

UNIVERSITY INTERNATIONALIZATION POLICIES IN ARGENTINA: STUDENT MOBILITY AND SCIENTIFIC PRODUCTION

POLÍTICAS DE INTERNACIONALIZAÇÃO UNIVERSITÁRIA NA ARGENTINA: MOBILIDADE DE ESTUDANTES E PRODUÇÃO CIENTÍFICA

LAS POLÍTICAS DE INTERNACIONALIZACIÓN UNIVERSITARIA EN LA ARGENTINA: MOVILIDAD ESTUDIANTIL Y PRODUCCIÓN CIENTÍFICA

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ABSTRACT: The internationalization of higher education presents challenges and opportunities for industrialized countries. Within the logic of power, universities in central nations dominate the scenario in attracting students from all over the world. Meanwhile, Latin America shows itself with limited and mostly regional recruiting capacity; Argentina is not the exception. Using secondary data, the objective of this work is to inquire about the internationalization processes in Argentina in relation to the flow of students and researchers. We first present an approach to the multiple definitions of the concept, to then describe the main policies developed by governmental agencies. Different dimensions linked to student mobility and the internationalization of scientific production are analyzed through statistical data that account for the phenomena under study.

KEYWORDS: Higher education. Internationalization. Student mobility. Scientific production. Argentina.

RESUMO: *A internacionalização do ensino superior oferece desafios e oportunidades para os países em processo de industrialização. Dentro de uma dinâmica de poder, as universidades das nações centrais dominam o cenário para atrair estudantes de todo o mundo. Enquanto isso, a América Latina se apresenta com capacidade limitada e principalmente regional de convocação; A Argentina não é exceção. O objetivo deste trabalho é indagar sobre os processos de internacionalização em relação ao fluxo de estudantes e pesquisadores no setor universitário argentino a partir de informações secundárias. Aborda-se aqui as múltiplas definições do conceito, expõe-se as principais políticas desenvolvidas pelos órgãos governamentais e analisa-se as dimensões relativas à mobilidade estudantil e à internacionalização da produção científica, apresentando dados estatísticos que dão conta dos fenômenos estudados.*

PALAVRAS-CHAVE: *Educação superior. Internacionalização. Mobilidade estudantil. Produção científica. Argentina.*

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RESUMEN: *La internacionalización de la educación superior ofrece desafíos y oportunidades para los países en vías de industrialización. Dentro de una dinámica de poder, las universidades de las naciones centrales dominan el escenario a la hora de atraer a estudiantes de todo el mundo. Mientras tanto, América Latina se presenta con capacidad de convocatoria acotada y mayormente regional; Argentina no es la excepción. El objetivo de este trabajo es indagar acerca de los procesos de internacionalización en relación al flujo de estudiantes e investigadores del sector universitario argentino a partir de información secundaria. Se realiza aquí un acercamiento a las múltiples definiciones del concepto, se exponen las principales políticas desarrolladas desde los organismos gubernamentales y se analizan las dimensiones vinculadas a la movilidad estudiantil y a la internacionalización de la producción científica, presentando datos estadísticos que dan cuenta de los fenómenos estudiados.*

PALABRAS CLAVE: *Educación superior. Internacionalización. Movilidad estudiantil. Producción científica. Argentina.*

Introduction

The internationalization of higher education is a phenomenon of increasing characteristics that knows no borders. However, it is still the industrialized nations that attract the largest number of students and scientists from around the world. While it is true that each nation has universities with attractive and unique characteristics, it is also true that they are affected by their own national realities. The low funding available in developing countries, for example, prevents them from having infrastructure according to a technologically complex and sophisticated world. Similarly, the means by which the knowledge produced is distributed in the world are predominantly monopolized by the wealthiest nations. In a view, it is evident that higher education institutions interact within a stratified system where the dynamics "of the developing periphery" and "to the industrialized center" establish the standards of academic mobility in terms of the flow of students and researchers, and in the opposite direction to the distribution of knowledge between countries (GUAGLIANONE; RABOSSA, 2018). Within a global landscape totaling more than 5 million international students, Latin America has a strong under-representation compared to Europe, a continent that attracts almost 50% of foreign students (OECD, 2016). As for Argentina, there are only 80,000 non-native students, most of them from neighboring countries (SPU, 2017).

In the first part of this work, a reference was defined to help determine what is meant by internationalization. The flows of internationalization, both from the perspective of students and research, are part of this section. The Argentine University System according to official statistics (SPU, 2017) is addressed in the third section, in addition to national policies aimed at promoting internationalization in the country. The third part presents a quantitative analysis of

the internalization in Argentina in terms of its students and scientific production. Discussions and conclusions close this paper.

Internationalization of higher education: Meaning and dimensions of analysis

The term internationalization has different borders and therefore puts us before different dimensions in terms of its analysis, scope and content. Similarly, it is not a new word, but has been used previously in political science, for example, as well as has been part of the language that describes the dynamics that runs through relations between governments. However, when we refer to the university sector, the phenomenon of internationalization begins to gain ground only in the late 1980s. New concepts emerge to describe both the flows of students who migrate temporarily or permanently from one country to another and to portray the relations of exchange of researchers and scientific cooperation between countries (KNIGHT, 2004). Within this broad panorama, Knight (1997) defines it as this integrative process, from an international and intercultural perspective, with the objective of offering post-secondary education to students from diverse backgrounds. Scott (1998) proposes four dimensions to analyze it: 1. exchange of students between countries; 2. flow of professors and researchers between universities beyond their own geographical boundaries; 3. international interinstitutional collaboration; 4. Flow of ideas that intersect between countries.

Based on the identification and categorization made by Yip (1995) on the elements that mobilized the growing globalization of industries and companies, Rama (2017) transfers them to the educational field. Thus, it recognizes six main factors that promote internationalization: 1. the market that demands global certifications; 2. the reduction of communication costs facilitating exchanges; 3. policies of openness that, promoted by countries, stimulate knowledge flows; 4. competitiveness issues that make it unprofitable to offer education only in the local market; 5. the emergence of new information and communication technologies that reduce transaction costs; 6. State-of-the-art technology that does not exist in the countries themselves promotes the mobility of researchers to industrialized centers.

On the other hand, Tyler; Kehm (2007) highlights several aspects that promote and determine the degree of internationalization of a country. For example, the mobility of students and the academic team on which they impact, positively or negatively, legal issues that make the recognition of degrees between countries, among other aspects. Regarding academic mobility, the weight of personal ties between researchers as promoters of a higher degree of internationalization stands out (GARCÍA DE FANELLI *et al.*, 2018). Another important point

was present in the "foreignization" of curricula, in the teaching of foreign languages and in the use of bibliography mainly in English. These factors increase the volume of internationalization of systems. Under this same logic, the transfer of knowledge is inscribed from the export of study programs, the opening of the registered base of foreign universities in several countries, and graduates and researchers who return to their places of origin importing knowledge and knowledge acquired during their international stays. One point to be taken into account is the tension that, as a result of internationalization, is generated between the concepts of cooperation and competition. Given the need for more and better resources, not just national, but international, universities tend to turn into competitive entities rather than maintain their status as cooperative beings (TYLER; KHEM, 2007).

The internationalization of students

Student exchange between countries has been consolidated mainly in the last two decades. Of the approximately 0.8 million foreign students present in 1975, the number doubled at the end of 1995. This rapid expansion has increased from the mid-2000s to 2015, from 3 to more than 5 million international students (OECD, 2016). Anyway, this is a phenomenon that has not yet reached its limit. In fact, it is expected to reach 8 million in the next 5 to 10 years (OECD, 2016; MASLEN, 2012).

The distribution of international students presents a strong bias that favors the countries that are part of the G-20. These nations recruit 83% of the total. For example, along with the United States of America, which attracts almost 20%, Britain, France, Germany and Australia account for almost half of the total student flow between countries. As for Argentina, only just over 1% choose it as a destination (OECD, 2016). As for its origin, Asia comes 53% while Europe contributes 25%, Africa 8% and Latin America with 5%.

An important point is that while higher education institutions recognize the benefits of internationalization of their student body, recent debates are wary of the unlimited growth of, say, English language programs for foreigners. This has been questioned in countries such as Germany, Denmark and the Netherlands, for example. It is argued that the use of English has negatively impacted the quality of the courses as a result of the academics who are chosen for the handling of this language and not for the deep knowledge of the discipline taught (ALTBACH; FROM WIT, 2018).

Internationalization of research

International scientific production shows exponential growth. Although at the beginning of the 20th century only a dozen countries contributed to this phenomenon, it is estimated that currently about 200 countries produce science (MIHAY; REIZ, 2017). In any case, the nations with the most published articles are still those belonging to the OECD, with the exception of China and India. As for Latin America, the region is led by Brazil, followed by Mexico, Argentina, Chile and Colombia (SCIMAJOURNAL RANK, 2016).

Although universities in industrializing countries, including so-called elite, are more focused on teaching than on cutting-edge research, the partnership with institutions belonging to developed nations is decisive and fundamental to achieve progress on issues that make scientific research and national development (YNALVEZ; SHRUM, 2011). However, the type of regulation that each country or institution imposes to generate partnerships between universities, can hinder or promote international cooperation between them (CUMMINGS; KIESLER, 2005; Fox, Fox, MOHAPATRA, 2007). Interpersonal relationships between colleagues also play a key role in generating and consolidating aspects that make entrepreneurship, development and future consolidation of a collaborative research project between countries (GARCÍA DE FANELLI *et al.*, 2018). However, despite the great benefits observed, internationalization has also been identified with unfavorable aspects. For example, the commodification of the sector and the brain drain to the most developed countries (JIBEEN; ASAD KHAN, 2015).

The Argentine University System

The Argentine university was, in the Latin American context, one of the first institutions to adopt the Napoleonic model. The university reform, begun in Córdoba in 1918, gave different characteristics, mainly a new form of government³. And although the professional profile predominated, scientific and technological initiatives were developed within it. The National University of La Plata, founded in 1905, is a clear example of this.

Throughout its history, the University has gone through periods of political repression, as well as expansion and diversification, similar to what happened in the rest of Latin America. Its traditional academic structures, however, have remained over time resisting, adapting,

³ The system of government established in the statutes of 1883 granted control of the faculties to graduates who were part of the Academies. These make up the collegiates, self-recruited, went to life and appointed their own members.

refunctionalizing or rejecting demands for reforms or academic modernization (GUAGLIANONE, 2013).

Currently, the Argentine university sector has just over two million students (approximately 22% in the private sector), a number that places it among the countries in the region with the highest Gross Enrollment Rate according to the population of 20 to 24 years of age. It reaches 57% and reaches 85% if the 900,000 students who are part of the non-university tertiary sector are added. In its entirety, the system has 130 universities, 64 of them private (SPU, 2017).

Program and internationalization actors in Argentina

The Secretariat for University Policies (SPU) is a central actor in internationalization policies through the Program for the Internationalization of Higher Education and International Cooperation (PIESCI). Within the scope, cooperation activities are developed with other countries and promotion of the Argentine university in the world. These policies allow the design of specific programs and projects that tend, fundamentally, to increase the exchange and mobility of undergraduate and graduate students and teachers (GUAGLIANONE; RABOSSI, 2018).

The Ministry of Science, Technology and Productive Innovation and the National Directorate of Cooperation and Institutional Integration are another relevant player in the system. Participates in international technical cooperation activities related to science, technology and productive innovation. The collaboration is implemented through the realization of joint research projects, organization of different types of events, creation of binational centers and granting of scholarships for training (GUAGLIANONE; RABOSSI, 2018). Here, the emphasis of cooperation is on four main areas: 1. programs resulting from an agreement with an external partner linked to an institution similar to the Ministry; 2. programmes with the European Union; 3. the internationalization of technology-based companies; and 4. the Network of Argentine Researchers and Scientists Abroad (RAICES).

CONICET, as the main organization dedicated to the promotion of science and technology in Argentina, develops international cooperation activities through the signing of agreements with international scientific institutions and the financing of joint research projects based on bilateral and multilateral calls, with emphasis on the disciplines that make up the exact sciences, biological, medical, physical and chemical. As for the main international partners within the above mentioned programs, France, Germany and Latin America stand out. There is

also active cooperation with the U in the fields of engineering, medicine and biology; while progress has been made in recent times in opening relations with Asia and the Pacific region.

Finally, the Autonomous City of Buenos Aires stands out as one of the main actors in promoting internationalization through the creation of the "Study Buenos Aires" Program, in order to improve the experience of international students arriving in Argentina. Among other significant features, Buenos Aires and its suburbs have 61 universities, of which 24 are public and free. A peculiarity of the latter is that the conditions of entry are relatively free and without an entrance exam. In principle, freedom of access, especially in some careers such as medicine, appears as an incentive for those students facing entry quotas into their home countries. In short, taking into account the different forms that characterize internationalization, the city receives more than 80,000 students annually, with an economic benefit for 2017 equivalent to US\$ 581 million (CURCIO; LUNA, in the press).

The internationalization of Higher Education in Argentina in numbers

Undergraduate and graduate students

In Argentina, and as has happened in the different higher education systems of the world, the number of international students has grown at increasing rates. Most run short programs, known as *faculty-led* or "*customized programs*", while a second group focuses on "*exchange programs*". In the latter, they attend subjects for one semester, or one year of graduation, which have the same validity as the equivalents in their countries of origin. Finally, there is the group of those who attend undergraduate or graduate studies in their entirety.

Argentine universities have a total of 74,013 foreign students, representing only 3.4% of the system's students. Table 1 presents all those enrolled according to the sector (public/private) and level (undergraduate and undergraduate/graduate).

Table 1 – Foreign students in Argentina by sector and level (2017)

	Public	Private	Total	% Compared to the entire level
Undergraduate and undergraduate	46.724	16.416	63.140	3,2
Postgraduate studies	7.937	2.827	10.873	6,8
Total	54.661	19.243	74.013	3,4

Source: SPU (2017)

As observed, 63,140 were pre-graduated and graduated, while 10,873 did so at the graduate level. At the first level, 74% choose public management institutions and 26% opt for private management institutions. As for graduate studies, 73% and 27% respectively. As a particularity, if you look only at international students, the level of graduation and graduation of the private sector captures 4 percentage points more than what you can recruit when taking into account the totality of students in the system (22% vs. 26%). Something similar happens in graduate school (23% vs. 27%). In a way, and taking into account that the majority of foreign students in Argentina choose the public sector, in terms relative to private universities are more efficient when it comes to attracting international students in relation to local ones. On the other hand, in percentage terms or level of internationalization, graduate studies are more successful. In fact, it doubles the percentage of students observed in the undergraduate and undergraduate sector (3.2% vs. 6.8%).

It is clear from the analysis that Argentina's internationalization percentages are low in relation to countries with the highest capacity to attract foreign students, where the average of OECD members is close to 6% and reaches up to 18% in the cases of Australia and the United Kingdom, for example (CHOUDAHA; HU, 2016). In any case, Argentina does not deviate from the standards observed in most Latin American countries, that of a low participation of international students.

If we take into account the place of origin, most come from the American continent, mainly from Latin America, followed very far by The European and practically zero the incidence of the rest of the world (see Table 2). Thus, according to the place of origin of undergraduate and undergraduate students, Peru leads the payroll with about two out of ten. Brazil contributes almost 15% followed by Paraguay and Bolivia, with about 11% each. In short, four countries account for more than half of all international students in the system

Table 2 – International students at Argentine universities in undergraduate and undergraduate careers by country of origin.

#	Country	Percentage	Cumulative percentage
1	Peru	20,8	20,8
2	Brazil	14,6	35,4
3	Paraguay	11,8	47,1
4	Bolivia	11,2	58,4
5	Colombia	9,8	68,1
6	Chile	7,3	75,5
7	United States	6,2	81,7
8	Uruguay	2,8	84,5
9	Ecuador	2,8	87,3
10	Venezuela	2,0	89,4
11	Spain	1,3	90,7
12	China	1,0	91,7
13	Italy	0,9	92,7
14	Haiti	0,9	93,5
15	Mexico	0,7	94,2

Source: SPU (2016)

As for foreign graduate students, the ranking is led by Colombia, with 3,355, equivalent to 30.8% of students. Then, Ecuador, with 1,627 (15%), followed by Brazil, with 1,131 (10%).

One peculiarity of the system is that China contributes only one in 100 foreign students. Thus, as a country, it is absolutely under-represented, since, worldwide, students of this origin explain 50% of the total international. In any case, the inability to recruit Chinese students is a weakness that runs throughout the region. In fact, of the more than 600,000 students from that country who moved abroad in 2019 alone, the preferred destinations were the United States of America, followed by British universities, those from Australia, Canada, Hong Kong, Germany and Japan (YUJIE, 2019).

In relation to the chosen careers, a high percentage is inclined towards the health sciences. In this sense, there is no public/private differentiation at the level of undergraduate and undergraduate studies. Table 3 summarizes the distribution according to the careers most chosen by international students in each sector.

Table 3 – Distribution of international undergraduate and undergraduate students in Argentine universities by sector and career type (2016)

	Students	Percentage	Cumulative Percentage
Public Universities			
Medicine	8.402	21,0	21,0
Infirmery	3.545	8,9	29,9
Business Administration and Management	2.571	6,4	36,3
Architecture and Urbanism	1.626	4,1	40,4
Advocacy	1.589	4,0	44,4
National Public Accountant	1.513	3,8	48,2
Audiovisual Arts	954	2,4	50,6
Private Universities			
Medicine	3.670	23,8	23,8
Business Administration and Management	1.094	7,1	30,8
Infirmery	1.045	6,8	37,6
Audiovisual Arts	724	4,7	42,3
Psychology	537	3,5	45,8
Advocacy	530	3,4	49,2
Foreign trade	493	3,2	52,4

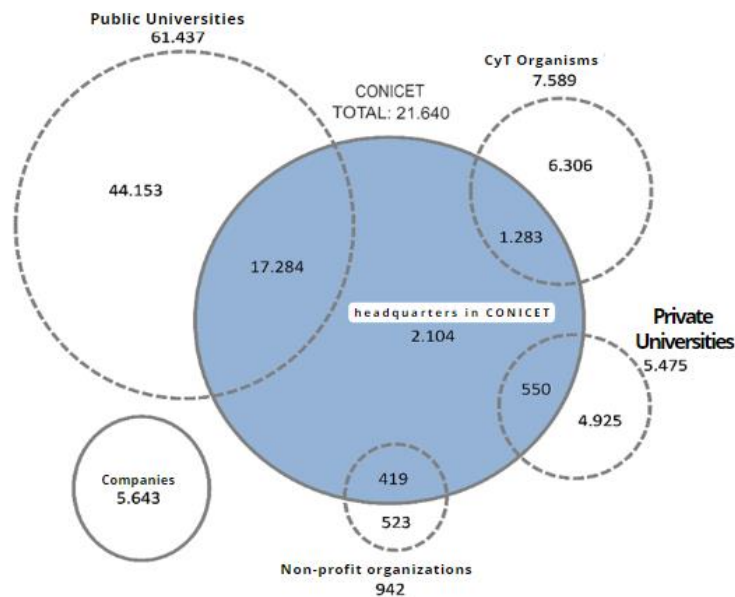
Source: SPU (2016)

As noted, in seven careers out of a total of 146 in the public sector and 102 in the private sector that have at least one student of foreign nationality, half of the international students are concentrated. It stands out mainly that of Medicine, which leads, as it was said, in both sectors. On the other hand, when the students of Nursery are added to this, those enrolled in careers related to the Health Sciences explain 30% of all foreigners of the Argentine university system. Once again, it can be speculated that the strong demand that exists for careers related to this specialty is linked to the conditions of admission to the university that, in Argentina, tend to be looser than in many countries in the region.

The Argentine System of I&D in an international perspective

Researchers and fellows dedicated to research and development (I+D) in Argentina, in 2017, were 83,190, being distributed according to the following infographic.

Infographic 1 – Researchers dedicated to I&D in Argentina by sector and



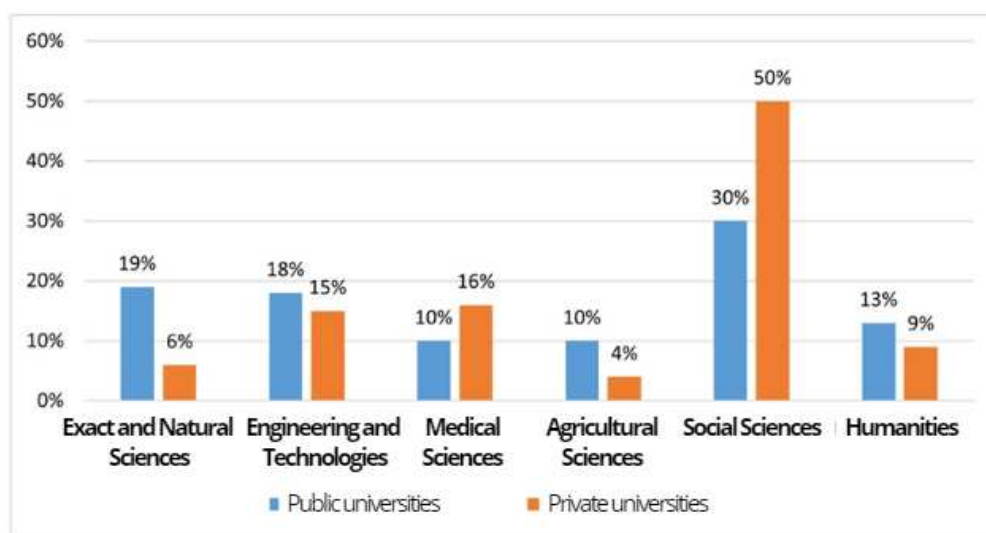
*Note: Of the 21,640 researchers belonging to CONICET, 17,284 are based in public universities, 1,283 in Science and Technology organizations and so on.
Source: MCyT (2018)

It is noted that the highest proportion is concentrated in public universities (74%), while almost 7% develop their activities in private universities. This distribution shows that human resources in private universities dedicated to research are relatively underrepresented. That is, of the total that works in some university of the system, almost 92% do it in the public sector. Here we must keep in mind that, in terms of size, the private sphere represents one fifth of the public. However, less than one in ten does their job in this sector. The remaining 20% are distributed among public science and technology agencies, non-profit entities, the private sector of industry and the National Council for Scientific and Technical Research (CONICET), the country's main public agency dedicated to the promotion of science and technology. We emphasize that a significant number of researchers distributed among the different sectors are part of CONICET. In the case of the public university, 17,284 are part of this body (28% of the total). As for the private university sector, 10% belong to CONICET (see Infographic 1). Thus, in the latter case, a transfer of public resources for research to the private sector is generated, since its salary is paid mainly by the State.

Regarding the percentage distribution by disciplines, 43% of public sector researchers and 59% of private universities are linked to social and human sciences (see Graph 1). These fields, in general, are less likely to publish works with international cooperation, an aspect that,

in many cases, is related to the epistemology that represent them. It turns out that in these areas of knowledge there is a tendency to use a language a little less universal than in the basic and natural sciences, for example. As for the latter, if we add the contribution of those defined as applied, in the case of the public represent 47% of the total and only 25% in private. Medical sciences represent 10% and 16% of the public and private sectors, respectively.

Graph 1 – Researchers and fellow tips for I&D. Percentage distribution according to academic training disciplines and type of institution. Year 2017.



Source: Own elaboration

It can be said that in Argentina the processes of evaluation of research production at the international level explain the strong predominance of traditions that were built in the area of Basic Sciences, alignment that corresponds to a homogeneous international system, defined by disciplinary development carried out in industrialized countries. In this sense, it is the center that establishes the research standards of the countries that are part of the periphery in the industrialization process. Physics, chemistry, mathematics and biology tend to generate universal processes of research knowledge and are thus evaluated. Different is the case of those associated with the study of local realities from a social and human approach, and those linked to applied areas such as engineering, computer science or statistics, for example. However, the preponderance of basic science criteria, with the dominant model of papers (scientific articles) published in international reference journals, subordinated to other processes of knowledge transmission.

The situation described can be seen in Table 4, which represents the percentages of distribution of predominantly international publications in high-impact journals. It should be noted that, in sci, about 97% of its journals are English-speaking, which makes it a good proxy to determine the degree of internationalization of each science (Liu, 2016). Although it is true that the predominance of the basic and medical is evident, the increase in the last 2 years in the production of papers in the areas of social sciences and humanities I would suggest a paradigm shift. However, it can also be argued that they start from relative percentages very low and, in that sense, any small change is noticeable. Even so, it could be interpreted as a principle for a trend that incorporates a greater international look in these disciplines more accustomed to interacting with local phenomena.

Table 4 – Argentine production in SCIENCE CITATION INDEX (SCI), according to scientific discipline. Years 2011 to 2015

Discipline	2011	2012	2013	2014	2015
Physics, Chemistry and Earth Sciences	27,0%	26,8%	26,0%	29,3%	25,6%
Life Sciences	25,7%	26,2%	24,3%	21,9%	23,2%
Agriculture, Biology and environment	18,3%	19,0%	18,5%	18,5%	17,0%
Clinical medicine	16,6%	15,6%	16,2%	14,1%	15,4%
Engineering, Computing and Technology	6,8%	6,3%	7,1%	6,7%	7,4%
Multidisciplinary Sciences	1,9%	3,0%	2,5%	2,6%	3,4%
Social and Behavioral Sciences	2,9%	2,4%	3,7%	4,2%	4,7%
Instruments*	0,5%	0,5%	0,5%	0,5%	0,6%
Arts and Humanities	0,2%	0,3%	1,0%	2,1%	2,7%
Unsigned	0,1%	0,0%	0,1%	0,0%	0,0%
Total	100,0%	100,0%	100,0%	100,0%	100,0%

*Note: Refers to resources in the application of instruments for observation, measurement or control of physical and/or chemical systems.

Source: Thomson Reuters data development - Web of Science

Table 5 lists the ten countries with which Argentina has the most international scientific collaboration in the period 2013-2015. It is observed that the most significant articulation in collaborative scientific production among researchers is performed with the USA (18%), followed by Spain (11%) and Brazil (10%).

Table 5 – Argentine production in the SCIENTIFIC CITATION Index (SCI), second country of collaboration. Years 2013 to 2015.

#	Country	2013	2014	2015
1	USA	1.481	1.704	1.772
2	Spain	928	1.052	1.104
3	Brazil	753	886	963
4	Germany	542	744	759
5	France	532	635	733
6	Italy	459	567	600
7	United Kingdom	434	549	565
8	Chile	401	495	558
9	Canada	416	465	481
10	Australia	290	375	406

Source: own development on Thomson Reuters data - Web of Science

Only Chile, along with the last country, Brazil, enters this first batch as a representative of the Latin American region. The rest belongs to nations outside the region and with an industrialized profile. An interesting case is that with Spain, second in terms of international academic collaboration with Argentina. In a way, it can be said that cultural affinity would also have something to say when it comes to scientific cooperation. It is interesting to note that the strongest articulation is established with the United States, and there are no national programs, networking and associations that promote the relationship between the two nations, such as France, Germany, Spain and Latin America in general. Obviously, the scientific strength of the United States alone drives bilateral scientific production between the two countries.

Now, if we take as reference the information base elaborated by Scimago Journal Rank (SJ), Table 6 allows us to characterize Argentina in terms of areas of knowledge and the degree of internationalization of each of them. For the analysis, the first 10 disciplines were taken as reference, according to the categorization of SJ of a total of 27, in which the country has the highest volume of production.⁴

⁴ We call the degree of internationalization of scientific production for those publications in which the affiliation of the researchers involved belongs to different countries.

Table 6 – Scientific production in Argentina in the first ten areas of knowledge according to quantity and percentage of international collaboration (2016)

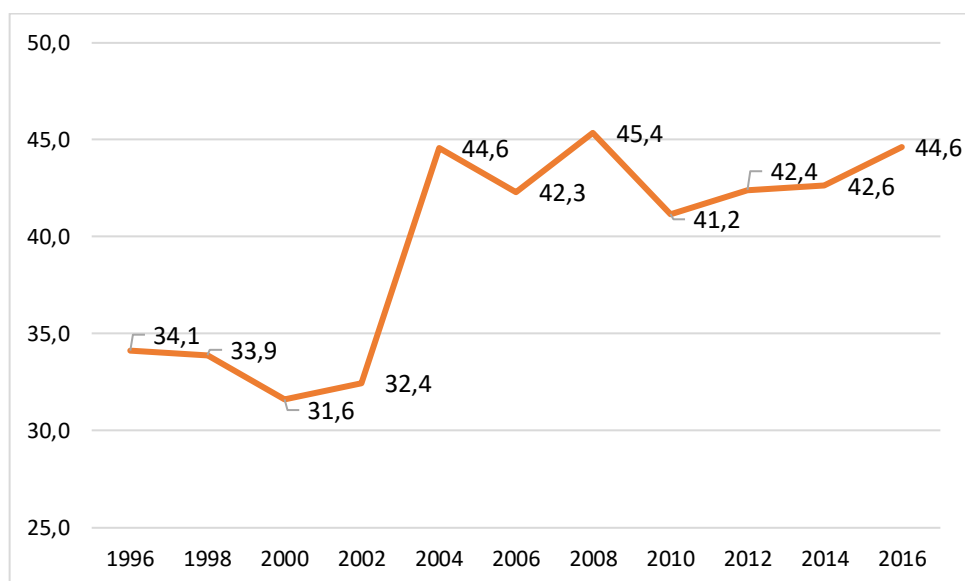
#	Science / Area	Quantity	%	% Accumulated	International Collaboration*
1	Medicine	3.183	15,0	15,0	47,1%
2	Biology and Agriculture	2.884	13,6	28,7	41,4%
3	Biochemistry, Genetics and Molecular Biology	1.798	8,5	37,2	53,0%
4	Physics and Astronomy	1.474	7,0	44,1	60,8%
5	Engineering	1.242	5,9	50,0	41,8%
6	Earth and planetary sciences	1.106	5,2	55,2	52,8%
7	Chemistry	1.056	5,0	60,2	49,5%
8	Environmental Sciences	984	4,7	64,9	45,2%
9	Social sciences	957	4,5	69,4	27,4%
10	Computer science	913	4,3	73,7	38,8%

*Note: Refers to the percentage of scientific production in which a document is produced by researchers with affiliations in different countries.

Source: Scimago Journal Rank data preparation (2016)

As for the published works, the first five areas explain 50% of what Argentina produces in science. It is clear, as already said, that the basics dominate, followed by those applied. The social workers moved away, representing just under 5% of the total produced. On the other hand, regarding the degree of internationalization of each of the ten, it is confirmed that the areas of human and social sciences have a less globalized profile than those of exact and natural, applied and medical. This is an international trend, so it is not surprising that the degree of internationalization of scientific production in social sciences barely exceeds 27% (approximately one in four publications is with international collaboration), which implies almost 34 percentage points less than the most internationalized, in this case physics and astronomy. In the latter case, more than 6 out of 10 publications are in partnership with researchers from other countries (SCIMAGO JOURNAL RANK, 2016).

A particularity is evident in Graph 2, which shows the trend, or degree of internationalization, of Argentine scientific production over a period of 20 years (1996-2016). There has been a growth in the level of internationalization, especially since 2004, during which more than four out of 10 papers published in Scopus have the collaboration of academics residing beyond the country's borders.

Figure 2 – Percentage of Argentine academic production with international collaboration (1996-2006)

Source: Own elaboration

Although total scientific production in the country increased during the reporting period, the percentage that included international collaboration seems to have reached a certain level of annual growth after growth since the late 1990s. Part of this relative stability could be explained by the certain growth of research work in the field of social and human sciences, areas that, as stated, tend to produce local scale, at least in relation to medicine, exact and natural.

Conclusions and discussion

The internationalization of higher education, as a theme on the educational policy agenda, has been installed in Argentina since 2000 in a national and international context with trends that favor integration and cooperation between nations. However, the country, like the rest of Latin America, is relatively isolated from this process, since only 3.4% of the total number of students is international. In any case, and despite these difficulties, there is a growing pattern in terms of promoting binational and multilateral scientific development programs, as well as in the case of publications involving Argentine researchers with their international peers.

Although the integration of Argentine institutions with the rest of the world seems to be finding its place within the universe of higher education to implement their particular potentialities and competitive advantages, there are still certain inconsistencies, both at the micro institutional level and in terms of macrosystem policies. These limitations did not allow

amalgamation and thus fully integrate the virtues of universities with those of the rest of the world. For example, the scarcity of funding makes it difficult for Argentina to connect more closely with the international academic world, along with the weak mastery of the English language by students and teachers, a situation that hinders international cooperation beyond Spanish-speaking countries. Similarly, there is a lack of coordination within and between institutions and between them and state agencies, added to a preferably peripheral and local perspective, especially in the social and human sciences, disciplines that do not yet target the academic centers of industrialized countries (GUAGLIANONE; RABOSSO, 2018). The list conspires against a takeoff that would allow Argentina to increase its participation in the global game of higher education. In any case, participation in international university fairs, the construction of networks and, to a lesser extent, two degrees, especially in graduate school, allows us to have a certain optimism for the future.

As for national organizations linked to science and technology policies, there are important developments in bilateral and multilateral research projects with international scientific institutes. To a greater extent, international co-authorship publications are identified with predominance in basic and medical sciences and with low incidence of social and human sciences, which alone have a less internationalized profile and more linked to local problems. Similarly, there is an incipient beginning of connection between the non-academic productive sector, in some foreign cases, and the State. These are global issues of concern for private companies and for the Ministry of Science, Technology and Productive Innovation itself.

On the other hand, and as a theme to be analyzed in greater depth, regardless of the sector, public or private, in the last decade, on average, it is observed that Argentine universities have formalized their internationalization policies from organizational structures in the form of boards, areas, secretariats or departments and, in some cases, with independent budgets (GUAGLIANONE; RABOSSO, 2018). Over time, these structures gained prominence within the institutional hierarchy, mainly through the promotion of student exchange programs between countries and also as representatives of the institution in international congresses, in order to put the university in the crosshairs of potential foreign students. Although this is within the observed average, it is also true that certain universities with little international contact have difficulty finding a location on the global academic map.

In any case, we face a new challenge for higher education, and particularly for internationalization since the emergence of coronavirus globally. Social isolation and border closures, as a palliative to contain the pandemic, had a direct impact on the mobility of international students. Altbach and De Wit (2020) argue that there is likely to be a greater

increase in online teaching-learning and in the more diverse recruitment of international students, with less dependence on China. It is considered likely that, once the restrictions imposed by the coronavirus are normalized, there will be a restructuring of student mobility standards. And while we cannot yet accurately assess the true impact that this pandemic will have, there will be many questions to be answered linked to the new ways that the internationalization of higher education will take on around the world. However, possibly for many countries that have not yet emerged as major players, this is an opportunity to be taken advantage of and thus achieve greater internationalization of their programs through the use of online platforms. Of course, remote program accreditation agencies should play an essential role in ensuring that higher education institutions maintain the quality of their academic offerings.

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How to reference this article

RABOSSI, M. GUAGLIANONE, A. University internationalization policies in Argentina: Student mobility and scientific production. **Revista Ibero-Americana de Estudos em Educação**, Araraquara, v. 15, n. esp. 4, p. 2556-2576, Dec. 2020. e-ISSN: 1982-5587. DOI: <https://doi.org/10.21723/riaee.v15iesp4.14504>

Submitted: 10/09/2019

Revisions required: 10/01/2020

Approved: 30/04/2020

Published: 01/12/2020