in the evaluated period: sector archive, LABIEX, LAFEA, LAIS and LAFIMT laboratories, rooms for GEPEN and GEETE study groups, new rooms for the athletics Association and junior enterprise. Projects are underway to cover the sports courts and adapt the dance room and storeroom for athletics and bodybuilding equipment.
- School of Applied Sciences (FCA) – The unit has been improving and adding new spaces for individual and group study. Some programs do not have laboratories for the full conduct of their activities (such as Sports Science, which uses AABB due to the lack of a Sports Center, and Engineering programs, whose laboratories are not yet fully equipped). There are problems with classroom size and availability, with constant demand for more space in subjects/classes.
- School of Education (FE) – The construction of the Annex III Building was concluded over the period with more than 1,000 m<sup>2</sup>, research groups were relocated and sectors were moved around.
- Institute of Mathematics, Statistics and Scientific Computing (IMECC) – Annex II was inaugurated in 2018, housing the institute's research laboratories, a computational laboratory and a graduate classroom.
- Office for Research – Conclusion of the first stage of the Interdisciplinary Research Laboratories (LIP).

Other important works such as: Publishing house facilities in the main library and renovation of the bookstore area; conclusion of the renovation of [EA]2 in the upper floor of the undergraduate Basic Cycle I; renovation of the IFGW sidewalks and parking lot; renovation of the sports court flooring of the Unicamp Multidisciplinary Gymnasium;



renovation of the ceiling of the old IFCH library; conclusion of the IFGW Kyatera Laboratory building; conclusion of work in the PAGU and CESOP building, interdisciplinary research centers located near IFCH; conclusion of the INOVA Biofuels Laboratory; in addition to general and infrastructure work such as the construction of telecommunications rooms, adaptation of electrical and air conditioning installations in various points of the Barão Geraldo campus, adjustments in hydraulic, logic, fire prevention and lightning rod systems, restroom renovations, among others.

Of the 21 Unicamp Interdisciplinary research centers, two of them are outside the Barão Geraldo campus, LUME and CPQBA, the former located very close to the university, on rented property in the Santa Izabel district, and the latter in the city of Paulínia. In general, the interdisciplinary research centers occupy smaller areas than the schools with facilities spread over the university and often occupying segregated spaces, which hinder the activities and requires more human and financial resources for maintenance. Even distinct interdisciplinary research centers have related and even identical activities, such as administrative areas of procurement, finance, human resources, information technology and libraries. In addition, the interdisciplinary research centers consider that their main need is space for research laboratories, followed by venues for collections, and, in some of them, classrooms. The interdisciplinary research centers themselves have executed adaptation and outreach work with extra-budgetary resources. The interdisciplinary research centers occupy space according to need and availability, with no pre-established criteria.

The following specific infrastructure issues require addressing:

- CIDDIC, whose spaces are segregated, insufficient and unsuitable for the type of use. Space change planning is being carried out in partnership with DEPI, scheduled for execution in 2020;
- CCSNano, which is installed in an inappropriate site, an old building with insufficient space, water infiltration and electrical wiring problems that cause damage to the high-value equipment kept there;
- CMU, which has segregated spaces, with problems related to electrical wiring, conservation and security of the collection. The center is scheduled to move to the main library in 2020;
- NIED, with lack of space for workshops;
- CEPETRO, which despite having the largest area among the interdisciplinary research centers claims not having enough space to accommodate groups and research projects, a situation aggravated in the last five years due to high investment in research. To solve the problem the center has executed expansion work with extra-budgetary resources and by the end of 2019 will occupy the former Comvest building;
- CIDDIC, LUME and NICS, due to insufficient and inadequate space for the type of activity conducted, have sought together partnerships and definitive solutions to create a shared space for contemporary art or cultural center.

A crucial point of interdisciplinary research centers is libraries. Of the 21 interdisciplinary research centers, 11 have their own library, comprising a total area of more than 870 m<sup>2</sup>. Seven

of them are small (30 m<sup>2</sup> each) while others are larger (CEB, CIDDIC, CLE and CMU). Centralizing and sharing libraries could be an alternative for the centers, optimizing not only space but also human and financial resources.

Regarding the comparison of interdisciplinary research centers with similar institutions in Brazil and abroad, 50% of them consider they fall short, 10% consider they are superior and 40% consider they are equal. In this sense, the most common problems found in this comparison are related to the inadequacy of the facilities, since almost all interdisciplinary research centers were set up in temporary spaces rather than purpose-built sites, and their reduced size. A case in point is the Unicamp orchestra and choir, whose rehearsal spaces are limited and inadequate, in addition to having no acoustic treatment, which does not occur in other institutions.

In early 2014, COTUCA, installed in a historic building since the 1960s, had to vacate the premises due to risks found in the roof structure of its main building and move to rented property and spaces in the Barão Geraldo campus, with infrastructure conditions that are unsuitable to its needs such as an insufficient number of classrooms and laboratories and lack of space for the library, faculty and administrative sector. Being a listed building, its renovation is very expensive, and the budgetary constraints over the period have made such an investment unfeasible. In 2019, a partnership was signed between Unicamp and Campinas Decor Eventos, which will renovate the building for its 25th Decoration and Landscape Exhibition, enabling the school to return to the site in the second half of 2020, with Unicamp contributing about a tenth of the investment.

The Technical High School of Limeira (COTIL) has old facilities, and despite the adaptations made over the years, the teaching lab environments do not meet all the school's needs, in addition to the lack of space for study and extra-class activities and poor infrastructure in living spaces. Investment is needed to expand and adapt the infrastructure of its teaching laboratories to meet the requirements of the courses, and also for the sports complex and changing rooms used for physical education classes.

About 60% of the schools report having plans for the physical expansion of their buildings and living areas and urbanization of the surroundings, especially to provide accessibility. The others claim that their priority is to adapt and improve existing areas, modernize data networks and execute important maintenance work such as renovating old or deteriorated systems, overall painting and electrical reform.

Relevant reports on the need for expansion were made by:

- Institute of Geosciences (IG), which reports using maximum classroom capacity. New rooms are needed to expand undergraduate activities and new laboratories are needed for new research projects, especially in the oil, gas and energy sectors;
- School of Technology (FT), with lack of space for faculty and classrooms, limited library space and lack of study space for students, thus proceeding with plans for the construction of new facilities on campus II, such as the faculty and library buildings and other teaching laboratories in preparation for its transfer;
- Arts Institute (IA), which aims to construct the music building, and Block L, a complementary building to the Lab Theater (work currently stopped due to budget constraints – estimated amount for conclusion R\$ 18 million). In addition,

- the rooms and spaces are insufficient for the number of students and faculty;
- School of Dentistry of Piracicaba (FOP), which requires the conclusion of two unfinished projects related to the undergraduate clinic and the preclinical building, since the current facilities do not meet health surveillance standards, have very old equipment and lack space for health care, teaching activities and extra-class work;
  - School of Nursing (FENF), which has two physical expansion projects: the construction of a living center and a new building to house simulation laboratories and new amphitheater classrooms;
  - School of Food Engineering (FEA), which plans the construction of an Innovation Center for Food Processing, aiming at closer cooperation with the food industry;
  - School of Civil Engineering, Architecture and Urbanism (FEC), which has a comprehensive expansion plan for the block where the school is located, including landscaping, universal access, departments, laboratories, integration, auditorium and service support;
  - School of Physical Education (FEF), which intends to expand the facilities of the bodybuilding room, a specific area for archery practice, auditorium, activity area at LABFEF;
  - School of Medical Sciences (FCM), which has plans for closer interaction between healthcare sectors in existing health centers, such as the installation of ASD (Autistic Spectrum Disorder) care in the current building of the FCM library and the construction of a building close to the FCM main premises for the teaching library;
  - School of Education (FE), which intends to build a high-quality Educator Training Center of around 6,200 m<sup>2</sup> in built-up area, which in addition to contributing to the improvement of public education, is part of the school's pedagogical-political project for its undergraduate programs (Education and Teaching Degrees), graduate programs and research and extension activities, consolidating its social commitment.

For the expansion area of the Barão Geraldo campus, better known as *Fazenda Argentina*, planning is underway to create an International Hub for Sustainable Development (HIDS), which is to be a model district of sustainable and smart urban development, like a living laboratory, including expansion beyond its limits and in partnership with the city of Campinas, the state of São Paulo and all the actors involved and already allocated in the area to be planned. The purpose of the HIDS is to contribute to sustainable development, combining national and international efforts to produce knowledge, innovative technologies and education for future generations, mitigating and overcoming the social, economic and environmental weaknesses of contemporary society, as will be detailed below.

Unicamp needs to find a good work methodology that enables it to evaluate the real need for new spaces and affords it autonomy to reallocate idle or underused spaces, thereby reducing the demand for new buildings.

## 10.7.2 Renovation and Construction Management

To address the subject of the university's renovation and construction works, one must consider the environment. The theme is inherently complex, given the university's

characteristics and strategic interests and the fairly strict legislation. The previous institutional Evaluation and the perceptions of the community and management in this matter already indicated the need for improvements in the process. The general data for the execution of works are shown in Graph 10.41 below, considering the works concluded in the periods informed.

GRAPH 10.41 – CONCLUDED WORKS BY QUANTITY, AREA AND VALUE PER YEAR



Source: DEPI, Obras 2019.

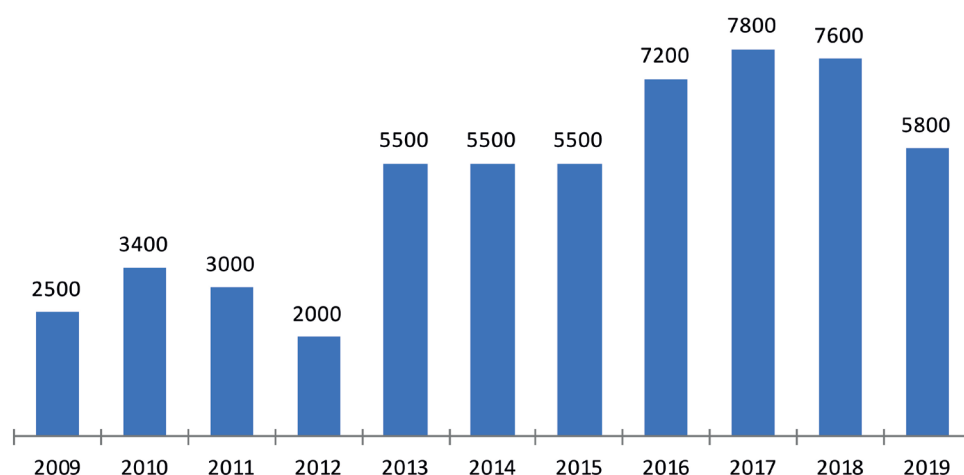
Considering Unicamp's substantial investments in works and infrastructure to meet the needs of the university community, DEPI has been working to provide continuous improvement in the processes related to projects and works. One of the stages of this improvement process was to trace the causes behind the non-execution of works in the campuses, carrying out a complete diagnosis on the matter and launching in 2017 the strategic project called "New Model for Enterprise Management at UNICAMP." The first phase of the project deployed a new decision-making system for works, formalized by Resolution CONSU-A-019/2019, which defines a prioritization framework involving an Enterprise Committee for technical assessment based on a multi-criteria decision-making method. The new strategy-based system defined COPEI as the decision-making body on this matter. COPEI is tasked with setting work priorities and strategically guiding available budget investments, following the premise that any enterprise can only be initiated after all resources for its execution and operation of facilities are ensured. Organization and prioritization of execution are based on the operational capacity of the teams and availability of budget resources for surveys, plans and execution of works. The organization of demands by "type" is another innovation of this decision model.

### 10.7.3 Building Maintenance

The maintenance division of the campus administration answered 7,500 work order requests in the 2018 fiscal year. The division serves the Barão Geraldo campus, student

housing, CPQBA (Pluridisciplinary Research Center for Chemistry, Biology and Agriculture), the COTUCA technical high school and the Cultural Center for Social Inclusion and Integration (CIS-GUANABARA). Its duties basically comprise the provision of repair services, which currently are largely performed by an outsourced contractor.

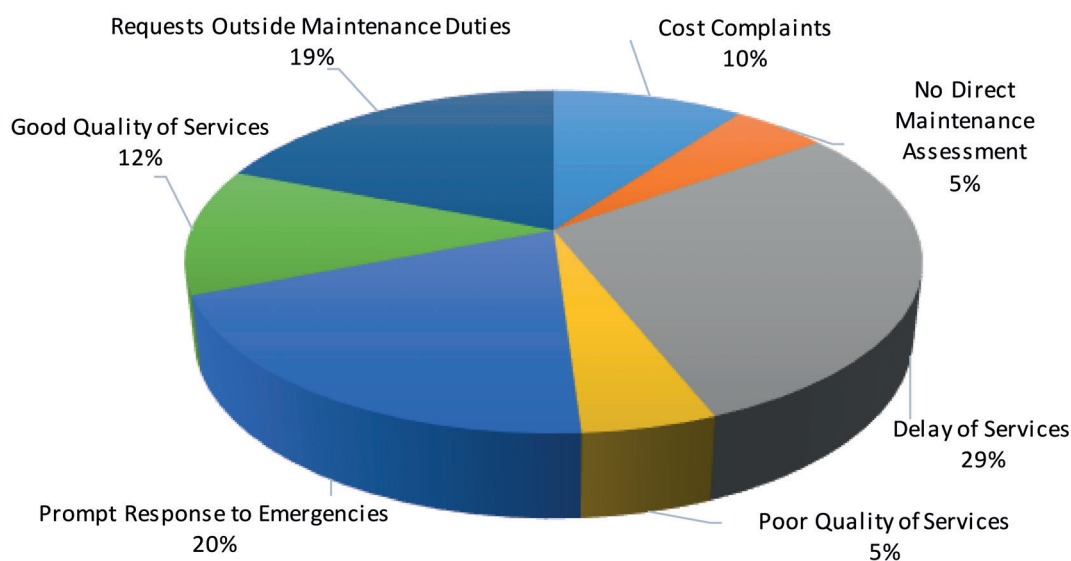
GRAPH 10.42 – PERFORMANCE OF BUILDING MAINTENANCE WORK ORDERS (WORK ORDER REQUESTS X PERFORMED)



Source: DEPI, Obras 2019.

Assessment of the provision of building maintenance services by the campus administration indicated the need to reduce waiting time and included criticism related to the cost of services that are covered by the Schools with PMP funds, to the provision of extra services and to occasional work of unsatisfactory quality that needs to be redone. Work overload, reduced technical staff and growing demand due to the aging of facilities and lack of preventive maintenance are the main alleged reasons for those problems.

GRAPH 10.43 – SCHOOLS' ASSESSMENT AND EXPECTATIONS REGARDING MAINTENANCE SERVICES



According to the assessment, 12% of the Schools considered the services provided by the Maintenance Division of Unicamp (DMAN) to be good. Emergency services (electrical and hydraulic) had a 21% approval rate for promptness. Only 5% of the Schools did not directly evaluate the services.

Regarding delays in service provision, 29% of the Schools showed dissatisfaction. Delay relates to large-scale maintenance work in which the waiting time exceeds 70 days. This is due to reduced staff, purchase of materials for the works by the Schools and the curing time of the service steps.

Another point to be noted is the need to create janitorial services for several Schools. The Institutional Evaluation indicates a 19% demand in this sense.

#### 10.7.4 Accessibility and Mobility

Most schools reported that there has been progress in investments in and attention to accessibility in recent years. Nonetheless, there is a consensus that Unicamp is not fully accessible for people with special needs or reduced mobility.

From the viewpoint of infrastructure, the newer buildings are already adapted to provide accessibility. However, most buildings do not meet the minimum requirements provided in Standard 9050 for accessibility to buildings, furniture, spaces and urban facilities, especially due to construction date and design, since accessibility laws date from 2000 and Standard 9050 became mandatory only in 2004. Thus, both buildings and urban areas require many adaptations to serve people with special needs. Access to areas of widespread circulation such as cafeterias, libraries and squares also need improvement, as well as the creation of tactile paving. Therefore, a substantial share of investment in works started being allocated to accessibility as of 2018.

There is much to improve from the point of view of communication, methodology, programs and attitude, as these are points that are still poorly addressed at the university. There are specific initiatives among the schools, but they are insufficient to deal with the complexity and size of the subject. Even the newest buildings lack signage and guidance for people with special needs, or even information points to assist them in the complicated activity of getting around and making the best use possible of the campuses. Solutions are needed addressing not only special needs related to mobility, but also to visual impairment (tactile signs and smart environmental models), speech and hearing impairment (sign language service, information material) and dwarfism (compatible service counters). Of special importance is the training of staff (academic and non-academic) in sensitive, proactive and unprejudiced attitudes to serve people with different kinds of special needs.

An important movement is perceived in the university towards becoming increasingly accessible, including the creation of the Permanent Accessibility Committee by DeDH, with the task of proposing initiatives to improve the access and permanence of people with special needs in the university. A project to map accessibility in the campuses is also being designed, analyzing current conditions based on Standard 9050 and issuing an "Accessibility Seal" to buildings, separating them by levels. Accessibility works with earmarked resources are also planned, with 15 new projects scheduled for the next three years.



The Barão Geraldo campus is an urban environment with a daily circulation of approximately 30,000 vehicles and 80,000 people (excluding weekends), according to information from the Citizen Information Service (SIC).

Being a large campus, there is a need to maintain circular bus routes. This service is made available to the university community in the Barão Geraldo campus, monitored by a system called “Circulino” which provides real-time location information to users through an application. The service was rated as good by most Schools regarding frequency, punctuality and availability of bus stops, as was the “Circulino” app. Since June 2019 all vehicles have been equipped to transport people with physical disabilities or reduced mobility.

The main problems traced related to mobility were the number of vehicles during peak hours (between 7:30 a.m. and 8:30 a.m. and between 5 p.m. and 6 p.m.) and in the healthcare area. Around 35,000 vehicles circulate inside Unicamp per day. This is a critical situation, not only in the university, but also in its surroundings (mainly on Dom Pedro I and Prof. Zeferino Vaz highways) and the main streets of the city of Campinas. This results from people’s traditional preference for individual transport and the inadequate urban transport services in Brazil.

Studies to solve and mitigate this problem must be carried out together with the Campinas municipal government, such as those provided in the Integrated Master Plan.

The road surface markings and traffic signs provided by the university follow the standards of the Brazilian Traffic Code – CTB. In partnership with internal and external bodies, the campus administration organizes awareness campaigns throughout the year, such as “Yellow May” and “Traffic Week” (in September), aiming to convey to the university community the importance of preserving life in traffic. However, the impact of these campaigns is limited.

The Schools argue that mobility between the Limeira campuses and the Barão Geraldo campus is insufficient. Unicamp provides four daily two-way shuttle services between Limeira and Campinas for the transportation of students. However, the survey carried out by the Regional Administration Secretariat of Limeira and Piracicaba (SAR) in 2019 shows that these lines operate below their capacity, indicating that there is no need to expand this service. However, students claim that the shuttle schedules are not aligned with their classroom hours.

Regarding pedestrian mobility, the main issue mentioned by the Schools is lack of accessibility on the university’s sidewalks. This problem is being addressed by the campus administration and SAR, but it involves a huge backlog. Therefore, it must be dealt with as a long-term program to be solved over time.

For cyclists, the university has approximately three km of exclusive bike tracks linked with the internal bike lane of the Student Housing region in the Barão Geraldo District. The bike lanes and tracks are concentrated in the academic area (basic cycle) and University Restaurant. The largest deficit is in the administrative region and healthcare area. As highlighted by the campuses, this structure is insufficient for the number of people, mainly students, who circulate in the university. There is a partnership with the bike and electric scooter rental companies Yellow and Grin, and almost 3% of students use bicycles to move around the district and university. As previously mentioned, the current road infrastructure of the Barão Geraldo campus makes the creation of new bike lanes and tracks very difficult. There are no bike lanes in the Limeira campuses.

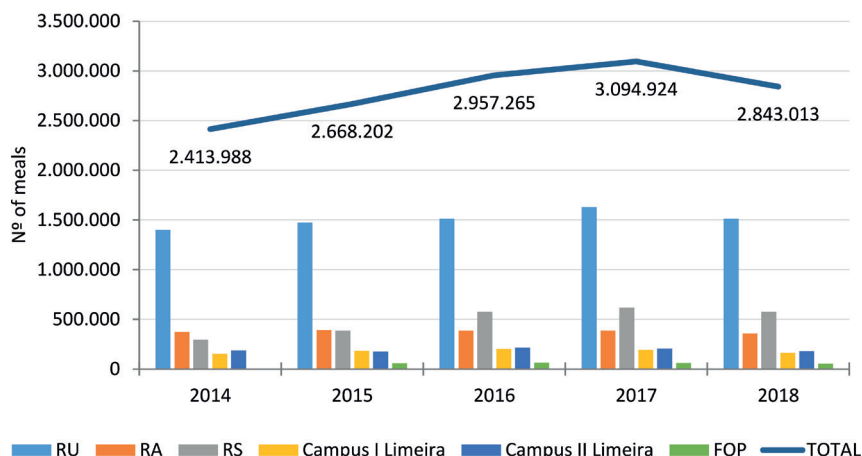
Unicamp has a parking area of 196,355.90 m<sup>2</sup>. A deficit of parking space was reported by the Schools, mainly in the healthcare area. Currently there are approximately 480 regulated parking spots around the University Hospital (HC). In contrast, parking space in some areas, especially close to the Technology Hub, is still underused. One notes a trend to park very close to the work or study site (even if this results in irregular parking), avoiding walking or using public transport. Once again, this results from previously mentioned reasons, namely: the university's road infrastructure hinders the expansion of parking spaces; lack of traffic inspection; and lack of a mobility plan, which should prioritize other means of transport, given the scarce parking area. In 2019 SAR expanded the parking space of campus I in Limeira by creating 20 parking spots accessed through the side entrance (for services and pedestrians). In addition, SAR will adjust the parking signs of spots reserved for senior citizens, pregnant women and people with special needs. However, it should be noted that there is no scope for expanding parking space in the master plan of the Barão Geraldo campus.

### 10.7.5 Catering and cleaning services

Unicamp manages a huge and complex catering system that includes: University Restaurant (RU), Administration Restaurant (RA), Saturnino Restaurant (RS), University Hospital Restaurant (serving the healthcare area), and the restaurants of the School of Applied Sciences of Limeira (FCA), School of Technology (FT) and Technical High School of Limeira (COTIL), School of Dentistry of Piracicaba (FOP), Technical High School of Campinas (COTUCA) and DEdIC – Division of Early Childhood and Supplementary Education.

The restaurants have an operational and technical team made up of nutritionists and food engineers, offering a balanced menu of breakfast, lunch and dinner. There are different types of subsidies for students and staff, with the difference in cost covered by the university's budget.<sup>8</sup> The community's perception is that the meal prices are affordable for students and low-income employees, since Unicamp subsidizes most of the cost, and the benefit-cost ratio is considered satisfactory.

GRAPH 10.44 – NUMBER OF MEALS SERVED IN THE UNIVERSITY'S RESTAURANTS



Source: DEPI.

8. Information on opening hours, prices, daily menu and other details is available at: <https://www.prefeitura.unicamp.br/servicos/divisao-de-alimentacao>

According to the Evaluation, 84% of the schools consider that the university's restaurants meet the needs of the university community, 4% consider that they meet them partially and 12% consider that they do not meet the community's needs. The COTUCA and COTIL technical high schools reported that the restaurants meet their needs.

Some criticisms refer to: food preparation, long lines during peak hours, lack of flexible opening hours, opening on weekends, distance from some programs (Medicine and Speech Therapy) and access for external users taking part in events at Unicamp, among others. All of these issues are being analyzed by management and there are difficulties in meeting these demands. The operation of restaurants is under constant review.

#### UNIVERSITY RESTAURANT



SIARQ – Unicamp (photo archive).



SIARQ – Unicamp (photo archive).



## LIMEIRA CAMPUS II RESTAURANT



FCA – Unicamp (photo archive).

The outsourcing and location of other kinds of food services is run by the campus administration. According to the Institutional Evaluation, food fairs and stalls serve the Unicamp community well, but the snack bars fall short of meeting the needs of the inside internal and external public, as their numbers are insufficient. Faculty, students and staff who work at night are even more affected. In the opinion of the evaluators, there is little variety of food services. Other options are needed, such as the provision of meals. There is a lack of varied and healthier menus, as well as snack bars with varied options. In some of them the quality falls short of expectations.

With very few exceptions, the physical spaces for food concessionaires were not designed for this purpose. Therefore, there is a need to review the matter, which is being done by the campus administration. A better mapping is required of the campuses' services and needs, pointing out the improvements made, so that the Schools may evaluate the quality of the service in normalized conditions. With the change in occupation rules to comply with the requirements of the Health Surveillance Department and other inspection bodies, specific sites can no longer be used by food services. These sites need adjusting to meet the standards of Health Surveillance and the Fire Department, requiring considerable investments, which are now the responsibility of the tender winners, as it is not the role of the university to make said investments.

According to the respondents of 2014-2018 Institutional Evaluation, most consider both the services and support provided by DGA to be adequate. Staff is assigned to monitor the services in all Schools and in the event of problems, both the Schools and DGA act promptly to resolve them. The few existing complaints about cleaning services concern issues that are not related to the actual contract, such as the high turnover rate of the outsourced company's employees. DGA has already started procedures to select the next contractor. Internal meetings have been held at DGA and a Working Group of DGA, PRDU and DEPI staff will be formed so that the future contract includes any adaptations and innovations desired by service users, within the university's budget sustainability goals.

### 10.7.6 Technology Infrastructure

Unicamp's Computing Center (CCUEC) provides Information and Communication Technology (ICT) services to the University of Campinas. It supplies systems and tools that support the university, as well as innovative services and projects that support the teaching, research and daily activities of schools, interdisciplinary research centers and administrative bodies, as well as various external research and healthcare entities.

CCUEC is in charge of some computing services, such as:

- **Printing:** The Computing Center is in charge of managing the printing solution offered to the entire university. This solution is made available to all UNICAMP academic units and administrative bodies and can be requested through the DGA Contracts Division. In addition to the corporate printing solution, some Schools have their own solution with local control.
- **Data Backup Services:** CCUEC offers backup copy services of the data of Unicamp academic units and administrative bodies, hosted or not in the CCUEC datacenter. It is noteworthy that the academic units and administrative bodies have full autonomy to manage their data, making copies and retrieving data using the tool provided by CCUEC.
- **Services and Environment Monitoring Service:** CCUEC offers computer environment monitoring services to check the availability of systems and equipment in Unicamp's network. This service relies on VideoWall framework that helps technicians detect incidents in the computational environment run by CCUEC and also in services requested by the departments. The monitoring service is carried out by CCUEC staff during UNICAMP office hours and by monitoring operators provided by SVC outside normal hours.
- **Software:** UNICAMP, through the Integrated Coordination of Information and Communication Technology (CITIC), provides software for corporate use to the university community. These include software contracts such as: Adobe, Kaspersky Antivirus, ArcGIS, Autodesk, Borland, Mathematica, Matlab, Microsoft, Origin and SAS. Corporate contracts result in a significant reduction in prices. Most academic units and administrative bodies use these software programs and also benefit from agreements signed with companies that make their cloud computing platforms available for academic use, such as Microsoft with the Azure platform, Office365 and Google with the GSUITE for Education platform. Many academic units have requested an expansion of these agreements for administrative use, in addition to educational use.
- **Infrastructure as a Service:** Infrastructure as a Service allows academic units and administrative bodies to create and host, on demand, virtual machines and systems in the university's corporate and centralized computational environment, called Unicamp Cloud Computing. The service is intended for the execution of administrative systems and teaching and research activities. Unicamp Cloud Computing is in production at the university, housing various services of the administrative bodies linked to the central administration. The computational

resources of this cloud service have been recently expanded to serve a larger number of users, which will be available for use in the first quarter of 2020. Therefore, the Computing Center, which is the administrator of this infrastructure, made part of the cloud computing resources available to the schools so they may also benefit from this service, hosting their productive environments in the cloud. Initially, this allowed the schools to implement various services such as websites and portals. For specific projects with funds earmarked for the purchase of infrastructure, the schools are requested to contact CCUEC to evaluate the best way to use UNICAMP Cloud Computing together with such funds, which can be invested in the expansion of the cloud infrastructure and thus increase the resources available for the schools.

Table 10.26 below shows the current use of Unicamp Cloud Computing by academic unit.

TABLE 10.26 – CLOUD DOMAIN INFORMATION

Domain	# VMs	# VCPUs	Memory (Gb)	Disk (Gb)
CBMEG	3	5	3,512	100
FCF	4	12	11	340
FCM	8	9	5,56	241
FEA	2	6	5	130
FEEC	2	3	1,512	21
FEM	2	4	3	120
FENF	7	13	11,512	165
FEQ	15	35	36,024	391
FOP	7	13	12	285
IA	4	10	12	72
IB	6	28	46	370
IC	9	29	27,512	371
IE	4	7	6	221
IFGW	4	14	20	392
IG	5	6	4,512	130
IMECC	5	10	8	101
Total	87	204	213,144	3450

Source: CCUEC.

A few recommendations were made by the schools:

- To encourage the use of UNICAMP Cloud Computing
- To set up a partnership between CCUEC and schools so financial resources of projects may be transformed into credits for use by UNICAMP Cloud Computing
- To encourage the use of cloud computing for the administrative activities of the schools

CCUEC is also in charge of computational infrastructure, having developed the following services in the Evaluation period:



- **Telecommunications Infrastructure: Telephony:** Unicamp's voice network (telephony) infrastructure, whether landline or mobile, is managed by CCUEC. All extensions of the university are connected to a state-of-the-art, stable and reliable telephony system. This year, analog technology is being replaced with VoIP (Voice over IP) technology, which will improve the quality of services available to users. The CCUEC Portal provides access to services and information related to billing, new telephone extensions, changes in extension category and site, repairs, telephone maintenance and mobile telephony. Throughout 2018, the CCUEC telephone staff answered 1,364 service requests related to telephone services.

The schools complained about the cost of extensions and calls, particularly the cost of extension fees due to contract costs, especially after the deployment of the VoIP system. Regarding the lack of extensions mentioned by some schools, in the process of preparing the tender for IP telephony services, a survey was carried out with the schools to ascertain the number of extensions by type of access (IP device, softphone, analog device). In this new contract the old digital extensions no longer exist, migrating to IP extensions. Still regarding the availability of extensions, in 2018, during the term of the previous contract, there was an increase in the number of extensions to meet the demand of some schools such as IG, which had moved to the new building.

Concerning the switch to IP technology, some schools further reported that their internal networks are not yet fully ready for migration. For the deployment of IP telephony, the schools' network infrastructures must be structured and prepared for VoIP protocol traffic. This is the responsibility of each school which, if necessary, should request technical support from the CCUEC telecommunications staff.

All reported failures related to burnt or damaged telephone circuit boards that caused inconvenience to users were solved by the maintenance company (3Corp) within the deadline set forth in the service level agreement, following calls opened by CCUEC.

Regarding the delay in issuing the schools' phone bills, which is done through the SISFATEL system and depends directly on the processing of invoices sent by the telephone operator (CLARO SA), from the second half of 2018 and throughout this year invoices were received with amounts that exceeded the contractual terms, forcing Unicamp to contest them. An incorrect database was also received, which needed to be corrected. As the dispute process is quite lengthy, this caused a long delay in phone bills, which could not be issued with incorrect values.

- **Network Infrastructure – Wireless Network (Wi-Fi):** The institutional wireless network (eduroam, Unicamp-Visitante, Unicamp-IoT and Unicamp-Configuração) is available to the entire university community and visitors in the Campinas, Limeira and Piracicaba campuses, as well as external bodies, CPQBA and schools. The institutional wireless network is managed by the CCUEC Networks and Information Security Board, which has been working on several projects aimed at expanding and improving the availability and quality of services. In 2018 it served 68,779 different users. The two institutional networks with the highest usage rate are "eduroam" and "Unicamp-Visitante," described below.

- **Wireless service – Eduroam:** The eduroam (education roaming) wireless network is a global mobility service developed for the education and research community. Through eduroam, students, researchers and staff from participating institutions access the internet through the wireless network of their campuses and also when visiting partner institutions in Brazil and abroad, using the same configuration on their laptop, tablet or smartphone. Users can enjoy this service in Unicamp or anywhere else in the world where it is available. In 2018 it served 47,997 different users.

In addition, CCUEC provides wireless network service for visitors. The Unicamp-Visitante wireless network is an institutional service available to people who are not formally linked to Unicamp and wish to use a wireless network in the university. In 2018 it served 20,782 different users.

Many schools reported the lack of coverage or signal in some sites of the Barão Geraldo campus, as well as the lack of more modern devices capable of working with 802.11ac technology. The Planes Project for the Expansion of the Unicamp Wi-Fi Network provides the replacement of all access points of schools where the Wi-Fi network is managed by CCUEC with more modern equipment, as well as the expansion of coverage through the deployment of new access equipment. There were specific complaints, especially in Basic Cycles I and II, where the Wi-Fi network is deficient, with a very poor signal, which hinders activities that require the use of wireless networks by students. In late 2018 CCUEC was charged with addressing this issue, which was included in the Planes Project for Wi-Fi Network Expansion. This project provides the installation of 36 new access points in classrooms, in addition to the replacement of 14 points already existing in those sites with more modern equipment.

Regarding the lack of a wider IP address range for use in the schools' local Wi-Fi networks, CCUEC recommends migrating to the centralized model under its management. This migration definitely solves the problem of few IP addresses pointed out by the schools. As reported by FEM, this migration would afford the Unicamp Wi-Fi network greater economy, security and standardization.

FEEC reports that the Wi-Fi network does not meet requirements related to number of users and quality of courses. FEEC manages its own Wi-Fi network infrastructure, comprising approximately 60 access points. In addition, it has 15 access points already centralized in CCUEC controllers. FEEC has shown interest in centralizing all access points, and within the Planes Project for Expansion of the UNICAMP Wi-Fi Network all access points will be replaced by new models, thus improving the quality of the wireless network.

FE considered the service to be excellent and suggested its standardization for all Unicamp schools. It also proposed abandoning the TTLS security protocol and deployment of PEaP, aiming to reduce configuration efforts. A technical assessment identified that if all the prerequisites for the secure configuration of the wireless network (with the use of a digital certificate) are followed, the use of this protocol would not bring significant improvement to the configuration process.

FT of Limeira reported that the network is unstable and slow, and that the wireless network service in FT is not centralized, i.e., it is managed by local IT staff.

It is also observed that users find it difficult to use the wireless network services, as they do not know where to find information and how to configure and access the services. Concerned with users' experience, CCUEC provides on its website an updated set of guidelines on the use of wireless network services, in addition to the possibility of personalized service to users in configuring and using these services by SAU CCUEC.

Regarding the wireless network for visitors, some schools complained about the approval process to access the service, especially for a large number of users. In order to facilitate and expedite these approvals, the "social login" was made available. Additionally to Facebook, authentication via Google is now available for schools using the centralized Wi-Fi service. This option will soon be made available to the other schools.

- **Network Infrastructure – VPN:** The secure remote access service (VPN – Virtual Private Network) consists of in creation of a protected communication channel between the user's computer and Unicamp's VPN server, providing secure access to the university's network. VPN provides access to university-restricted services, such as electronic journals, databases and corporate systems, among others. In 2018, 350 licenses were made available to users with simultaneous access and 12,734 different Unicamp users (faculty, staff and students) made use of the VPN service. Regarding complaints about problems related to the difficulty in using the VPN service, all support information is available on the CCUEC website. In addition, SAU CCUEC offers support to users to configure and use these services. Last year this service was occasionally unavailable on weekends, but the situation has already been addressed and solved.
- **Network Consultancy and Support:** The CCUEC Networks Board offers consultancy services in data network projects to Unicamp academic units and administrative bodies. It also offers support services to network managers in executing daily tasks related to network management and tracing and solving problems related to the operation of local networks in academic units and administrative bodies. As for complaints of delays in providing assistance, the numerous steps involved in solving problems and the lack of a call center, consultancy services are provided according to the complexity of the demand and the availability of the requesting schools' technical resources. The support service has similar characteristics, albeit most times with a shorter assistance and resolution cycle. It is worth mentioning that these services are offered during business hours only and there is no on-call duty. In order to improve the service, it is important for requesters to take note of problems. Based on this information, CCUEC will be able to make specific adjustments to provide better and quicker services. Lastly, it should be noted that CCUEC has scheduled public examinations to replace technical staff, which, when concluded, will streamline the flow of services provided by consultancy and support services.

## 10.8. Sustainable Development

Sustainability is mandatory as principle, commitment and, mainly, as practice, being essential for the future of humanity. It is incorporated in the university's mission statement. Therefore, it is up to Unicamp to accomplish its mission of educating people who, regardless of their academic area and program, have adopted the concept of sustainability and know how to apply it in their professional areas and in their daily lives as citizens.

DEPI has a team called Sustainable University Management Group (GGUS) tasked with proposing and implementing policies, guidelines and standards for a sustainable university, based on continuous improvement and environmental, economic and social performance. The group works through technical chambers responsible for designing programs that are part of Unicamp's Integrated Master Plan in order to achieve targets aligned with the 17 Sustainable Development Goals of the UN 2030 Agenda.

FIGURE 10.5 – SUSTAINABLE DEVELOPMENT GOALS



During the five-year period of Institutional Evaluation, Unicamp became a signatory to the International Sustainable Campus Network (ISCN), and in 2019 joined and submitted a report to the UI GreenMetric World University Ranking, an international system created by the University of Indonesia to measure sustainability efforts of universities through sustainability programs and policies, the results and ranking of which will be announced by the end of 2019.

In addition to the operational activities of DEPI, linked to university management, several types of academic activities are being carried out, notably the incorporation of SDG in curricula, academic events, discussion forums, research and development projects, etc.

### 10.8.1 Energy Efficiency and Renewable Energy Generation

Energy efficiency aims to reduce the consumption of electricity through improvements and/or physical and behavioral changes related to rational and efficient consumption of end-use energy, preserving work comfort and quality.

In this context, UNICAMP, through its schools and technical high schools, addresses energy sustainability in its environments. About 50% of these schools have taken some kind of initiative to promote energy efficiency, such as: replacing fluorescent bulbs with LED bulbs; installing photocells (motions sensors); optimizing air conditioning systems, replacing inefficient devices with more efficient equipment; developing super battery projects; reducing UPS equipment; developing human resources in photovoltaic energy and energy efficiency through outreach courses.

As of 2017, smart meters started being installed in 304 energy conversion points in the Barão Geraldo campus. The goal is to have direct measurement of electricity consumption in 100% of university schools by early 2020, enabling the monitoring, planning and management of electricity use and consumption, as well as the development of energy efficiency initiatives through online platforms for managers and the university's electrical system monitoring center. This solution, integrated with others in progress, is part of the Sustainable Campus project,<sup>9</sup> lasting 48 months and starting in January 2018. It is a partnership between Unicamp and CPFL Energia with investments worth R\$ 11.5 million under the Research and Development (R&D) Programs and the Energy Efficiency Program (PEE) of the Brazilian Electricity Regulatory Agency (ANEEL). The project aims to establish an energy efficiency management model that can be replicated in other institutions and gradually cut down on electricity expenses at Unicamp, achieving savings of at least R\$ 1 million of the current expenditure of R\$ 25 million, considering only the Barão Geraldo campus.

The economy will come from eight integrated initiatives including: installation of the electricity measurement system; generation of 534 kWp of photovoltaic solar energy, installed in seven panels in the Barão Geraldo campus; replacement of 43 air conditioning devices and 3,000 bulbs with more efficient models; introduction of an electric bus in the Barão Geraldo circular shuttle system and efficiency analysis of existing vehicles, starting in 2020; installation of sensors (IoT) to help users utilize the equipment, promoting energy efficiency; development of a labeling plan for the university's buildings, using the model used by PBE-Edifica (Brazilian Building Labeling Program); improvement of the electricity procurement process of Unicamp, the only public university in Brazil to operate in the free energy market; review of electricity contracts of the other UNICAMP campuses; design of an energy efficiency training program for students, staff, faculty and managers.

In addition to saving energy and financial resources, the project's infrastructure will be integrated with the university's teaching, research and operation system, exploring the concept of campuses as living laboratories for the study and development of new technologies, in addition to being used for the actual university to apply energy management. In this sense, an energy efficiency project is under development in the UNICAMP Multidisciplinary Gymnasium, with the replacement of eight main air conditioning devices (average of 15 TR each), installation of 192 dimmable LED bulbs, increasing the brightness of the indoor sports court to 1,000 lux, which will allow events and games to be held in this environment, in addition to the distribution of 8,100 18W LED bulbs around the university.

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9. To learn more about the project visit: <https://www.campus-sustentavel.unicamp.br/>



### SOLAR PANELS INSTALLED ON THE MULTIDISCIPLINARY GYMNASIUM AND FEEC AT THE BARÃO GERALDO CAMPUS



CPFL Energia (photo archive).

These projects support the “Sustainable Campus Office” certification currently underway at the university, which aims to help Unicamp’s academic units and administrative bodies address the issue of energy sustainability in the campuses.

#### 10.8.2. Reduced water consumption and water efficiency

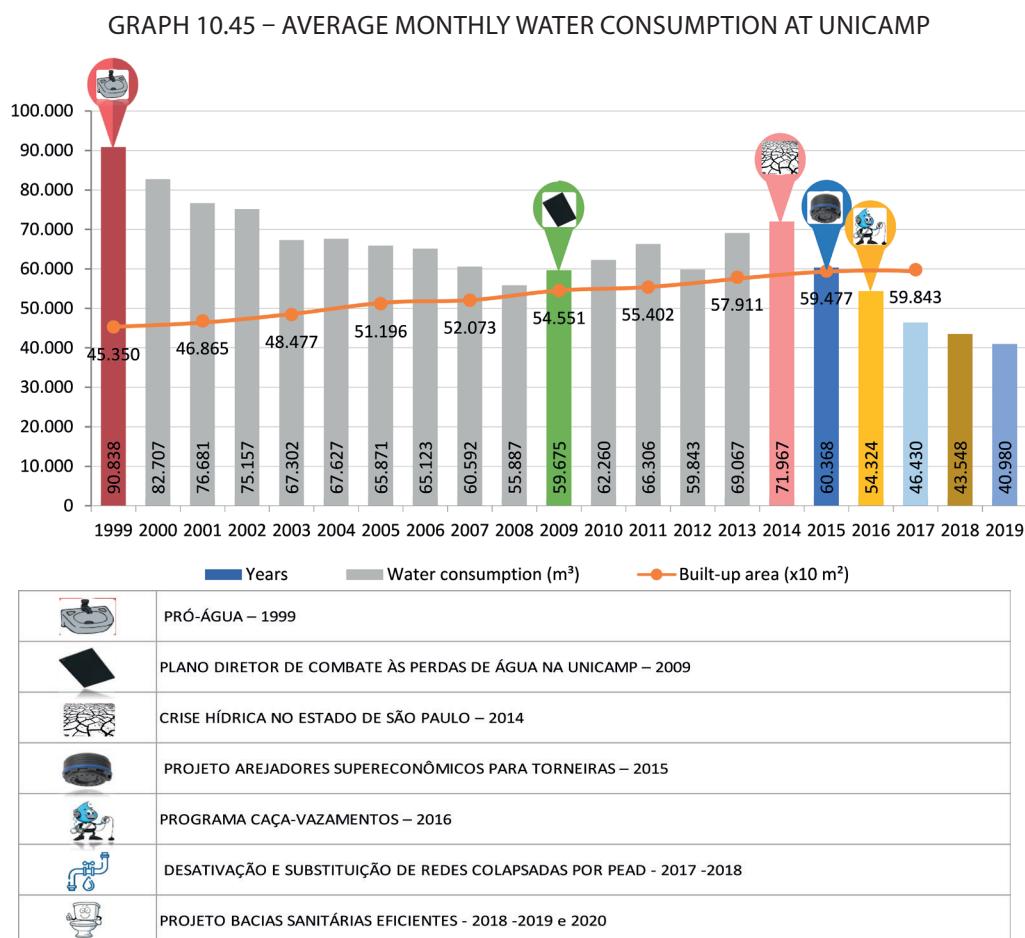
Concerning reduced water consumption and water efficiency, 75% of the schools have already adopted related initiatives. In general they were guided by the Campus Administration Systems Division, which developed and implemented the projects described below. At local level, independently of centralized projects, many schools are gradually replacing flush valves with dual flush toilet tanks and conventional faucets with automatic faucets with timers and aerators; and carrying out studies to harvest rainwater and water from air conditioners for reuse in toilets, urinals, garden irrigation and general cleaning.



Some schools have systems to treat sewage and reuse water in agricultural activities and by-products of this reuse water, water saving procedures with cleaning contractors and replacement of laboratory equipment with reverse osmosis systems.

Since 1999 Unicamp has invested in policies and actions to reduce water consumption in the Barão Geraldo campus. In recent years it has implemented initiatives such as leak hunting, replacing pipes with HDPE (High Density Polyethylene), deactivating asbestos cement pipes and, more recently, replacing old toilet bowls and flushing systems, which consumed 12 to 30 liters of water per flush, with dual flush toilet tanks of three and six liters per flush. As a result, the university's consumption fell below the level agreed with SANASA, in both the educational and healthcare areas.

Graph 10.45 shows the average monthly water consumption at UNICAMP since 1999 with the deployment of the PRÓ-ÁGUA project and the main policies and measures implemented to reduce consumption in this period, in relation to the built-up area of the Barão Geraldo campus.



Source: Campus Administration.

Note: the average monthly water consumption at Unicamp for 2019 considers consumption measured up to October 2019.

The graph also shows that despite the increase in built-up area in the campuses, and the consequent population increase, the falling trend in water consumption persists, that

is, the reduction in water consumption is greater than what is shown, since part of the saved water is supporting the population increase on the campuses.

### 10.8.3 Waste Management

Waste management is understood to be all aspects related to generation, sorting, packaging, collection, storage, transportation, recycling, treatment and final disposal, as well as protection of public health and the environment.

90% of Unicamp schools claim to execute some kind of waste management, whether of hazardous or non-hazardous waste, which varies in type and complexity according to specific contexts, given their diversity. This includes current institutionalized programs related to the collection of cartridges and toners, batteries and fluorescent bulbs according to the waste sorting program of the campus administration. In addition to these programs, there are specific initiatives related to reduced paper consumption in printing, rational use and proper disposal of recyclable materials and organic waste composting. The schools sort non-hazardous waste and the campus administration Environment Division collects it and recycles suitable material. The Urban Cleaning Board, linked to the Environment Division, is responsible for collecting this waste in the university on a weekly basis, according to a previously established schedule.

Coordinated by the Technical Chamber of Environmental Education (CTEA), based under DEPI, a noteworthy initiative is the No Disposable Cup Day at the University Restaurant (RU). It started in 2017 during the Unicamp Environment Week with the proposal to eliminate or reduce for one day the use of disposable plastic cups at the RU, on an experimental basis. Due to the community's adherence, support and request, this action was repeated every Monday and Friday in the RU. In parallel, several schools and administrative bodies have adopted the use of mugs, eliminating the use of disposable cups.

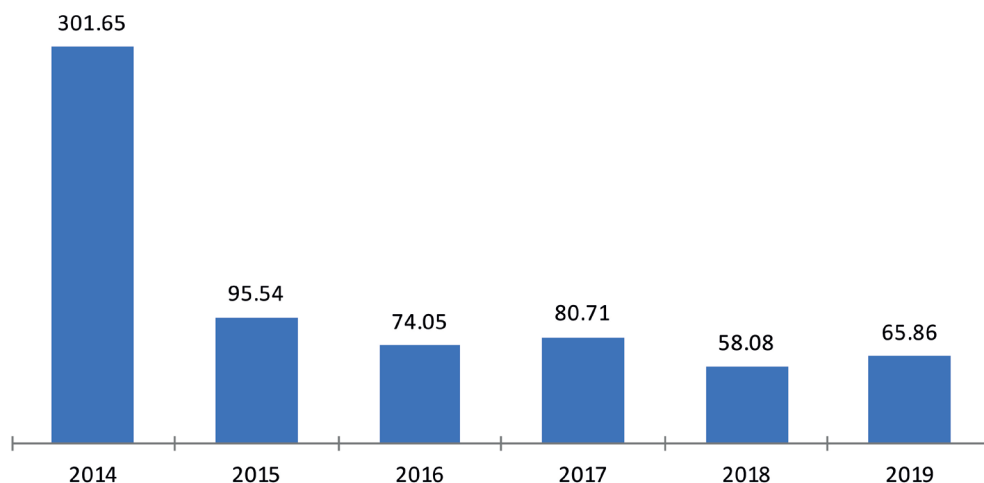
UNICAMP's Waste Management Plan (PGR) stems from the practical and managerial experience accumulated at the university, inspired by best practices, legislation and academic knowledge. The goal of PGR is to enhance the university's environmental performance, meet the requirements of the National Solid Waste Policy (PNRS) and other environmental laws, and adopt best practices to prevent the generation of solid waste and cause the least environmental impact possible from its activities. All schools and bodies with hazardous waste received training for PGR given by facilitators. A technical review for academic units and administrative bodies with hazardous waste is planned for 2020, in addition to the expansion of PGR to administrative areas. To support the operationalization of PGR, GGUS coordinates programs for the disposal of hazardous organic chemical waste for incineration, of inorganic chemical waste for landfilling of hazardous products, treatment of formaldehyde, disposal of lubricating oil for re-refining and disposal of lead-acid batteries and aerosols. In 2018, 33 tons of waste were sent for incineration, 4.3 tons of lead-acid batteries for reverse logistics and 900 liters of oil for re-refining.

Due precisely to the scope of the measures adopted by each university school, some of them have set benchmarks in waste management, even for external institutions. This is the case of the healthcare areas (University Hospital, Gastrocentro, Hemocentro, CAISM and CECOM), IQ and IB, which have their own consolidated Waste Management Programs. The program is a model for countless educational institutions in Brazil and is continuously enhanced by intense

training of students and staff. There are also initiatives to donate expired reagents, minimizing waste generation and recovering non-hazardous waste (reuse, recycling, etc.).

The university has an established procedure (Resolution GR 003/2009) for the correct disposal of asbestos, or amianthus, as it is more commonly known, considered a hazardous product under CONAMA Resolution 348, dated August 16, 2004, and according to state legislation prohibiting its use in the state of São Paulo (State Law 12684, dated July 26, 2007). This procedure is managed by GGUS. Since 2014 more than 675 tons of this waste have been sent to the hazardous waste landfill.

GRAPH 10.46 – ASBESTOS – DISPOSAL (IN TONS)



Source: DEPI.

The activities of the Unicamp LixoZero Program started in 2018. These activities aim to encourage the community not to generate waste. Examples of effective GGUS actions are: I Unicamp LixoZero Week, September 10-24, 2018; creation of the LixoZero Logo; World Cleanup Day (of public spaces); “No Disposable Cup Mondays at the University Restaurant”; Domestic Composting Workshops at FEC; guided visit to the Environment Division: Where do Unicamp’s recyclables go?; conversation circle: “Pastel Meeting at IFGW” on zero waste practices; guided walk: “Trees and their Interactions with Man and Nature,” learning about the fruit trees at the Barão Geraldo campus; World Car-Free Day at Unicamp, which encouraged the internal community to walk and use public transport on that day; “Correct Waste Disposal” awareness campaign and collection of disposable items with users of CECOM, CEPETRO, FCM and CAISM, and rational water use in the FEAGRI labs; distribution of mugs to FEF staff; campaign to eliminate disposable cups and stirrers in the IEL kitchens and Projeto SustentaSVC with corporate, collective and individual initiatives at the Living Office. These initiatives can be replicated in all Unicamp academic units and administrative bodies.

One notes the lack of measures for communicating the importance of waste management (at laboratory level); raising awareness (environmental education) among the internal community (at school level); and developing a culture of environmental education (at university level). The implementation of the aforementioned initiatives will unfold into

new supplementary and continuous measures that will definitely support sustainable initiatives persisting into the future.

The future challenges to be met in waste management relate to minimizing waste generation, reusing, recycling and expanding the range of managed waste so it may return to the production process, in a circular chain. Examples include setting a goal to reduce incinerated waste and the responsible use of part of this waste as fuel. It is also necessary to reduce organic waste, which can be used for composting, implement widespread institutional measures for zero waste and reduce the consumption of items such as paper, plastics and other products that harm the environment. Regarding overall sustainability, the main challenge is to introduce an Institutional Environmental Education Program to raise the community's awareness of each one's role in building a more sustainable society that will ultimately benefit everyone.

#### 10.8.4 Social-Environmental Education

CTEA was created in 2014 to assist, support, encourage and promote widespread educational processes with the different kinds of public that daily frequent the UNICAMP campuses – in a participatory, aggregating and synergistic way – aiming to generate reflection and practices for the sustainability of the different social and environmental dimensions of UNICAMP. The work of this group is largely executed in partnership with facilitators, who are staff members appointed by managers to develop social-educational initiatives in their respective areas. These include educational activities such as the Environment Week, notably the formulation of the “Letter of Intent – towards Sustainable Unicamp,” Unicamp LixoZero Week, Educational Campaigns, lectures for new staff in partnership with DGRH, annual welcome for new students – Calourada, Biodanza (the art of human contact by looking, walking and dancing) in the square and schools, awareness activities, workshop, forums, planning meetings and ideas with the socioenvironmental collective and participation in congresses and seminars. A noteworthy recent initiative is educational work to minimize the use of disposable plastic cups in academic units and administrative bodies, as already mentioned, which resulted in a significant reduction in the consumption of this item.

In 2016, CTEA helped produce the participatory mapping, or social cartography, a mapping process that showed and spatialized the association between the area and local communities, using the language of cartography, which aimed to assist in the development of the UNICAMP Sustainable Master Plan (currently called Integrated Master Plan), evaluating social and environmental issues such as security, accessibility, quality of spaces, transportation, among other local needs.

Regarding projects and activities related to social-environmental education, 75% of the schools claim to address the subject, with the remaining 25% not having taken any action. Many of the initiatives adopted are part of programs developed or encouraged by central administration areas, such as the Campus Administration and the Sustainable University Management Group. Others occur individually within the context of activities related to the subject in each school, as illustrated in the good practices below.

FEA organizes the annual event “Sustainable FEA” which addresses topics such as recycling policies, waste control, expansion of green spaces, among others, aiming to raise the community’s awareness. In addition, environmental sustainability has been incorporated into the curriculum of undergraduate programs in Food Engineering, with students reflecting on and developing projects and products that meet the demands of society in this regard.

FEQ offers lectures on social-environmental awareness in elementary and high schools in the city of Campinas, based on the 5R’s Model (Reduce, Rethink, Reuse, Refuse and Recycle) with the aim of discussing the indiscriminate use of polluting materials and promote a culture of sustainability from a practical and applicable approach. The project is developed by 22 undergraduate students, involving around 180 students per year.

FENF created a community garden and organized meetings with the distribution of mugs (to replace disposable cups) and lectures on consumption and responsible disposal of waste, water and energy consumption and *The Burden of Choices: Sustainable Lifestyle*.

At FCM, the university community helped plant specific plant and tree species in busy outdoor areas and took part in projects to identify species, make identification plaques and catalog existing vegetation. In addition, social and educational activities with videos and discussions on waste reduction were carried out during the environment week and annual training sessions on “Living Office” were given to administrative staff and maintenance technicians focused on reduction and proper sorting of waste produced in these functions.

Other social-environmental activities common to some schools are promoted and encouraged: awareness campaigns on rational use and non-use of disposable cups, printing paper, water and energy; guidance on replacing materials with more environmentally friendly options; awareness raising among cleaning staff on the importance of saving water when cleaning buildings; awareness raising on minimal waste generation and waste sorting and disposal; sharing of solutions adopted at Unicamp (waste management model) with external institutions with a view to replicating them.

Despite the numbers, it is noted that many activities occur because they are inherent to the operation of schools. For example, laboratories that work with chemical and biological products are obliged to ensure safety and compliance with standards and legislation. In other cases they are encouraged by central administration bodies, and many schools have expressed the desire for a main social-environmental education program and measures to promote sustainability. More than that, it is necessary to advance in reviewing the curricula of all UNICAMP undergraduate and graduate programs, introducing the issue and promoting discussions on education and social-environmental sustainability from different approaches. This need stems primarily from legal requirements: at both federal (Law 9795/1999) and state (Law 12780/2007) level, legislation provides the introduction of “environmental education” and/or “environmental dimension” at all education levels and systems, including higher education. If the legal requirements were not enough, UNICAMP’s commitment to sustainability and the intrinsic collective and complex dimension of the issue mandate our university to offer training to all participants of our teaching, research and extension courses and activities, helping them understand and oppose unsustainability in all its forms. This will require all programs, regardless of the academic area, to support knowledge and values inherent to integral sustainability.

## 10.9 Repositories and Collections

The Unicamp Library System (SBU) aims to promote the integration of UNICAMP libraries by developing policies and standards that provide widespread access to information stored and generated at the university, fostering the development of research excellence and promoting quality teaching and extension activities.

Concerned with having adequate bibliographic and informational resources for the development of excellence in research and teaching, Unicamp has always invested in the development and modernization of its collections, an effort reflected in the quality of the collections available in its libraries. Over R\$ 9,450,000.00 were invested in bibliographic and information resources over the Evaluation period, and around R\$ 373,000.00 worth of purchased equipment.

The SBU collection comprises 1,065,480 bibliographic materials, in addition to 16,192 titles of printed journals, 3,045 electronic journals, 617,590 e-books (about 300,000 with perpetual rights) and 61 reference or full-text databases provided by UNICAMP and 142 through the CAPES Journal Portal. This entire bibliographic and informational universe has been carefully selected, organized and constantly updated, with the aim of ensuring support for the university's core activities.

The Digital Library has a new profile to meet the demands of the Unicamp community. It currently comprises 17,000 materials, consisting of: rare works, works in the public domain, books for entrance exams, Library System reports, special materials such as music scores, among others. SBU also includes the Zika Digital Library, with a collection on diseases transmitted by the *Aedes aegypti* mosquito taken from major national and international databases in the areas of healthcare and multidisciplinary studies.

CHART 10.1 – THE SYSTEM COMPRISES 29 LIBRARIES, FEATURED BELOW.

Library Abreviation	Type	Library Name	Schools served (Abreviation)
BAE	Sector	Engineering and Architecture Library	FEAGRI, FEC, FEEC, FEM and FEQ
BCCL	Main	Cesar Lattes Main Library	General
BORA*	Sector	"Fausto Castilho" Rare Works Library	General
CEB	Sector	Biomedical Equipment Reference Center	COCEN
CIDDIC	Sector	Unicamp Center of Integration and Cultural Diffusion	COCEN
CLE	Sector	Michel Debrun Library	COCEN
CMU	Sector	Prof. José Roberto do Amaral Lapa Library	COCEN
CTC	Sector	Prof. Ricardo Regazzini Verçosa Library	COTUCA
FCA	Sector	Prof. Daniel Joseph Hogan Library	FCA
FCM	Sector	School of Medical Sciences Library	FCF
			FCM
			FENF



CHART 10.1 – THE SYSTEM COMPRISES 29 LIBRARIES, FEATURED BELOW

continued

Library Abreviation	Type	Library Name	Schools served (Abreviation)
FE	Sector	Prof. Joel Martins Library	FE
FEA	Sector	“Angelina Godoy Montgomery” Library	FEA
FEF	Sector	Prof. Asdrubal Ferreira Batista Library	FEF
FOP	Sector	Prof. Dr. Carlos Henrique Robertson Liberalli Library	FOP
FT, CTL	Sector	FT/CTL Unified Library	FT, CTL
IA	Sector	Arts Institute Library	IA
IB	Sector	Institute of Biology Library	IB
IE	Sector	“Lucas Gamboa” Document Center	IE
IEL	Sector	Antonio Candido Library	IEL
IFCH	Sector	“Octavio Ianni” Library	IFCH
IFGW	Sector	“Gleb Wataghin” Institute of Physics Library	IFGW
IG	Setorial	“Conrado Paschoale” Library	IG
IMECC	Setorial	Institute of Mathematics, Statistics and Scientific Computing Library	IC
			IMEEC
IQ	Setorial	Institute of Chemistry Library	IQ
NEPAM	Setorial	NEPAM Library	COCEN
NEPO	Setorial	Bel Baltar Library	COCEN
NEPP	Setorial	Ana Maria Medeiros de Fonseca Library	COCEN
NUDECRI	Setorial	Library of the Center for the Development of Creativity	COCEN
PAGU	Setorial	Beth Lobo Library	COCEN

\* Final pre-operational phase.

In addition to the libraries under SBU, the interdisciplinary research centers have rich specialized collections in the areas of surveys on political and social behavior in Brazil (CESOP), oil engineering (CEPETRO at FEM), laboratory animals (CEMIB), State of São Paulo Agricultural Zoning and meteorological data (CEPAGRI), musical works (NICS), theater research (LUME) and information technology in education (NIED). In addition to these bibliographic collections, they also have collections of microorganisms and medicinal and aromatic plants (CPQBA), strains of *in vivo* and *in vitro* laboratory animals (CEMIB) and imagery from the geostationary meteorological satellite and the meteorological station database of CEPAGRI.

For most schools, the physical and digital collections meet the quality and quantity requirements of undergraduate, graduate and extension subjects and research (FCF, FCM, FE, FEA, FEAGRI, FEC, FEEC, FEF, FEM, FEQ, FOP, FT, IC, IE, IEL, IFCH, IFGW, IG and IQ). In the case of the IB, IMECC and FENF libraries, the committees reported that the collections are compatible with research activities and graduate studies, but insufficient to meet the requirements of undergraduate studies, as they offer many subjects to students from other schools (IMECC and IB) or the collection does not meet the undergraduate demands of the actual schools (FENF). In addition, IE stressed the inadequacy of procurement with

budgetary funds, given that orders can only be placed once a year, usually in October. However, the purchases are only made in the following year, usually in February/March, through the bidding process. Thus, the materials start to arrive after the beginning of the school year and gradually, which often implies the use of extra-budgetary resources to streamline the process.

In general, the schools reported that the library system has been trying to reinvent itself by investing in e-books and digital collections, following the new paradigm of scientific communication. On the one hand, this leads to a rationalization of resources, avoiding duplicated titles and expanding the general collection, which does not need to be distributed to the sector libraries. On the other hand, it is more convenient for users. Only IB reported that the use of e-books is not widespread due to the low availability of titles in the area of biological sciences.

Also concerning digital collections, two situations were reported as worthy of being replicated:

- IE has several national and international agreements via SBU which provide access to technical-scientific documents (articles, book chapters, theses, dissertations, congress proceedings, technical reports, etc.) that Unicamp or Capes does not have (authorized by the Copyright Law) and that are available in the collections of Brazilian libraries and international libraries and information centers;
- IMECC uses an on-demand system to purchase scientific articles to meet specific demands for publications not available in the CAPES Journals Portal.

Regarding mechanisms to select articles to be purchased, some schools reported the use of interesting instruments, such as online forms (IE and engineering courses via BAE) and titles taken directly from Subject Teaching Plans in the case of the FCM library, which manages the resources of the Medicine and Speech Therapy, Nursing and Pharmacy courses.

### 10.9.1. Repositories and metric and search tools

Unicamp's Scientific and Intellectual Production Repository (IR) contains Unicamp's intellectual output, which is divided into scientific and technical production. Technical production currently consists of patents that Inova provides to SBU. Scientific production, in turn, comprises all the university's theses and dissertations since 1963, and articles that were extracted from five indexes (Web of Science, Scielo, PubMed, Scopus and Scientific Electronic Journals Portal – PPEC), these from 1964. Since October 2018, RI has been part of the university's Strategic Planning (GEPLANES), with the goal of populating the Institutional Repository. SBU, through the Information Treatment Board and System Libraries, is working on populating RI to ensure the quality of records, as demanded by GEPLANES. One of the goals of this work is to enable the generation of reliable indicators of Unicamp's scientific production.

The Scientific Electronic Journals Portal (PPEC) provides support for the creation of the persistent identifier (ORCID). Since June 2019, under Resolution 25/2019, it is mandatory

for researchers and faculty to register an ORCID ID. In addition, PPEC supports the training of the portal's editors, while SBU provides support for other categories of users in the university (faculty, researchers and students).

SBU also offers its community the Turnitin tool, a system to check originality and prevent plagiarism in academic and scientific works available on electronic media.

In addition, SBU has offered services for the metric analysis of scientific information to support decision making in schools and other university bodies, especially in the Offices of the Vice-Rectors. Scientific production indicators make it possible to understand the development of research in the areas of knowledge, as well as produce a wide variety of performance indicators to monitor productivity and the scientific impact of research outcomes at all organizational levels. It also makes it possible to evaluate scientific performance against international benchmarks, monitor potential new opportunities for cooperation and develop strategic partnerships, as well as support new funding proposals or monitor the performance of funded projects, among other possibilities.

All schools carried out activities to spread the training offered by SBU or offered training in their own libraries to expand knowledge of the digital collection, standardization services, persistent identifiers (ORCID and DOI) and similarity checking tools (Turnitin), both collectively and as individual advice to requesting users. In addition, they created tutorials and other materials made available online to assist users.

Regarding the use of ORCID, most schools were unable to estimate the adherence of faculty, despite the requirement to register on the platform. Some schools took explicit measures to expand adherence to the service:

- IG appointed a staff member linked to the Research Office to assist faculty with ORCID requirements and started instructing graduate students requesting the index card to create a register;
- FOP has been working with its community since 2017 to register with ORCID;
- FEC included the participation of BAE librarians in graduate subjects that deal with research methodology to assist with both ORCID and other services and databases.

In addition, IFGW, IA, IQ, FENF and FEAGRI reported a high rate of faculty registration with ORCID, in some cases also including collaborating lecturers and researchers and postdoctoral researchers.

Regarding Turnitin, in most schools registration is done at the request of faculty. In the case of students, it has been used at the time of writing, before publishing articles or defending dissertations and theses. However, the tool is still underused. A highlight is the policy being implemented at FCM requiring the mandatory presentation of similarity reports to defend theses and dissertations.

Overall, the schools pointed out the benefits of the three tools (ORCID, DOI and Turnitin) for digital standardization and integration of scientific output data and checking of originality and plagiarism, helping to qualify and strengthen the representation of scientific production in the international scientific milieu. However, they claim to have no

data to evaluate the impact of the use of these tools on the visibility of scientific output, and actually suggested such data be collected systematically.

Therefore, with the exception of a few schools, adherence to the services still seems to be limited. This is partly due to the fact that such adherence is viewed as individual choice rather than institutional policy to, on the one hand, prevent plagiarism and, on the other hand, increase the visibility of scientific production. In addition, few initiatives link the use of these tools to academic routines, such as those mentioned: association of ORCID with the creation of thesis and dissertation index cards; inclusion of this content in research methodology subjects; use of Turnitin when submitting publications, theses and dissertations; and more efficient ORCID registration policies for faculty and researchers.

### 10.9.2. New technological features and tools

SBU has also sought to add value to its products and services through information and communication technologies, integrating work routines and therefore increasingly offering online services via internal networks and Web interface for research and information retrieval. Such initiatives have had a positive effect on the use of electronic research resources, which has increased significantly in recent years. To this end SBU currently has 13 self-service machines (which account for 10% of total circulation), the Unicamp – Biblioteca application (for research, renewal, reservations and information about libraries and chat support services), in addition to the use of social media.

Regarding user autonomy, most libraries have automatic loan equipment (IFGW, BCCL, BAE, FCA, IE, IMECC, IFCH, IEL, IB, IQ, FE, FEA and FEF). For automatic return, most libraries have a return box with a server which later checks back items individually (IFGW, FEC, FCM, BAE, FCA, IE and IMECC). Only four schools have neither of these resources (FOP, IG, FT and IA).

Communication with users has been through social media, especially via Facebook, Twitter, Instagram and YouTube channels. In addition to having their own pages, the schools reported benefitting from SBU's presence on social media. Only four libraries reported the deployment of a virtual chat service for users (BCCL, IA, FCM, FEF and BAE) and FCA reported the use of Messenger on its Facebook fanpage.

### 10.9.3. Relationship with the internal and external community

SBU offers user training services for the UNICAMP internal and external community. In 2018, 9,236 users received more than 1,906 hours of training. Over the same period, the cataloging in publication service produced 3,270 index cards of theses, dissertations and other university publications.

Eight libraries reported the existence of training rooms and/or teaching laboratories on the library's premises (IEL, IE, IFCH, IA, IB, FCM, IQ, FEA and BAE). However, IE, IQ and IA claimed the spaces are small or inadequate. In addition, eight other libraries reported not having such spaces, but using other spaces in the school for these purposes (FT, IFGW, FEF, FE, IMECC, IG, FCA and FOP).

The local consultation service of SBU materials is available to the external community and the lending service between libraries is available to teaching institutions registered in the system.

In addition, the libraries often organize social and cultural events open to the whole community, such as exhibitions, social and educational campaigns, discussions, cultural and artistic performances, etc., usually in partnership with other schools and ongoing university projects, as reported in the Extension and Culture chapter. However, some libraries reported difficulties in this regard: FT, IA and FOP due to reduced space and IEL due to the 2013 fire, which resulted in the room used for soirees being permanently occupied by staff.

Concerning service provision, it is noteworthy that the circulation of bibliographic materials involves 1 million operations per year on average. The flow of users and visitors in the libraries is around 1.1 million people per year, highlighting the importance of UNICAMP libraries at both national and international level.

#### 1.9.4. Editorial support for the Unicamp community

Regarding editorial support, PPEC provides subsidies and editorial support for the Unicamp community, aiming to ensure the quality and visibility of everything that is produced within the university.

As main services, PPEC offers support in registering journals in the Portal, creating journals and e-books, requesting ISBN and ISSN and assigning and validating the Digital Object Identifier (DOI) for all types of material. In this regard, in addition to its main functions, PPEC provides editorial services to the entire university at institutional level, such as: assistance in scientific and academic standardization of publications; assistance to editors in submitting requests for indexation in national and international databases; guidance on the use of Creative Commons licenses and copyrights; and lastly, support through E-Contents, an electronic services portal on the management platforms of the PKP community free software packages.

From the schools' point of view, SBU has provided good support to editors and contributed to qualify and afford visibility to Unicamp's scientific publications. In this sense, SBU provides the university with technical know-how for publishing books and journals, especially schools that do not have this support locally. Alongside other initiatives, such as the Institutional Repository and use of the ORCID tool, among other tools, the trend is to increase the quality and visibility of the material published by the university itself. Financial aid for publications was suggested.

#### 10.9.5. Facilities and equipment

Most libraries and collections have suitable facilities and equipment for their operation, with the exception of the following cases:

- The FCA library is currently located in a building section originally intended for classrooms or computer labs, without sufficient infrastructure or physical space

to integrate specific study rooms and labs to provide training and other activities. To minimize the negative effects of the site's facilities, FCA provides a room separate from the library environment for students who prefer to study in groups and offers spaces for collective study spread across the campuses. The library's training sessions are given in the schools' computer labs and classrooms;

- Both the CIDDIC library and the NICS collection do not have adequate space and equipment for on-site access to materials;
- The PAGU library had very little space before the recent move to the new building, and still reports insufficient investment resources;
- At the CLE library, the technical processing area is small and needs to be renovated to improve the layout;
- At NIED, despite the importance of its collection, there is no circulation due to lack of space and a librarian. The Center has adopted a series of initiatives to address the problem, such as digitizing part of the collection, partnering with SIARQ to preserve and circulate the memory of the projects and donating part of the collection to the FE library.

Regarding security, most libraries possess or have purchased a security system with cameras (FT, IEL, IE, IB, FCM, FEF, FE, IMECC, IQ, FEA and IFGW) and use magnetic tapes for the security of materials. In general, they do not consider the use of radio-frequency identification (RFID) technology for the automation, security and management of collections due to the high cost, despite the advantages in collection management and more efficient and reliable circulation processes, in addition to providing greater property protection. Only six libraries have adopted it or plan to use it in the near future (IMECC, FCA, IQ, FEA, BAE and BCCL).

Little investment has been made in fire prevention, as only the IFGW library has acquired a system and the IA and FCM libraries consider it a priority. This is a matter of concern, not only due to the vulnerability of this type of facility, but also because there was a concrete case in the recent history of the university (IEL).

## 10.10 Advances and challenges in university management

In the last five years, Unicamp has made significant progress in university management. Despite the budget constraint experienced since 2014/2015, Unicamp was able to structure a number of important measures that resulted in improved management.

The institution has evidently advanced in the deployment of strategic university management, not only by aligning PLANES with the Institutional Evaluation and promoting strategic projects, but also by adopting metrics and indicators to manage projects and work processes, as is the case of enterprise management, and formulating objective criteria for decision making in hiring/replacement processes and budget allocation.

Regarding organizational structure, through a new certification of their organizational structures, schools and interdisciplinary research centers reviewed their



work processes, aiming to simplify and merge structures, reduce hierarchical levels and increase organizational efficiency. This review was important, given that the university is experiencing an intense cycle of staff retirement which will probably not be accompanied by a similar rate of replacement, since the services provided by the actual institution are undergoing a process of evolution, standardization and computerization.

Several of Unicamp's strategic goals depend directly or indirectly on ICT. Among them, the "2020 Digital University" project is the most significant and one of the pillars of the strategic map. In this sense, several efforts and initiatives were deployed to create an ICT Governance, which did not previously exist due to the decentralization of IT services and development. One of the initiatives was the adoption of "Software as a Service" (SaaS, or cloud computing services) solutions to achieve a balance between our ICT costs and the budget allocated to that item. In addition, several computerized systems were developed in order to optimize and streamline non-core activities, impacting core activities.

Other important advances relate to structuring the Communication Department by combining the two bodies responsible for communication (ASCOM – Communication Office and RTV – Radio and Television). This enabled progress in 2014-2018 in structuring new external communication platforms and setting up procedures and practices for internal communication.

Lastly, some of the challenges Unicamp still needs to address relate to optimizing resource management and making efforts to solve essential infrastructure issues such as accessibility, completion of unfinished building works, regularization of building safety with the Fire Department, creation of living spaces, modernization of computational networks and solutions, making full use of its human resources and work and research capacity. Regarding sanitation management, the challenges relate to renovation of the existing infrastructure on the campuses, over 50 years old, and continuous review of the 2004 agreement with SANASA according to current water consumption levels and new demands generated by the growth of the campuses. In addition, procuring funding for sanitation (FEHIDRO, BNDES, PAC – Ministry of Planning, Ministry of Regional Development, Caixa Econômica Federal, among others) will also be important.

The next five years will require the institution to sustain the budgetary-financial balance, a challenge overcome in 2018 thanks to efforts started in 2017, as well as preserve academic and technical-administrative staff compatible with the goals of upholding the institution's recognition, with an effective policy of valuing both; maintain laboratories (teaching and research) and classrooms with modern systems, adequate computer equipment and functional and adequate physical spaces; and, finally, urgently simplify and reduce bureaucratic processes that consume valuable staff time which could otherwise be dedicated to the production of knowledge, which is our core activity.

# **EXTERNAL EVALUATION**



**11.**

**STATEMENT OF THE EXTERNAL  
EVALUATION COMMITTEE ABOUT  
THE PRE-UNIVERSITY EDUCATION**



## 11.1 Introduction

This statement was prepared by the External Evaluation Committee for Pre-University Education at the University of Campinas, designated by Ordinance GR 115 of November 21, 2019, and published in the D.O.E. of November 22, 2019, Section I, p.60. It was based on the documents entitled *Preliminary Report of Institutional Assessment 2014-2018*, *Political-Pedagogical and Curriculum Plan of the Technical High School of Campinas (COTUCA)*, *Political-Pedagogical Project DA/NA DEdiC – Books 1 and 2*, and *Political Pedagogical Projects of the Technical High School of Limeira (COTIL)*. The committee's activities were carried out between February 10 and 12 of 2020, including meetings and visits to the units. The analysis was performed following the external evaluation guidelines previously presented.

The evaluated points are organized in relation to the quality and presentation of the data, as well as according to aspects of the Division of Children and Complementary Education of Unicamp (DEdic) and the Technical High Schools of Campinas and Limeira, thus following the items of said guidelines.

### 11.1 Quality of the data and presentation format

Firstly, the committee recognizes the transparency of the data, related to the infrastructure, management or human resources, but it also positively highlights the groups' willingness to share and accept its contributions in a summative process of institutional evolution.

The external evaluation committee identifies the absence of a theoretical-methodological framework indicating and integrating the objectives and starting points and systematizing the analysis and criteria for choosing data related to Pre-University Education. The inclusion of a historical perspective that is capable of incorporating Pre-University Education units in the institutional mission is recommended.

The newly created DEEPU mentioned in the Pre-University Education chapter has not explained its performance in relation to basic education at the municipal and state levels and in Unicamp's mission since the presentation of the document. It is recommended that Unicamp's management consider DEEPU's participation in the University Council (CONSU) to ensure the effective integration of the units with the university as a whole.

From the previous observations, it is suggested:

- i. to organize the report so as to allow the inclusion of summary tables presenting the indicators chosen according to the specificity of the offer and the respective locality, or even to allow the effective comparison of each unit's evolution throughout the evaluation cycle;
- ii. considering that the report refers to 2014-2018, it is suggested to explain the actions of the institution and of the units in the years following the evaluation cycle, and how they are aligned with the critical analysis of the evaluation. This



- need is mainly perceived based on the observations made during the visits, which clearly show progress in relation to the report;
- iii. due to the large volume of actions, projects and dynamics within the units, the inclusion of documentation such as photos, plans and other elements could grant materiality to the evaluation.
  - iv. to review the structure of the items making up the documents, paying attention to the concepts to properly organize them and their ways of implementation (Political-Pedagogical Projects of the Units, Curriculum Plan and Pedagogical Project, and Course Plans).

## 11.2 Early Childhood and Complementary Education

DEdiC's action, based on the report and visits, points to the recognition of the division's performance and commitment to the preservation and maintenance of the learning space. In this direction, we reinforce the importance of the respective units consolidating themselves as members of Unicamp by establishing a organic relationship with the institutional project it is inserted in.

In this context, it is essential that DEdiC moves forward in the development of the referred department's political-pedagogical project, and that this project is capable of covering the specificities of the different age groups contained in PRODECAD's proposal, from early childhood education to non-formal education, in a coherent and systematic way.

It is also necessary that all DEdiC units, including PRODECAD, explain their pedagogical political proposals and the theoretical-conceptual framework underlying the education of this group of children, with methodological clarity concerning the actions of teachers, as well as clear and precise evaluation criteria that are consistent with the theoretical-conceptual framework adopted.

It is observed that the department and its respective units have the intention of pursuing a learning process that promotes the integrality of the human beings inserted in its socio-historical context, and, as a result, we believe this idea should be further developed, giving strength and meaning to the pedagogical practices produced there in order to reinforce its formative, and not only welfarist character. Finally, the process of evaluation of teaching activities must be supported by the political-pedagogical project.

## 11.3 Technical High Schools

Based on the local observation of the technical high schools and the analysis of the documents, there is demand for greater clarity in relation to what is the mission of technical high schools at Unicamp today, its maintenance being important so that it may guide the development, implementation and evaluation of a curriculum that meets this proposition. The concepts of Man, Citizen, Society, Science, Innovation, Knowledge and Technology require greater clarification to provide a basis for the curricular proposal and its respective documents (pedagogical plans and projects of the course).

Although the document mentions important aspects regarding the curricular intentionality to cover the technical and humanistic formative dimensions, it is of utmost importance to collectively develop a Political-Pedagogical Project, with the effective participation of the entire community (educators, students, servers, managers and representatives of the external community).

For both schools, the report as well as the course plans comply with the legislation and with the requirements of technical and professional councils. However, given the intense dynamics of the work world, of the modern relations between society and technology, and considering how the catalogs themselves may be outdated in relation to the current conception of plural professional performance, this committee recognizes the potential of and recommends that schools develop innovative proposals that go beyond the regulations in force.

The high professional qualification and potential of the teams making up the high schools is notorious. The composition of multidisciplinary teaching support groups, the professional qualification of the teaching staff, as well as the acceptance of the courses by and their impact on the dynamics of cities in the region makes them suited to overcome the challenge of developing new dynamics of dialogue with the work world and assessing its adequacy not only in relation to the demands of the productive sector, but also technological, scientific and humanistic demands, with nationwide repercussions.

The nature of the two schools as technological education environments and their qualification to execute the projects and respective missions characterizes, above all, a paradigm associated with the definitions and correlations of technology in school life and in the development of methodological innovations. The complexity of the definitions of knowledge and the role of the school in its critical construction by educators creates challenges for both schools as to how technologies and methodologies will be incorporated into the teaching-learning process. If, on the one hand, technologies are identified as part of an institutional plan to support the dimensions of management and administration, on the other, there is need to prepare a clear pedagogical plan, using these technologies as tools to facilitate the development of critical, analytical and humanistic thought, while considering the way in which these instruments can be effectively used to create innovations and support teaching in the following mechanisms: supplementary lessons for failing students, advanced learning, academic probation programs, didactic modules, simulators, working groups, etc.

Clarity regarding the concept and function of the so-called “extracurricular activities” in the political-pedagogical project is recommended. The activities listed in the documents are, in fact, inherent to the curriculum proposal, and integrate the students’ formative process. Thus, classifying activities as extracurricular contradicts the basic principles contained in the definition of the schools’ curriculum and mission, as well as in Unicamp’s mission.

Additionally, the nature of the schools and their condition of belonging to Unicamp, as well as the training of the teaching and technical-administrative staff, emphasize, above all, the inseparability of teaching-research-extension in the constitution of the units’ school life. Based on this, it is suggested that these activities are understood first and foremost as constituent parts of the curriculum itself, and built collectively as part of the Political-Pedagogical Project. This organization must be based on the definition of university

extension adopted at Unicamp, as well as on the understanding that the dimension of research and innovation is inherent to professional training courses, assuming concepts such as research as a pedagogical principle and work as an educational principle.

Both the visits and reports indicate that despite the continuous effort of the management and administration team to improve infrastructure, there is still absence of access ramps, elevators, tactile flooring and other environmental accessibility adaptations, human and professional resources trained in Brazilian sign language (LIBRAS), and caregivers accompanying students with disabilities. Additionally, attention is drawn to the absence of safety procedures and measures for laboratories, technical inspection reports from the fire brigade, and mentions of waste disposal policies.

The committee recognizes the pioneering effort to create a system for monitoring alumni as part of institutional planning, and believes that the dynamics of development of a Political-Pedagogical Project with the external community's participation must be based on the contributions of former students. However, attention is drawn to the beacons used for the evaluation and monitoring of alumni, as their score in the National High School Exam or the quantification of new students and of professionals entering the labor market are insufficient elements to assess the high schools' mission and curriculum projects. Therefore, it is suggested to create a policy for monitoring alumni that is guided by international parameters and experiences, to allow the assessment of their formative process and of the impact of said process on Brazilian society and the labor market.

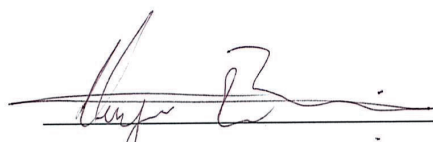
It is understood that the professional qualification of both faculty and staff is excellent, and consistent with the quality standards required. However, we emphasize the institutional importance of the pedagogical training of all education professionals, and of a clear continuing education policy that is adapted to the current needs, covering concepts of curricular integration, interdisciplinarity, and teaching-learning methodologies and assessment.

Finally, despite the previous indication of weaknesses in infrastructure regarding environmental accessibility adaptations, the quality of the laboratories, classrooms and libraries visited should be emphasized. In order to improve them, we suggest paying special attention to multiple-use laboratories in different areas of knowledge, promoting interdisciplinarity, as well as to collective living spaces that may encourage a pluralistic, humanistic and comprehensive formative process.

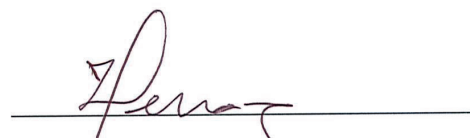
Finally, we congratulate the efforts of all teams directly and indirectly involved in the institutional evaluation process and highlight Unicamp's role as an institution par excellence and a national and international reference.

Campinas, February 12, 2020

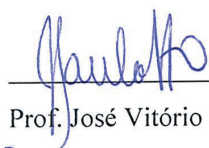
### External Institutional Evaluation Committee



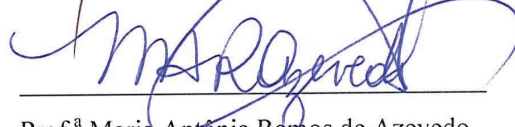
Prof. Huyra Estevão de Araujo  
IFSP/Piracicaba



Prof. Isnard Domingos Ferraz  
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Prof. José Vitório Sacilotto  
Centro Paula Souza/SP



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Prof.ª Maria Helena Guimarães de Castro  
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**12.**

**RESPONSE TO THE EXTERNAL  
EVALUATION OF THE PRE-  
UNIVERSITY EDUCATION**





The External Committee was made up of the following members: Prof. Huyra Estevão de Araújo – IFSP/Piracicaba, Prof. Isnard Domingos Ferraz – CAP-COLUNI-UFV/MG, Prof. José Vitório Sacilotto – Centro Paula Souza/SP, Prof. Maria Antônia Ramos de Azevedo – UNESP/Rio Claro, and Prof. Maria Helena Guimarães de Castro – CNE/Brasil.

The visit of the members took place between February 10-12, 2020. The Committee carried out the analysis and prepared a statement following the external evaluation questions previously presented.

The evaluated points were organized regarding the quality and presentation of the data from the Division of Early Childhood and Complementary Education (DEdIC) and from the Technical Schools of Unicamp (COTIL and COTUCA).

After analyzing all the documents made available and during *in loco* visits, the External Committee recognized the transparency of the data regarding infrastructure, management, and human resources. The External Committee positively emphasized how well the groups of each unit evaluated received them, which resulted in a summative process for the institutions' evolution.

The Internal Committee for Institutional Evaluation, after analyzing the issues indicated in the report of the External Committee, presents below its considerations.

The External Committee requests the inclusion of a historical perspective capable of including the Pre-University Education units in the institutional mission, pointing out that their performance within the perspective of primary education at the municipal and state level has not been made explicit. The Internal Committee understands that because the Executive Board of Pre-University Education is an innovative board within the University, its role is still being set up but that it fully fulfills its role with the basic premise of ensuring minimum standards of teaching quality. Unicamp has the vested supervision to authorize and supervise teaching establishments for primary and secondary education. This vested supervision is regulated by Deliberation CEE 152/2017, which entrusts the universities and public university centers, belonging to the State Education System, with this competence. This deliberation is recent, however it will be the legal basis for the historical construction of these units within the institutional mission. The Internal Committee believes that this new Deliberation will indirectly lead to institutional actions that contribute to the discussion and construction of methodologies linked to primary education at the municipal and state level.

The External Committee advised the management of Unicamp to consider the participation of the Executive Board for Pre-University Education (DEEPU) in the University Council (CONSU), to ensure the effective integration of the units with the University as a whole. This discussion is in the higher instances of Unicamp, however with the intention of making the directors of the technical high schools full members of CONSU. Although DEEPU is institutionally responsible for these schools, each unit has its own particularities. The Internal Committee understands that, institutionally, the inclusion of directors of the technical high schools will allow a more effective contribution to discussions within CONSU. Anyway, the topic has

already been discussed in the university's central administration and, in the near future, the directors will probably be included in CONSU.

The External Committee advised DEdIC to further develop its pedagogical political projects, so as to reinforce its formative and non-assistentialist character, and also to clearly reinforce its criteria for assessment, which must comply with the theoretical-conceptual line adopted by the division. This recommendation is in line with the wishes and desires of the DEdIC management team and, since the setting up of DEEPU, in April 2017, the pedagogical team has been guided in this direction. Thus, this recommendation is consistent with the understanding of the team, which has already started studies to align its pedagogical proposals.

Regarding technical colleges, the Committee highlighted the current lack of clarity concerning the mission of the units at Unicamp. Moreover, the concepts of Man, Citizen, Society, Innovation, Knowledge, Technology, which should guide the curricular proposal and its respective documents (plans and pedagogical projects of the courses), are not clear. It was also suggested that the effective participation of the entire community (teachers, students, employees, managers, representatives of the external community) be included in the construction of the Pedagogical Political Project. The Internal Committee recognizes the difficulty that the managers of the units are facing in terms of the construction of the pedagogical political project to clarify the conceptions pointed out with the effective participation of the whole community. The formation of representative committees for the community has been worked on and this recommendation will be addressed as one of the themes to be included in the strategic planning of the Schools.

The External Committee pointed out that the course plans of both technical high schools are in line with the laws and requirements of technical and professional councils, but stated that the schools must move forward with innovative proposals. Aware of their capacities, in recent years, the schools have been very concerned about this point, and modern high school and technical proposals have been a constant consideration. The Internal Committee evaluates that these curricular changes involving innovative activities will be shown in the next five years of institutional evaluation. This observation is also in line with the next issue highlighted by the External Committee, which points out the noteworthy high quality and capacity of the teachers and staff who are engaged in the running of the schools. The External Committee proposes that the schools implement the challenge of elaborating new dynamics regarding the world of work and the technological, scientific, and humanistic demands. The Internal Committee considers that this challenge meets the expectations of the schools, which is to make better use of human potential to strengthen the teaching and learning process.

The External Committee emphasized the inseparability of teaching-research-outreach in the establishment of the schools' life. Furthermore, it also highlighted the definition of university research and extension, as well as the understanding that the dimension of research and innovation is inherent to professional training courses, and that the conception of research is a pedagogical principle and that work is an educational principle. The Internal Committee evaluates that the profile of the

students and teachers of the technical high schools has changed. The dynamics of association between theory and practice is increasingly encouraged and necessary, especially from the perspective of technical training linked to the world of work. It is understood, therefore, that the inseparability of teaching-research-extension must be rethought. Today, it occurs indirectly in schools, because the professor's career does not include research and the time spent in the classroom is 70% of their working day. Currently, application research, linked to the world of work, is already a reality within schools, and its accomplishment occurs due to the inclusion of project disciplines in the curricula.

The External Committee also signalled the need for improvements to the building infrastructure and accessibility adjustments. A lack of safety was also generally observed in the laboratories. However, the quality of laboratories, classrooms, and bibliographic collections was noted. The External Committee recommended the multiple-use of laboratories in different areas of knowledge, including interdisciplinary training, as well as being collective spaces for school coexistence that can encourage a pluralist, civic and comprehensive training. The points highlighted in this item corroborate the information presented by the Internal Evaluation Committee. However, in the period evaluated, it is also a fact that the administration of the schools did not spare efforts to advance the building adaptations, already obtaining some significant improvements, mainly in Cotil, which already has its own building for its activities. As Cotuca is located in a rented building, the Internal Committee considers that its infrastructure can only be effectively changed after the move to its own headquarters.

The External Committee recognized the efforts to create a system for monitoring alumni, and suggested a greater participation by the external community, which should be made up of alumni. The Internal Committee admits the fragility of the data and points out the importance of including this suggestion in one of the themes for the strategic planning of the technical high schools.

Despite the emphasis made by the External Committee on the excellent quality of the school teachers and staff, they highlighted the institutional importance of efforts towards pedagogical training of all professionals and a clear policy of continuing education that meets the current needs, including the conception of curricular integration, interdisciplinarity, methodology and teaching-learning concepts, and assessment. The continuing education of professionals working in the units that make up the DEEPU has been widely encouraged, including internationalization, studies, and participation in various events.

In general, one of the main points highlighted by the External Committee, which the Internal Committee understands as fundamental, is the need for organization and articulation between the Political Pedagogical Projects, Course Plans, and curricula in the three units that make up the Executive Board of Pre-University Education. The Internal Committee evaluates that this matter is under discussion and in advanced implementation within the Technical High Schools and is being developed in the different DEdIC units. The origin of DEdIC was due to the need to support employees by offering a place for their children while they were

working but today it is understood that its role has been transformed. The story of how the DEdIC units were set up explains how there is a lack a political pedagogical project. As already pointed out by the Internal Committee, the implementation of actions such as improved communication and opportunities for a dialogue between professionals working in the DEdIC units will establish the continuity of training between pre-university teaching units at Unicamp through DEEPU as well as the legal basis derived from Resolution CEE 152/2017.

In the technical high schools, the Internal Committee considers that the biggest challenge is to effectively integrate the vocational curricula to that of high school. The greatest difficulty will be the implementation of multidisciplinary meetings and review of curricula. These improvements will take place based on team effort and continuous evaluations that will be carried out for the success of the entire process.

**13.**

**STATEMENT OF THE EXTERNAL  
EVALUATION COMMITTEE ABOUT  
TEACHING, RESEARCH, OUTREACH AND  
CULTURE AND UNICAMP MANAGEMENT**





## 13.1 Introduction

This report is the result of the external evaluation of the State University of Campinas, herein referred to as Unicamp, São Paulo, Brazil, which took place virtually due to the COVID19 pandemic instead of the site visits planned for March 2020. This report summarizes the results of the analysis conducted by an external team of peers herein referred to ERC, invited by Unicamp to review the “Preliminary Report of Institutional Evaluation Unicamp – 2014/2018.”

### 13.1.1 The Preliminary Report of Institutional Evaluation Unicamp – 2014 /2018

The report process was undertaken by a management team led by the Rector of the institution, Professor Marcelo Knobel, together with the following Vice-Rectors/Provosts and Executive Directors:

- Eliana Martorano Amaral
- Fernando Augusto de Almeida
- Francisco de Assis Magalhães Gomes
- Nancy Lopes Garcia
- Munir S. Skaf
- Teresa Dib Zambon Atvars
- Mariano Laplane
- Newton Frateschi
- Rafael Dias
- Ana Maria Carneiro

The distinctive features of the report are:

- Strong emphasis on the self-evaluation phase
- Local, regional and international perspectives
- Support for improvement and transformation

In general, the Report provides an extensive, detailed and well-balanced summary of the work done by Unicamp during the 2014/18 lustrum. It demonstrates the significant achievements of the University and also provides an objective discussion of key current challenges. It should be noted that the period of analysis includes a portion of the tenure of the previous institutional administration (2013-17) and a portion of the current institutional administration (2017-2021) headed by Rector Marcelo Knobel. The Report clearly indicates that Unicamp has been developing steadily and without any doubt progressively.

### 13.1.2 University of Campinas: national & international context

Unicamp is a foundation state university established by law on December 28, 1962, but effective functioning begun in 1966. As a public university, it held two major celebrations, the first in 2016 commemorating the 50th anniversary of its foundation and the second between 2018 and 2019 for the 30 years of academic, financial, and management autonomy. The university occupies a prominent place in the national and international scenario of Higher Education, Science, Technology, and Innovation. Unicamp profiles itself as an ambitious and proud institution, with a high level of awareness of its uniqueness and commitment towards an interdisciplinary view of higher education, and the will to “make a difference” and bring change to the Brazilian higher education landscape. As a research-intensive university for which it is well-known to the world academic community, and it is deservedly considered one of the most powerful centres of education and research not only in Brazil but in Latin America as well. This is a tribute to Unicamp leaders, professors, and research staff. It happened likely due to the regular support of the state of São Paulo government and of the research foundation of the state of São Paulo (FAPESP). In 2018, the university had 37,927 students in 66 undergraduate and 159 graduate courses.

Unicamp is a large educational and scientific organization. Therefore, even in the Report, which includes almost 700 pages, only the most important aspects of its activities can be highlighted. We believe that such a volume of text, numbers, and graphs, already gives a rather complete and profound picture of the developments at Unicamp. In its intended purpose, the Report is an internal self-assessment of Unicamp. Views of the system “from the inside” and “outside” (namely, in this is the task of the External Review Committee) may at some points not coincide. The external evaluation may be useful for correcting some aspects, not noticed or considered as not very important. External assessment cannot constitute a “compulsory” impetus for correction. In addition, when perceiving judgments from the side of the external evaluation committee, it is necessary to take into account the difference (sometimes a significant difference) in the educational systems in Brazil and other countries.

The Evaluation Review Committee (ERC)<sup>1</sup>

- Valentin A. Bazhanov – Ulyanovsk State University, Russia
- Andrés Bernasconi – Pontificia Universidad Católica de Chile, Chile
- Silvia Braslavsky – Max Planck Institute for Chemical Energy Conversion, Germany
- Naziema Jappie – University of Cape Town, South Africa
- Thomas Maack – Cornell University, USA
- Francisco Marmolejo – Qatar Foundation, Qatar (ERC Chairperson)
- Patti McGill Peterson – American Council on Education, USA
- Luis Enrique Orozco Silva – Universidad de los Andes, Colombia (unfortunately could not join virtually)

1. See Annex 1 for further information about the members of ERC.

The ERC would like to thank the university for the virtual hospitality shown during the meetings and is grateful to the Rector, Professor Marcelo Knobel, for his openness and attention throughout the evaluation process. The ERC would like to express gratitude to all the other Vice-Rectors/Provosts and Executive Directors for their professionalism, collegiality, and candidness, with which they shared information and perspectives. Finally, our appreciation and thanks are extended, in particular, to Ana Maria Carneiro for having organised the meetings in an efficient and pleasant manner.

## 13.2 Methodology

### 13.2.1 Scope of analysis

This report does not include analysis of Pre-University Education, considering that a separate similar evaluation was conducted by another team of reviewers.

Even though the Report covers the 2014/18 lustrum, many discussions and analysis are extended beyond such a period up to the present time. In fact, recommendations for the way forward are intended to contribute to internal reflections in Unicamp about future institutional directions.

### 13.2.2 Methodological approach

An external review committee (ERC) was assembled by Unicamp. Some of the members of ERC have had previous professional connections with Unicamp, but none of the team members has any contractual relationship with the institution.

Due to COVID-19 pandemic, original plans for a site visit to Unicamp for the ERC were cancelled. In substitution, a series of weekly e-meetings aimed at discussing in detail each of the sections of the Report were held during the months of June and July 2020 (see Annex 2). During those meetings, the administration team of Unicamp and, more specifically, the heads of the departments in charge of each of the sections included on this Report, presented key accomplishments during 2014/18, introduced follow-up actions implemented during 2019/20, and outlined plans for the future. They also answered questions raised by the external evaluators. After, all ERC members interacted with attending members of Unicamp's management team. In addition, separate specific meetings were convened with heads of units involved in the analysis.

Considering that for a deeper and more objective look at Unicamp, sometimes more information was needed, the ERC members received timely responses to their extensive questions from Unicamp authorities. Unicamp's management provided to ERC members all requested background documents and a more detailed analysis on an *ad-hoc* basis. The ERC conducted only-members e-meetings to discuss issues and agree on findings and recommendations.

### 13.2.3 Limitations of the analysis

Even though virtual meetings were an excellent way to freely interact with Unicamp's leadership, the ERC missed the opportunity to conduct further separate meetings with faculty members, staff or students, due to the closure of the University.

Perspectives provided by the ERC are based on experience in different contexts, but the level of knowledge of its members about Unicamp's intricacies, day-to-day operations, and unique historical and contextual framework is, in the end, limited. Consequently, it may be the case that some of the assumptions, observations, and recommendations may not reflect such perspectives.

### 13.2.4. Schedule of Meetings (May – July 2020)

- May 22 – Unicamp and Undergraduate Studies
  - General Unicamp presentation: Marcelo Knobel, Rector
  - 2014-2018 Unicamp Institutional Evaluation: process and external evaluation work: Teresa Atvars, Vice-Rector
  - Undergraduate studies: Eliana Amaral, Vice-Rector/Provost for Undergraduate Studies
- May 29 – Graduate studies
  - Nancy Garcia, Vice-Rector/Provost for Graduate Studies
- June 5 – Research
  - Munir Skaf, Vice-Rector/Provost for Research
- June 12 – Outreach and Culture
  - Outreach and Culture: Fernando Hashimoto, Vice-Rector/Provost for Outreach and Culture
- June 19 – Management
  - Unicamp Management: Francisco Gomes, Vice-Rector/Provost for University Development
- June 26 – Management
  - General discussion about Management
- July 3 – Technological Innovation / Social Innovation
  - Technological Innovation: Newton Frateschi, Executive Director of Inova Unicamp Innovation Agency
  - Social Innovation: Rafael Dias, Professor at School of Applied Sciences
  - Unicamp Alumni: Ana Maria Carneiro, Advisor to the Vice-Rector
- July 10 – Internationalization
  - Internationalization: Mariano Laplane, Executive Director for International Relations
- July 16 – Internal meeting of the External Review Committee
- July 24 – Wrap-up meeting
  - Delivery of ERC Report and discussion with Prof Marcelo Knobel and Unicamp's leadership team

## 13.3 Undergraduate education

### 13.3.1 The Case of Exact and Earth Sciences and Engineering, and Multidisciplinary

The report covering the years 2014-2018 is certainly very comprehensive, full of data, and impressive in its breadth as well as in its depth in all covered areas. It reflects the enormous effort on the part of the administrators to put together the very complex and diverse functioning of Unicamp.

The report shows the many positive developments in Unicamp, as well as the points needing either improvement, changes, or deep elaboration in the area of graduate studies.

The general accent on inclusion is remarkable, such as are the efforts to incorporate the less privileged sectors of the society through various programs, in particular the PAAIS program. Similarly, new educational strategies are developed to improve the performance in the entrance examinations of students from public schools and of BBI students (self-declared black, brown, and indigenous people). In this context, the program ProFIS (Higher Education Interdisciplinary Program), a university pre-professional two-year program, created in 2011, aims at students who attended Secondary Education in public schools in Campinas. In fact, the Report demonstrates that the incorporation of the less privileged sectors to Unicamp has changed many of the approaches of programs and attitudes at Unicamp, making them more open and more prone to understand the complexities of societal development and better accept changes in general. Scholarships and housing represent a major positive effort at Unicamp, as well as the partnership with institutions outside Unicamp. This is imperative to effectively implement the inclusion programs.

#### *Observations*

The number of undergraduate students from the countryside of the state of São Paulo has notably increased in the period, which speaks about the increasing influence of Unicamp in the region. Notably is also the number of foreign students, in particular from South America (Colombia, Peru, Argentina, Chile, Ecuador) but also from Europe and Africa.

With regards to entrance to Engineering and Exact and Earth Sciences, current efforts are being undertaken to increase the low number of students entering these areas. This requires more attention.

A widespread problem in Latin American universities is the high percentage of drop-out at the undergrad level. In Unicamp, it is reported to be less than 20 percent (relatively low as compared with other universities) by adopting several strategies to decrease this number in the different schools, which is very positive.

There are also problems related to the completion times, especially in the area of Technology, but also in general in the Exact and Natural Sciences, as less than 40 percent comply with the required maximum completion time.

Very positive is the integration of undergraduate students in research or technological initiation activities (graph 3.17 of the Report), although the percentage in the Exact Sciences is low (15 percent).



Efforts are devoted to have the undergraduate students participating in student exchange programs. This obviously enhances the horizon of the students who also bring fresh ideas to Unicamp upon return.

### *Curricula*

Regarding the curricula in the various disciplines, a remarkable effort has been made to implement changes and updates. A strong multidisciplinary approach has been taken involving the whole University.

### *Observations*

1. Twelve percent of the programs have not reported updates, especially in Engineering and in Exact and Earth Sciences (as recognized in the report, section 3.2.2). With the rapid development of digitalization, robotics, artificial intelligence, new materials, the need of materials changes (less use of plastics), alternative energies, exploitation of special minerals, major changes need to be made in the mentioned curricula.
2. Internationalization of curricula vs. specific needs of Brazilian and Latin-American development and integration, as well as environment conservation. This constitutes obviously a permanent tension in the definition of the goals of Unicamp at large.  
The burning of the Amazonas, the non-restricted expansion of sugar cane and soja plantations, the local epidemics (Zika, Chagas disease, malaria, COVID-19), the possible use of local plants as sources of medicines, require local handling and local studies with a broad knowledge of local problems. A particular case in which this tension might be expressed is in the Chemistry curriculum; the Institute of Chemistry has its program approved by the Royal Soc. of Chemistry (London), a British Institution with limited knowledge of the Brazilian reality and its changes.
3. Elective subjects are not common practice in all curricula. If they are, they represent a very low percentage (as low as 3 percent), almost always are offered in the unit where the regular curricula courses are also offered and are frequently non-credited.

### *Recommendations*

- Expand the ProFIS program to include more students from the public schools, beyond Campinas.
- For the comprehensive formation of critical thinking: Increase elective courses, centering in the student interest, including out-of-unit courses (e.g., environmental issues for Engineers and Earth Sciences students, interactions of industrial emissions with the biosphere and water handling for Chemical Engineers and

Chemists, etc.). Reducing redundancy between courses should give more space for elective courses. This will require better coordination between professors in the different programs (a problem so far). The elective courses should be credited. Precisely in Chemistry and Chemical Technology, an effort should be made to include integrated interdisciplinary projects in their curricula (problem, section 3.2.2). *Include elective general sciences courses in arts and humanities curricula (in order to increase general scientific literacy in times of science denials) as well as arts and humanities in science curricula.*

- Reinforce the efforts to decrease the dropout percentage at the undergraduate level, by individual coaching through advanced students and also by increasing the adherence to teaching training programs.
- Insist in the update of curricula, including the new technological developments (robotics, artificial intelligence, new materials, sustainable energy sources, water management) considering the local specifics and needs (without neglecting international standards in the basic knowledge, of course).
- Reconsider the time required for completion of the technology program since a very low performance (less than 10 percent of students finish within the prescribed time) is observed (Table 3.8 of the Report). New technologies might require a longer study time. Not so bad but also low (ca. 40 percent) is the percentage of completion within time of the Exact and Earth Sciences students. Some schools have developed special programs to attack the drop out problem. There is space for improvement in this aspect.
- Develop special strategies to attract more students, and more young women, to the Exact/Earth Sciences and Technology programs. Engage advanced students in these efforts (visits to schools showing videos and experiments, open-doors' days at Unicamp, social media programs).
- Increase the use of the student-evaluation of curricula and performance of teachers and professors (as already performed in some schools, page 119 of the Report).
- Give credits to students engaging in outreach and social services activities.
- Should participation in undergraduate (UG) research programs be made compulsory? So far, it is not, and, e.g., only 15 percent of students in the Exact Sciences participate in the UG research programs.

### 13.3.2 The Case of Biomedicine, Biology, and Multidisciplinary

The biology and biomedicine units had outstanding accomplishments in the 2014-2019 period. These fields maintained and expanded their leadership position in the country and had significant international recognition. The units include the Faculty of Medical Sciences (FCM), the Institute of Biology (IB), and the Dental School of Piracicaba (DOF), as well as multidisciplinary units, including Pharmacy, Nursing, Speech Therapy, Nutrition, Sports and Metabolic Sciences, and Physical Education. By necessity of the particular expertise of external evaluators, and the major role of FCM and IB within the overall structure of Unicamp's main campus, the following evaluation will center on the undergraduate education in medicine and biological sciences.

The undergraduate teaching in medicine is shared between the faculty of the FCM and the IB, the former being responsible for the teaching of transitional disciplines (e.g., pathology, pathophysiology, immunology, microbiology, parasitology), the clinical disciplines, and the two years internship. The IB faculty is responsible for the teaching of basic sciences.

### *Students*

The undergraduate students are of exceptional quality. FCM is one of the most competitive medical schools in the country for student acceptance. This significantly contributes to the high quality of medical students. In addition, the student body is well diversified as to economic status, and more recently, as to ethnic and racial composition due to exceptionally successful programs of diversification (PAAIS, PROFIS, and BBI) that were highly expanded in the current period.

In spite of the high quality of the students, the lack of at least two years of pre-professional university education in the country creates significant deficiencies in their knowledge of foundation sciences (math, physics, chemistry, biology). This has a negative impact on the integration of basic and clinical sciences in the medical curriculum as the faculty of IB must expend significant time in foundation aspects of the disciplines that they teach in medical school.

The establishment of a general pre-professional university education is a national problem and cannot be solved unilaterally by Unicamp. However, the highly commendable PROFIS program (a two-year pre-professional university education to elevate the level of knowledge on foundation sciences as well as arts and humanities for students from public schools) is a good example of how effective a pre-professional university education can be. The performance of PROFIS students in medical school (10 percent of the class) has been very good.

### *Faculty and Administration*

Faculty activities towards undergraduate education in biology and biomedicine are complex as it involves not only education but also other activities. Thus, the full-time faculty of FCM, in addition to the medical education tasks and research, are active physicians, surgeons, and specialists in several of Unicamp's hospitals, clinics, and health outposts. In many instances, the professional and educational activities merge, becoming difficult to account for faculty teaching load. Recently, the FCM gave greater consideration to these merging activities resulting in a more just accounting of teaching loads. Nevertheless, there is still significant time pressure on the clinical faculty resulting in "burn-out," early retirements and increased turnover of faculty. On the other hand, the IB faculty is not only responsible for teaching the basic sciences of the medical school but also for several undergraduate multidisciplinary units. In addition, the IB is among the most, if not the most, productive research units at Unicamp, and its faculty is greatly involved in graduate education.

The time pressure is at least an important contributory factor to the decrease of FCM and IB faculty in the age range of 50-59 years, which is one of the most important faculty age groups in biology and biomedicine. In the previous periods, the losses of faculty at FCM were staggering. Although in this period FCM (as well as IB and multidisciplinary disciplines), was able to successfully replace the faculty who left, there are still questions on whether Unicamp is providing sufficient incentives to avoid excessive turnover. The hired younger faculty needs role models and mentors among the older faculty to fully attain their potential.

Moreover, when faculty rotate through administrative positions, which is the norm at Unicamp, the incentives are not sufficient to compensate for the added workload. This results in shorter than necessary terms of administrative rotations in the units, sometimes as short as three years. Although reasonable turnover of faculty administrative services has significant advantages, very short terms make it difficult to complete new initiatives, and in some instances, may increase rather than decrease bureaucratic inertia.

### *Curricula*

The curriculum of the medical school is modern as far as content is concerned. There is reasonable integration of the disciplines in the basic sciences following a modern international trend in medical education. From the first year, students are in contact with patients, another trend in modern medical education. The curriculum also adopts modern methods of evaluation (OSCEs). Although the structure of the internship years is currently under revision, a 2-years instead of a 1-year internship that was pioneered by Unicamp provides for excellent preparation for residency, which is one of the principal tasks of undergraduate medical education.

In spite of its obvious high quality and many pioneering innovative initiatives in the country, the undergraduate biomedical curriculum is still not adapted to the most modern medical curricula in the industrialized world. The main reason is that it does not follow a fundamental didactic concept of incentivizing self-study by students and providing opportunities to expand their horizons by elective and selective courses. Presently, the fields of biomedicine, biology, pharmacy, and speech therapy have zero electives in their formal curricula. This is unacceptable for a prime university in the country, such as Unicamp. The present central administration is aware of these deficiencies and is planning to correct them.

The main reason for the lack of time for self/group study and electives is that the present curriculum is fully occupied with excessive hours of passive learning, leaving students in classrooms and labs from 8-6 almost every single day of the week. The problem is not difficult to solve per se. There are several models to make time available for this purpose without affecting the factual knowledge that is presently delivered to medical students at Unicamp. One of these models was delineated but not executed in 2011. In this model three afternoons /week are left open for self/group study and electives in the first three years of medical school (and corresponding time in the 4th year) by just trimming 2-hours lectures to 1-hour, eliminating some redundancies, and reducing the hours of two subjects that were well in excess of the norm. Many other models employed by different

medical schools in industrialized countries also strive for freeing large portions of time for self-study and elective activities.

Another modern trend in medical education in the industrialized world is the integration of basic and clinical sciences. Although there are good examples of such integration in biomedicine (e.g., the course of neurosciences in the medical curriculum), and in this period, there were more efforts of integration, greater effort in this regard is desirable. One difficulty in accomplishing this integration is that basic sciences and clinical sciences are taught by faculty in two separate units (IB and FCM). The faculty of IB also teaches in different multidisciplinary courses. As a result, it is difficult -albeit not impossible- to direct their teaching specifically to medical basic sciences, and to organize together with their colleagues from FCM integrated basic-clinical sciences courses (e.g., physiology and pathophysiology). Administratively, that could be solved by having a group of IB faculty exclusively dedicated and specialized in medical basic sciences (e.g., medical physiology, medical cell biology), which would coordinate with their counterparts in FCM all curricular matters while maintaining their respective unit affiliations. The recent creation of a curricular committee to foster, among other things, better integration of the FCM and IB faculty is a good step in this direction

### *Combined MD-Ph.D. Program*

As a prime medical school in the country, the FCM has among one of its important objectives the formation of the future academic leaders in medicine as educators and researchers in biomedicine. This is best accomplished in industrialized countries by a combined bachelor (MD) and graduate program (Ph.D.). There is an enormous lack of such programs in Brazil. At Unicamp, after sometimes painful and contentious discussions, and back and forth attempts, the FCM successfully instituted the MD-PhD program during this period. This was an outstanding accomplishment. However, the program is still too timid as it reserves only two slots/year for students. The size of the program should be increased to create a sufficient student mass to be fully effective.

### *Recommendations*

#### ■ Students:

The excellent performance of PROFIS students in medical school suggests that it would be desirable to increase the representation of students coming from this program in biology and biomedicine fields. The PROFIS representation in medical school (presently 10 percent of the class) could be increased to 15-20 percent.

#### ■ Faculty and Administration:

To avoid excessive turnover of faculty, Unicamp should strive to increase retention of intermediate age faculty by using appropriate incentives, such as being flexible in accepting request for leaves of absence and sabbaticals, reliving teaching loads significantly when faculty rotate through administrative

and service positions, increasing the value of activities other than traditional lectures (such as student advising, student mentorship, instructors or facilitators of small group activities, and others) in the computing of mandated teaching loads.

#### ■ Curriculum:

Complete the modernization of biology and biomedicine and multidisciplinary curricula to the best international standards by adding significant time in the formal curriculum for self-study, group study, electives, and selectives. When the first step of modernization took place in the medical curriculum in 2001, the process was preceded by a week-long workshop involving faculty, students, administrators, medical educators, and staff. The curricular changes were presented and thoroughly discussed by the community before the implementation of the changes. A similar approach could be used to complete the modernization process.

Strive to integrate basic and clinical sciences in the curriculum by using faculty development tools to specialize part of the IB faculty in the teaching of basic medical sciences, and to promote combined planning of integrated courses between FCM and IB faculty.

Two-hour long lectures in the fields of biology and biomedicine are notoriously counterproductive and should be abolished, except in very special circumstances. Increase the flexibility of allowing students during internship years to gain experience by spending some clinical time in other medical centers, inside or outside the country.

#### ■ Combined MD-PhD Program:

Strive to increase the size of the program from 2 to 5 students/year to create a sufficient student mass to make it a more effective program.

### 13.3.3 The Case of Arts and Humanities

A large number of applicants, taking the entrance exams, enables Unicamp to choose talent and competent students (overall relation 1:15). Nevertheless, only 30 to 40 percent of students complete their education within the suggested period of 4 years (the average period is 4.5 years). This means that knowledge and qualification requirements during study at Unicamp are rather high. Due to mostly relevant curriculum and artful educational methodologies used by qualified professors and lectures (95 percent full-time), students gain a high professional profile enabling them to search for adequate positions in the employment market.

Almost 30 undergraduate programs in Arts and Humanities (full time and evening; 7,000 students), covering most crucial disciplines, may be considered a reliable indicator of high status in this area of higher education. It is worth noting that 50 percent of students have grants for education.



Many students engage in research activities (in 2018, there were 250 students from Humanities and 57 from Arts). This is an important opportunity for students, especially for those who wish to continue their education in masters and doctoral programs. Multi-interdisciplinary programs of various types make a significant contribution to the university's contemporary research goals. In 2018, international exchanges included almost 550 students. More than 110 foreign students confirm internationally wide interest for Arts and Humanities programs at Unicamp.

Offering didactic courses and courses for teaching should be endorsed as well.

### *Recommendations*

For the comprehensive formation and development of *critical thinking*, to increase general literary literacy, to promote a scientific worldview, as well as to provide a foundation for further study at the graduate education level, introduce into curricula credited elective or required courses such as:

- 'A Preface to Philosophy' (with the emphasis on questions like 'Why Philosophize?', 'Reading Philosophy (Kinds of Philosophical Writings, Reading for Understanding, Reading Critically, etc.), 'Writing Philosophy (The Nature of a Critical Essay, Organizing Essay, Achieving Clarity, etc.)';
- 'The Art of Scientific Rhetoric (with the emphasis on questions like What to Believe and How to Talk about Nature, The Role and Value of Rhetoric in Science and Education, Mnemonical Loci and Natural Loci, The Examples of Rhetoric in the History of Science and Humanities, etc.).
- 'Theory and Practice of Argumentation' or 'Practical Logic' (with the emphasis on assessment of arguments, types of arguments – inductive and deductive, justification, validity, truth, types of fallacies, sources and meaning of knowledge);
- 'A Preface to the History of Modern Science' (with the emphasis on questions like 'History of Natural Sciences,' 'History of Social Sciences,' 'Emergence of Multi- and Transdisciplinary Research, etc.)';
- 'Intermediate English' or 'English for Business and Communication.'

## 13.4 Graduate education and research

The review of graduate programs and research at Unicamp without any doubt speaks in favor of assessment of its development as a modern research and practically oriented university. Within the relatively short period, a little more than a couple of decades, Unicamp won recognition as one of the leading research universities in Latin America. Unicamp research covers a wide range of scientific disciplines in both basic and applied research. It is also significant the emphasis on cooperation with industry and business. Graduate education at Unicamp strongly speaks in favor of pursuing these aims vigorously and successfully.

A special chapter in the Report confirms that research is one – and quite demonstrative – indicator that Unicamp pays much attention to progress in this direction, and science is one of the crucial pillars of Unicamp progress.

### 13.4.1 The Case of Exact and Earth Sciences and Engineering, and Multidisciplinary

The broad spectrum of subjects treated by the various programs is really impressive. They address many problems of fundamental significance, such as ecological questions, problems of the chemical industry, technology transfer in agriculture, bioenergy, biomaterials, as well as improving the quality of biology education in the public school system, nutrition, pharmacology, plant biology, computer sciences, and biostatistics, and several others. The interdisciplinarity is remarkable, as is also the participation of students from all over Brazil into the graduate programs at Unicamp. The Interdisciplinary Research Centers cover a wide range of areas, and their respective profile integrates many disciplines.

Several of the programs have strong ties with technology companies, and the results from various studies have found their way into patents.

In the graduate programs, as pointed out for the undergraduate programs, there is a steady mention and general concern about social inclusion, in some cases in the formulation of the programs and projects, and often in the practical outcome in the form of services (e.g., in Dentistry). However, the answers given by the schools to the question of Affirmative Action in the graduate programs show a non-homogeneous approach. In some of the programs, for example, in the Arts and in other programs, there is a high concern about the problem and about incorporating all sectors of the society. In the Exact and Natural Sciences, Physics is an example in which care has been taken towards inclusion both in admission and further support. In other programs, however, such as those in Chemistry, confidence is expressed in the effect of the undergraduate efforts, and no provision is taken in the graduate courses. And still, in other programs, such as Engineering, all the Biological, and Medical Sciences programs and Applied Mathematics, the answer has been very negative, indicating that the only valid admission criterion is that of merit. With 50.7 percent of “people of color” in Brazil (Census 2010), this is obviously not a minority problem any longer.

Also remarkable is the irradiation of some programs into other areas of Brazil, as is, e.g., the case of the “Functional and Molecular Biology” program and, prominently, of the “Science and Technology Policy,” located within the Institute of Geosciences. This program senses a serious need in South America where often scientists, not trained to manage science, perform managing activities out of need. The professionalization of science management deserves increased support.

The number of programs that have received high grades by CAPES is noteworthy. In several of the programs, the professors participating have a strong international reputation and have obtained recognition for their work in the form of awards. Also remarkable is the number of thesis and dissertations carried out at Unicamp that have been recognized among the best in Brazil.

It is, however, sometimes difficult to see the reason for the formulation of several programs around the same concept, such as is, for example, the case around Food with

the programs on Food Technology, Food Science, and Food Engineering. A program on just Food should give the student the opportunity of getting a broad image of the field by taking several elective courses before following a very specialized pathway.

As Unicamp has several highly multidisciplinary centers interweaving many disciplines, it could be assumed that the graduate students would be able to choose elective courses that could result in a wider variability in his/her formation and better preparation for interdisciplinary teamwork. In light of these, the important issues are (i) the frequency of regular seminars in the research groups or general seminars in the Centers in which the graduate students present their work or make a survey of the literature, and (ii) how these seminars contribute to the evaluation of the graduate students.

Evaluation and accountability are issues causing controversial assessments. The quantitative approach (number of publications, H number, number of congresses, poster and oral presentations, number of patents, hours of seminars), whereas giving a tool for evaluation, leave out activities that are not represented by numbers, such as service to the community, participation in outreaching activities, helping the disabled or less privileged students, or even participating in the organization of scientific meetings, thus distorting the evaluation of professors and students. Being Unicamp immersed in a society with many social problems, ways should be found to evaluate activities “qualitatively.”

Regarding the general question about the “strategy to match Unicamp’s scientific production with that of internationally recognized institutions,” the strategies have been excellent: Unicamp’s researchers and the programs are well recognized in Latin America and internationally, as evidenced by the high citations that many publications receive, as well as by the participation of Unicamp’s professors in international meetings and societies, journal editorial boards, as well as by the participation of many foreign students in the graduate programs. However, a balance should be found in the conflict between the national vs. international focus.

The international conflicts and dangers (like the present pandemic) demonstrate that more focus should be given on approaching local problems with local solutions in the international context (think globally, act locally). For example, jointly with other South American universities, proposing new approaches to pressing common issues, such as endemic diseases (Chagas, malaria, COVID-19, vitiligo), infrastructure (transport, i.e., rapid trains, energy, housing), food supply, sweet water supply, wide availability of sewages and sewage treatment plants, contamination of inner lakes and rivers, that are confronted by various South American countries (the Paraná river bringing down the waters of the Amazonas Forest is a wonderful example). On these lines, and considering the financial constraints facing Unicamp in the near future, it would be advisable to prioritize some (few) goals.

Precisely Chart 7.1 on page 485 of the Report, presents a series of Thematic Fields and Priority Themes for high-level International Cooperation. Following these themes, which cover and interlace many fundamental research areas, should undoubtedly help to approach together (various universities from various countries, in particular from South America) the pressing problems mentioned in the previous paragraph. Undoubtedly, the cooperation activities already established with European and North American universities are a very positive asset and should be preserved and even enlarged.

For the purpose of integration and collaboration with universities in Latin America, the best approach might be starting from projects already initiated between a particular group in Unicamp with another particular group in another university, i.e., a bottom-up approach, and expanding then the program incorporating other groups.

The many technological developments, the relatively high degree of licensing, and the many incubated companies at Unicamp represent an extremely positive development. The many companies led by Unicamp graduates constitute a real treasure, which should be better “exploited” by Unicamp. Integrating these former students to the alumnae network, as proposed by the Office of the Rector, is a very positive step. In fact, considering that many graduates from Unicamp occupy prominent political and professional positions, the alumni network could become a powerful tool both for Unicamp (politically and even economically) as well as for the organization(s) in which the former student is active. Having alumni presenting their activities in a seminar should prove an extremely rich experience for those attending, as well as for the presenter, who could profit from newer developments and even be exposed to critical discussions (thinking about the energy sector, the ecology, the climate catastrophe, the origin of zoonosis, etc.).

Also, a very positive development is the creation of small companies by Unicamp students. This experience serves them to be better prepared for the work market.

### *Recommendations*

- Introduce creative ways of discussion (Seminars, Lectures, Art performances) at the university level, with the participation of staff and students from Natural Sciences, Biomedical and Humanity and Arts Schools, regarding the problems, opportunities and ways of solving the questions around inclusion (especially in the graduate programs) of all social sectors.
- Analyze possible overlapping of graduate programs, tending to the more efficient use of resources and a broader horizon for the students.
- Strengthen the relations with Latin American Universities focusing on priority themes, by promoting and helping the agreements and projects between individual groups (from Unicamp and other academic institutions, in particular in South America) around the priority themes already defined in Table 7.2 of the Report. These individual agreements should serve as seeds for larger joint projects.
- As pointed out for the undergraduate students, and more so for the graduate students, the students should be able to choose among various elective courses. These courses should be credited. The goal should be expanding interdisciplinary abilities and favoring teamwork.
- Promote (and credit within the normal graduate courses) intra- and interdisciplinary seminars in research groups and in Centers, in which the graduate students present their work-in-progress or even a survey of literature on novel subjects.
- Find ways of recognizing the engagement of professors and students in activities that cannot be measured quantitatively.

- Help the alumnae organize themselves and work with them in activities supporting Unicamp. Bring them to discuss actual problems with the students and professors.

### 13.4.2 The Case of Biomedicine, Biology, and Multidisciplinary

#### *Graduate programs*

Almost half of Unicamp's student body are graduate students, supporting the conclusions that Unicamp's greatest strength is as a research university. In 2018, out of approximately 17,500 students, there were 1,380 Master's dissertations and 1,040 doctoral theses. The proportional number of Ph.D. doctoral thesis is not only the best in the country but is impressive even by international standards. The more recent Professional Master's program, an important CAPES initiative, increased significantly by 63 percent from 2014-2019. In addition, Unicamp offers graduate courses to non-regular students contributing significantly to higher learning of professionals.

In spite of the impressive number of graduate students, the lack of ethnic-racial diversification of the graduate student body is still disappointing. Some programs in graduate education use the same arguments against affirmative action initiatives as were used in the past for undergraduate education at Unicamp. As shown in chart 4.6 of the Report, the success of the undergraduate affirmative action programs did not yet affect many graduate fields of sciences. On the other hand, the graduate programs in arts and humanities are attempting to do much better on affirmative action initiatives.

The graduate program has an important internationalization component with students and professors working in programs abroad. None of them is more important than the CAPES Sandwich program. It is lamentable that presently the CAPES program was significantly defunded, crippling to a great extent the internationalization efforts of Brazilian universities in general and of Unicamp in particular. The decrease at Unicamp in funding for this program reached 50 percent.

In this period, there was also an increase in the number of professors and students coming to Unicamp from abroad, mainly from Latin America, a positive aspect that expands the diversification of the graduate faculty and student bodies.

With few exceptions, there has been a decrease in the ratio of incoming students/Professors in all units of the Biology, Biomedicine, and Multidisciplinary Units. This may be good for students as they can receive more attention from their mentors, but it may decrease the research productivity of the mentor.

As far as the CAPES evaluation of Unicamp's 73 graduate programs, 15 had the highest grade (7), followed by 18 with grade 6, and 18 grade 5. Thus, almost 70 percent had superior, excellent, or very good evaluations. This is an exceptional accomplishment, the very top for Brazilian universities. Unicamp had about 26 percent of the programs with grade 4 (good, but below average for the funded graduate programs). Some of them were new programs that usually receive lower evaluations initially, but many were established

programs. The latter deserve special internal evaluation to seek areas of improvement within these programs. In this period, Unicamp's graduate programs received a significant number of CAPES Awards, two grand prizes, 18 awards, and 26 honorable mentions.

The Institute of Biology was the highest-rated program in Biology and Biomedicine. From the seven graduate programs of the IB, almost half (3) have the highest CAPES grade, i.e., they are programs at the level of the best international programs. Two have excellent CAPES grades, one a very good grade, one a good grade, and none has a marginal grade. This is a truly impressive performance in this period.

One of these programs (Biology Education) is targeted to science teachers of K-12, with the expectation to support a key deficiency associated with a generally low level in science education in middle and high school, which is due in great part to poor teacher preparation. Thus, this graduate program is of great importance and should be emulated in other graduate Unicamp's science units.

The 13 graduate programs in the School of Medical Sciences (FCM) continue to perform at a good level. In CAPES evaluations, two were rated as outstanding, three very good, and seven were good. There is a predominance of programs that were considered simply good. For FCM, one of the prime medical schools in the country, one would expect a somewhat better overall evaluation of its graduate programs. The reasons for that are not entirely clear. Part may be due to the fact that some of these programs were young, but the majority were important standing programs at FCM. Part may be due to the recent large turnover of faculty at FCM. In the previous period 2009-13, FCM had lost no less than 50 faculty positions. This was at least partially compensated in the present period with the addition of new faculty. It is too early to state whether the new faculty members will be able to further improve the standing of the graduate programs that received only a good grade. However, some of these programs are very valuable.

Unicamp's Dental School in Piracicaba is one of the foremost research-oriented dental-school in the country. As such it has seven graduate programs: Dental Chemistry (CAPES grade 7) Dental materials (Capes grade 6), Dentistry (CAPES grade 7), Oral Biology (CAPES grade 5), Oral Pathology and Oral Medicine (CAPES grade 6), Oral Radiology (CAPES grade 5), and Management and Collective Health (CAPES grade 5). Thus, all the courses are well above average, 60 percent being superior or excellent, and 40 percent very good. By any standard, national or international, this is an outstanding accomplishment.

The graduate program in Nursing received a CAPES grade of 5, showing that it is an above-average program. The program also received a CAPES Thesis Award.

The Nutrition, Sports, and Metabolic Sciences graduate program (CAPES grade 4) is an interdisciplinary program that is presently in a consolidation phase.

The Pharmaceutical Sciences program (CAPES Grade 4) started in 2017, has good possibilities of improving its evaluation by joining forces with the pharmacology program of the Institute of Biology.

The Physical Education graduate program (CAPES grade 4) is an established program that, among other strengths, distinguishes itself by graduation the most PhDs in the field in Brazil (366 doctoral theses.)



The new MD-PhD is in a separate category as it combines an undergraduate and graduate education. It was an important accomplishment during this period. The program is still too new to allow for evaluation

### *Research with emphasis on Biology and Biomedicine*

In this period, Unicamp maintained and expanded its status as a premier research university in Brazil.

In spite of the economic recession and inflation in the 2014-2019 period, Unicamp kept its level of public funding that is mostly provided by two federal agencies (CNPq and CAPES) and one state agency São Paulo Research Foundation (FAPESP), and to a lesser degree by the federal agency FINEP. The support by CNPq decreased significantly, as much as 50 percent, but this was almost entirely compensated by an increase in the support by FAPESP and FINEP.

In 2014-2018 there was an 8 percent increase in the number of indexed articles published by Unicamp researchers compared to the 2009-2013 period. However, the indexed scientific production compared to the country as a whole decreased somewhat in this period. The probable reason is that the production of indexed articles increased more in some other Brazilian universities and institutes. This could be a positive sign as scientific production in less developed areas in Brazil is increasing.

Unicamp's normalized citation impact index (CNCI, a useful index of institutional research productivity) was greater than that of USP and UNESP, the two other major public universities in the State of São Paulo. As a whole, the CNCI for Unicamp was also respectable when compared to international standards.

Another strength of the research program is a large number of Research Centers, including CEPID (a competitive excellence program among the universities of the State of São Paulo funded by FAPESP) and eight centers of excellence under the umbrella of National Institutes of Science and Technology (INCT). This is a highly competitive program, and the wide representation of Unicamp in the INCT further demonstrates Unicamp's important leadership in research in Brazil. In addition, there are several important thematic research centers that contribute significantly to the excellence in research at Unicamp. In combination, all of these programs provide for a great degree of interdisciplinarity, which is a modern trend in research in the biological and biomedical fields.

As pointed out by the internal report, a general weakness of the research programs at Unicamp is the relative paucity of research seminars and invited research speakers. This denotes a certain lack of communal dynamism in research at Unicamp.

The School of Medicine (FCM), the Institute of Biology (IB), and to a lesser degree, the School of Dentistry in Piracicaba (FOP) are by far the better-funded research units. IB is the better-funded/faculty unit with an impressive (even by international standards) of approximately US \$300,000/faculty. The decrease in funding in this period compared to the previous period at FCM and FOP was less than that of USP and UNESP.

FCM and IB accounted for 44 and 28 percent, respectively, of the published articles in indexed journals, but FCM has 3-4 times more faculty than the IB. In terms of scientific

output, the biomedical sciences are slightly below international standards and above Brazilian standards. FCM and FOP had a decrease in published articles compared to the 2009-13 period. The internal report attributed this issue to a decrease in the number of faculty at FCM and FOP in this period, but this is not clear (see below). Pharmacy, a recently created program, has had a good performance in relation to the traditional Unicamp programs. The Nursing research program is too recent to be subject to external evaluation but already got an award.

There are some concerns in the internal report about a certain decrease in research funding and productivity at the School of Medical Sciences (FCM). The internal report tends to attribute this to a decrease in the number of faculty. It is true that there was a slight decrease in 2017 and 2018, but it was minimal (1 percent or less). On the other hand, there was a large turnover of faculty in the last ten years, and the new faculty may not be as productive up to now. The concerns of the internal report about the FCM are valid, but the observed decrease in funding and productivity did not reach a critical level. In international terms, it is very complex to compare research performance at FCM with that in first-rate international medical schools. The latter usually have strong basic sciences departments, which is not the case at FCM and other Brazilian university medical schools. The faculty of the IB, not of the FCM, provide the basic science component of the medical school and produce a great deal of basic medical research at Unicamp. Therefore, it is not fair to compare the research productivity at FCM with medical schools, e.g., in the USA. Moreover, in addition to the high turnover of faculty, there was a major decrease in the age group 50-59 years, which usually is a very productive age group for research in biomedical sciences. In any event, in regard to future strategic planning, it is valid to focus on potential research shortcomings at the FCM. The FCM is still the largest research component in biological and biomedical sciences at Unicamp.

In all units of the biological and biomedicine field, there was a very large proportion of foreign authors' collaboration, reaching 25-30 percent or even more of the published articles. This is very positive as it shows significant internationalization of the research program at Unicamp. However, as pointed out in the Report, it is practically a one-way internationalization as researchers from developed countries rarely come to Unicamp. In addition, it reinforces a tendency among Brazilian scientists to hesitate to develop lines of research and/or methodologies that are not being pursued in more developed countries. However, overall the significant collaboration of foreign authors to the scientific production of the faculty in biological and biomedicine sciences is very positive. English proficiency in spoken and written language is nowadays a necessity. Unfortunately, the lack of English proficiency has impaired the full development of many students in science graduate programs as independent scientists.

As recognized by the Report, except for the IB, apparently no unit has a regular cycle of research seminars. This should be corrected as soon as possible because normal cycles of seminars in research units increase the possibilities of collaboration among researchers. It also provides for intellectual stimulation and dynamism that is an essential component for research performance in academics. In essence, the lack of systematic research seminars is my major criticism of the research program in the biological and biomedical sciences at Unicamp.

## Recommendations

- If the funds by CAPES dedicated to sending graduate students abroad do not increase substantially for the next period, Unicamp should make a great effort to search for alternative funding to support a program similar to the CAPES Sandwich program.
- The lack of ethnic-racial diversification of the student body in science graduate programs is not simple to solve. The acceptance of students in graduate programs is more subjective than in undergraduate fields. The individual decisions of the faculty of science graduate programs determine to a great extent the selection of the students into the graduate program. The central administration and CONSU could, in theory, dictate rules for affirmative action measures in the science's graduate programs. However, such unilateral centralized measures are not within the cultural framework of Unicamp. Thus, a major effort should be directed to create awareness about the benefits and advantages of wider participation and inclusiveness. It would be beneficial to have a number of workshops with the participation of students, faculty, and knowledgeable professionals on the practicalities of implementing affirmative action initiatives at the graduate level.
- The number of slots for the MD-PhD program (2/year) is too small to create a critical student mass for the program to be fully effective. The ideal immediate goal for this purpose would be about 5 percent of the medical school class (in the best MD-PhD programs in the US, the proportion is 10-15 percent.)
- All graduate programs with CAPES grade 4 (or below) should be internally reviewed to analyze the possibility of improvements, including the merger with other similar programs.
- Although the research productivity of the FCM faculty is still at very high levels, if the small decrease in scientific productivity observed in the present study continues in the near future, the FCM should review the criteria for hiring new faculty members. It also should provide enough incentives to avoid that more senior and highly performing clinical faculty retire prematurely from their full-time academic position.
- Weekly research seminars in all biological and biomedicine units should be scheduled and posted on all science units of Unicamp to provide for the intellectual stimulation of the faculty, promote greater exchange among the researchers, and increase opportunities for collaborative research.
- All graduate programs in sciences should require full proficiency in spoken and written English before graduation. For this purpose, Unicamp should offer rigorous and intensive English courses, which include written examinations for the ability to write a composition and oral examinations for spoken English. This course would be mandatory for all science graduate students, except those who demonstrate that they are already proficient in spoken and written English.

### 13.4.3 The Case of Arts and Humanities

A section of the Report (chapter 5) shows that Unicamp pays special attention to Research and Development (R&D). Despite inflation at 35 percent, funding for Arts and Humanities, for instance, has risen by 31 percent in 2014-2018. For some indicators (publications in journals), there was an increase (8 percent), for some indicators a decline (publication of books – 20 percent). This happened probably due to worldwide increased demand for articles in journals from the WoS/Scopus databases and more active cooperation with scientists from other countries (the growth of joint articles from 42 to 54 percent). Hence, the growth of indexed articles took place in all areas of research (FE, Education from 0.1 to 0.28; IFCH from 0.18 to 0.48; IEL from 0.04 to 0.66, etc.).

The number of articles with foreign co-authors increased as well: FE from 0 to 0.17; IFCH from 0.06 to 0.12; IEL from 0.03 to 0.49, etc. At the same time, the growth of articles in leading foreign journals is 157 percent, artwork creation even 556 percent (!). All these figures show that key problems, methodology, and methods of research are not only adequate for modern R&D (Arts and Humanities included) and used both by Unicamp professors, and graduate programs students, but an indicator that Unicamp scientific and technological products are internationally recognized as well. Almost 1,400 Master dissertations and more than 1,000 doctoral theses in 2018 speak for themselves.

Noteworthy, that multidisciplinary research is 2 percent above the world average. The active work of more than 20 Interdisciplinary Research Centers at Unicamp contributes to this result.

It should be stressed that Unicamp production exceeds Brazilian in all areas of research. It is very likely that the master dissertations and doctoral theses exceed in quality the Brazilian average level. Twenty-three graduate programs in Arts and Humanities, most with the grades from 5 to 7 in Education, Political Sciences, Sociology, Philosophy, Music, Literary theory, etc. show a very high level of graduate education and research at Unicamp.

Publications in leading foreign journals with a high quartile (Q1, Q2) are certainly very important and contribute to the growth of the university's reputation and R&D growth. However, these publications always were done in English. A decline in publications in Brazilian journals of 25 percent is noticeable. Meanwhile, the development of national academic terminology is crucial for many reasons. The decline in publications in Brazilian journals in this aspect may suggest that more attention must be paid to the preservation of the national academic thesaurus.

The 'visibility' and world academic community standing of Unicamp may significantly increase when construction of the university website in English, with detailed information related to Unicamp research groups, centers, programs along with personal webpages, is completed.

#### *Recommendations*

- For the further development of critical thinking, to promote foundations for academic excellence, and preparedness for Multi- and Transdisciplinary Research, the introduction of elective courses into the curricula is recommended:

- 'Introduction to Logic' (with the emphasis on Propositional Logic, Natural Deduction, Predicate Logic, Induction, Causality and Mill's Methods, Probability, Statistical Reasoning, Hypothetical Reasoning);
  - 'A Historical Introduction to the Philosophy of Science' (with the emphasis on the Emergence of Science in Ancient Greece, Galileo, Francis Bacon, Descartes, Newton's Axiomatic Method, Positivism and Conventionalism, Evaluative Standards, etc.).
  - 'General History and Philosophy of Science' (with the emphasis on problems related to rationality, Objectivity, and Values in Science, Laws of nature, Empiricism and Scientific Realism, Intertheoretical Relations, Science and Pseudoscience, etc.);
  - 'Ethics of Science and Technology; Fundamentals of Bioethics';
  - 'How to Write an Academic Paper';
  - 'How to Write a Winning Grant Proposal' (the Basics in Social Sciences, Psychology, Sociology, etc. – dependent on the field of future work);
  - 'Upper-Intermediate (or better Advanced) English.'
- It is recommended to organize regular seminars to discuss the latest achievements, novel methodological trends, and crucial literature in the field of current interest.
- For all graduate students (some recommendations are dependent on the field of future work) some recommendations include:
- 'General History and Philosophy of Science and Technology' (with the emphasis on problems related to rationality, Objectivity, and Values in Science, Laws of nature, Empiricism and Scientific Realism, Inter Theoretical Relations, Science and Pseudoscience, Techno-Science, etc.);
  - 'History of Mathematics,' 'History of Physics,' 'History of Chemistry,' 'History of Social Sciences,' 'History of Psychology,' etc. – dependent of the field of future work;
  - 'Philosophy of Mathematics,' 'Philosophy of Physics,' 'Philosophy of Chemistry,' 'Philosophy of Social Sciences,' 'Philosophy of Psychology,' 'Philosophy of Art,' etc. – dependent of the field of future work.

## 13.5 Outreach and culture

In the external review analysis, best practices existing in foreign universities with a similar background, size, and complexity to Unicamp, were considered, without disregarding the importance of context and its implications for the functioning of the institution. Overall, the analysis considers whether the self-evaluation process adopted by Unicamp in the area of outreach and cultural dissemination had clear public goals aligned with the institutional mission statement and the corresponding Development Plan; whether it enjoyed efficiently organized human resources and physical infrastructure to achieve them; the level at which they are being achieved; and the capacity to continue consolidating its institutional project.

## 135.1 Outreach

Outreach (or Extension) avers exactly what is involved: a reaching out from Unicamp to the community and organizations it serves. Outreach involves transferring knowledge and technology from the university to its constituents; the flow is basically one way. The University's cultural activities, on the other hand, are what is described as the institution's 'transformational power. It helps to transform:

- people, through their experience as students and members of staff;
- knowledge, through scholarship and research; and
- society, through the communication and application of knowledge and through the University's wider role in the community.

Unicamp provides active and vibrant outreach and cultural programs that give students the skills, opportunities, belief, and confidence to pursue their own goals. In doing this, Unicamp also connects students with faculty and the community, which is important for further education and employment. However, this necessitates a clear understanding and definition of the terms used in the Unicamp report.

The Preliminary Report gathered a large amount of information about outreach, highlighting the lack of reporting of many of these activities that take place in academic departments or through the initiative of students and faculty, despite the coordination work done by ProEC, or even of activities performed by academic departments independently or supported by other institutions. Even so, a few particularly relevant numbers stand out. For example, the 2019 report informs that 299 projects and programs were carried out in the 2014/2018 period, although some schools did not report related data.

An important component of outreach is related to courses being offered outside of the regular academic scheduling and student audience. This important work contributes to increasingly position Unicamp in distance and virtual education (MOOCs) or hybrid formats. This area has huge potential and growing demand in the region, despite concerns about the academic quality of distance learning, as indicated by the report. In addition, the schools offer extension courses, which are not always recorded.

The Preliminary Report also describes a good number of external services provided, such as consultancy services in various areas and subjects; services to communities and municipal youth organizations; execution of projects in technology areas; dentistry and arts projects and activities involving the community and the university; partnership agreements with the Brazilian Ministry of Education and Culture; provision of technical services to several laboratories, among others.

As informed in the Report, these multiple and varied activities stemming from different areas of Unicamp do not represent the full perception of the different schools and institutes about the characterization and importance of this activity under the Forproex guidelines; consequently, the evaluation of its importance is not homogeneous, as many events are not reported or afforded the same importance as teaching and research activities.



This situation is reinforced by the fact that, in faculty performance evaluations, this variable does not carry the same importance and weight assigned to academic work or teaching and research. In addition, it is a voluntary activity and performed on a low budget.

### *Achievements*

- Overall the Unicamp Outreach and Cultural Programs are achieving positive results for participants. Some of the programs are successful in a complex environment to make a difference in education and other associated outcomes for the young people and the community.
- The programs positively impact the strengths, resilience, and aspirations of students. The programs supported by ProEC must be commended: ITCP; Projeto Rondon; Universidade, and the Preparatory courses.
- There are many activities which are worthy of mention, like the Health projects where the impact is visible. The idea of CESCOP is good because it relates to the strategic plan and the academic agenda of Unicamp.
- Regarding Unicamp's core functions, it is important to note how outreach activities have contributed to raising students' awareness of their future professional practices, which in turn has enabled an improvement in curriculum programs and the creation of theoretical and practical teaching processes and methodologies. In relation to research, some activities resulted in research projects or were incorporated in some schools. Outreach's work at Unicamp enjoys relevance at national level, but not international.

### *Challenges/shortcomings*

A significant concern is that of the concept of outreach, which was not clear in the report. As the report states: *"The lack of alignment of the concepts of outreach and the underappreciation of outreach activities in academic areas greatly contribute to these distortions"* (Report p. 397). For instance, populations studied in research projects seem not to be part of outreach. Similarly, clinical education and practicums are dimensions of teaching, not outreach, though they engage communities outside Unicamp. But what about service-learning? It is up to Unicamp to tighten its definition of what counts as outreach.

Engagement of students in learning activities with community partners as part of their academic experience has become increasingly prevalent in today's educational settings and therefore required a more structured approach.

Whilst there are some good initiatives from schools, there seems to be a lack of alignment to the strategic plan and no accountability to ProEc; except in some instances. In addition, there is a lack of coordination and a clear framework, even though there are a number of interesting activities. Example: there are clear interactions between IRC+ CIDDIC + LUME and IRC + CESOP + NEPP on policy work. (Ref p. 426 of the Report) However, no

alignment between the work of IRC to PLANES (ref. p.430 of the Report). Also, despite the adequate alignment of NUDECRI and PAGU to the Strategic Plan, the situation is different when it comes to evaluating it in relation to the Forproex guidelines. The alignment seems to be less evident in the research centers and interdisciplinary research centers, especially in following the Forproex guidelines. It should be noted that sometimes research projects do not report their outreach activities, while outreach projects with involvement in research are not reported as such.

Regarding the impact of outreach in teaching, the incorporation of outreach activities in curriculum programs and educational projects is still fairly unsatisfactory, with the exception of the Institute of Arts and Humanities.

Also, although there is evidence of great incentives from external stakeholders, there are no internal incentives for faculty and students, which could enhance self-motivation. There is a serious disconnect to the formal curriculum, which should take into account the five principles of Forproex. Therefore, there is no consensus about what constitutes best practices for the community partners, or even what types of benefits might accrue to communities that participate in these mutual exchanges with academic partners.

Another important issue is that outreach programs are beneficial not only by providing the students with an academic foundation but also to develop their self-confidence, leadership qualities, and their responsibilities toward the community. Thus, the report had no clear evidence of monitoring and evaluation, which in turn makes it difficult to gauge the impact.

The students deliver relevant and meaningful care that relates academic content to the real world. The programs at Unicamp do not illustrate how this strengthens their sense of responsibility toward their studies and whether it had a positive impact on their attitudes regarding care for communities.

Finally, faculty's priorities, incentives, assessment depend on research and somewhat less on teaching. Outreach is ignored and depends on the vocation of individuals who care about it. It is a fact everywhere that in faculty assessment research performance will always trump everything else. Unicamp could reflect and decide whether outreach is an expected part of the profile of tasks of all professors or just of those who have a personal interest in them.

### *Recommendations*

- There is a need for a clear definition of outreach using the Two -pronged approach of informal education and training for adults and more formal, curriculum-based education for students. These should include:
  - Service Learning
    - Community engagement
    - Further and continuing education (diplomas),
  - community development,
  - Partnerships/Collaboration
  - Technology transfer, consulting and technical assistance,
  - Policy development

- Outreach programs should be encouraged so that students not only become knowledgeable in their own field of study, but also develop features such as community awareness, community involvement, commitment to service, career development, self-awareness, leadership qualities, awareness of determinants of health, and understanding of course content. This requires proper assessment.
- Engagement of students in learning activities with community partners as part of their academic experience has become increasingly prevalent in today's educational settings and should be linked to credits, assessment, and evaluation
- In an effort to address the scholarship of engagement, it would be useful to look through the lens of service-learning and community engagement to explore the quality and impact vs. quantity and impact of Unicamp's outreach programs and how it matches with community development needs and the transformation agenda
- Institutional partnerships and collaborations are essential for connecting institutions in an increasingly global world and for sharing knowledge and expertise. The strategic plan clearly outlines priority programs – Outreach & Society; Outreach & Evaluation; Infrastructure - Solutions to global challenges are unlikely to be found by one department or faculty, but groups of faculty working together and bringing their multiple perspectives to work on the challenges. Reason to increase international outreach.
- In the matter of whether and how outreach “counts” for faculty advancement, Unicamp could define more clearly whether outreach is an expected part of the profile of tasks of all professors, and thence align assessment, incentives, recognitions, based on the three missions of the university, or it would rather remain peripheral to faculty assessment and advancement.
- In the future, it will be necessary to develop procedures and indicators to measure and evaluate the university's outreach work and increase resources from the main budget for this function, whose potential as something truly exceptional is recognized by everyone at Unicamp.

### 13.5.2 Culture

Lifelong learning for individuals is a reality in a developing society that has organized ways of raising its collective educational level, of gaining new knowledge, and of applying the new knowledge. Unicamp, with its strategic positioning within Sao Paulo, must be key in developing these societies. Culture is generally felt to be about nurturing the creativity and interpreting the world in new and challenging ways that improve the quality of life. It involves interaction between students that are productive, and between students and their communities. It is often said to encompass not only the performing and visual arts but also other areas of the humanities, as well as aspects of heritage, the sciences, and sport.

Unicamp's existing and potential cultural strengths are not well recognized or cherished at present. There is an important job to be done in raising awareness of this aspect of the University's life and so capitalizing on it. In an increasingly competitive higher education environment, it is becoming essential for universities to differentiate themselves in the market

and to make the most of their advantages. A more dynamic cultural life would be valuable in its own right, but it would also have implications for Unicamp's identity and reputation.

### *Achievements*

- The formation of a new Board – D Cult was indeed a very good idea to ensure a proper governance structure. Unicamp has many amazing cultural activities. It seems much of the work is focused within the confines of the CIDDIC, which plays a prominent role.
- It is evident from the report that there are some good linkages though with the IRC; LUME; NICS and Arts Institute with the CIDDIC. The following schools have shown interest and commitment to the theatrical arts – FENF; FCA, and IFGW even though they are in nursing, applied sciences, and physics, respectively. This is very encouraging.
- It is commendable to see that Exact and Earth Sciences, Biological and Biomedical Sciences programs acknowledge culture as part of student development and have culture in some cases as part of the curriculum. (ref. p 454)

### *Challenges and shortcomings*

Regarding the alignment of cultural activities with Unicamp's Strategic Development Plan, the Preliminary Report consistently informs that there is no alignment with the institution's previous Development Plans since the policy on this subject is recent. Such alignment will be gradually achieved and consolidated.

However, the concept of "Culture" should be further conceptualized. What does it mean for Unicamp? Can this be part of the outreach program? This is not clearly understood.

Also, it is needed to understand the concept institutionally of what this means and the governance structure. This is a very important limitation considering that there are no visible structure/ outcomes to the ProEc, and there is a lack of accountability from departments.

Funding is an issue that can threaten the sustainability of the many diverse programs.

No clear marketing and growth potential.

Very limited scope of cultural activities – what about student clubs and associations where do these fit? No mention of debating teams, volunteering.

Only once were sports mentioned – this is essential for better health and well-being of students.

### *Recommendations*

- Unicamp must persist in its efforts to create viewpoints and consensus within academic departments on what exactly is involved in cultural production, provide

improved organicity among activities within schools and interdisciplinary research centers, improve infrastructure for events and other activities and increase incentives for those who commit to these initiatives, which for the time being are voluntary.

- Consequently, there is a need for clear objectives:
  - To establish a broad policy and development framework within which cultural activities and assets are formally acknowledged as significant contributors to the University's success and supported accordingly
  - To help existing and proposed cultural enterprises succeed and to safeguard and promote cultural assets
  - To help faculties, departments, divisions, and student groups identify and pursue new cultural opportunities
  - To achieve greater internal and external recognition of the University's cultural strengths
- Sports as a cultural activity does not feature much in this report – it is an important aspect of student mental and physical well-being. Develop the University's provision for sports to meet the needs of students and staff and build stronger links with the community.
- A possibility that students can apply to participate in the Intercultural Leadership Program. This brings together a group of domestic and international students for a series of workshops and projects, with the aim of nurturing "an intercultural community of leaders who are ready to take on issues they are passionate about, learning more about communities different than their own, and make a lasting impact."
- This could be extended to the residences, which promotes intercultural exchange by encouraging students from diverse backgrounds to live together in a shared accommodation facility and also to participate in a series of social, academic and cultural programs.
- A final aspect to be highlighted concerns the appreciation of cultural dissemination activities and of outreach work in general when evaluating faculty performance. In the departments' view, they are underappreciated in faculty performance evaluations. Perhaps the solution here might be what happens in other institutions, which acknowledge the value of teaching in comparison to research when evaluating faculty. Likewise, it is a question of evaluating the correlation between outreach and culture and teaching and research work in faculty performance.

### *A final note*

Unicamp has an opportunity, elicited in part by the outreach and cultural programs, to consolidate and take forward all activities. This would be an inherently positive move and would also bring significant benefits in terms of the quality of life for students and staff, the identity and reputation of the University, and the nature of its relationship with the city-region.

The vision and mission outlined in this report indicate clearly what would be required to make this a practical proposition rather than a pipe dream. It is hoped that these recommendations will be taken forward by the appropriate office, used as a working document by relevant project leaders and reviewed in three years' time.

## 13.6 Internationalization

The University of Campinas is a leading institution not just in Brazil but also in Latin America. It also has extended its global recognition through its research programs and collaboration. A comprehensive internationalization strategy is not only an important way to continue to expand its global reach but also to bring international dimensions to Brazil and particularly the state of Sao Paulo, through the international mobility of its students and faculty, by carefully designed international research and outreach programs and by a commitment to internationalizing its academic programs for students who are unable to study abroad. We commend the university's continued progress in its internationalization efforts and provide the following observations and suggestions toward the continued strengthening of that work.

### 13.6.1 Strengths

During the period of the Unicamp self-evaluation, internationalization has been elevated to an important strategic priority for the university. The report has provided substantial trend data for student mobility at both the undergraduate and graduate levels as well as data on the number of international students enrolled at Unicamp and the international diversity of the faculty and research activity.

Of particular significance for its internationalization efforts is the university's understanding that international partnerships with other universities should be approached from both a strategic and comprehensive perspective. This approach of emphasizing fewer but more robust and multifaceted partnerships is a wise decision.

Unicamp's participation in a number of global networks is also an important way to bring an international dimension to all facets of the university. Its membership in Santander Universia is not only an important network with Latin American institutions but also a network for other global links. Moreover, the Santander relationship also provides funding for support and expansion of Unicamp's internationalization efforts.

The university no longer benefits from federal support of the Science without Borders program, but the relatively new PrInt Program introduced by CAPES shows great promise as an important aspect of Unicamp's internationalization. The priority themes chosen by the university invite multi-disciplinary cooperation on important topics of both local and global relevance.



### 13.6.2 Areas for further attention and improvement

*Increased internal collaboration for internationalization:* The highly decentralized structure of Unicamp makes it difficult for a strategic, collaborative approach across the institution. For example, opportunities to further develop a full range of internationalization activities with the strategic partner universities will require cooperation at the undergraduate and graduate levels as well as in research projects. The PrInt Program presents an interesting collaborative model, but it is limited by CAPES to graduate-level education.

The inherent centralization-decentralization tension existing at Unicamp is also reflected in the limited scope of work and level of influence of the Office of International Affairs. This is a systemic issue requiring a serious analysis as Unicamp plans future organizational reforms. Being mindful of the many legal and bureaucratic limitations in place, nevertheless, there may be areas in which a more coordinated approach in key areas such as the acquisition of a second language will yield positive results.

*More emphasis on comprehensive internationalization:* Much of Unicamp's internationalization focus thus far has been on student and faculty mobility and international research collaboration. The internationalization of the curriculum has taken a back seat to these other initiatives. This important aspect of comprehensive internationalization is often referred to as "internationalization at home" and warrants more attention. The reality is that the overwhelming majority of students are unable to study abroad but would benefit from greater global, multicultural perspectives in their academic programs. This is an activity for which the Office of International Affairs can play a significant enabler role, but it requires direct involvement of the different Schools, and also of related institutional support units. Also, this may require a carefully developed Comprehensive Internationalization Plan with high ambitions but an incremental approach.

*Targeted incentives:* Given the limitations of a centralized approach to internationalization at Unicamp the availability of incentives will be important to encourage greater participation by Schools and Institutes whether in collaborative activity with partner universities or in such things as internationalizing the curriculum. Such incentives will require budgetary support during a time of scarce resources.

*Expansion of international networks and the role of alumni:* While Unicamp is a member of many international networks, it can benefit greatly from developing its own networks through its graduates who leave Brazil to pursue their careers in other countries. This has the potential of opening up many cross-border connections. Nurturing a more targeted relationship with alumni can reap significant benefits to Unicamp that can be channeled into the internationalization activities conducted by the university. Recent efforts towards identifying alumni, mapping their location, and connecting with them, are actions in the right direction for which the Internationalization team should get involved. We applaud these efforts and encourage the university to further develop this capacity.

*Widening language competencies:* Unicamp exports more students to study abroad than it imports. Whereas Unicamp is a well-regarded university internationally, the ability of foreign students to speak Portuguese is undoubtedly an obstacle in expanding foreign student enrollments. It will be important for the university to consider to what extent it

wishes to promote the study of Portuguese for foreign students versus offering programs with tracks that are taught in English. With only 5% of professors and researchers from other countries, the language issue may also be a factor for this group as well. Related to this issue, there seems to exist good institutional capacity to support faster, wider, and more effective acquisition of competencies in English and other languages by students and faculty members. However, this may require revising the approach and focus of the Institute of Language Studies.

*Connecting areas of excellence with internationalization:* In a competitive global landscape for higher education, it is difficult for young universities to compete with institutions that have longstanding recognition internationally. However, international reputations can be accelerated and enhanced by the selective choices universities make. It is not clear whether Unicamp can or will decide to foster a higher global profile in certain areas of research, teaching, and outreach. However, such considerations should be part of its internationalization and strategic planning discussions.

*Assuming a leading internationalization role in Latin America:* A significant advantage of Unicamp is its gained recognition as one of the top universities from Latin America in the international context. Nevertheless, as the university aspires to become more widely recognized globally, it may miss the opportunity to more effectively connect with universities in the Latin American region, as a way to address challenges and opportunities within the region.

### Recommendations

- While it is important to continue to support and expand international mobility for students and faculty, Unicamp needs to include in its definition of comprehensive internationalization a plan for internationalizing academic programs at Campinas for the many students who do not have the opportunity to study abroad.
- In working with the university community, the International Office should make clear what aspects of institutional internationalization require ongoing cooperation across the university by all schools and institutes. It may be necessary to review the list of functions, areas of authority and areas of coordination that both, the central office of internationalization, and the schools and institutes have, in order to explore a more effective array.
- To further the work of internationalization, the university should consider having a designated member in every school and institute who is responsible for helping to guide the international agenda toward clearly described goals and outcomes. Importantly, there should be incentives to encourage this work at the level of schools and institutes.
- English is the lingua franca for the academic world. While there is great merit in teaching and preserving the use of Portuguese<sup>2</sup>, students, and faculty who study and do research internationally need more opportunities for English language acquisition. This may require further review if the Institute of Language Studies

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2. Brazil is known for a number of indigenous languages

is adequately suited to support such an effort, or if a different arrangement is needed.

- An international alumni network will substantially help with the university's internationalization efforts. We encourage Unicamp to move forward with this important initiative.
- As Unicamp further considers what kind of global footprint it wishes to have in teaching, research and extension, we recommend that discussions around these topics and ultimate decisions be a central part of the university's strategic planning.
- As Unicamp further develops its international profile, special attention is recommended towards a more effective outreach to other universities in Latin America. This can be achieved without diminishing efforts of collaboration with other regions of the world. Nevertheless, the opportunity to assume a more prominent role as an enabler of internationalization in the Latin American region is highly recommended.

## 13.7 Social and technological innovations

The 2014-2018 Report on social and technological innovations set impressive goals, demanding actions and efforts across multiple interconnected social, economic, and environmental issues. Innovation is often given complex definitions, but it is easier to refer to new ideas that work. Universities exist in for three reasons, and Unicamp is no different:

- To preserve and transfer knowledge to the next generation (education);
- To create new knowledge and understanding (research); and
- To assist and promote society through training, development, and technology.

Unicamp's innovative activities and services are motivated by the goal of meeting socio-economic needs that are mainly developed and dispersed through the university. Social innovation is different from technological innovations, which is generally motivated by needs for income generation and developing the STEM areas.

### 13.7.1 Social Innovation (SI)

It is very important for Unicamp to achieve significant development in the area of social innovation, going beyond the classic model of the University (von Humboldt), in which knowledge is an end in itself, with little or no awareness of its value for the development of society, but rather, promoting its importance for the development of the institution's area of influence and clearly assuming its social responsibility and urgency of being relevant to the country's development. In turn, the participation of students in projects and programs of broad social impact ensures the acquisition of experiences and ethical-political values as important competences of new leaders in their professional practice.

In the case of Unicamp, three central axes of performance are being considered: 1) making available highly qualified training; 2) developing adequate scientific-technological infrastructure that allows a broad relationship with the external business sector and the social sector in general; and 3) conducting applied research to solve problems in the communities where it operates and in its area of influence.

The Preliminary Report provides sufficient information about the cases that illustrate Unicamp's concerns regarding social innovation. Also, the Preliminary Report emphasizes specific aspects that can be considered of high importance from the perspective of student involvement in these activities. In addition, Unicamp performs activities to support solutions for structural problems in Brazil (poverty, exclusion, and inequality.)

### *Achievements*

- The report describes key conditions that enabled a successful university agenda for social innovation. Integral to this success is an overarching institutional commitment to the value of social innovation so that it pervades the university's activities.
- Excellent examples, without going into details, of social innovation are the PAAIS and ProFis programs, the innovations in health, and the ITCP program. The ITCP program has five (5) projects well-funded and is an important space for student learning. The university has taken pride in development in this area, and the staff /faculty must be commended for their amazing work.
- Unicamp is particularly well placed to stimulate a commitment to social innovation and has a diversified approach to community engagement. This is done by integrating innovative thinking, a commitment to the community, and activities among the student body. It was noted that students played a crucial role in SI and that they contributed significantly to the success of Unicamp.

### *Challenges and shortcomings*

New forms of collaboration are a serious challenge, firstly, both within Unicamp and across sectors, and new ways of working reflecting the greater knowledge about the innovation process itself. Secondly, new understanding about complex systems, about how people organize, and how ideas move between different types of partnerships (public/private, profit/non-profit, and public/profit/non-profit) is not clear. Engagement with local, regional, national, and international imperatives (including national policy frameworks and objectives) is crucial to establish the fitness of purpose of the institution. Adequate attention to be given to transformational issues in the mission and goal-setting activities of the institution, including issues of community engagement

One of the shortcomings is that social innovations are increasingly called upon to fill gaps left by devolution or divestment of responsibilities. In the context of the recent pandemic and economic downturn, the financial situation of Unicamp is riskier than ever.

## Recommendations

- Where SI is discharged through a range of activities, including service-learning, quality considerations for institutional engagement with the local and broader community should be formalized within an institution's quality management policies and procedures. These arrangements should be linked to teaching, learning, and research, where possible, and given effect through the allocation of adequate resources and institutional recognition.
- There should be an overall strategy, together with policies and guidelines, to advance social innovation Unicamp with the participation of all departments. An important point to note is that SI activities should transcend disciplinary boundaries in facilitating open access to information and resources that may be foundational to achieving relevant and sustainable solutions.
- Issues to be examined must include cross-disciplinary strategies and relationships; financing and funding models and mechanisms; governance issues; and accountability and evaluation in the social innovation field.
- There is a critical need for data sources, research infrastructure, and monitoring and evaluation processes to be established.
- Unicamp needs to invest in its work to better understand the return of investment of social innovation activities. Although the report has no empirical indicators of social impact measurement (because they are not always immediate or have an impact on cultural changes and lifestyles of communities, it is indicated in the document), it would be important to systematically measure this impact in the future.
- A university wide event should be created to bring together staff and students from all sectors. Who would be able to connect and to share effective practices, collaboration processes, knowledge transfer, and capacity-building? There is a need for the adoption of cross-sectoral strategies and the development of new networks.

### 13.7.2 Technological Innovation (TI)

Technological innovation is constant in Unicamp's management and comprises several dimensions: 1) technological innovations resulting from research activities; 2) achievements in protecting intellectual property related to research results; 3) technology transfer; and 4) culture of innovation and entrepreneurship. The report provides sufficient information about actions and achievements in each of these aspects. Some examples of particularly relevant projects and actions are provided below; they were selected for their impact and alignment with the institution's mission, without implying a hierarchy between actions and projects.

The information provided in the report is very accurate, well-known, and convincing to illustrate actions and projects and explain their importance in three basic areas: protection of products resulting from the research activity through intellectual property, technology transfer, and innovation and entrepreneurship.

## Achievements

- Science, technology, and innovation play a central role in the success of Unicamp. The process initiated by technological progress helps to transform economies and improve living standards by increasing productivity, reducing production costs and prices, and helping to raise real wages. Harnessing Unicamp's resources, combined with the motivation to address gaps and to develop technological innovations show the commitment to achieving sustainable development goals and producing more healthy and inclusive societies.
- Inova's strategic goals, as reported, are remarkable, ensuring high quality IP services; licensing resulting in increased royalties and, most notably, the 1000 alumni companies. The extent of the developmental impact of technological advances at Unicamp has illustrated transformative effects of society. In addition, new technological innovations have the ability of societies and policymakers to adapt to the changes they create, giving rise to widespread collaborations with Unicamp.
- Patents granted in a ten years period is impressive, from 9 (2008) to 71 (2018). Active Intellectual Property (IP) licensing agreements have resulted in financial gains for Unicamp. Overall the university has made enormous strides in R&D towards advancement of technological innovations for the betterment of the country. TI functions and processes are supported and developed in a way that assures and enhances quality and increases research participation and increases R & D productivity.

## Challenges and shortcomings

Regarding the Technology Transfer Office (TTO), it is important to note that benchmarking within the EU has shown that there is no clear evidence on the effectiveness of these intermediaries and their role in improving industry and science links. Hence, how does Unicamp view the TTO? Benchmarking frequently against internal and external reference points for the purposes of goal setting, improvement, and establishing institutional reputation and competitive edge is essential.

Also, efforts towards the development of regional clusters and science parks require significant funding. How is Unicamp securing funding for the science parks?

## Recommendations

- Although responses to the issue of impact assessment have shown progress, it is important to ensure that this is consistent for all projects/programs and sustainability of programs recognizing that the financial situation of the university needs serious consideration, given the current crisis. Impact studies must be undertaken on a regular basis to assess the effectiveness of quality



assurance, and quality enhancement systems Regular review of the effectiveness of benchmarking (mentioned above) and the extent to which survey findings are utilized for priority setting and quality enhancement is imperative.

- A key point to note for TI is that frequent reviews of the effectiveness of arrangements for the quality assurance, monitoring of R & D functions could enhance postgraduate education and research.
- For Unicamp, this means thinking constructively and creatively about how to integrate TI into existing operational frameworks, or indeed –as is already the case in some respects– building capacity and infrastructure around the current environment.
- Data usage is important in innovation. This includes data about the end-user as well as trends and cost implications. Data can help determine if a projected and planned solution will work and whether it is sustainable. Remember that innovation happens when desirability, feasibility, and viability intersect: that intersection is determined through data.

### *A final note*

The benefits of SI and TI at Unicamp extends regionally and beyond the present moment in time. In light of this, fostering innovation requires a certain amount of commitment and re-imagination. Unicamp must tolerate the disruption of today for a better tomorrow. It is crucial to foster a culture that embraces social and technological innovation, not based just on the assessment of costs and benefits—it has an ethical dimension as well. Nurturing innovation is part of good stewardship of staff and student development during this crisis.

## 13.8 Alumni

Main aims of alumni and their association are to create a desire among ex-students to identify themselves with their university; to generate and sustain interest and participation in the affairs of their alma mater; to contribute to the developments of the university; and to promote the university's name and reputation, particularly the role of alumni associations as an alternative income for universities.

In addition, an effective connection with alumni is essential to enrich and consolidate an institution. It is a relationship that, on the one hand, and through multiple actions, has an impact on the formation of the country's human talent and, therefore, contributes to its development. On the other hand, in the development of this role, the University helps to meet the country's need for well-educated citizens, as a way to improve social mobility and increase individual income.

## Achievements

- Unicamp has done a huge amount of work in catching up on the growth of its own programs in terms of tracking the effectiveness of that education and, eventually the alumni. In other words, they sought to obtain data on how many of their students went on to become successful social entrepreneurs or innovators and from which programs they graduated. A great effort was made to collect the data considered most pertinent and based on descriptive statistics to highlight the most significant topics in Unicamp's relationship with its graduates.
- The profile of the graduates identified as part of Unicamp's analysis shows very well the contribution of the institution towards the local and regional development, its strategic importance in the development of the country, and its role in training its students in multiple fields of knowledge and professional occupations.

## Challenges and shortcomings

Three key challenges identified:

- i. Alumni and institutional interactions are random and one-sided. To be fair, this was done for this evaluation cycle and will have to be given further consideration.
- ii. Lack of Alumni communications and engagement that do not provoke action for Unicamp.
- iii. Alumni interactions fail to add high value or provide high returns for realistic situations.

The shortcomings of the report are based on the fact that Alumni has not been a clear priority and no systemic approach for Unicamp. All the data collected, however, do not measure the success of Alumni and, more interestingly, the impact those Alumni created through their endeavors? It must be noted that the impact of an alumnus journey is deep and nuanced. There is a lot to discover and a lot of data to be leveraged.

Some key issues identified in Alumni data management and program evaluation execution include:

- i. *Collected data is not enough to discover and leverage insights.* Tracking only high-level data, simple outputs, which is used in reporting and marketing materials. This data includes the number of graduates, the number of registered companies created or the rate of employment, etc.
- ii. *Lack of incentives for alumni.* Incentivizing alumni to provide data is an issue across the higher education sector. The largest roadblock is asking respondents for time, time which they probably don't have (especially if they are entrepreneurs).
- iii. *Lack of cloud-based data management.* The main issue here is that administrators, faculty, and the marketing team should be able to have access, manage, and

utilize impact data. Such tools need to be user-friendly, easily accessible, and leveraged across departments. At least it will be most effective for all involved if this can be achieved.

- iv. *International Alumni relationship.* No data captured for Alumni who are based globally except on LinkedIn. This data is important to attract income for the university by visiting Alumni in other countries and establishing and maintaining contact with that constituency.

## Recommendations

- Considerations to be given to the following questions: What kind of impact are graduates creating in the world? How effective is our mentorship network? What's working really well, or what's not working well in terms of getting our graduates investment opportunities?
- One easy way to motivate better response rates is streamlining how respondents receive the request and how easy it is for them to navigate (for example, an online survey). On the backend, on the university side, that data needs to be stored in a way that allows it to be shared easily. That includes sharing results with those Alumni so that they can be told how their data helped and what exciting things are happening at the university. Future response rates may increase if there is information sharing.
- The benefits of cloud-based applications are obvious. A cloud-based tool focused on the alumni will manage, track, and report impact data, particularly across teams and departments at Unicamp. Such a tool will allow a more seamless transfer and management of data because it would be housed in one place and simply accessed via different accounts. Each person in the Unicamp ecosystem would then be able to access and leverage that data according to their needs and expertise.
- Creation of Alumni Associations for mentorship and expertise. It is important to create an alumni association which also helps with institutional governance. Alumni can play an active role in voluntary programs like mentoring students in their areas of expertise. They have a wealth of experience, knowledge, and skills to share with current students via talks and meetings.
- Establish communication platforms for alumni interaction and for income generation. Use projects to attract funding and keep Alumni informed at all times.
- Therefore, it is necessary that Unicamp, based on this pioneering study, defines a policy, strategies, and lines of action that it may implement in the immediate future to institutionalize and consolidate this relationship with its alumni, based on the question: what is the perspective (vision, strengths, and opportunities) of the institution to face this challenge with courage and with the best available knowledge?

## *A final note*

Creating an engaged, supportive alumni network is crucial to an institution's success. If communication stops once graduates depart from an institution, their understanding of the university will become outdated. An engaged and connected alumni network allows the University to benefit from the skills and experience of graduates, by offering support to current students, to the institution and to each other. In recent years assisting in employability is a real benefit. This enhances the students' experience and gives them that competitive edge in today's tough job market. The influence brought by the alumni community can be a win-win for both the institution and the alumni.

## 13.9 Management

Unicamp is a well-respected, comprehensive, and very complex university. Its bureaucracy and governance bodies are equally complex. The efforts by the senior administration to move the university forward through active strategic planning are well-conceived but also significantly limited by Unicamp's highly decentralized structure and state and national government mandates. While the independence of academic units is a valued tradition, it also limits progress toward the goals and outcomes that the university has set for itself. This is further complicated by the current COVID-19 crisis and an economic downturn that strains the university's resources. Agility and speed to address priorities need to be balanced against a multilayered governance structure and a deep and sometimes slow bureaucracy.

### 139.1 Strengths

There is much to admire about the administrative leadership of the university, including the diligence of its self-evaluation resulting in a voluminous report of its activity and progress during the period 2014-2018, and the openness to enable a review from external peers. The report and ancillary documents point to an active and dedicated management team working together to secure Unicamp's reputation for excellence in higher education in Brazil, Latin America, and globally.

As noted, the governance structure of Unicamp is complex. The CONSU, its highest governance body, brings a broad cross-section of representatives from the schools and institutes together with senior management to address issues of policy and practice. Decisions rendered by the body require a consensus-building process that represents an ongoing collaboration between faculty, staff, students, and the senior administration. This has the benefit of bringing many perspectives to the table for major issues facing the institution.

The Rector's Office has been restructured in recent years with the establishment of the Executive Board Offices. This has supported more focused attention to the administration

of the university's hospitals and health services, pre-university education in its technical high schools, early childhood and complementary education, strategic planning with special emphasis on issues of sustainability, and most recently inclusion, diversity, and equity in the Unicamp community. These additions reflect a prioritization of areas that are highly important to the services Unicamp provides to surrounding communities as well as the importance of sustainability and diversity in a modern university.

While the university's strategic planning efforts were underway in the 2014-2018 period, much of the report focuses on the content and direction of PLANES 2016-2020. We can assume that substantial effort was involved during the period of the self-study to develop and begin to implement the 2016-2020 plan. Importantly, the report indicates that this PLANES was based upon the 2009-2013 evaluation report. Maintaining a close relationship with self-evaluation and external evaluation builds a solid basis for developing an institutional strategy. The report's strategic planning documents show a strong conceptual understanding of the elements of strategic planning and the need for monitoring and benchmarking.

It is apparent that Unicamp is paying increased attention to communication within the university as well as with external audiences. Its action to consolidate communication in one office is evident of its desire to have a more effective communication system. Additionally, its open-access policies are heading in the right direction, for example, through the Scientific Electronic Journals Portal (PPEC) and, more recently, with the creation and ongoing addition of materials to the Repository of the Scientific and Intellectual Production of Unicamp.

Another important strength is Unicamp's highly disciplined management of its limited financial resources. In fact, right before the COVID19 pandemic, the trajectory initiated in 2016 towards eliminating the deficit on overall expenditures was on track to become a reality. There is no doubt that this effort has required strict measures, reduction of unnecessary expenditures, and efforts aimed at increasing revenues from other than public subsidies.

### 13.9.2 Areas for Further Attention and Improvement

#### *Governance Structure*

Unicamp's structure is highly decentralized. This means that the locus for decision-making authority, accountability, and responsibility for the institution's priorities are very diffused. While the CONSU can decide on strategic goals, objectives, and areas of corporate excellence, the Schools and Institutes determine through their decisions and actions whether they will align with those goals and be held accountable to any external measurement of the results. The power and authority of academic units are not unique to Unicamp. There is much to be said for the importance of letting faculty who are knowledge experts decide on a department's curriculum and to safeguarding academic freedom. However, this same structure also can be the locus of resistance to change and innovation with regard to the curriculum and new approaches to teaching-learning. It is a very faculty-

centric structure and challenges a commitment to a broader student-centric view. This is particularly problematic in the case of undergraduate education, where the learning outcomes for students are much broader than those for graduate education.

There are clear signs that the administration knows that this is a problem and has developed initiatives to address this challenge with projects such as RenovaGrad. Nevertheless, it is important to analyze carefully whether this effort will be enough to successfully address a strategy of excellence for teaching.

Questions can be raised about the ability to give strategic direction in other areas. For example, Unicamp has an impressive pattern of research activity. It is not clear in the self-evaluation report whether Unicamp wants to strategically prioritize specific areas of research and expertise locally and internationally. Currently, there is impressive entrepreneurial research activity among individual faculty members in the various schools and institutes. However, it is unclear whether the university will make extra effort to encourage interdisciplinary teams to form around strategic research priorities. This is a somewhat urgent issue as some of the most daunting problems facing humankind, such as climate change and health issues that have local and global import require an interdisciplinary lens for a solution. The early stages of the PrInt program that is sponsored by CAPES shows promise and provides a model for this kind of effort but will require long-term support.

### *Strategic Planning and Institutional Results*

While an impressive pyramid of strategic priorities guides the university forward, the elements of excellence that support those priorities need better articulation and sharper definition. Returning to teaching, this is one of four areas designated as a strategic hallmark for the institution. RenovaGrad, an initiative to improve teaching, is listed in monitoring documents as 81 percent complete, but it is not clear what the indicators tell us about the success of this initiative and how they are being measured. Observations from various members of the external evaluation team have cited the lack of electives and opportunities for field study, excessive hours of passive learning, and a dearth of interdisciplinary approaches. Ideally, RenovaGrad should address these issues, but individual academic units offer self-evaluation without a common template. This begs the question of what 81 percent complete really means and whether this and other strategic priorities can realize substantial progress and measurement of successful achievement in a highly decentralized context.

One of the questions that strategic planning is obligated to answer is how we will know when we have achieved excellence in the designated priority areas of teaching, research, and extension? Each dimension of excellence requires clearly defined outcomes. Will undergraduate students have greater critical thinking skills and citizenship capability alongside their professional preparation by virtue of excellent teaching? How will we know that this has been achieved? Will excellence in research be measured primarily by numbers of publications and research funding or will impact on society and international cooperation also be important indicators of success? If so, how will academic units be held



to those measures of success? How should we judge excellence for Extension? Should it be the number of interactions with the external community or the quality and impact of those interactions or all of the above? How do we measure those dimensions? All of these questions and more need to be answered as the university addresses areas marked for excellence in its strategic plan.

If strategic goals are not well defined and the elements of achievement are not clearly established, progress cannot readily be measured. When this happens, the danger is that the process becomes more important than the product. While Unicamp can be complimented for the number of improvement projects underway, it is not clear how closely they align with the achievement of its major strategic priorities. Some of the projects may support key priorities, but they may also be an atomized substitute for clear and unified central direction for the achievement of strategic priorities with full cooperation from the schools and institutes.

### *Autonomy and National Requirements*

Given Unicamp's statutory relationship with the state of Sao Paulo, a first impression is that the institution enjoys extensive autonomy in running its own affairs. However, it soon becomes clear that the State of Sao Paulo and the Federal government of Brazil have promulgated a number of laws and regulations that considerably limit the sphere of management decision-making within the university. CAPES makes significant decisions about graduate programs, and CNE defines curricula for undergraduate programs. National law impacts governance structures. In the area of faculty staffing and retirees, there are a number of laws that dictate such things as the prohibition of firing faculty for non-performance, automatic promotions, and an obligation for ongoing financial support of retirees. Inasmuch as human resources are the principal resource of the university, there appears to be little management discretion in that arena. Support for strategic initiatives and innovation becomes very difficult in this scenario.

### *Faculty*

Unicamp is in a position of national prominence and international recognition that allows its faculty recruiting to be very competitive. However, some hurdles remain in the recruitment of international faculty, including the current economic downturn in Brazil, and also in some cases perceived communication limitations of non-Portuguese-speaking foreign scholars. Yet internationalization of the faculty make-up should remain at the top of the long-term agenda at Unicamp, as international faculty both enrich the campus environments and play against inbreeding.

After hiring, the rules on faculty performance and accountability are heterodox: faculty in all ranks are tenured from the day they are hired and cannot be fired. Unicamp has found a way around the limitations of these government rules by keeping faculty with poor performance in contracts for 12-20 hours per week, instead of full-time contracts. Yet this regime is very exceptional, as 95% of faculty are in full-time contracts. This problem

is compounded by a rather long cycle of assessment: 3 to 5 years between evaluations. Especially if the evaluation is mostly formative (as underperforming faculty cannot be fired and only can see their hours of employment decreased), a more frequent and “friendly” cycle of assessment for improvement could be considered. We realize that given the quality of Unicamp’s faculty, underperformance is most likely exceptional, but still, rigorous evaluation is an element of a culture of quality and accountability.

Retirement of faculty due to age can be a problem if not adequately addressed. For instance, there’s a worrying decline in the number of faculty in the 50-59 age group, especially in Engineering, Biology, and Medicine. This is an echelon of the faculty that no university should see thinning without concern. On the other hand, it is very positive that the replacement in the departments of faculty who retire is no longer “automatic.” Automatic replacement meant that retiring faculty had to be replaced by a new faculty member in the same department. As a result of the economic and other crises, all replacements of faculty positions need to be justified in terms of their strategic value to the institution.

### *Financing*

The significant dependence of the institution on the state subsidy has been beneficial since it has assured the flow of economic resources, but at the same time, it has created an organization highly dependent on government subsidies with limited room for diversification of financial sources.

On the other side, the fact that Unicamp must absorb the cost of continued salaries and benefits for retirees of the university represents a significant burden on operational expenditures, which has been increasing in recent years, and it signals to become more burdensome in the future.

In addition, the fact that Unicamp has very limited control over the composition and permanence of the payroll due to restrictions imposed by legal regulations leaves the institutions with very limited if null maneuvering capacity, on financial considerations related to human resources.

Finally, despite efforts towards diversification of sources of revenues, still, income generated by patents, contracts, research grants, and philanthropic contributions from donors and alumni, is relatively marginal.

### *ICT*

Unicamp has made significant investments in order to keep up with the rapid obsolescence and the increased demands of ICT. Despite those efforts, as indicated in the Evaluation Report, a general perception prevails about inadequacy and insufficiency. Evidently, the highly decentralized nature of Unicamp may allow the rapid development of ad-hoc solutions applicable to the specific cases of Schools and Institutes, but at the same time limits the capacity for more coherent coordination and the opportunity to reduce overlaps and redundancies.

## *Concluding Observations*

Unicamp is much more than the sum of its schools, institutes, and interdisciplinary research centers. The faculty and staff that work in those centers devote their energies to larger enterprises that form undergraduate and graduate education, teaching and research, and extension activities that have local as well as international impact.

In a complex institution such as Unicamp, many choices have to be made about the direction of the resources that the faculty and staff represent. While the national government may have a major role in the nature of the academic programs, there are still decisions to be made about how resources will be used and how programs will be supported. One of the things that strategic planning can do is guide the disposition of resources. It is unclear, especially in a limited budget scenario, how resources will be allocated and divided to support the strategic plan.

If teaching, research, and extension are all slated for excellence, they will necessarily compete for resources to support initiatives to achieve excellence. Likewise, major undergraduate education initiatives such as a greater focus on student-centric and innovative teaching models will compete with graduate education and research for resources. As the university pursues excellence in its extension efforts, what proportion of time, attention, and financial resources will be directed to local needs and what to international issues and can the two not only be balanced but also interfaced so that one can inform and enrich the other? These are all important strategic choices and decisions that should be at the heart of strategic planning.

As the university faces budget deficits and the fall-out from the economic downturn, it will be important to develop a number of “what if” scenarios in terms of the availability of human and financial resources. This may require revisiting the number of strategic priorities and activities that support those priorities. It may also be necessary to choose fewer strategic objectives for each strategic priority with a clearer focus on outcomes and incentives for widespread cooperation across the institution. More is not necessarily always better, depending on the circumstances that face the institution. Selective choices can produce outstanding results that will carry the institution forward during challenging times.

## *Recommendations:*

- Unicamp’s management should take advantage of problems and issues identified by the external evaluation team’s report to focus on key areas, i.e., supra goals that warrant elevation to university-wide attention and action. This should be very selective (i.e., not too many priorities) and targeted to those areas that would benefit from widespread cooperation and would move the institution forward in important ways. Ultimately, if successfully managed, it will have the advantage of developing a more centralized approach to areas slated for improvement and in overall support of Unicamp’s strategic goals.
- While management is capable of making its own selection of supra goals for its

ongoing strategic planning efforts, the external evaluation team has a consensus view that the following areas warrant special designation in the university's ongoing self-improvement efforts:

*Continue to Expand Diversity and Inclusion Efforts at All Levels of the University*

ProFis is a remarkable program that has demonstrated success. The way it welcomes students to the university community and engages them for academic achievement is noteworthy. Creating “pipelines for greater diversity” in other aspects of the university may require other creative models, but ProFis shows that it can be done. As importantly, it shows that cooperation among schools and institutes around the goal of greater diversity and inclusion can produce demonstrable results.

*More Emphasis on Innovative Models for Teaching-Learning*

It was noted in other sections of the evaluation report that the curriculum and the way it is taught deserve attention across the university. Making sure that not only content is regularly updated but also that modern methods of conveying knowledge and engaging students are used in Unicamp's classrooms. More electives, less lecturing, self-paced learning, field experience, and community-based projects should be considered. Ideally, goals for all students, regardless of area of study, should include curricula that encourage critical thinking, basic literacy in the arts, humanities, and science, knowledge of Brazilian culture and history but informed by a global perspective. Earlier efforts like RenovaGrad need more support and cooperation across the institution. We encourage the university to renew its efforts in this area and find ways to assure the participation by all schools and institutes with incentives for faculty to learn new teaching methods.

*Research Initiatives that Create Greater Interface between the Local and the Global*

Unicamp has an impressive array of research activity among its faculty and an enviable reputation as a research center. In the area of applied research, the external evaluation team encourages the university to prioritize projects that have global value but that target regional and local issues such as health and infectious disease, food security, water resources, environmental degradation, and conservation. These are pressing issues in Brazil (and in many other parts of the world) and warrant special attention by Unicamp.

*Bring the World to Campinas*

Much of the university's internationalization efforts have been directed toward sending students and faculty abroad to study. Unicamp would be greatly invigorated by a commitment to bring more of the world to Campinas. This could be a multifaceted effort involving the internationalization of curricula in schools and institutes, extension projects that are international and/or take advantage of Diaspora in the local community, an international alumni network and global projects with international partners that involve a wide spectrum of the university as well as the local and regional community.

- Within the governance structure, the rector should present select issues emerging from the evaluators' report to the agenda of the CONSU for discussion, ongoing attention, and action. Clear guidelines for participation by schools, institutes, and administrative offices should be provided, including templates for evaluating participation and progress.
- Strategic planning efforts will need to focus on whatever key issues are selected and provide extensive support for an institutional response. This will mean moving away from many separate projects to a focus on fewer strategic priorities and their implementation. Also, the strategic planning team will need to assist with benchmarks, outcomes, and evaluation so that progress can be effectively monitored.
- Unicamp's communication system should be an active part of conveying messages about the importance of the issues elevated to university-wide status for attention within and outside the institution. Senior management should generally review whether current vehicles for communication are delivering messages that inform and involve stakeholders on a regular basis.
- The limitations imposed by the multiple laws and regulations posed by the Federal government would benefit from some relaxation to provide greater latitude for management of the university. The rector of Unicamp is encouraged to identify those areas that would benefit from greater local decision-making and work with like-minded rectors of other universities to present a case to the Federal government.
- More efforts are needed to diversify sources of funding. This may look like a suggestion easy to be made but difficult to implement, considering the many constraints, traditions, and the current and expected economic situation. Nevertheless, concerted efforts with achievable goals should be directed towards increasing revenues. This recommendation should be seen as a diversion on the continuously needed support from the state of Sao Paulo and the federal government.
- On the expenditure side, despite previous rationalization efforts, there is still room for improvement. A review of the strategic alignment and priorities due to the after-pandemic financial retrenchment will support decisions on this matter.
- Even though it is being said that it is impossible to modify salaries and benefits, in the long-run the only way to avoid the university getting into further financial trouble with the significant weight of the pensions' cost, is to come up with a long-term plan towards the establishing or replenishment of a pension fund, as other similar public institutions have done in other Latin American countries.
- Regarding ICT, options for a more centralized operation may need to be considered. Due to the nature of the governance and management of Unicamp, this only can be achieved with a gradual process of transitioning towards a more centralized process.
- To enhance continuity of projects and innovations and to maintain a longer-term strategic focus on university priorities, it would be recommended to conduct studies and discussions analyzing the feasibility of increasing the minimum duration of a term for administrative leadership positions in the central

administration and in the units to a minimum of 5 years, with a possibility of a second term. Also, the university should consider ways to further professionalize senior administrative positions by supporting the additional effort of the faculty who assume leadership administrative positions by providing related professional development opportunities and compensating them in a way that recognizes the additional workload and responsibility that these positions entail.

State University of Campinas, São Paulo, Brazil

External Institutional Evaluation for period 2014-2018  
Report by External Review Committee (July 2020)

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# 14.

## RESPONSE TO THE EXTERNAL EVALUATION OF TEACHING, RESEARCH, EXTENSION AND CULTURE, INTERNATIONALIZATION, INNOVATION AND MANAGEMENT AT UNICAMP





SUMMARY

This text presents the internal committee's considerations about the evaluation prepared by the external evaluation committee. On the one hand, the strengths pointed out by the external committee are highlighted. On the other hand, the weaknesses and recommendations are discussed based on the referrals made in 2019 and 2020, after the evaluated period (2014-2018), as well as the points in the strategic planning process being initiated deemed as deserving of special attention.

The considerations presented pertain to undergraduate and graduate teaching activities, research, extension and culture, internationalization, social and technological innovation, and management. The document was prepared by the Undergraduate, Graduate, Research, Extension and Culture Vice Rectories, the General Coordination of the University, and the Innovation and Internationalization Executive Boards.

A general consideration to be made is that the external evaluators recognized Unicamp's leadership role, contributing to the training of people and production of knowledge. They also stressed that the report has a self-assessment character, with information supplemented by members of the university's central administration, with whom they met. They regretted the impossibility of an on-site visit that would also allow them to conduct interviews with professors and students, due to the pandemic, and acknowledged that, although the report refers to the 2014-8 period, it brings a lot of information that allows analyzing the subsequent evolution and effect of institutional policies under development initiated in recent years.

The internal committee is very grateful to the external committee, both for its enormous reading and understanding efforts, as well as for the quality of the analysis of Unicamp's strengths and weaknesses to subsidize the university's strategic planning, always aiming at the pursuit of excellence in teaching, research and extension.

## 14.1 Graduation

The external evaluators recognized the wide variety of education opportunities offered by Unicamp, in curricular, co-curricular or extra-curricular activities, and the potential for interdisciplinary education.

In relation to the undergraduate studies, they highlighted the institutional inclusion efforts, initiated with the PAAIS bonus system and strengthened in 2019, with quotas, an entrance exam for the indigenous population, and the selection of medalists and revision of the PAAIS score to include a bonus for public school students also in the 2nd half of elementary school. They praised the support offered to students, seeking to guarantee their true inclusion while considering their needs, with qualified permanence and completion of the education cycle. They also positively highlighted the beginning of the activities of the Alumni platform, which responded to one of the strategic projects proposed by the Undergraduate Vice-Rector (PRG) in 2017, with the goal of creating mentoring projects for alumni and receiving their feedback on their experience in the undergraduate course in relation to the career developed later. This initiative was in line with other initiatives for obtaining donations by alumni, in addition to external demands for the analysis of their trajectory (e.g., the Capes Evaluation).

However, they also identified challenges that are already being faced, but which should continue to be the object of specific actions in the future. The first concerns the percentage of students who complete their course in the minimum time expected, which is that suggested by the Pedagogical Project of the Course (PPC), based on the National Curriculum Guidelines (DCN). Based on the notion that curricular issues may be influencing the reduction in this percentage, they recommend updating the curricula, making them more flexible, coordinated and multidisciplinary, and, in particular, reducing the hours of passive, less reflective and more content-centered learning, while increasing those of student-centered, transdisciplinary and more effective learning, focused on the application of knowledge.

The excess of hours of didactic activities in the classroom, depending on the presence of the professor or teaching assistant, with little space for complementary studies, independent studies or co-curricular activities, could be discouraging for students of the new generations. An important aspect that was widely discussed was the need to create space for elective educational experiences with disciplines based on transdisciplinary projects, a proposal that was already being promoted by PRG and stimulated by the course coordinators. They conclude their observations by recognizing the need to increase the offer of teacher training activities covering aspects of pedagogy and didactics in higher education.

These challenges had been previously recognized, being presented in the Internal Evaluation Report part and appearing in the observations of the teaching units and their courses, thus justifying the RenovaGrad strategic project that is currently under development, with forums and workshops aimed at curriculum revisions to be proposed by the teaching and research units, and the aid of the Teaching and Learning Support Space (EA2). The objective of the project, proposed and initiated in 2017, is to review and update curricula while maintaining academic excellence based on best practices, with student-centered learning and making use of interdisciplinary knowledge-integrating projects to provide humanistic education to creative agents of change, with social commitment. Additionally, they suggest the adoption of more technological innovations and routine evaluations of the curriculum by the students. In order to implement these changes, they emphasize the relevance of training the faculty on the application of new educational approaches and complementary resources, seeking greater use of hybrid teaching. These actions have been developed with the support of EA2 and the Educational Technologies Management Group (GGTE). The current Covid-19 pandemic has accelerated teacher learning processes concerning the use of electronic resources for the development of emergency remote education.

The strategic PRG projects proposed for 2017-2020 were presented in the External Evaluation Report, in the introduction to the chapter on Undergraduate programs. Among them, RenovaGrad is particularly noteworthy, having been mentioned and had its contribution recognized by the teaching and research units throughout the report. Other strategic projects relate to RenovaGrad, such as GestaGrad, which has provided data and indicators to highlight the need for changes to be implemented alongside the schools, the courses and their faculty. Since Unicamp offers the Teaching Internship Program (PED) to graduate students, the strategic PED+ project, focused on didactic-pedagogical education, has also been developed since 2017.

The relevance of reaching out to alumni was quite emphasized, and the evaluators suggest giving continuity to the collection of data on their trajectory, proposing the creation of the Alumni Association. With the recent launch of Unicamp's Alumni Portal, in July 2020, this will be an area to which special attention should be paid in the new planning and management cycles.

Another aspect pointed out by the evaluators concerns the need to provide access to foreign language courses, notably English courses, to all students. This issue has already been the subject of discussions and debates, in particular recognizing that the Language Teaching Center (CEL) cannot meet this demand, posing a challenge that will need to be discussed in a new cycle of institutional strategic planning.

The expansion of ProFIS was another recommendation that should be the subject of future discussions, recognizing its potential to acclimate new students to the environment and the demands of higher education so they can perform better and have a more positive experience. Likewise, external evaluators suggest greater integration between extension activities and teaching-learning activities, and participation in scientific initiation projects, if possible, as a mandatory curricular activity.

The ProFIS expansion project for the Limeira region had already been the subject of studies in a Working Group in 2019, but the financial crisis and the need to support students, allocating scientific initiation scholarships to all, as is currently done and recommended, prevented the proposal from evolving. As for the integration of extension activities in the curricula, measures to create extension vectors have already been approved and added to the extension disciplines that already existed in the catalogs and in the Graduation Regulations. The external evaluators stressed the importance of giving credit to outreach and community service activities. Curriculum renewal proposals should cover the incorporation of extension activities into the curriculum of all students, as required by the Federal Law, according to which said incorporation must be completed by 2022.

Some of the recommendations were specific to the major fields of knowledge. For the area of Exact Sciences and Engineering, it was suggested to develop strategies alongside the secondary education system to attract more women to this field of knowledge, increase the space for elective courses in the curriculum (including outside the unit, with interdisciplinary projects covering other fields of knowledge), reinforce actions to reduce dropout with mentoring by senior students and teacher training programs, and give continuity to the curriculum renewal, with incorporation of topics such as artificial intelligence, robotics, sustainable energy and water resources, considering the local needs.

Dropout issues had already been identified and discussed, and are the basis of the GestaGrad project, aimed at collecting data on the percentage of completion of the curriculum in the minimum and maximum times expected, the average time of completion, and the students' performance in the disciplines, per course, being complementary to RenovaGrad. The lack of access to data deposited in clouds, which can be consulted and worked on by the coordinators themselves, still requires centralized preparation, but it is necessary to plan the evolution to provide easier access to them and more friendly and transparent analysis and presentation tools.



The demand for curriculum changes brought by the new Engineering DCN, planned for 2022, points to many of the external evaluators' suggestions, and has already been the subject of discussions with the courses' coordinators, to whom a specific report on the status of the pedagogical projects and their alignment with the DCNs will soon be delivered, to subsidize debates on the necessary changes.

For the field of Technology, the evaluators suggested revising the completion time or the density and requirements of the curriculum, since a very low percentage of students has been completing the course within the expected time. This aspect is in the scope of the ongoing discussions at RenovaGrad, and the effective actions to minimize the problem must be intensified during the preparation of a new curriculum proposal.

The evaluators suggested promoting strategies to attract more women to the Exact Sciences, Technology and Engineering courses, with visits to schools, open days at the universities, and videos. Actions that are similar to these but not specific to women are already carried out, but there is an initiative led by a group of female students and professors aimed at this population, with a scientific immersion program for basic education students, which is in its final phase (Meninas Supercientistas). It would be important for this goal to be established and included in Unicamp's new strategic planning cycle.

They also suggested increasing the use of the assessment of the curriculum and professors by the students and considering the inclusion of scientific initiation activities as compulsory. In relation to the former, it is already carried out routinely in the courses, in various formats, and the attempt to propose a common instrument that also considers the local specificities and surveys, made by a specific WG in 2018-9, was not successful. However, since 2018, there is one day per semester in the school calendar in which the discussions and evaluations take place, with the participation of students and professors and suspension of other didactic activities. The definition of a simplified, common and regularly used instrument remains an objective to be achieved, and should be included in the next institutional planning cycle.

In the field of Biomedicine and Biology, it was recommended to increase the participation of ProFIS students in the Medicine course. There was specific focus on the proposition of strategies to retain mid-career professors, promoting the multiple activities of teaching professionals, which go beyond traditional classes (mentoring, facilitating activities in small groups, and others), and seeking greater balance between teaching and activities such as administration and health care.

They also recommend giving continuity to the modernization of the curricula in this field, aligning them with the best international standards, with inclusion of more independent studies, group activities and space for elective courses, abolishing long classes, continuing to promote the integration of basic and clinical sciences, and, in Medicine, allowing part of the internship to be served in other services, in Brazil and abroad. These aspects are already being worked on by the courses' coordinators, in accordance with the proposals of RenovaGrad.

A particular aspect that stands out as a positive example, with suggestion for expansion, is the MD/PhD program, which allows students to pursue a doctorate degree concomitantly with the undergraduate Medicine course, so they can obtain both degrees

in sequence. This recommendation stresses the importance of promoting the relevance of research as part of undergraduate courses at a university like Unicamp, something that we have already highlighted in the curricula.

For the Humanities, the importance of introducing elective or mandatory subjects to expand critical and scientific thinking and global thinking was emphasized. Examples would be philosophy, scientific argumentation and language, the history of modern science, the history of social sciences and the history of natural sciences, while also stimulating transdisciplinary research activities and the acquisition of foreign languages, notably English, as it is the most widely used language. These suggestions have already been the subject of discussions, and the evaluators' observation corroborates their need.

Finally, the external evaluators highlighted the importance of establishing a two-way relationship with the alumni, making suggestions to be incorporated. Regarding the study based on secondary data on the alumni's professional trajectory, carried out for institutional assessment and addressed in chapter 9, the evaluators recommended that the data should be shared with the university's managers through cloud-based applications. They also recommend creating the Alumni Association for academic and professional mentoring and inviting its members to participate in the association's management board and in the activities of the programs themselves, also contributing to the professional training of current students by offering them internships and mentoring. Additionally, it is suggested that the integration between current students and alumni is promoted through interdisciplinary projects. These suggestions, once again, are in line with what was proposed in the strategic project that resulted in the Alumni Platform.

In conclusion, the external evaluation reinforced many of the aspects that need improvements and that were already being addressed by specific projects, understanding the role of inclusion, qualified permanence and completion of the education cycle to ensure a good academic experience. As many of the actions are supported by changes in the pedagogical projects or institutional management policies, which require time to prepare, implement, evaluate and reassess, it is important that they are incorporated in the next cycle of institutional strategic planning.

## 14.2 Graduate Courses

External evaluators pointed out that UNICAMP is considered one of the leading universities in Latin America. Some of the positive points highlighted by the committee are:

The high number of master's dissertations and doctoral theses defended annually.

- I. The level of excellence of Unicamp's graduate programs, almost half of which have received the highest CAPES grades (45% of them with grades 6 and 7, and only 30% with grades 3 and 4).
- II. The number of well-evaluated graduate programs in Arts and Humanities, most with grades from 5 to 7.
- III. Development of innovative studies and practice-oriented performance.

- IV. The technology transfer resulted from the broad spectrum of the subjects addressed in graduate programs, such as ecological issues, problems in the chemical industry, agriculture, bioenergy, biomaterials, and many other areas.
- V. The university's regional brand as having students from all over Brazil and Latin America.

Regarding the number of graduates, as pointed out in the report, in 2018, there were about 17,500 students enrolled in Unicamp's graduate programs, and 1,380 master's dissertations and 1,040 doctoral theses were defended. The numbers for 2019 are 1,362 dissertations and 1,017 doctoral theses defended, as well as 112 professional master's programs. For the external committee, this indicates that the annual number of people who receive a doctoral degree from Unicamp, compared to the total of graduate students, is indeed very impressive, even for the criteria of advanced countries.

In addition to the challenge of attracting graduate students to contribute to national and state policies related to graduate education, Unicamp has to continue making an effort to ensure the permanence of graduate students, prevent them from dropping out, and maintain the quality of the research carried out. This is a major challenge when considering the budget crisis of universities and development agencies. As scholarship grants have been cut, it is more difficult to demand exclusive dedication to research from the graduate students. Unicamp has been trying to diversify its sources of financial assistance, such as the Teaching Internship Program (PED) and the agreement with UNIVESP, which provides scholarships for facilitators.

Internationalization is a very important component for Unicamp's graduate programs. In this sense, the external evaluators highlighted both the performance of Brazilian professors and students in programs abroad, as well as the foreign students and professors sent on missions to Brazil. The most prominent programs were CAPES's Sandwich and PrInt programs. Since 2018, Unicamp is one of the 36 universities covered by the latter. The program's idea is to decentralize the internationalization program's resources and management, which has resulted in a governance not to be overlooked by the university. In numerical terms, the number of inter-university exchange scholarships remained the same (one 12-month scholarship per program), but now they are distributed across 117 of Unicamp's projects, covering 5 major themes:

- Biodiversity, energy and sustainability: challenges of the 21st century.
- Complex natural and artificial systems: from basic to applied.
- Democracy and economic, cultural and social development.
- Health and society: a global challenge.
- Frontiers of Mathematics, Natural Sciences and Engineering.

In addition, there is financial support to receive and send exchange visitors to the selected countries. One disadvantage is that most countries in the Southern Hemisphere are not considered to be a preferred destination. Other problems are the recurring changes in the rules, terms and amount of funds granted that have been occurring in recent years.

The evaluators stressed the importance of focusing international collaboration on the South-South context. With regard to collaboration with other research groups in Latin America, there are other sources of funding, such as CAPES's Sul-Sul Program; the FAPESP/CONYCIT; FAPESP/CONICET; CNPq/CONYCIT; and PROAFRICA/CNPq agreements; the Escala program for graduate students (Montevideo Group – AUGM); the Bolsas Brasil Program (PAEC OEA-GCUB); and the Macro Network of Public Universities in Latin America and the Caribbean. In fact, many Unicamp groups already work in collaboration with countries in Latin America, especially South America, as well as Africa. There are several agreements with institutions in Colombia (44), Argentina (30), Mexico (26), Chile (14), Ecuador (11), Peru (11), Mozambique (5), among others.

It is also important to highlight the contribution of Unicamp's graduate programs to the qualification of graduate programs in Latin America. Many of the graduates are now faculties of universities in Peru, Colombia, Ecuador, Argentina, among others. It is an interesting strategy to think that, as pointed out in the report, the best approach may be to start from existing projects between a certain Unicamp group and a group from another university, i.e., from the bottom up, and expand them with the program, incorporating other groups. In any case, the South – North relationship cannot be overlooked. There will always be a good return on investments in research projects that involve institutions of excellence from all over the world, and that allow the internationalization of the university's faculty and student body.

Another point related to the internationalization and expansion of the quality of Unicamp's graduate studies was the requirement of full proficiency in English on the part of the student body. Although foreign language proficiency exams are required of all graduate students prior to the defense of the dissertation and thesis, the proficiency level of most graduate students at Unicamp is basic. Knowing that English is the universal language of science at the moment, all Unicamp students should be expected to know how to read and write in it. This will require the university to offer more courses and tools, and use the new technologies currently available.

Regarding the pursuit of excellence, almost 70% of the Graduate Programs (PPGs) received grades above 5 in the last CAPES evaluation. This is an exceptional achievement, which places Unicamp at the top of Brazilian universities. However, the grade of about 26% of Unicamp's PPGs was 4 (good, but below the average for funded graduate programs). Some of them are new programs, which usually receive lower initial evaluations, but others are already consolidated, and should be monitored so as to close gaps and overcome problems, in order to improve performance. Of the three PPGs graded 3, two are newly established programs. The third has been making a great effort to rehabilitate itself, as it used to have a higher Capes grade. In general, the problem is the shrinking of the faculty due to an expressive number of retirements, as well as the hiring of new professors who are still trying to stabilize their teaching and research career, and have not, therefore, established a continuous flow of scientific publications, research projects and supervision. In this management, PRPG has analyzed the weaknesses and strengths of each PPG to help them comply with CAPES's requirements, whether by accrediting more experienced professors from other colleges or institutes, hiring young and productive researchers, or stimulating dialogue between the coordinators of similar programs to study the possibility of merger or integration between them.

The external committee points out the difficulty in justifying the formulation or existence of several PPGs around the same teaching and research concept or themes. According to the committee, a more comprehensive program “should give the student the opportunity of getting a broad image of the field by taking several elective courses before following a very specialized pathway”. In this sense, PRPG brought together the coordinators of three related programs: Biosciences and Technology of Bioactive Products (Institute of Biology), Pharmacology (School of Medical Sciences) and Pharmacy (School of Pharmacy) to study the possibility of merger. They decided not to include the Pharmacology program in the merger, as its focus was different from that of the other two. On the other hand, CAPES has already approved the merger of the Biosciences and Technology of Bioactive Products and Pharmacy programs, to be allocated to the School of Pharmacy.

Great part of the PPGs were instituted many decades ago, at a time when interdisciplinarity did not have the strong appeal it has today. At that time, the important thing was to expand the graduate system and cover new and distinct scientific fields. In order to change this, a structural revision is necessary, causing anguish among the different groups that fear changes and adjustments. Many of these PPGs have high CAPES grades (6 and 7), and ask themselves “why change?”, despite realizing the benefits of and even the need for a broader and less disciplinary view of scientific knowledge, making courses more comprehensive. However, without a doubt, this is a necessary reflection and a sensible strategy to not only reduce the overlap of themes, but to strengthen, in several cases, the PPGs themselves, with greater interdisciplinarity.

There is a growing demand for professional master’s programs at Unicamp, and the number of these programs has steadily increased over the years. In 2020, another program was approved at the institutional level, and will be submitted to CAPES for certification. CAPES has also recently implemented the concept of professional doctorate, although this is a controversial subject worldwide. PRPG believes that there are common characteristics between academic and professional doctorates, but also differences. The most important characteristic of a doctorate is developing the students’ independent and original thinking, and this must be valid for both academic and professional doctorates. It is important to note that Professional Programs do not receive CAPES grants.

Professional programs with national reach (PROFMAT, PROFBIO and PROFHISTORIA) aimed at elementary and high school teachers, mainly in public schools, were highly praised by the external committee. Although these programs’ CAPES grades are 4 and 5, it is important to note that, in CAPES’s grading system, a program that offers a master’s degree only cannot have a grade higher than 5. Therefore, 4 is not a bad grade, on the contrary. CAPES has been studying the possibility of allowing these programs to offer doctorates.

As already mentioned, the Medical Researcher Program (MD/PHD Program) was highly praised, but it was noted that it is still very timid, as it only offers two places/year to students. The external evaluators suggested increasing this number to 5 places/year for it to be more effective. The definition of 2 places per year was based on i) few examples of successful cases in other Brazilian universities; ii) the low demand for informal research identified among students; iii) some internal resistance to the Program. Thus, the number was considered a good start for the Program, and it may be increased if demand is identified. However, it is important to note that, due to an agreement signed with the

Federal University of Rio Grande do Norte, in Caicó, 5 master's and 20 doctorate students, and, in an innovative manner, 2 MD/PhD students have been accepted, and are expected to begin in the 2nd semester of 2020.

The external evaluators pointed out that, as in the case of undergraduate programs, graduate programs have strict curricula. This is a fact that can be pointed out for most programs, and it is necessary to make them more flexible. Most of the electives allowed are within the same department or in related areas. This aspect should be actively shared with the coordinators of PPGs and CPGs so that it can be thoroughly considered when revising the regulations of graduate programs.

The external committee also pointed out that the evaluation of research and graduate programs is strongly based on quantitative criteria, and that qualitative indicators should be incorporated. This is a general reality, not being limited to Unicamp. Since its implementation in Brazil, the graduate system has grown in numerical terms and in quality due to the development of the CAPES evaluation and accreditation system. As the system grew, the evaluation became increasingly more dependent on quantitative indicators. However, in the last evaluation (2017) covering the 2013-2016 period, CAPES understood that it is necessary to expand its focus, recognizing that self-evaluation, now widely used in international experiences, can strengthen the qualitative development of programs. Undoubtedly, external evaluation guarantees basic standards, which is important in a continental country, but has its limitations. It is important that the people involved in identifying the problem are also involved in solving it. In this sense, many PPGs have already installed their self-evaluation and future planning committees, with the expectation that this new form of evaluation will favor the construction or validation of their identity, promoting heterogeneity, diversity and their involvement in the community, not only to ensure the minimum standards, but to go beyond them. Additionally, for the next quadrennium, new qualitative criteria are being included in Capes' evaluation, which is very decisive for a PPG, as it determines the attractiveness of the program and the amount of scholarships and financial aid it can grant to students and professors.

CAPES' evaluation is based on the imposition of rules that establish strict desirable deadlines for the completion of the graduate course, strict requirements for the scientific production of professors and students (based on the QUALIS ranking), minimum requirements for the accreditation of professors, among others.

The external evaluators pointed out concerns about the issue of inclusion and diversity in Unicamp's graduate programs, the data for which were systematized based on the PPGs' responses in the internal evaluation. Public Brazilian universities have been expanding their inclusion policies. At Unicamp, the procedure for admitting students to graduate programs differs in relation to undergraduate programs. While for the latter there is an entrance exam that is common to all students, for the former, each PPG establishes its own rules and requirements. Therefore, given the decentralized nature of this action, PRPG believes that it makes more sense to educate/train/inform the student body and the faculty about the advantages and the need for diversity, which can be done through lectures given by guest speakers, seminars and discussions within each school.

In summary, despite the fact that Unicamp's graduate programs have achieved excellence and that the institution is considered one of the leading universities in Latin



America, it is necessary to always aim higher. Several of the points indicated by the external committee are already being discussed and worked on by PRPG. However, other aspects pointed out were of great value to subsidize improvements.

## 14.3 Research

Research was addressed by the external evaluation committee jointly with graduate education, dividing the analysis by the major fields of knowledge, i.e., Exact and Earth Sciences; Engineering; Biological and Health Sciences; and Arts and Humanities.

In general, the committee's opinion about Unicamp's research activities in the 2014-2018 period is very positive, and highlights the advance in academic production, both quantitatively and qualitatively, compared to the previous five-year period, despite the sharp reduction of almost 50% in support received from CNPq.

The committee recommended actions in the field of research in order to encourage and promote greater cooperation with other Latin American countries, without losing, however, the insertion in the northern hemisphere's scientific environment. It suggested that Unicamp focuses its research efforts on some topics of great relevance in the context of Brazilian society so as to encourage local vocations, and also that the institution promotes and recognizes the value of teaching (and student) activities from a qualitative point of view, and that it tries to engage the alumni community in discussions, so the University can improve also in a more general sense.

Particularly with regard to the evaluation of teaching activities, more qualitative promotion of research activities and also of the engagement with society, activities dedicated to community services, tutoring of students from less privileged social backgrounds, and other similar actions are recommended.

The committee also suggested that academic units establish more robust research seminar programs, with the participation of world-renowned researchers, aiming to strengthen the research environment and promote international two-way cooperation, i.e., not only from the inside out, but also from the outside in.

In the Biological and Health sciences, in particular, the role of the Institute of Biology in basic research was highlighted. The reduction in FCM's scientific production was pointed out, and it was recommended that special attention is paid to the renewal of the Unit's teaching staff.

In the humanities, the committee pointed to a reduction in the academic production in Portuguese, and recommended initiatives to increase the number of publications in the national language, as well as the maintenance of Brazilian journals in these areas.

Another important aspect highlighted by the committee during the discussions that took place in the external evaluation meetings, despite not being explicitly mentioned in the report, is the apparent lack of global communication between the administration and the Units regarding research activities, the processing of research agreements and related operations, an aspect that should be considered in the next planning process.

## 14.4 Outreach and Culture

The report of the External Institutional Evaluation Committee shows that the performance of UNICAMP in the field of outreach and culture is intense and diverse, and that it has effectively been transforming the university's academic activities. However, there is a theme that appears at various points in the report, which is the lack of better understanding and definition of its terms and concepts.

In relation to outreach, the report mentions several success cases of outreach programs and actions developed at the university, and points out weaknesses by making observations and recommendations regarding some of these aspects. Basically, they can be grouped as follows: concept of outreach, control and registration of actions, promotion of outreach activities, and development of an outreach curriculum.

Regarding the concept of university outreach, it can be concluded that, in the 2014-2018 period, despite the recent efforts to promote the dissemination of and discussions about outreach in the units, there is still need for institutional actions that establish milestones to define and regulate outreach activities. In this sense, it is important to report that CONEX discussed and forwarded to CONSU an amendment to UNICAMP's general statute, in order to update the concept of outreach in the university's official documents. At the same time, PROEC has been intensively promoting the engagement of the internal and external community in outreach actions through its Communication Board (Dcom). In 2020, PROEC launched the International Extension Journal of UNICAMP and, strategically allied to it, created the public notice for outreach research, understanding it to be one of the gaps in the area in our country, which obviously leads to a lack of qualified discussions about the topic.

The concept of university outreach is also not a consensus when comparing visions and missions of foreign universities. The terms that are generally used, such as outreach, civic mission, social engagement, among others, vary and have divergent characteristics. An example mentioned in the report is the definition of outreach as a one-way action, the completely opposite of what is understood by PROEC, which bases its definition of it on the dialogic characteristic as fundamental in the establishment of outreach activities, following the rules of the National Forum of Extension Deans (FORPROEX), as well as the recently approved federal legislation.

Both the internal and external evaluations indicate that the registration of outreach activities has been partial, as some occur without approval from the corresponding institutional bodies, and are not added to the university's general records. This aspect may be related both to the low value attached to outreach activities by Unicamp's community, and to the lack of structure to define flows and coordinate these activities. With this understanding, the university recently approved the creation of paid functions for extension coordinators and secretaries, which is considered a fundamental step towards the strengthening of outreach activities in the units. Additionally, PROEC developed the Bank of Extension Activities (BAE), which is a repository of outreach activities that is intended to be used as an effective tool for managing them.

Regarding the value attached to outreach, the external committee pointed out that it is restricted in daily academic life, in the periodic evaluation of activities, and

in the progression of the careers of professors and researchers. In recent years, some actions have been taken to address this issue. On the one hand, UNICAMP established the award for extension activities and, on the other, a discussion on how to increase the value attached to outreach activities in the renewal of the Teaching Activities Report (RAD) and in RDIDP/CPDI's rules of procedure is currently underway. With the two actions mentioned, PROEC has been trying to increase the visibility and the value attached to outreach activities.

The external committee emphasized that the extension activities have been achieving positive results both in the internal and external community, given that the programs have a positive impact on the students themselves, with expansion of their professional vision during the course and the consequent improvement in the school curriculum. Even so, the importance of including outreach activities in the pedagogical projects of the undergraduate courses in a more structured way was emphasized. Since May 2017, PROEC and PRG have been discussing the topic within the latter's Renovagrad program. The report also points out that few students have access to university extension projects and programs, and that it is necessary to ensure this access in an appropriate manner.

Finally, the external committee highlighted other important points that deserve to be mentioned, such as its recognition of the importance of extension courses within outreach actions, highlighting that distance learning, or in a hybrid format, is a trend that the university must be prepared to adapt to. In the last year, even before the pandemic, there was a steep increase in the number of students in the distance learning modality of extension courses. PROEC has expanded its notices of support for distance learning courses in recent years, and has established partnerships to improve the offer of support to interested professors, albeit in a limited way. The outreach activities should be aligned with the next institutional strategic planning, to be carried out soon. Their evaluation must be deepened, and the indicators must be clearly defined for the community – in this respect, PROEC notices have been following the indicators approved within the scope of FORPROEX. However, the university still needs to broaden this process.

Despite the performance of UNICAMP in extension having national relevance, internationally, it is still very timid. In recent years, actions and projects carried out alongside international universities have been established, with South American universities as their main axis. However, these actions are punctual and not characterized as long-term projects. The report reinforces the need to expand them, including the provision of resources.

In relation to culture, it stresses that, despite the many qualified activities in this field at UNICAMP, these have not yet achieved the recognition they deserve. Culture is an aspect of university life that must be taken into account not only for the improvement in academic life, but also for the definition of the institution's identity, contributing to the establishment of its reputation. It is important to note that the Office of Outreach and Culture was recently reformulated, with the inclusion of culture. However, part of the time frame covered by the report (2014-2016) concerns a period prior to this change. In this sense, the external evaluators mention the importance of promoting cultural activities in the evaluation of the faculty's performance. The clarification of the concept of culture applied within the context of the university and its differentiation with university outreach should be disseminated to the entire community.

The report commends the creation of the Board of Culture (Dcult) as an organizing agent for cultural actions and their related bodies, but it is necessary to align these actions with the Institutional Strategic Planning. The absence of cultural activities in the reports of some of the units demonstrates that a system for registering them should be created by PROEC, similarly to what was created for extension activities.

The external committee points to the absence of reports on physical activities developed within the university. This fact can indeed be considered a failure that occurred in the preparation of the internal evaluation form and in the consolidation of the report, which could have used complementary data. Furthermore, the theme should not be included only in the chapter on extension and culture. This aspect must be reformulated and incorporated in the next evaluation processes, giving visibility to the great production that takes place at UNICAMP in the area of sports, including the involvement of undergraduate students and related extension activities.

Finally, the external committee suggests that there may be difficulties in financing various cultural programs and projects. In the last year, PROEC established institutional programs that seek exactly what was pointed out by the evaluators, i.e., programs involving a large number of members of the community in a multi and interdisciplinary way, as well as programs involving external populations, such as the Funciona Cultura and Otras Latinoaméricas Programs.

## 14.5 Internationalization

The external evaluation committee examined Unicamp's current internationalization stage in the light of the objectives established in PLANES 2016-2020, which aimed to improve the internalization of teaching activities, especially in undergraduate courses. Internationalization was defined as one of the strategic axes of the University's development, and budgetary resources were allocated to promote the mobility of students, professors and employees.

The external committee positively evaluates the inclusion of internationalization as a strategic priority for the University, generally validating the ongoing actions in this direction, considering it appropriate to concentrate efforts on the cooperation with a small number of partner institutions, as has been done in the initiative to build strategic partnerships. It also positively evaluates Unicamp's participation in international networks of higher education institutions, mainly in Latin America, as well as in Banco Santander's global network Universia, and CAPES's PrInt program.

The committee also indicated a series of points for improvement in Unicamp's internationalization strategy, considering that the focus of the actions should not be restricted to the international mobility of professors, researchers, employees and students. It believes that it is necessary to expand the foreign language skills of the students and staff and better explore the potential of South-South cooperation, especially with partner institutions in Latin America and Asia.

DERI considers that the weaknesses identified by the external committee effectively represent obstacles to the progress of the University's internationalization, particularly in the context of the post-Covid-19 reality. Taking into account that internationalization is not an end in itself, but a means to improve the quality of teaching and research, the obstacles observed represent challenges for the development of Unicamp itself.

In DERI's view, the strategies for overcoming the weaknesses in Unicamp's internationalization identified by the committee can be divided in three lines: 1. Implementing a comprehensive internationalization strategy; 2. Forming solid international alliances; 3. Adopting a strategic and integrated vision. Advancing in the direction suggested by the committee will require coordinated and persistent efforts on the part of the University to promote internationalization and the quality of teaching and research.

Regarding the first challenge, comprehensive internationalization, the external committee correctly points out that internationalization focused on international mobility has a limited scope. The high cost limits the number of students who can participate, largely due to the limited number of scholarships the university can offer. Additionally, possible mobility restrictions in the post-pandemic world may make it impossible to carry out exchanges and internships abroad, for an indefinite period.

As an alternative, the external committee suggests adjustments to the curriculum that allow the vast majority of students to become acquainted with other academic, cultural and linguistic realities at Unicamp itself. The proposal, known as "internationalization at home", is already implemented in several universities around the world.

An important resource in this strategy is the "virtual exchange" or "remote exchange", which could allow Unicamp's students to take courses taught remotely at foreign universities, and foreign students to take remote courses at Unicamp. The offer of disciplines of this type and the formation of "international classes", with foreign and Brazilian students, could be performed in partnership with foreign universities, with the participation of professors from both institutions. Universities in Brazil and abroad have initiatives in this direction.

The weakness pointed out by the external committee concerning the lack of foreign language skills represents an obstacle to the viability of the proposal in the short term. First, it will be necessary that students in Unicamp's undergraduate and graduate courses reach an adequate level of qualification in a second language. It would be essential, in this sense, to develop initiatives that allow expanding the offer of language courses, as well as the offer of subjects in foreign languages at the institution.

Offering foreign language education to students and staff is essential and urgent, not only for the advancement of internationalization, but for the quality of teaching and research, to expand the possibilities of cooperation with institutions abroad and for the development of Unicamp as an international institution of excellence.

Regarding the second point, international alliances, the external committee correctly points out that Unicamp should better exploit the international recognition of its performance in research and teaching in order to build alliances that are able to strengthen its image globally. It is not enough to sign cooperation agreements and participate in international networks: Unicamp should aim to provide a benchmark for similar institutions around the world concerning issues that can support the formation of solid partnerships with them.

The strategic partnership agreements being implemented are pilot experiences through which Unicamp must establish alliances with institutions that have complementary competencies and are willing to develop collaborative research and teaching and jointly collect resources from funding agencies and other financing sources. Cooperation agreements must include joint work plans, with objective deadlines and targets and well-defined mechanisms that allow for adequate monitoring and evaluation of the outcomes.

The results so far show that the size and profile of the institutional partners with the greatest potential are similar to Unicamp's. In Latin America and other regions of the South, there are universities with this profile that have expressed interest in cooperating with the institution.

In relation to the third point, integrated strategic vision, the external committee correctly perceived that the implementation of its recommendations requires the protagonism of the University's institutes, schools and interdisciplinary research centers. Thus, the internationalization initiatives incorporated into the University's teaching, research and extension plans should be aligned at all levels of management. The strategic vision must be common, but also have flexibility to meet the specificities of the different realities that exist at the university.

Finally, it is desirable that internationalization occupies an even more central position in Unicamp's institutional strategy.

## 14.6 Social and Technological Innovation

For the first time, an Institutional Evaluation Report has highlighted Social Innovation (SI) at UNICAMP as an essential theme in the context of the activities developed by the university. The recognition of the relevance of initiatives of this nature in the field of teaching, research, extension and administration, expressed by the introduction of a specific section in the Report, is, in itself, a noteworthy fact.

Social Innovation has been increasingly recognized as a topic of relevance to the context of Higher Education Institutions, which increasingly recognize the need to consider alternative results of their activities, in addition to conventional products and traditional indicators, such as the number of publications and references. Additionally, it is supported by the perception that the concern with "impacts on the real world" may be capable of guiding positive changes in the teaching, research and extension activities carried out by these institutions.

During the last few years, initiatives associated with Social Innovation have been consistently developed at UNICAMP by the university's Higher Administration, its academic units and bodies, and also students, professors, researchers and employees. The Report presented some of these initiatives, indicating their main characteristics, dynamics and results. It is important to recognize that this description in no way represents an exhaustive and in-depth mapping of everything that UNICAMP does in terms of Social Innovation, but it satisfactorily illustrates, as highlighted by the external evaluation committee, the conditions, possibilities and challenges related to this diverse and fragmented set of initiatives.



The committee pointed to the prevalence of innovative thinking at UNICAMP, a fundamental substrate for developing SI initiatives in the context of the university, and also underscored the remarkable commitment of the internal community to these actions and projects. Finally, it stressed the importance of the engagement of students for the success of these initiatives, and as a means of enhancing their positive effects on the student body's academic experience.

Supported by the recognition of the relevance of the theme for a university with the characteristics of UNICAMP, inserted in a context that requires it to assume a leadership role, the external evaluation committee highlighted, above all, the need to define a clear and comprehensive institutional strategy that is capable of stimulating the expansion of the scale and scope of the SI initiatives developed by it. This strategy should be associated with a policy through which, as suggested by the committee, UNICAMP should seek to:

- Institutionalize mechanisms of support for and recognition of SI initiatives, stimulating connections with teaching, research and extension activities;
- Plan and implement actions based on interdisciplinary approaches, with the definition of funding mechanisms, governance models and ways of evaluating results;
- Expand the institutional knowledge about SI initiatives developed at UNICAMP, systematizing experiences, monitoring initiatives and holding events to strengthen connections and consolidate networks.

Finally, the committee recognizes the challenges posed by the increasing limitations on the university's resources, which may affect the advance of institutional initiatives in the proposed direction. This condition makes it even more important to clearly define the institutional strategy, so that UNICAMP can prioritize its support for actions and projects that are more aligned with its mission and vision for the future.

There is a great accumulation of experiences and skills at the university, which can be more effectively mobilized to expand the scale and reach of the Social Innovation initiatives developed therein. The evaluation presented by the committee adequately identifies the issues that must be faced so that this can occur in the coming years, even considering the adversities currently faced by the institution.

In accordance with the diagnosis and the recommendations presented by the committee, it is essential to give the theme of Social Innovation a more central role within the scope of the institutional agenda, which must be done in the context of the next Strategic Planning exercise to be conducted by the university. The theme must also be definitively incorporated into the university's future Institutional Evaluation efforts. With this, it is expected that UNICAMP makes its institutional commitment to the theme explicit, so it can create and strengthen mechanisms that are capable of supporting Social Innovation initiatives with the engagement of professors, researchers, employees and, above all, students.

Already recognized as an institution of excellence in the generation of technological innovations, UNICAMP may, with this, strengthen its position in the development of

social innovations, contributing even more actively to the overcoming of complex social, economic and environmental problems faced by the country.

Regarding technological innovation, the external evaluation committee first emphasized the constant presence of technological innovation in the University's administration agenda, describing four dimensions, namely:

- innovations from research,
- the process of protecting results by enforcing intellectual property rights,
- technology transfer, carried out through R&D and licensing projects, and finally,
- actions to promote and disseminate the culture of innovation and entrepreneurship.

It then praised the report, commenting that it was clear and precise, and finally highlighted three main points in the presentation of the evaluators:

- The central role of science, technology and innovation at Unicamp, and its importance to create a knowledge-based and, therefore, sustainable socio-economic environment;
- Inova's performance in intellectual property, licensing and entrepreneurship, with an impressive number of Unicamp Alumni Companies, showing the effect of the university's actions on the transformation of society.
- The increase in the number of patents granted, and the efficiency of the processes that increase the effectiveness of the University's research and development actions.

Clearly, the insertion of a specific chapter to address the results related to technological innovation and entrepreneurship at the University in the 2014-2018 Institutional Evaluation Report was a step forward. In previous reports, information was scattered and did not emphasize the engagement of the university's central management in this area, not bringing Unicamp's pioneering spirit and outstanding results in this sector to the external evaluators' attention.

Even so, it is important to point out some aspects that deserve to be incorporated in the next institutional evaluations, such as the impact of the Incubator and the Technological Park through various metrics established by Inova. Likewise, it is necessary to establish indicators to monitor the progress in the area of dissemination of the culture of technological innovation and entrepreneurship.

In relation to the increase in the number of patents granted, this should be attributed in part to changes implemented by the National Institute of Industrial Property, with the goal of reducing the backlog of processes. Of course, this increase also depends on whether the deposits are solid, which is evidently the case.

Regarding the challenges and deficiencies highlighted by the external evaluators, they commented that even in the USA there is no clear evidence of how effective

Technology Transfer Offices (TTO) are in promoting a link between industry and science. They suggested that the university bases strategies in this area on internal and external evaluations. These impacts, not only on the link mentioned, but also on the promotion of an entrepreneurial ecosystem around the University, are in fact difficult to assess. This has been extensively studied around the world, and the reason for the difficulty in seeing the impacts clearly stems from the fact that their occurrence is scattered across places and over time. In this sense, it is very difficult to establish clear metrics on which to base this assessment. In any case, it must be made clear that Inova is much more than a TTO, as it has a complete structure to stimulate innovation and innovative entrepreneurship.

Regarding technology transfer itself, although Unicamp recognizes the difficulty in measuring the impacts, some parameters are being created, such as: (1) metrics of new technologies developed through R&D partnerships; (2) licensing of technologies present in products/services available on the market; (3) creation of new companies with technology from the University and (4) socioeconomic impact of our technologies in terms of jobs, wealth and direct improvement in services to the population. With these metrics, it will certainly be possible to better measure and, beyond that, compare the data with those available in the USA and Europe.

The external committee pointed out that building scientific and technological parks and innovation clusters requires resources, which are in fact necessary, yet scarce. However, Unicamp's experience is that once the initial resources to cover the cost are obtained, the park will become profitable. Furthermore, promoting the local ecosystem and interacting with more parks tends to create a self-sustainable system. The difficulty lies in increasing the capacity to house new companies. A new way of dealing with this issue is to distribute the park within the premises of Unicamp itself, in spaces where the necessary infrastructure already exists. This was recently approved by the University Council. As for creating new spaces, the difficulty lies in obtaining private financing, due to the complexity of public-private partnerships. Therefore, Unicamp is looking for new governance models.

Subsequently, the report listed recommendations that essentially deal with the aforementioned challenges, namely:

- It is necessary to constantly check key points to measure the impact of technology transfer, referencing the results of the USA and Europe.
- Technological innovation has a great impact on graduate studies and research, and the link between these activities must be strengthened.
- Regarding the incorporation of innovation actions into the University's existing structure, they must be disseminated beyond the park's borders to promote the interactions between industry and academia. The new innovation policy related to the sharing of laboratories and the approval in CONSU of the possibility of the entire campus acting as a park can greatly increase the impact of technological innovation, both promoting a knowledge-based socioeconomic environment with important social impacts, and internally improving the culture of innovation and entrepreneurship and the quality of teaching and research.

- It is important to develop well-established metrics to measure the impact of actions so that, based on the results of this quantitative analysis, it is possible to better define and evaluate performance and create strategies.

At the end, the committee makes an important comment, reproduced here: *“The benefits of SI and TI at Unicamp extends regionally and beyond the present moment in time. In light of this, fostering innovation requires a certain amount of commitment and re- imagination. Unicamp must tolerate the disruption of today for a better tomorrow. It is crucial to foster a culture that embraces social and technological innovation, not based just on the assessment of costs and benefits—it has an ethical dimension as well. Nurturing innovation is part of good stewardship of staff and student development during this crisis”.*

It is certainly necessary to be attentive so that social and technological innovation has a real impact on society, which will only happen if it is ethical, sustainable and promotes the best quality of life for all. This is explicitly part of the mission of Unicamp and Inova.

## 14.7 Management

Regarding Unicamp’s Management, the external evaluation committee focused its comments on seven aspects, namely: governance, strategic planning, communication, Unicamp’s performance in the pandemic, development of the faculty career, autonomy and finance.

In relation to governance, the committee pointed to the tension between centralization and decentralization that characterizes this issue at Unicamp. It is necessary to make the university more agile so it can focus on its priorities, while balancing this with the multiple collegiate structures that make the decisions, which is part of Unicamp’s tradition. In addition, there needs to be less bureaucracy.

The current administration is aware of this problem and has been acting in an objective manner to address it, with the creation of two programs, *Desburocratize* and *Simplifique*. Recently, Unicamp joined the Federal Network of Innovation in the Public Sector and, for this, LabGesta, a laboratory dedicated to innovation in public management, was created within the scope of the University’s General Coordination.

The committee indicated that the current governance, highly decentralized, needs to be improved, as this format complicates the establishment of strategic priorities, and can create an environment of resistance to change and innovation. According to the committee, there is evidence that this is occurring in some projects, such as, for example, in the curriculum revision being carried out by the departments and academic units. Another example is related to research and scientific production. Although the committee highlighted its quality and relevance, it is not clear whether the university will make an extra effort to encourage an interdisciplinary approach to major problems as one of its priorities, with the support of the units and researchers.

To improve the university’s governance, the administration must select topics to be comprehensively discussed as clear guidelines and define an objective way of monitoring

the improvements implemented based on the report of the external committee, which will be addressed in the Strategic Planning Revision to be initiated shortly.

In relation to the second theme, Strategic Planning, the external evaluation committee pointed out that it must be associated with Institutional Evaluation, as has been done, maintaining a connection between Internal and External Evaluations. Although the strategic planning process is well structured, it is necessary to better define priorities, combine strategic projects and establish monitoring metrics.

Regarding this point, the analysis of the external committee is once again correct, and should be taken into account in the next planning process. The way of monitoring the projects is not based on strategic indicators of the actions' impacts and results, but on indicators of the project's development. Only recently has Unicamp started setting up a database on which to base the definition of its strategic indicators. This should be one of the essential topics of the planning revision planned for September 2020, as it will allow Unicamp to adequately answer the questions made by the committee: what should be the priority areas for teaching, research and extension and culture?

What products are expected from the activities developed? What are the requirements for excellence in each of the university's missions? How will they be met? These are some of the questions that should be analyzed in Planes 2021-2025.

Thus, the Strategic Planning's revision must pay attention to the proposed recommendations: 1. Defining few strategic objectives, which will be addressed in projects with objective results and indicators on which to base their analysis and monitoring; 2. Prioritizing budget allocation in alignment with the strategic priorities; 3. Trying to rationalize the IT structure and governance, with gradual centralization of the systems; 4. Giving continuity to long-term projects. In relation to this last point, the committee suggested that a possible extension of the mandates of the university's administration could be discussed to ensure the planning's continuity, allowing it to grow and mature.

Regarding communication, the external committee positively highlighted the university's concern with structuring it within the internal and external communities, as well as the policy of access to national and international journals and the consolidation of the Scientific and Intellectual Production Repository of Unicamp. The institution has been making a great effort to make all of its theses and dissertations available online, and is now also seeking to make the scientific production available, which is not a trivial matter due to current copyright laws, as well as the rights of third parties in the case of production in non-open access journals. On the other hand, publication in international open access journals still has a prohibitive cost. This is a topic that is being constantly discussed and evolving around the world, and Unicamp has been trying to keep up do date.

It is necessary to organize a communication structure that ensures that the various stakeholders receive information regularly and consistently. The development of a communication strategy was already one of the strategic objectives listed in Planes 2016-2020, but the current structure is still far below what is necessary.

Although not inserted in the period covered by the report, Unicamp's actions against the pandemic were widely highlighted and praised for the national and international leadership role the university has been playing. The external committee commended the

role of the current rector in reducing the deficit since 2017, and the good management of resources, but also expressed enormous concern about the sharp reduction in revenue due to the pandemic, which will require a very strong action plan to ensure that the level of excellence achieved by the university is maintained.

The external committee pointed to the importance of academic and financial autonomy, but also drew attention to the amount of state and federal regulations limiting the autonomy in management, which does not occur in other international contexts. This is a complex theme in Brazil, as shown by examples such as the lack of flexibility in the establishment of curricula, in the training of professionals with more comprehensive profiles, or even in the freedom of students to choose different academic paths. This is also true for the graduate programs, the performance of which is based on Capes' evaluation process, or the strict criteria for granting research fellowships or scholarships. There is not much to comment about these topics, only that Unicamp is aware of this reality and has been trying to adapt to it. The institution needs to be more involved in these national discussions to verify the possibility of greater flexibility.

Regarding the development of the teaching career, the external committee made observations regarding recruitment, evaluation and retirements. Unicamp is an internationally recognized university, but despite this, the recruitment of professors from abroad is still limited. They recognized the language problem, but indicated that this needs to be addressed by the university. This concern is already included in the institution's agenda, and some units have been holding open competitive examinations in a foreign language to attract talented individuals and reduce endogeneity.

Some changes in the assessment of the performance of professors were suggested to make it more rigorous, frequent and formative. This matter should be dealt with by the Internal Chamber of Faculty Development.

Another concern expressed by the committee is related to the great loss of professors in the 50-59 age group that Unicamp suffered in the evaluated period, which is worrying, since in several areas this is usually one of the faculty's most productive phases. The committee indicated that automatic replacement should occur, but in accordance with the strategic objectives established, according to demand. They also expressed concern about replacements in the critical scenario imposed by the pandemic, which was reinforced by the entry into force, during the period of the external evaluation meetings, of Supplementary Law 173, which prevents new hires and promotions until December 2021.

In relation to Unicamp's finances, the committee stated that it is a great risk to continue depending only on government resources, and recommended that the university tries to diversify its funding sources, since the payroll with retired personnel has been growing substantially, in addition to regular expenses. Alternative sources could include intellectual property licensing, contracts, philanthropic contributions, donations etc. Additionally, the university must also revise its priorities and priority activities, focusing on results that are more transversal.

This form of performance has been pursued on a daily basis by PRDU and the Budget and Heritage Committee, and is being carried out by the current administration. Sustainability is one of the premises of Planes 2016-2020, and has been prioritized by



management, as it is a highly strategic issue. The current administration created CEPLAE under PRDU. This committee has the permanent function of analyzing the external scenarios outlined in the country, guiding PRDU and the Budget and Heritage Committee in the decisions related to the financial and budgetary sustainability of the university.

It must be made clear to all the institution's bodies that it is no longer possible to exceed the limits of their budgets, and that they all must adapt their work processes to the reality of the necessary and pressing financial sustainability. This is one of the pillars of good public administration, and was implemented in 2017. It should be emphasized that this responsible type of management gave excellent results until the beginning of the pandemic, which introduced a further drop in tax revenues, strongly impacting the university's finances. There is no doubt that the seriousness of the crisis will require all bodies to adapt to the new reality, and thus, the committee's recommendation must be fully accepted.

In the same way that Unicamp has been acting responsibly in the management of expenses, it is not exempt from seeking new funding sources, and in this sense: 1. As of 2018, Unicamp started to receive oil royalties to help reduce the financial deficit of the social security payroll (still far from being paid off); 2. The Endowment Fund was created, and is currently being implemented; 3. The Unicamp Solidarity Program (Programa Unicamp Solidária) was created, through which donations that are essential in the context of the pandemic are being received and allocated to hospitals, charity programs, and low-income students; 4. The Unicamp Partners Program (Programa Parceiros da Unicamp) was created, through which the university recognizes partners who contribute to the development of its activities. This search for new funding sources is, however, insufficient to meet the institution's current needs.

## ANNEX 1 – REFERENCES FOR COMPARISON OF SCIENTIFIC PRODUCTION

*Throughout the text and, mainly, from Graph 10.1 to Graph 10.7, comparisons of UNICAMP's scientific production with different references were presented. Here, those references are described in greater detail.*

### COMPARISONS WITH THE UNITED STATES OF AMERICA

*All scientific production in the US, in the respective areas, accounting for all Research Institutes, Public and Private Universities, Public and Private Companies, which had scientific production in the period in question.*

### COMPARISONS WITH BRICS

*All scientific production in the Russia, India, China and South Africa, in the respective areas, accounting for all Research Institutes, Public and Private Universities, Public and Private Companies, which had scientific production in the period in question.*

### COMPARISONS WITH EUROPE

*All scientific production in the Germany, Austria, Belgium, Denmark, Spain, France, Hungary, Netherlands, Ireland, Italy, Poland, Portugal, United Kingdom and Sweden, in the respective areas, accounting for all Research Institutes, Public and Private Universities, Public and Private Companies, which had scientific production in the period in question.*

### COMPARISONS WITH ASIA

*All scientific production in the Japan, South Korea and Singapore, in the respective areas, accounting for all Research Institutes, Public and Private Universities, Public and Private Companies, which had scientific production in the period in question.*

### COMPARISONS WITH AUSTRALIA AND NEW ZEALAND

*All scientific production in the Australia and New Zealand, in the respective areas, accounting for all Research Institutes, Public and Private Universities, Public and Private Companies, which had scientific production in the period in question.*

### COMPARISONS WITH ARGENTINA, CHILE AND MEXICO

*All scientific production in the Argentina, Chile and Mexico, in the respective areas, accounting for all Research Institutes, Public and Private Universities, Public and Private Companies, which had scientific production in the period in question.*

## COMPARISONS WITH THE BEST BRAZILIAN STANDARD

*All scientific production of Brazilian Institutions with programs in the respective area with the best grades at CAPES, based on the similarity of these programs with the graduate programs of UNICAMP. UNICAMP, USP and UNESP were removed from the comparison.*

### FCA

*No comparisons were performed for this unit.*

### FEA

*Universidade Federal de Lavras  
Universidade Federal de Santa Catarina*

### FCF

*Universidade Federal da Paraíba (João Pessoa)  
Universidade Federal de Minas Gerais  
Universidade Federal do Rio de Janeiro  
Universidade Federal do Rio Grande do Sul*

### FEAGRI

*Universidade Estadual de Maringá  
Universidade Estadual do Norte  
Fluminense Darcy Ribeiro  
Universidade Federal de Lavras  
Universidade Federal de Pelotas  
Universidade Federal de Santa Catarina  
Universidade Federal de Santa Maria  
Universidade Federal de Viçosa  
Universidade Federal do Rio Grande do Sul  
Universidade Federal Rural de Pernambuco  
Universidade Federal Rural do Rio de Janeiro  
Universidade Federal Rural do Semi-Árido*

### FCM

*Fiocruz (Centro de Pesquisa Gonçalo Moniz)  
Fiocruz (Centro de Pesquisas René Rachou)  
Fiocruz (Fundação Oswaldo Cruz)  
Pontifícia Universidade Católica do Rio Grande do Sul  
Universidade do Estado do Rio de Janeiro  
Universidade do Extremo Sul Catarinense  
Universidade Estadual de Londrina  
Universidade Federal da Bahia  
Universidade Federal de Minas Gerais  
Universidade Federal de Pelotas  
Universidade Federal de São Paulo  
Universidade Federal do Ceará  
Universidade Federal do Rio de Janeiro  
Universidade Federal do Rio Grande do Sul*

### FEC

*Pontifícia Universidade Católica do Rio de Janeiro  
Universidade de Brasília  
Universidade Federal de Minas Gerais  
Universidade Federal de Santa Catarina  
Universidade Federal do Ceará  
Universidade Federal do Rio de Janeiro  
Universidade Federal do Rio Grande do Sul  
Universidade Presbiteriana Mackenzie*

### FE

*Pontifícia Universidade Católica do Rio Grande do Sul  
Universidade do Estado do Rio de Janeiro  
Universidade do Vale do Rio dos Sinos  
Universidade Federal de Minas Gerais  
Universidade Federal de São Carlos  
Universidade Federal do Paraná  
Universidade Federal do Rio de Janeiro  
Universidade Federal do Rio Grande do Sul*

### FEEC

*Pontifícia Universidade Católica do Rio de Janeiro  
Universidade Federal de Campina Grande  
Universidade Federal de Santa Catarina  
Universidade Federal de Santa Maria  
Universidade Federal do Ceará  
Universidade Federal do Rio de Janeiro  
Universidade Federal do Rio Grande do Sul*

## FEF

Universidade Federal de Minas Gerais  
Universidade Federal de Santa Catarina  
Universidade Federal de São Carlos  
Universidade Federal do Paraná  
Universidade Federal do Rio Grande do Sul

## FEM

Instituto Tecnológico de Aeronáutica  
Pontifícia Universidade Católica do Paraná  
Pontifícia Universidade Católica do Rio de Janeiro  
Universidade Federal de Pernambuco  
Universidade Federal de Santa Catarina  
Universidade Federal de Uberlândia  
Universidade Federal do Rio de Janeiro  
Universidade Federal do Rio Grande do Sul

## FENF

Universidade Federal de Santa Catarina  
Universidade Federal do Ceará  
Universidade Federal do Rio de Janeiro

## FEQ

Universidade Federal do Rio de Janeiro  
Instituto Militar de Engenharia  
Universidade Estadual de Maringá  
Universidade Federal de Minas Gerais  
Universidade Federal de Santa Catarina  
Universidade Federal de São Carlos  
Universidade Federal de Uberlândia  
Universidade Federal do Ceará  
Universidade Federal do Rio Grande do Sul

## FOP

Universidade Federal de Minas Gerais  
Universidade Federal de Pelotas  
Universidade Federal de Uberlândia  
Universidade Federal do Rio Grande do Sul  
Universidade Universus Veritas Guarulhos

## FT

Universidade Federal de São Carlos  
Universidade Federal do Paraná

## IA

Universidade Federal da Bahia  
Universidade Federal de Minas Gerais  
Universidade Federal do Rio de Janeiro  
Universidade Federal do Rio Grande do Sul

## IB

Universidade Federal de Minas Gerais  
Universidade Federal do Rio de Janeiro  
Universidade Federal do Rio Grande do Sul

## IC

Pontifícia Universidade Católica do Rio de Janeiro  
Pontifícia Universidade Católica do Rio Grande do Sul  
Universidade Federal de Minas Gerais  
Universidade Federal de Pernambuco  
Universidade Federal do Rio de Janeiro  
Universidade Federal do Rio Grande do Sul  
Universidade Federal Fluminense

## IE

Fundação Getúlio Vargas (RJ)  
Pontifícia Universidade Católica do Rio de Janeiro  
Universidade Católica de Brasília  
Universidade de Brasília  
Universidade Federal de Minas Gerais  
Universidade Federal do Rio de Janeiro  
Universidade Federal Fluminense

**IEL**

*Pontifícia Universidade Católica do Rio Grande do Sul*  
*Universidade Federal da Paraíba (João Pessoa)*  
*Universidade Federal de Minas Gerais*  
*Universidade Federal de Santa Catarina*  
*Universidade Federal do Paraná*  
*Universidade Federal do Rio de Janeiro*  
*Universidade Federal do Rio Grande do Sul*  
*Universidade Federal Fluminense*  
*Universidade Presbiteriana Mackenzie*

**IFCH**

*Pontifícia Universidade Católica do Rio Grande do Sul*  
*Universidade de Brasília*  
*Universidade Federal de Minas Gerais*  
*Universidade Federal de Pernambuco*  
*Universidade Federal de Santa Catarina*  
*Universidade Federal de São Carlos*  
*Universidade Federal do Rio De Janeiro*  
*Universidade Federal do Rio Grande do Sul*  
*Universidade Federal Fluminense*

**IFGW**

*Centro Brasileiro de Pesquisas Físicas*  
*Observatório Nacional*  
*Pontifícia Universidade Católica do Rio de Janeiro*  
*Universidade Federal de Minas Gerais*  
*Universidade Federal de Pernambuco*  
*Universidade Federal do Ceará*  
*Universidade Federal do Paraná*  
*Universidade Federal do Rio de Janeiro*  
*Universidade Federal do Rio Grande do Sul*  
*Universidade Federal Fluminense*

**IG**

*Instituto Nacional de Pesquisas Espaciais*  
*Universidade de Brasília*  
*Universidade Federal de Minas Gerais*  
*Universidade Federal do Ceará*  
*Universidade Federal do Pará*  
*Universidade Federal do Paraná*  
*Universidade Federal do Rio De Janeiro*  
*Universidade Federal do Rio Grande*  
*Universidade Federal do Rio Grande do Sul*  
*Universidade Federal Fluminense*

**IMECC**

*Universidade Federal de Minas Gerais*  
*Universidade Federal do Rio de Janeiro*

**IQ**

*Universidade Estadual de Maringá*  
*Universidade Federal de Minas Gerais*  
*Universidade Federal de Pernambuco*  
*Universidade Federal de Santa Catarina*  
*Universidade Federal de Santa Maria*  
*Universidade Federal de São Carlos*  
*Universidade Federal do Ceará*  
*Universidade Federal do Paraná*  
*Universidade Federal do Rio de Janeiro*  
*Universidade Federal do Rio Grande do Sul*  
*Universidade Federal Fluminense*

**COMPARISONS WITH BRAZIL**

*All scientific production in Brazil, in the respective areas, considering all Research Institutes, Public and Private Universities, Public and Private Companies, which had scientific production in the period in question, after excluding UNICAMP, USP and UNESP.*

## ANNEX 2 – CURRICULUM OF THE MEMBERS OF EXTERNAL EVALUATION COMMITTEES

### EXTERNAL EVALUATION COMMITTEE ON PRE-UNIVERSITY EDUCATION

#### **HUYRA ESTEVÃO DE ARAÚJO**

*Professor, Integrated High School Coordinator at Federal Institute of Education, Science and Technology of São Paulo (IFSP), Coordinator of the INOVA-IFSP Research Project, Researcher and Member of the International Exchange Alumni and the American Ceramic Society. Physicist (UFSCAR), master in Material Sciences and Ph. D. in the área of Science and Engineering of Materials with studies in developing protonic conductive ceramics with potential for solid electrolytes for fuel cells.*

#### **MARIA HELENA GUIMARÃES DE CASTRO**

*Sociologist and master in Political Science (Unicamp), she is a retired professor at IFCH/Unicamp, where she also worked as a researcher at the Center for Public Policy Studies (NEPP). She was president at INEP, Executive Secretary at Minister of Education, Full member of the São Paulo State Education Council, Executive Director of SEADE Foundation, Secretary of Education of the São Paulo State, Secretary of Social Development and Assistance and Secretary of Science, Technology and Economic Development of the São Paulo State. President of the Brazilian Educational Evaluation Association (ABAVE). She participated in the Curriculum Common National Basis Movement and many international educational committees at UNESCO and OECD. She has been a member of the Brazilian Education Academy since 2005 and of the São Paulo State Education Academy since 2015.*

#### **ISNARD DOMINGOS FERRAZ**

*Director of the Colégio de Aplicação (COLUNI) from the Federal University of Viçosa. Physicist, master and Ph. D. in Applied Physics at the Federal University of Viçosa. He is full professor of Basic, Technical, and Technological Education Career since 2005. He worked as a physics teacher, from 1993 to 2005, at the Central Teaching and Agrarian Forest Development (CEDAF) at the Agro-Technical School in the Federal University of Viçosa.*

#### **JOSÉ VITÓRIO SACILOTTO**

*He was Pedagogical Coordinator, Coordinator, Supervisor, and Director of the Trajano Camargo State Technical School in the State Center of Technological Education Paula Souza (CEETEPS), where he currently works as a management and planning specialist. He has an education degree at the Pontifical Catholic University of Campinas with an*



*emphasis in School Supervision and Educational Supervision. He also has an emphasis in School Management from the São Caetano do Sul College of Philosophy, Sciences, and Language. Master and Ph. D. in Education from the University of Campinas, with studies in the área of policy, administration, educational systems.*

### **MARIA ANTONIA RAMOS DE AZEVEDO**

*She is the vice-director of the Biosciences Institute and professor in the Education program at UNESP. Graduated in education from the Pontifical Catholic University of São Paulo. She is master in education at the Federal University of Santa Maria and Ph. D. in Education at the University of São Paulo.*

## **EXTERNAL COMMISSION FOR THE EVALUATION OF TEACHING, RESEARCH, EXTENSION AND CULTURE, INNOVATION AND MANAGEMENT AT UNICAMP**

### **THOMAS MAACK**

*Emeritus Professor of Physiology Biophysics and Medicine. He is graduated in Medicine (USP). He was a professor at SUNY Upstate Medical Center and a researcher at Mount Desert Island Biological Laboratories. He was visiting professor at several universities, including the Free University of Berlin (1976), Escola Paulista de Medicina (1979-1980), Faculdade de Medicina de Ribeirão Preto (1982), and Universidade Federal do Rio de Janeiro (1983 and 1986). He served as a consultant and reviewer of programs and grants for the National Institutes of Health in the United States and FAPESP, CNPq, and CAPES in Brasil. In Brazil, he also served as a consultant for the medical curriculum reform in several medical schools. Member of the Brazilian Academy of Sciences.*

### **VALENTIN A. BAZHANOV**

*Professor, chairperson of the Philosophy Department at Ulyanovsk State University, Russia. He has been on the faculty of Philosophy at Kazan University from 1979 until 1993. He has been the Senior Research member at the Institute of Philosophy (Moscow) from 1987–88. Since 1993 he is at the Ulyanovsk branch of Moscow State University, Department of Philosophy, The Dean of the Humanities (1993 – 1995). In 2002 V.A. Bazhanov was elected corresponding member and in 2009 as a full member of Academie Internationale de Philosophie des Sciences in Brussels.*

### **SILVIA BRASLAVSKY**

*Senior Research Scientist at Max-Planck Institute for Bioinorganic Chemistry, from 1978 to 2007 (up to 2003 Max-Planck Institute for Radiation Chemistry, Section Prof. Kurt Schaffner). Since 2006, she is corresponding Member at CONICET (Argentine Research Council), with a working place in INQUIMAE (Instituto de Química de los Materiales, Medio Ambiente y Energía), Buenos Aires. Graduated and Ph.D. in Chemistry (Universidad de Buenos Aires. Recent Honours-Awards: 2017 European*

*Society of Photobiology, Medal “for outstanding and sustained contributions to the science and promotion of Photobiology” (Pisa, Setiembre); 2019 International Union on Photobiology, Finsen Medal for “Outstanding contributions to the Photosciences” (Barcelona); 2019 International Photoacoustic and Photothermal Association (IPPA). 2019 Senior Prize (Moscow, July); 2019 European Photochemical Association (EPA) (Novel) Award for Service to the Photochemical Community.*

## **FRANCISCO MARMOLEJO**

*He is currently Education Advisor at Qatar Foundation. Former World Bank’s Lead Tertiary Education Specialist and Coordinator of its Network of Higher Education Specialists. He served as the coordinator of the internal thematic group on higher education, which helps facilitate the exchange of ideas on higher education initiatives across the globe. Previously, he served as founding Executive Director of the Consortium for North American Higher Education Collaboration (CONAHEC), a network of more than 160 higher education institutions primarily from Canada, the U.S. and Mexico, based at the University of Arizona (UA). At UA, he was Affiliated Researcher at the Center for the Study of Higher Education and Affiliate Faculty at the Center for Latin American Studies. He graduated from the Autonomous University of San Luis Potosí Universidad Autónoma de San Luis Potosí (UASLP) in business administration with emphasis in Agri-business. He received a master’s degree in business administration from UASLP, and later conducted doctoral work in Organizational Administration at Universidad Nacional Autónoma de México. Marmolejo has consulted for universities and governments in different parts of the world, and has been part of Organisation for Economic Co-operation and Development (OECD) and World Bank international peer review teams of experts conducting evaluations of higher education in Europe, Latin America, Africa, the Middle East and Asia.*

## **NAZIEMA JAPPIE**

*Director for the Centre for Educational Testing for Access and Placements (CETAP) at the University of Cape Town. In January 2017 she was appointed as Honorary Consul for the Republic of the Maldives. She holds a Bachelor of Social Science, an Honours degree (Social Science), and a Master of Social Science, specializing in industrial and labour studies and a Higher Education Diploma (postgraduate) and Adult Education. Her awards include the National Research Foundation; USAID; Ford Foundation for research in student services in Higher Education; the Fellowship in Labour Studies at the University of Iowa, USA as well as the Standard Bank Recognition Award in 2007 and in 2019 she received an Emerging Scholar Award at the Learner Conference, Queens University, Belfast. She joined the Durban University of Technology (DUT) as Executive Director: Student Affairs from her position of Dean of Students at the University of the Witwatersrand. She has taught at the Institute for Women’s Studies in Lahore over a period of three years. She has extensive experience in institutional evaluations and audits as a panel member for the higher education quality assurance*

*committee (HEQC) for the South African higher education sector and has been project leader for reviews with Boston Consulting Group (BCG) and IBM at the University of Cape Town. Moreover, she has served as a member of the task team for Gender Equity in Education for the Ministry of Higher Education; President of the Student Affairs Association (SASSAP); Vice Chair of Higher Education AIDS (HEAIDS) Programme for Universities was the Vice Chairperson of the South African Women's Forum and South Africa. She is involved with the Global Access to Postsecondary Education (GAPS) and is a key role player in this area.*

### **PATTI MCGILL PETTERSON**

*Senior Fellow, Center for Internationalization and Global Engagement at the American Council on Education (ACE). Prior to joining ACE, she was senior associate at the Institute for Higher Education Policy (IHEP) whose mission is to increase student access and success in postsecondary education. From 1997-2007, she served as executive director of the Council for International Exchange of Scholars (CIES) and vice president of the Institute of International Education (IIE). CIES, a division of IIE, administers the worldwide Fulbright Scholar Program on behalf of the US government. Patti is president emerita of Wells College and St. Lawrence University, where she held presidencies from 1980-97. As a tribute to her leadership at Wells, the Patti McGill Peterson Chair in social sciences was established. At St. Lawrence, the Center for International and Intercultural Studies was named in her honor. She has served on the faculty of the State University of New York, Syracuse University and Wells College and was senior fellow at Cornell University's Institute for Public Affairs. Patti served as chair of the US-Canada Commission for Educational Exchange, the National Women's College Coalition, the Public Leadership Education Network, and ACE's Commission on Leadership Development and Academic Administration and is a past president of the Association of Colleges and Universities of the state of New York.*

### **ANDRÉS BERNASCONI**

*Full professor at the UC Faculty of Education. He is currently director of the Center for Advanced Studies on Educational Justice (CJE), after serving as deputy dean of the UC Faculty of Education from 2015 to 2017. He also assumed the leadership - between 2014 and 2015 -from the Center for Studies on Policies and Practices in Education (CEPPE). He is a lawyer and holds an Law Degree from the Pontificia Universidad Católica de Chile, Master in Public Policy at Harvard University and Ph.D in Sociology of Organizations at Boston University. He has been an Associate Researcher at the School of Education at Harvard University, Academic Vice-rector and Vice-rector for Research and Postgraduate Studies at the Andrés Bello University, and Dean of the Faculty of Legal Sciences at the University of Talca. He has been a consultant in policy and management of higher education in a dozen countries in America, Europe and Asia, for the IDB, UNESCO, the World Bank, the United States Agency for International Development (USAID) and the European Commission.*



SUMMARY

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*Sandra Luzia Scarano (Secretary)*  
*Gabriela Brioschi Morais*  
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*Monica Barbosa de Melo*

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*Stanislav Mochkalev (President)*  
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## FINAL REPORT OF INSTITUTIONAL EVALUATION UNICAMP 2014 – 2018



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