

University Postgraduate Programs and Their Evaluation - Comparative Aspects between Argentina, Brazil and Uruguay

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Abstract

This paper analyzes the research policies adopted in universities and their evaluation, comparing aspects between Argentina, Brazil and Uruguay. The study encompasses diverse documents on current regulations, impact assessments and interviews to key persons. The comparison allows for identifying, among the common aspects, the difficulties for developing a quality evaluation process, considering the diversity of systems in higher education, being heterogeneous in the three countries. There exist differences related to the origin and consolidation of the systems evaluating university quality and science and technology, the policies developed at the different stages and the influence of the political and economic context. These aspects exert great influence on the different ways to evaluate the research function, among the national cases as well as regarding their inner characteristics.

Keywords: higher education, science and technology quality evaluation, research function

1. Introduction

Quality assurance processes and the evaluation of the research function in such framework are becoming increasingly more relevant at world level, with growing impact on universities. Higher education systems and university public policies assign priority to research, so that the institutions end up focusing resources and actions on research, many times to the detriment of other equally relevant functions, such as teaching and outreach activities.

Through comparing some aspects between Argentina, Brazil and Uruguay, this paper aims to understand the different degrees of progress in research policies in universities, and their evaluation in the framework of the respective development processes of national quality assurance systems related to higher education and science and technology. The methodological approach takes qualitative research as the perspective. A documentary analysis is conducted involving various secondary sources, among them regulations, reports and resolutions. Interviews are also included to different actors of the educational environment.

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2. Current Regulations and Institutional Framework

The National Council of Scientific and Technical Research (*Consejo Nacional de Investigaciones Científicas y Técnicas*, CONICET) is the primary matrix of research evaluation processes in Argentina, and exerts great influence on current evaluation mechanisms, particularly those developed by the National Commission for University Evaluation and Accreditation (*Comisión Nacional de Evaluación y Acreditación Universitaria*, CONEAU). CONICET was created by Decree-Law No. 1291 dated February 5, 1958, with the purpose of promoting scientific and technological research in the country. It was established as an autonomous body depending on the Presidency of the Nation; it was given a wide range of instruments that still today form the backbone of their actions: the Career of Scientific and Technological Researcher and the Career of Research Support Staff, scholarships for doctoral and postdoctoral studies, financing for projects as well as for research execution units, and links with government and non-government international organizations with similar characteristics. Universities participated in this expansion associated to CONICET, particularly in the case of basic sciences in large Argentine universities.

As from the enactment of the Higher Education Act, (LES, for its Spanish acronym) Law No.24 521, in August 1995, the evaluation and accreditation processes are institutionalized for university quality with the creation of CONEAU, a decentralized entity within the Argentine Ministry of Education.

Article 46 of LES establishes CONEAU functions which, among others, include accrediting undergraduate careers mentioned in Article 43, as well as postgraduate studies, whether in the public or private sector, pursuant to standards provided for by the Ministry of Culture and Education in consultation with the University Council³.

On the other hand, the Ministry of Education carries out the Incentive Program for Teachers-Researchers, intended to promote research in the academic field, fostering greater dedication to university activities and the creation of research groups, through payment of an incentive to categorized teachers-researchers in national universities.

In the nineties there were also other significant reforms to Science and Technology. Palamidessi, Galarza and Cardini (2012) characterize the nineties as the "Neoliberal turn of Peronism" in a context featured by makeshift breakdown of the state apparatus. However, regarding universities they recognize progress in State intervention in education. Their opinion is that through the creation of the Secretariat for Technology, Science and Productive Innovation, and the National Agency for Scientific and Technological Promotion within its scope in 1996, the political management began to participate more in guiding research activities conducted at universities. Likewise, they recognize the creation of bodies such as the CONEAU and the new methods for resource allocation. They also define the period beginning in 2002 as a period of "growing presence of the State," even if they view the continuity of policies implemented in the nineties, further identifying that the main difference between both periods is basically noted in the increase of financing. The funding lines cover a wide variety of recipients from scientists engaged in basic research, to businesses interested in improving their competitiveness through technological innovation. The Agency coordinates financing funds, among others, the Fund for Scientific and Technological Research (FONCyT, for its Spanish acronym) and the Argentine Technological Fund (FONTAR, for its Spanish acronym). The latter intends to promote links between the universities and private companies.

In the 2002 - 2007 period, a significant increase in funding for research takes place, the participation in these years grows from 0.39% to 0.51% of GDP, although there are no significant institutional changes as regards the previous decade. The Higher Education Act remains the same, in spite of submittal of several bills to Congress aiming at amending it.

³ The University Council is the **academic coordination** body, as well as the body for cooperation, consultation and proposals in university matters. It is made up of a representative of the Ministry of Education and the Presidents of public and private universities.

The same applies to the CONEAU, which assumes greater influence on universities. Likewise, in 2007 the Ministry of Science, Technology and Productive Innovation was created absorbing the aforementioned Secretariat and its functions, in addition to promoting new activities, among them institution funding through the evaluation of the research function in universities.

In 1985, in Brazil, the Ministry of Science and Technology was created, implying recognition of the importance of research in that country. However, in practice the Ministry became a bureaucratic structure unable to coordinate the country's research activities by linking them to the productive system (Schwartzman, 2008). The National Research & Development System (SNPD, for its Portuguese acronym) in Brazil is coordinated by the Ministry of Science and Technology (MST). The MST coordinates the work and the execution of programs and actions to consolidate the national policies on Science, Technology and Innovation. The two main Brazilian funding bodies are under MST responsibility, namely the Financing Body for Studies and Projects (FINEP, for its Portuguese acronym) and the National Council of Scientific and Technological Development (CNPq, for its Portuguese acronym) and its research units. Research development is funded mainly through the MST, and promotion bodies such as CNPq and FINEP. Another funding body is the Ministry of Education and Culture (MEC) through its own Coordination for Proficiency of Senior Staff (CAPES, for its Portuguese acronym).

In addition to SNPD, some state funds play an important role in R&D scenario. Particularly, the Foundation to Support Research of the State of São Paulo (FAPESP, for its Portuguese acronym) is one of the main funding bodies for scientific research and technology in the country. With autonomy guaranteed by Law, FAPESP is related to the Secretary of Higher Education of the Government of the State of São Paulo. FAPESP annual budget has amounted to over R\$ 400 million in the last three years, it is to say 1% of total State tax revenues. An important change in the context of Science and Technology funding was the creation in 1999, of 16 sectoral funds for S & T. The total invested amount in R&D in Brazil has almost tripled between 2000 and 2008. This increase was in line with a significant growth in terms of percentage of GDP investment, from 1.30 to 1.47%. The participation of the private sector amounts to an average 47% of total investments, and ranges between 43 and 50%, with no definite trend.

Unlike Argentina, in Brazil quality evaluation processes for postgraduate studies evolve jointly with the development of scientific and technological research. According to Bittar, Morosini and Bittar (2012), the decade of 1950 was characterized by the creation of several agencies to promote research and science. With the idea of implementing scientific and research policies in the country, the National Council of Research (CNPq) and the Coordination for Proficiency of Senior Staff (CAPES) were created. In 1961, the Foundation to Support Research of the State of São Paulo (FAPESP) was created; this is the first of a series of state foundations supporting research that were created in Brazilian states, as well as postgraduate programs *sensu stricto*. In 1968 there was an attempt to go ahead with a higher education reform, taking as a model the United States system of academic departments, development of postgraduate studies and research.

Simon Schwartzman (2013) argues that in practice, the objective to make the system converge on a single model of research university was not fulfilled, and it is still a divergent system divided into three sectors: a few state research universities that provide good quality courses in the major careers, a large group of state institutions that never reached good quality standards in research and teaching, while spending large amounts of the state budget for its numerous full-time staff, and finally, a growing private sector providing mostly inexpensive careers in professions primarily oriented to social areas, with no restrictions to student access, unlike other state universities that do restrict access, whether or not higher education institutions.

Quality evaluation policies in universities are focused on postgraduate courses within the scope of CAPES, an agency engaged in the evaluation of master and doctoral studies *sensu stricto*⁴. At the same time, CAPES associates evaluation to funding.

Simultaneously, there is a postgraduate system in the broadest sense equal to or greater than the *sensu stricto* system, without any type of quality evaluation or systematized information on its existence (Schwartzman, 2010).

Martínez Larrachea, Chiancone and Sanz Bonino (2012) argue that democratization implied reconstruction of conditions to develop scientific and technological research activities in Uruguay. Except for a few cases, these activities had disappeared during the military dictatorship, with trustees being appointed to Universities and mass removal of teachers and researchers, many of them establishing residence abroad. At the intersection between University and Science and Technology public policies, policies were defined impacting on the creation of new institutionality for local science and technology, building and consolidating groups with research and development activities, and integrating new practices relating to advanced training, evaluation, financing and encouraging R & D. Outstanding among recent policies are the creation of the National Agency for Research and Innovation (ANII, for its Spanish acronym) in 2007 and the implementation of the National System of Researchers (SNI, for its Spanish acronym), aimed to strengthen and expand the scientific community, identifying and evaluating all individuals undertaking research in the country, or Uruguayans working abroad, and establishing a system of financial support to encourage engagement in knowledge production in all areas, to be awarded by competitive procedures.

R&D expenses between 2006 and 2008 grew strongly, exceeding U\$S 120 million (annual average increase of 33%). As regards the GDP, it still represents a small percentage, around 0.4%, and is lower than the general level in Latin America⁵. As regards the origin of resources allocated to R&D, 2008 figures state that 60% of them come from the Government, 25% from the companies, 15% from Universities and 2% from abroad. Regarding allocation of R&D resources by sector, the 2006 information shows that 35% are allocated to the government sector, 37% to universities, and 29% to the business sector. Moreover, the General Education Act, Law No. 18,437 passed in 2008 introduced a number of important changes in the governance of education, the coordination of the educational system and the creation of new institutions, including an Institute for the Evaluation of Education, aiming to evaluate the quality of initial, primary and secondary education. However, this initiative does not comprise the university level, thus this is one of the few countries which have not yet set up a quality assurance agency for higher education.

Its participation in regional accreditation processes, first the experimental method (MEXA) and now the final one (ARCUSUR) takes place through an Ad Hoc Accreditation Commission (Dávila and Martínez Larrechea, 2009; Lemaitre and Zenteno, 2012). In 2000, a bill was sent to Parliament for the creation of an Agency to Promote Tertiary Education Quality (APACET, for its Spanish acronym). However, to date no progress has been achieved in parliamentary discussion of said bill.

In the three countries, the progress and re-definition of Science and Technology policies is noticeable. Simultaneously, from year 2000 onwards, there is a significant increase in funding for Science and Technology research by the National States. As regards the university quality evaluation practices, in Uruguay their institutionalization has not been achieved, as in Argentina and Brazil, through unified procedures for the whole system, in the framework of one or more agencies following international trends. The result is a fragmented process: on the one hand, the University of the Republic, a public university, develops its own process of self-evaluation and external evaluation, while for private universities, the

⁴In recent years, CAPES includes the figure of professional masters, although in comparison, its development is still insufficient in relation to academic masters.

⁵It should be noted that Uruguayan GDP has recorded a significant increase in 2004-2008, and, therefore, a significant increase in R&D expenses in absolute terms is not reflected in this indicator.

Ministry of Education and Culture has an advisory body, the Consultative Council for Private Tertiary Education (CCETP, for its Spanish acronym), which runs an administrative mechanism, but "borrowing" certain traits of academic evaluation processes based on self-evaluation and peer reviewers' visit.

3. The University Systems in Figures

3.1 The Argentine University System⁶

In 2014, the Argentine Higher Education System comprises 123 higher education institutions, distributed as follows:

- 47 national universities, 50 private universities, 7 state university institutes, 14 private university institutes, 3 provincial universities, 1 foreign university and 1 international university.

3.1.1 Students and Graduates from Postgraduate Programs

At postgraduate level, the distribution of students and graduates from postgraduate programs by sector for 2011, according to the Yearbook of the Secretariat of University Policies (SPU, for its Spanish acronym), is 74.9% of students in the public sector, and 59.1% of graduates from postgraduate programs. Out of the total number, the private sector has 20.3% of students, and 27.2% of graduates.

Considering the whole postgraduate system for 2011, out of the total 124,655 students, 36.24% belong to masters and 46.72% to majors, while only 17.04% opt for doctorate studies. By sector, the trend favors the masters in the private sector, and majors in the state and international sector (FLACSO). As for the foreign institution (University of Bologna), the offer is exclusively focused on masters. (Table 1).

Table 1: Postgraduate Students by Management Sector and Career Type

Career type	Sector									
	Total		Public sector		Private sector		International inst.		Foreign inst.	
Total	124,655	100.0%	93,415	100.0%	23,342	100.0%	5,762	100.0%	136	100.0%
Doctorates	21,246	17.04%	17,817	19.07%	3,371	13.30%	58	1.01%		0.0%
Masters	45,173	36.24%	31,671	33.90%	12,677	50.02%	689	11.96%	136	100.0%
Majors	58,236	46.72%	43,927	47.02%	9,294	36.67%	5,015	87.04%		0.0%

Own data. Source: 2011 Yearbook Secretariat of University Policies. Ministry of Education.

Table 2: Graduates from Postgraduate Studies by Management Sector and Career Type

Career type	Sector									
	Total		Public sector		Private sector		International inst.		Foreign inst.	
Total	11,795	100.0%	6,973	100.0%	3,206	100.0%	1,587	100.0%	29	100.0%
Doctorates	1,674	14.19%	1,476	21.17%	174	5.43%	24	1.51%		0.0%
Masters	2,807	23.80%	1,236	17.73%	1,458	45.48%	84	5.29%	29	100.0%
Majors	7,314	62.01%	4,261	61.11%	1,574	49.10%	1,479	93.19%		0.0%

Own data. Source: 2011 Yearbook Secretariat of University Policies. Ministry of Education.

Table 2 shows that 62% of graduates from postgraduate programs have attended majors. If compared to students, where majors and masters were of similar proportion, at postgraduate level both the master percentage (23.8%) and the doctorate percentage (14.19%) are down.

⁶Data are taken from the latest Yearbook (2011), prepared by the Secretariat of University Policies of the Ministry of Education. This yearbook includes statistical information of the Argentine university system, both public and private. All the information related to student population (tertiary, undergraduate and postgraduate studies), the human resources system and the national university budget, is for year 2011, as well as the information relating to other SPU areas and programs.

On the other hand, according to Table 3, while the public sector concentrates the greater number of students (75%), at graduate level the proportion is not the same, as it goes down almost to half the system graduates (59.1%). Instead, the private sector shows greater graduation percentages, since out of 20.32% of students, graduates represent 27.18%. FLACSO is a similar case, with 4.6% of students and 13.45% of graduates.

Table 3: Students and Graduates from Postgraduate Programs by Management Sector

Sector	Students		Graduates from Postgraduate Programs	
Total	124,655	100,0%	11,795	100,0%
Public sector	93,415	75%	6,973	59.11%
Private sector	25,342	20.32%	3,206	27.18%
International inst,	5,762	4.6%	1,587	13.45%
Foreign inst,	136	0.1%	29	0.24%

Own data. Source: 2011 Yearbook, Secretariat of University Policies, Ministry of Education.

3.2 The Brazilian System⁷

As of 2012, the Brazilian Higher Education System comprised 2416 higher education institutions, distributed according to academic category as follows: Public universities: 108, private universities: 85/ Public university centers: 10, Private university centers: 129/ Public colleges: 146/ private colleges: 1,898/ Federal Institutes and Federal Technological Education Centers (IF's and Cefets respectively, for their Portuguese acronyms): 40.

3.2.1 Students and Graduates from Postgraduate Programs

Considering *sensu stricto* postgraduate programs, in 2012 there were a total 3,342 programs distributed as follows:

Table 4: Master and Doctorate Programs, 2012

Program	Total	%
Doctorates	53	1.6%
Masters	1,230	36.8%
Masters/Doctorates	1,664	49.8%
Professional Masters	395	11.8%
Total	3,342	100.0%

Own data. Source: MST (Brazil)

It should be noted that most of the programs are *sensu lato* and there is no systematized information for them, which makes comparison to other countries difficult. Table 5 shows, in turn, the distribution of students and graduates for each modality as it pertains to postgraduate programs *stricto sensu*, hence the importance of academic postgraduate programs, including master's degrees which account for 53.8% of students and 70.2% of qualifications.

Table 5: Students and Graduates per modality, 2012

Modality	Students	%	Graduates	%
Doctorates	79,478	39%	13,912	22.8%
Academic Masters	109,515	53.8%	42,878	70.2%
Professional Masters	14,724	7.2%	4,260	7%
Total	203,717	100.0%	61,050	100.0%

Own data. Source: MST (Brazil)

⁷ Data taken from INEP for graduate courses and MST for postgraduate programs.

3.3 The Uruguayan System⁸

In 2014, the Uruguayan Higher Education System comprises 5 higher education institutions, distributed as follows: 1 public university and 4 private universities

3.3.1 Students and Graduates from Postgraduate Programs

The total students enrolled in postgraduate programs amount to 11,674, 58.6% study in the public sector while 41.4 attend private institutions. Out of the total graduates from postgraduate programs, 53.8% is from the private sector and 46.2% from the public sector (Table 6).

Table 6: Students and Graduates from Postgraduate Programs by sector, 2012

	Students	%	Graduates from Postgraduate Programs	%
Public sector	6,839	58.6%	590	46.2%
Private sector	4,835	41.4%	687	53.8%
Total	11,674	100.0%	1,277	100.0%

Own data. Source: Education Statistics Yearbook (2012), Statistics and Research Area of the Education Department of the Ministry of Education and Culture

Table 7 shows the number of students and graduates by postgraduate modality, there being greater preference for masters and majors, 54% and 41% among students, and 62% and 34% among graduates from postgraduate programs, respectively.

Table 7: Students and Graduates from Postgraduate Programs by Modality, 2012

Postgraduate type	Students		Graduates from Postgraduate Programs	
Total	3,759	100.0%	1,274	100.0%
Doctorates	126	5%	51	4%
Masters	1,965	54%	789	62%
Majors	1,488	41%	434	34%

Own data. Source: Education Statistics Yearbook (2012), Research and Statistics Area of the Education Department of the Ministry of Education and Culture.

4. Research Evaluation Processes in Postgraduate Studies

Pursuant to Articles 45 and 46 of the Higher Education Act, the Argentine Ministry of Education approved, in consultation with the University Council, Resolution No. 1168/97 that defined the minimum criteria and standards for accreditation of postgraduate studies, in relation to disciplines. It also established that the principles of autonomy and teaching and learning freedom must be respected to apply the above criteria and standards. In 2011, this regulation was amended and Resolution No, 160/11 was approved, maintaining these principles.

Research evaluation in postgraduate studies, among other aspects, impacts both on institutional development strategies and on human and material resources allocated to these processes. This is a matter of great relevance, since evaluations of the research function strongly affect the general evaluation determining the accreditation of the programs. Likewise, several tensions take place between the perspectives associated to traditions related to scientific research and those valuing the knowledge associated to practices of experimental development, or to professional practice.

⁸ Data are taken from the latest Education Statistics Yearbook (2012), prepared by the Statistics and Research Area of the Education Department of the Ministry of Education and Culture

In particular, there arise difficulties when the academic peers convoked tend to convey criteria linked to evaluations of researchers as such, restricted to more traditional parameters in force according to disciplinary traditions.

The predominance is observed of visions and paradigms pertaining to basic sciences teaching and research. Teaching is generally associated to research processes linked to experimentation and handling practices in laboratory. Hence the importance of full-time professors in this area. In other disciplines, most of researches do not require to be conducted by large teams and in the same institution. The important fact is that they are relevant researches linked to postgraduate thematic, and may be adequately conveyed to students. Likewise, in other activities, particularly in those related to liberal professions and especially in some areas, the quality of the faculty is defined by their placement outside postgraduate studies, and many times outside the institution itself where these programs are delivered. Besides, in many cases research applied to productive processes is relevant, and many times developed in their application contexts. In postgraduate programs related to the business and/or productive world, for example, what is important is the systematized transmission of processes known from effective social practices.

Taking into account the above considerations, substantive deficiencies were detected through the analysis of a sample of opinions of the first two calls to submit careers for their accreditation (1997-1998) (García de Fanelli, 2000; Guerrini and Jeppesen, 2001). Likewise, similar issues were raised, seven years later, both in the external evaluation report of CONEAU prepared by IESALC in 2007 and in the Workshop on Postgraduate Accreditation organized by the CONEAU, also in 2007. The external evaluation concludes, among other aspects, that a single vision prevails -university-based and excessively academic- about higher education and particularly postgraduate programs, which goes against diversification, flexibility and plasticity of courses, professional training, postgraduate programs, teaching and learning. At the workshop, among other weaknesses, the normative was considered insufficient to establish standards comprising the current heterogeneity in the system's postgraduate studies, in particular in inter-institutional studies, professional postgraduate programs and distance learning.

At this point, it should be noted that trends go in another direction. Gibbons analysis (1997) is interesting; the author argues that a new knowledge production mode has arisen, based on the application contexts, since knowledge production is guided by the problems, and this is why it is transdisciplinarily organized. Because of their complexity, problems require solutions from several disciplines. This is why the path goes from research focused on disciplinary areas to research focused on problems. There is also a wider, more ambiguous quality control system than academic publication subject to peer review. Knowledge producers must also respond to the stakeholders and society in general, not only to the scientific community.

In this regard, Resolution 160/11 tries to correct some of the aforementioned problems, and to do so, it includes the concept of professional master's degrees and differentiates objectives and teaching profiles. Thus, this resolution overcomes problems posed by Resolution No. 1168/97 that only defined academic masters, requiring as a quality criterion, the research in certain conditions and associated to refereed publication (Dávila, 2012). Doctorates, in turn, still have unresolved problems. While the system incentivizes demand for doctorates, their offer does not grow at the same level as masters (Barsky and Dávila, 2012). Regulations have not modified the academic nature of doctorates, even if and despite the fact that international trends show the development of different types of professional doctorates.

Likewise, in those disciplinary traditions that have recently included doctorates an effort is noted -as well as serious difficulties- to implement good quality proposals, different from master's, difficulties which evaluation and accreditation processes have not contributed to solve. However, many difficulties related to accreditation are not directly associated to regulations but to interpretation of these regulations by evaluating peers, their conceptions and peer selection mechanisms. In this regard, the new regulation does not include significant innovations, since peers come from the university system and no consultation processes are included in other professional levels.

Transformations are also being carried out in Science and Technology institutions. In 2012, MINCYT Resolution No. 007/12 was issued, which created the Advisory Commission on Evaluation of Scientific and Technological Staff. The resolution establishes a modification in evaluation criteria for scientific staff, modifies criteria to evaluate applied sciences, social sciences and humanities. However, other debates are still pending involving and affecting institutional decision-making in the Argentine scientific system (Barsky, 2012),

Likewise, the Higher Education Act and regulations related to postgraduate studies put forward guarantees in terms of university autonomy. The role of the University Council is also important, as it is formed by education authorities and presidents of public and private universities and establishes the criteria and standards of evaluation and accreditation, among other issues.

In Uruguay, the debate about research evaluation is on a similar course as in Argentina. Due to the aforementioned fragmented structure, there are differences in the way of valuating and evaluating the research function in the different sectors. For private universities, Article 19 of Executive Order No. 308/995 approved in 1995 -recently amended- establishes the types of university professional degrees to be issued by university institutions; for postgraduate programs: a) Majors, b) Masters and c) Doctorates

Regarding teachers, Article 13 establishes the following requirements: a) Three quarters of teaching staff assigned to each career, at least, must possess at least a degree equivalent to completion level, b) 10% of academic staff, at least, must demonstrate experience in research or teaching not less than five years, c) The absolute majority of academic staff should consist of natural or legal citizens, or residents in the country for a period of not less than three years, with full command of the Spanish language.

The former president of the CCETP, who had a strong impact on the development of evaluation policies during his tenure, raised the notion of following the Brazilian example, considering master's as a postgraduate program in the strict sense, with a high research component. To that end, he drafted a revision of the rules applied in the region and the world, that ultimately inspired Opinion No. 328 approved by the CCETP and proposed as a guiding basis for future decisions of the Council⁹, having a great impact on the evaluation of the research function and its relation to postgraduate studies.

In Opinion 328, there predominantly arises, according to the analysis of the official definitions applied in the region, the master's concept as a research program of academic nature. It should be noted that the current amendment to Executive Order No. 308/995 attempts to resolve several of these problems. Among other issues related to distance learning, it considers bachelor's degrees, and establishes the minimum duration for postgraduate studies, in number of hours: 300 for majors and 500 hours for master's degrees. Furthermore, according to international trends and consistently with the reform in Argentina and CAPES in Brazil, it also establishes a difference between academic masters -aimed to creation of scientific knowledge and with a thesis as final assignment- and professional masters -aimed to professional application and with final assignments according to their function. In doctorates, the requirement for at least three years' duration is maintained, and new specifications are established, among them, that Doctorate is the upper level postgraduate degree in a certain area of knowledge, its objective is scientific training, and a thesis is the final assignment. The definition does not enable the option for professional doctorates.

The previous regulation is extremely restrictive in terms of aspects such as teachers' profile, since it must be basically academic, thus affecting proposals of professional orientation and proposals of academic orientation in technological careers, where the professional experience of teachers is relevant. Some restrictions still remain, or are stronger, in amendment to Executive Order 308.

⁹ See Jorge Ares Pons (2011): "Academic and Professional Masters", Opinion No. 328 of CCETP.

In major and master's degrees, at least 50% of teachers must certify at least five years' experience in university research and teaching. This requirement is 75% for doctorates.

Public universities are regulated by the Ordinance for Postgraduates Studies of UdelaR¹⁰, which among other aspects defines the postgraduate studies: majors, masters and doctorates, and their scopes. For masters, the ordinance recognizes a differentiation between academic and professional ones (Article 18). As it can be noted, there are aspects in common with rules currently in force in Argentina. The same applies to doctorates and majors.

Within the system of Science and Technology, the ANII for the National System of Researchers (SNI) takes into account, in addition to the academic quality criteria related to research, such as publications, the criteria related to applied careers such as patents.

In Brazil, Bittar, Morosini and Bittar (2012) recognize that the past two decades with the governments of Cardoso and Lula marked the expansion, implementation and consolidation of the research and postgraduate system, contributing to the development of Brazilian science and scientific production, so that Brazil stands today in Latin America and in the world for possessing a sound system of postgraduate studies and an important place in the global scientific production in indexed journals. However, just 8% of higher education institutions forming the system develop research and postgraduate policies in strict sense. The members of the academic community, meanwhile, participate in decision-making and formulation of public educational policies (CAPES, CNPq) and state research agencies (FAPESP, FAPERJ, FAPERGS, among others), are involved at hierarchical level and also at intermediate levels, as well as in working commissions in the aforementioned institutions, in MEC and INEP.

The authors acknowledge that CAPES played, and plays today, an important role in the improvement of the system, but its policy was becoming very rigorous causing serious distortions in academic life, generating obsession arising from the increasing number of publications in scientific indexed journals, competition for academic positions that boost such publication, etc.

In spite of these statements, they also recognize that the evaluation policy has been created with the participation and intervention of the academic community, the researchers themselves related to postgraduate programs, and the main Brazilian universities.

It is interesting to observe that both in CONEAU and in CAPES there is a common problematic as regards the association of research quality to evaluation parameters from the basic sciences, and an excessively academic vision.

Schwartzman (2010) also suggests that the postgraduate studies in Brazil have prioritized the academic performance through a set of instruments of legal regulation, incentives and evaluation mechanisms, which ended up creating a system whose main function is to feed itself and, from an international comparison made by himself, the author detects that, except for some exceptions, it fails to produce world-class science, or technology for the productive sector, or assign due priority to those seeking advanced training for the labor market, or for the academy. The analysis of the labor market of university graduates from postgraduate studies shows that most are employed by educational institutions and the public sector, particularly the public education sector.

His greatest criticism is aimed at funding of postgraduate studies in Brazil, which occurs through two large mechanisms. On the one hand, salaries of public university teachers, who are mostly full time. On the other hand, through scholarships for master and doctorate students¹¹. Most students are over 33 years and many only seek improvement for their professional work.

¹⁰ Ordinance for Postgraduate Studies of UdelaR Res. No 9 of CDC dated 25/09/01 - DISTR. 431/01 - DO 10/3/01, as amended by Res. No. 6 of CDC dated 2/7/06 – Distr. No. 740/05 – DO 04/6/06.

¹¹ Out of a total 93,321 scholarships, 53,456 (57.3%) were granted for Master's studies and 36,951 (39.6%) for Doctorate studies.

Likewise, their income is higher than income of other social sectors. These characteristics make it difficult to justify a widespread subsidy. The author suggests charging fees in postgraduate studies as the general rule, and exceptionally proposing a credit-scholarship combination system for quality programs, as well as for the students from low-income homes in need of funding.

This system has, to a great extent, been promoted by the evaluation system carried out by CAPES. On the other hand, there is a *sensu lato* postgraduate system equal to or greater than the *sensu stricto* system, without any type of quality evaluation or systematized information on its existence (Schwartzman, 2010).

Among other issues, the revision of implemented regulations and processes raises the need for standards and criteria applied to evaluate quality that do not affect or condition institutional diversity. In this regard, they are in accordance with trends being raised globally in different countries and discussed at international forums such as the forum annually organized an INQAAHE (Lemaitre, María José 2011).

5. Conclusions

The three countries followed different ways to evaluate the research function and its consolidation. These differences have to do, among other aspects, with the different state agendas and policies implemented, and impact on the logics of processes that, besides, are intersected by national political events and economic realities.

The CONEAU in Argentina is the most relevant evaluation system of the research function in universities. Since its creation, its consequences have been decisive for many academic activities in universities. The mandatory nature of such accreditations and the potential penalties of a negative evaluation have mobilized the academic communities affected and have altered many of the institutional decisions of higher education institutions. Within these evaluation processes, the perspective from which the research function has been analyzed has been one of the more complex topics; this function has otherwise been declared compulsory in the Argentine university system, according to the Higher Education Act.

The heterogeneity of the university system arising from regional differences, the time of its creation, the relative weight of the different disciplines, whether they are public or privately run implies a challenge requiring creative responses and procedure systematization by the CONEAU. However, since the system used, and the most accepted both at international and national level, is the academic peer evaluation, the complexity of the object to be analyzed is in line with the heterogeneity and complexity of the evaluating instrument chosen.

The strong requirements on the research activities exceeded the standards agreed upon in Resolution No. 1168/97, currently amended by Resolution No. 160/11. However, although the regulatory reform of postgraduate studies constitutes a breakthrough in terms of solving the problems associated with raising different criteria for the evaluation of the research function, it is inadequate because peers opinion and their interpretation of it are also relevant. Nevertheless, it is necessary to consider that these are gradual processes whose implementation implies learning for the different actors involved in their different stages, to the extent they allow the exchange of views and discussion among different currents, and thus enables the analysis of errors so as to develop solutions through new proposals. One of the main aspects of evaluation and accreditation policies in Argentina is that, according to law, decision-making involves both education authorities, who must regulate the process, and the universities themselves.

In the Brazilian case, the evaluation and accreditation at postgraduate level was consolidated several decades before, in addition to being conducted by different institutions. Likewise, concerns are increasingly greater as regards quality evaluation of postgraduate studies in the broadest sense. In postgraduate studies in the broadest sense, the discussion is starting on evaluation processes that include the evaluation of the research function, among other issues.

Furthermore, the discussion also intersects with the debate on financing policies, in particular scholarships for academic masters and doctorates, and questioning is growing about the distribution of education resources among social groups.

Regarding research development in Brazilian universities, these processes were previously institutionalized because research and development of postgraduate education were raised as articulated, complementary objectives, and therefore, CNPq and CAPES were simultaneously created. Instead, in Argentina and Uruguay a scientific and technological system developed separated from universities. This situation only starts to be reversed with the advent of democratic governments, when mechanisms are generated to articulate both systems. But unlike Argentina, in Uruguay there is no development of university evaluation processes in line with fostering research.

Finally, the processes developed in the three countries, taking into account their peculiarities, reflect an international context of transformation of production of science and technology, which necessarily challenges the paradigm that prevails in the three countries. Several authors have identified this transformation of the knowledge production mode centered on the paradigm of Natural and Exact Sciences to another focusing on complex problems that require an interdisciplinary approach, related to application contexts. Associated to this paradigm shift in knowledge production modes, their evaluation ways and mechanisms are also being transformed, involving new actors outside the academic community and accounting for the results to the whole of society.

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