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Gerontological training programs offered by Latin American universities: Number, characteristics, and disciplinary contents

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ABSTRACT

One of the challenges of population aging is to ensure that there are enough trained professionals to meet the changing, specific needs of aging populations. The aim of this study was to describe the number, geographical distribution, and general characteristics of gerontological training programs offered by Latin American universities and to analyze their disciplinary content and the degree of similarity among programs. One hundred undergraduate and postgraduate programs with gerontological content were found to be offered by Latin American universities. Information on the institutional affiliation, academic level, management, length, and content of the programs was analyzed. Descriptive statistics were run and content analysis was performed on the programs' syllabuses to address the objectives of the study. Results show that despite being a relatively young region of the world, the majority of Latin American universities offer gerontological programs. However, the nature of this course offering seems to be quite diverse across countries. Moreover, the analysis of the programs' disciplinary content indicates that the program providers take a multidisciplinary approach to gerontology. The great diversity of programs and their multidisciplinary contents suggest a low degree of standardization of gerontological training in Latin America.

Introduction

Population aging is a global phenomenon that poses challenges at many levels. One challenge is to ensure that there are enough trained professionals to meet the changing and specific needs of aging populations. The Madrid International Plan of Action on Aging (UN, 2002), for instance, established that specialized training (and retraining) of healthcare and social service professionals is needed as a priority objective to promote older adults' health and well-being. Higher education institutions, in particular, are called on to play an important role in providing this specialized training.

Consequently, in recent decades, the number of undergraduate and postgraduate programs in gerontology has increased. Their characteristics vary across nations according to the level of population aging, the priority given to aging issues in political and educational agendas, and the very nature and flexibility of each educational system, among other factors (Kunkel, 2008). In addition, the nature of such programs is closely related to the response of educational leaders to two interrelated issues: (1) the nature of gerontology as a discipline; (2) the professional competences

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of gerontologists. The response to these issues is by no means evident or unanimous and this might explain, at least partially, the diversity of training programs in gerontology.

As to the first issue, some scholars (Alkema & Alley, 2006; Lowenstein, 2004) argue that gerontology has become a distinct academic discipline, whose goal is the study of human aging from a life-course perspective and the integration of health, psychological, and social knowledge bases. The presence of gerontological organizations (e.g., the Gerontological Society of America, the International Association of Gerontology, and the Association for Gerontology in Higher Education), as well as a wide range of specialized publications in gerontology, including handbooks and scholarly journals, would be additional indicators that support its disciplinary nature. However, other authors (Ferraro, 2006; Haley, Ferraro, & Montgomery, 2012) claim that gerontology is not a discipline, but a field of study drawing on many disciplines; a crossroad at which diverse disciplinary subspecialties (e.g., biology of aging, sociology of aging, or psychology of aging) meet, but maintain their disciplinary boundaries. From this point of view, gerontology does not meet some of the criteria required to be considered a scientific discipline, such as having an exclusive and integrated object of knowledge or a set of distinctive methods of inquiry.

This debate is closely related to the second issue: the professional status of gerontology. Professions typically have a number of characteristics (Kosberg, 1997; Wendt & Peterson, 1997), including a clear scope of practice, unique skills that are recognized by statutes, the ability to practice independently and without the supervision of other professionals, and the presence of organizations to protect professional interests. In this regard, *there is a movement* led by the Association for Gerontology in Higher Education *to support the recognition of gerontology as a profession*. This association has published a document specifying the competences in which gerontologists should be trained (AGHE, 2014), to advance both in the recognition of gerontologists as professionals and in the standardization and accreditation of gerontology training programs. However, according to others (e.g., Haley, Ferraro & Montgomery, 2012), there is no specific scope of practice for gerontologists, the list of skills attributed to gerontologists (e.g., the ones included in the aforementioned document) seems to be too broad, and some of their competences overlap at least partially with those defined by other professions, such as psychologists (APA, 2014) or nurses (NMC, 2015). Haley et al. (2012) also stated that graduates in gerontology may have difficulties in accessing the labor market, at least in the United States, since they have to compete with graduates from professional programs who have state licensure (nurses, clinical psychologists, and social workers) and a long tradition of working in aging-related institutions.

These discussions have deep implications for gerontology training programs. If gerontology is an independent discipline and gerontologists are (or aspire to be) recognized professionals with a set of distinctive competences, it makes sense to offer undergraduate programs. In contrast, if gerontology is a multidisciplinary field of study and the health, psychological, or social care of older people is delivered by professionals who are already recognized and licensed (nurses, clinical psychologists, social workers, etc.), perhaps it would make more sense to consider gerontological training as a postgraduate specialization. In some countries, such as the United States or Canada, both options are available (Haley & Zelinski, 2007; Pianosi & Payne, 2014), which also leads us to question the differences in contents and competences between undergraduate and postgraduate programs, if there are any.

To date, the discussion and studies about training in gerontology have been limited to developed countries; little is known about the extension and nature of this kind of training in other areas of the world (Kunkel, 2008).

Latin America is a paradigmatic region. Although it is still relatively young, it is experiencing a rapid process of population aging. By 2050, for instance, 25.5% of Latin Americans are expected to be 60 years and over. In some countries, such as Cuba, Chile, or Brazil, the percentage will be even higher (UN, 2015).

In this context, despite the fact that Latin American countries are committed to generating specific training for social and health professionals (OEA, 2015; UN, 2002), the scarce research on aging-related training suggests that few gerontology programs are available at Latin American

universities, and those that do exist have been established relatively recently. For instance, Bos, Padilha, Bos, and Gómez (2007) reported that in 2007 there were just 10 postgraduate programs on gerontology in the region. At approximately the same time, Kunkel (2008) estimated that there were around 200 undergraduate programs and 150 master's degree programs on gerontology in the United States alone. Therefore, the potential for growth in the region is very high.

Latin American higher education systems are still developing, and remarkable differences are found among countries (Lamarra, 2010). For instance, specific regulations and evaluations of the quality of undergraduate and postgraduate programs are still under development in some countries, and simply absent in others (Lamarra, 2010; Rama, 2006).

Therefore, an exploration of how gerontology training is distributed and organized in this region, where the challenges of population aging are not as urgent as in developed countries, would provide important cues for the design of programs that could meet the growing need for well-trained professionals in this area, and the efficient investment of resources that may be more scarce in Latin America than in other regions.

Consequently, this study has two aims:

- O1: To describe the number, geographical distribution, and general characteristics of gerontological training programs offered by Latin American universities.
- O2: To analyze their disciplinary content and the degree of similarity among programs.

Methods

Sample

The sample was made up of 100 undergraduate and postgraduate programs with gerontological content (namely, focused on later life, aging, or older adult issues) that were taught in Latin American private or public universities during academic year 2015–2016. We excluded Surinam, Belize, both Guyanas and the English-speaking Caribbean countries from our analysis.

To be included in the sample, programs had to meet the following criteria: (1) the title of the program had to include explicit mention of its gerontological focus (including words such as “gerontology,” “geriatrics,” “aging,” “older people,” or “older age”); (2) the program had to be taught over at least one academic year.

We did not include programs whose main aim was training in research competences; therefore we excluded PhD programs.

We used two methods to search for programs: (1) looking up the course offerings published on the internet by the main universities in each country; (2) using the local version (when available) of Google and Yahoo! search engines, and browsing the results of combining two sets of keywords. The first set included “university” (universidad), “bachelor” (bachelero), “degree” (grado), “master” (maestría), and “postgraduate” (posgrado). The second set included “gerontology” (gerontología), “geriatrics” (geriatria), “older age” (ancianidad), “later life” (vejez), “aging” (envejecimiento), “older people” (personas mayores), and “older adults” (adultos mayores). The search was carried out in Spanish, except the search for programs in Brazil, which was undertaken in Portuguese.

The search identified 100 university programs that met the aforementioned criteria.

Procedure and data analysis

The following information was collected on each program: (a) name; (b) university; (c) academic level (undergraduate vs. postgraduate); (d) management (public vs. private); (e) length of the program; and (f) contents (including internship hours and final dissertation).

To address the first objective of this study, we ran descriptive statistics to determine the number, geographical distribution, and general characteristics (academic level, management, length, and inclusion of an internship period) of the gerontological training programs offered in Latin America. All the analyses were carried out using SPSS 21 software.

For the second objective, we carried out a content analysis of the syllabus of each program. As 14 programs did not have an accessible online syllabus, they were excluded from the analysis. This left 86 programs that were analyzed in a multi-stage process designed to find the key themes or units of meaning that recurrently appeared on the syllabus.

In the first stage, two of the researchers independently read the syllabus of each program to become acquainted with the data. Afterward, they made a list of the main contents included in each syllabus. Contents that were identical or very similar were grouped into broader categories.

In a second stage, the category systems that had been drawn up by each researcher were compared, and similarities and differences were identified. Differences were discussed until agreement was reached on a common list of categories.

The agreed list of categories, as well as each syllabus, was then given to a third researcher who had not participated in the previous stages. His task was to assign the contents mentioned in the syllabus to the categories. This classification was compared with the original one, yielding an inter-rater kappa index of 0.89, which could be qualified as very satisfactory.

Finally, six independent judges were recruited. They were all university professors whose teaching and research focus was aging, in different disciplines (two psychologists, one demographer, one sociologist, one physician, and one nurse). They were asked to classify each category into one of three disciplinary areas, which the AGHE (2014) identified as the main disciplinary sources of gerontology: social sciences, behavioral sciences, and health sciences. Once this process had been completed, each category was assigned to a specific disciplinary area if at least five judges had classified the category in that area.

When this level of agreement was not reached, either because the content of the category seemed to refer to more than one area or because one discipline was not included in any of the three areas under consideration, the category was classified as “other gerontological content.” In addition, a fifth group of categories that referred to non-gerontological content was included.

Results

Number, distribution, and general characteristics of the programs

We used descriptive statistics to address the first objective of this study. The number and distribution of programs by country, academic level (undergraduate vs. postgraduate), and management (public vs. private), as well as the number and proportion of people aged 60 and over in each country, are shown in [Table 1](#). Clearly, the most populated countries (Brazil and Mexico) were also those with the most programs. If we look at the overall number of older adults, Colombia and Peru ranked lower than expected in terms of the number of programs, while Chile ranked higher. Programs were spread across Latin America, and just two South American (Ecuador and Bolivia) and two Central American countries (Honduras and El Salvador) did not offer any gerontological programs.

Postgraduate programs clearly outnumbered undergraduate ones, in a ratio of 3:1. However, there were some differences among countries. In Colombia and Mexico, undergraduate programs seemed highly consolidated, since their number matched (or even surpassed) the number of postgraduate programs. In other countries, such as Chile, Puerto Rico, or Costa Rica, the offer of gerontological higher education was based exclusively on postgraduate programs.

The number of programs offered by private and public institutions was balanced overall, although in some of the countries with more programs (Brazil, Argentina, or Colombia) the private offer outnumbered the public one.

Table 1. Population over 60 years (UN, 2015) and number of gerontology training programs offered by Latin American universities: by level and management.

	Total population over 60 years (thousands)	% 60 years and over	Total programs	Level		Management	
				Undergraduate	Postgraduate	Public	Private
Brazil	24,392	11.7	27	4	23	11	16
México	12,177	9.6	20	12	8	10	10
Argentina	6559	15.1	12	2	10	4	8
Chile	2818	15.7	10	0	10	6	4
Colombia	5226	10.8	7	3	4	2	5
Perú	3127	10.0	5	1	4	0	5
Puerto Rico	723	19.6	4	0	4	2	2
Costa Rica	613	12.8	3	0	3	2	1
Venezuela	2925	9.4	3	1	2	3	0
Cuba	2215	19.4	2	0	2	2	0
Guatemala	1145	7.0	2	0	2	2	0
Uruguay	657	19.1	2	0	2	2	0
Nicaragua	473	7.8	1	0	1	1	0
Panamá	430	10.9	1	1	0	0	1
Paraguay	598	8.3	1	0	1	1	0
Total			100	24	76	47	52

The average length of undergraduate programs was 7.58 ($SD = 1.67$) semesters, and most of them (13 out of 24) were designed for eight semesters. The majority (77.3%) included an internship in their syllabus. In contrast, postgraduate programs were shorter ($M = 3.46$ semesters, $SD = 1.06$). The most frequent versions were four (38 out of 76) and two (20 out of 76) semesters long. Most postgraduate programs (75.7%) did not include an internship in their syllabus.

Disciplinary content of the programs

To address the second objective of this study, we carried out a content analysis of each program's syllabus. The proportion of contents assigned to each disciplinary area is shown in Table 2. As we can see from the table, programs seemed to include a balanced percentage of social (28%) and health sciences (26%) contents. A considerable, but lower percentage of behavioral sciences (17%) and other gerontological content (22%) was also found. The presence of other non-gerontological contents was only minor (5%). Overall, the distribution of contents in disciplinary areas was very similar in undergraduate and postgraduate programs. Only non-gerontological content seemed to be more predominant in undergraduate (almost 8%) than postgraduate (4.5%) programs.

However, differences were found in the predominance of specific areas in some programs. In undergraduate programs, no specific disciplinary area accounted for more than 50% of the total content. In contrast, at postgraduate level, eight programs had over 50% social sciences content; seven programs had over 50% health sciences content; and two programs had over 50% behavioral sciences content. Overall, we found 17 (out of 64, 26%) postgraduate programs that seemed dominated by a specific disciplinary area. The rest of the postgraduate programs were more multi-disciplinary, as were all the undergraduate programs.

Table 2. Mean percentage (SD in parentheses) for each disciplinary content.

	Total ($N = 86$)	Level	
		Undergraduate ($n = 22$)	Postgraduate ($n = 64$)
Social sciences	28.04 (13.88)	26.56 (7.84)	28.54 (15.45)
Behavioral sciences	17.48 (11.98)	17.37 (6.32)	17.54 (13.42)
Health sciences	26.53 (15.70)	26.18 (11.45)	26.64 (16.99)
Other gerontological	22.55 (11.53)	21.95 (7.46)	22.76 (12.67)
Other non-gerontological	5.38 (6.68)	7.93 (6.54)	4.50 (6.55)

Table 3. Frequencies and percentages of social sciences content categories.

	Total (<i>N</i> = 86)	Level	
		Undergraduate (<i>n</i> = 22)	Postgraduate (<i>n</i> = 64)
Community gerontology	56 (65.1)	17 (77.2)	39 (60.9)
Administration and business	51 (59.3)	19 (86.4)	32 (50.0)
Social policy	37 (43.0)	9 (40.9)	28 (43.7)
Law and rights	29 (33.7)	13 (59.1)	16 (25.0)
Sociology	28 (32.6)	10 (45.4)	18 (28.1)
Demography	21 (24.4)	9 (40.9)	12 (18.7)
Social programs and resources	21 (24.4)	6 (27.2)	16 (25.0)
Anthropology/cultural studies	20 (23.3)	10 (45.4)	10 (15.6)
Economy	15 (17.4)	9 (40.9)	6 (9.4)
Human resources	7 (8.1)	4 (18.2)	3 (4.7)
Quality management	7 (8.1)	3 (13.6)	4 (6.3)
All categories combined	83 (96.5)	22 (100)	61 (95.3)

At least three aspects are remarkable in the tables showing the contents classified in each disciplinary area (see Tables 3–6). First, regardless of disciplinary area, very few categories were present in more than 50% of the analyzed programs. In social sciences, this was the case for just two categories (“community gerontology” and “administration and business”), while only one category in behavioral sciences (“psychology [generic]”) was found in 50% of the programs. In health sciences, two categories met the condition (“health and public health” and “geriatric syndromes”), and in other gerontological content, just one category (“research and methods”).

Second, the order of frequency of categories was very similar for undergraduate and postgraduate programs, regardless of disciplinary area (social, behavioral and health sciences, and other gerontological content). There were few exceptions to this trend. The most notable were “anthropology” in

Table 4. Frequencies and percentages of behavioral sciences content categories.

	Total (<i>N</i> = 86)	Level	
		Undergraduate (<i>n</i> = 22)	Postgraduate (<i>n</i> = 64)
Psychology (generic)	61 (70.9)	22 (100)	39 (60.9)
Palliative care	27 (31.4)	12 (45.4)	15 (23.4)
Psychosocial intervention	22 (25.6)	7 (31.8)	15 (23.4)
Psychological assessment	20 (23.3)	10 (45.5)	10 (15.6)
Family relationships	20 (23.3)	4 (18.2)	16 (25.0)
Program design and evaluation	15 (17.4)	7 (31.8)	8 (12.2)
Dementia and neuropsychology	12 (14.0)	3 (13.6)	9 (14.1)
Psychopathology	12 (14.0)	6 (27.2)	6 (9.4)
Caregiving	10 (11.6)	3 (13.6)	7 (10.9)
All categories combined	76 (88.3)	22 (100)	54 (84.3)

Table 5. Frequencies and percentages of health sciences content categories.

	Total (<i>N</i> = 86)	Level	
		Undergraduate (<i>n</i> = 22)	Postgraduate (<i>n</i> = 64)
Health and public health	51 (59.3)	16 (72.7)	35 (54.7)
Geriatric syndromes	44 (51.2)	14 (63.6)	30 (46.7)
Biology	33 (38.4)	16 (72.7)	17 (26.6)
Epidemiology	29 (33.7)	7 (31.8)	22 (24.4)
Anatomy and physiology	24 (27.9)	14 (63.6)	10 (15.6)
Geriatric assessment	23 (26.7)	2 (9.1)	21 (32.8)
Nutrition	22 (25.6)	13 (59.1)	9 (14.1)
Nursing	20 (23.2)	7 (31.8)	13 (20.3)
Physiotherapy	19 (22.1)	9 (40.9)	10 (15.6)
Pharmacy	18 (20.1)	8 (36.4)	10 (15.6)
Occupational therapy	14 (16.3)	7 (31.8)	7 (10.9)
All categories combined	82 (95.3)	22 (100)	60 (93.7)

Table 6. Frequencies and percentages of content categories related to other gerontological content.

	Total (N = 86)	Level	
		Undergraduate (n = 22)	Postgraduate (n = 64)
Research and methods	50 (58.1)	15 (68.2)	35 (54.7)
Active aging	35 (40.7)	14 (63.6)	21 (32.8)
Ethics	29 (33.7)	11 (50.0)	18 (28.1)
Adult education	25 (29.1)	10 (45.4)	15 (23.4)
Prevention and health education	22 (25.6)	10 (45.4)	12 (18.8)
Statistics	22 (25.6)	9 (40.9)	13 (20.3)
Gerontological theories	18 (20.9)	7 (31.8)	11 (17.2)
Ergonomics and architecture	13 (15.1)	8 (36.3)	5 (7.8)
Interdisciplinary team working	12 (14.0)	0 (0)	12 (18.8)
Ecology	9 (10.5)	5 (22.7)	4 (6.3)
Sexuality	9 (10.5)	6 (27.2)	3 (4.7)
Disability and dependency	6 (7.0)	3 (13.6)	3 (4.7)
All categories combined	81 (94.1)	22 (100)	59 (92.2)

social sciences, “nutrition” in health sciences, and “interdisciplinary team working” in other gerontological content. “Anthropology” and “nutrition” were more frequent in undergraduate than postgraduate programs; the opposite was the case for “interdisciplinary team working.”

Finally, in general, the main categories in each disciplinary area were found to be more frequent in undergraduate than in postgraduate programs. Thus, while the most common social sciences category was found in 77.2% of undergraduate programs, it was only present in 60.9% of postgraduate programs. In the case of behavioral sciences, “psychology (generic)” was common to 100% of undergraduate programs, but only found in 60% of postgraduate programs. Similar differences were found in the main health sciences and other gerontological content areas. This suggests that the degree of commonality of contents was greater among undergraduate than postgraduate programs. The contents of postgraduate programs seemed to be more heterogeneous. This result is consistent with the greater diversity of postgraduate programs, as mentioned above.

Discussion

The aim of this study was to describe the number, geographical distribution, and general characteristics of gerontological training programs in Latin America, and to analyze their disciplinary content. Our study shows that despite being a relatively young region of the world, most Latin American countries offer gerontological programs. The number of programs has increased sharply in recent years. Bos et al. (2007) estimated that there were just 10 postgraduate programs in 2006, while we found 100 programs 10 years later. Nevertheless, this number is still low when compared with the figures for other more developed regions of the world (Kunkel, 2008).

The nature of the course offering seems to be quite diverse across countries. Some countries, such as Mexico, have a rich offering of undergraduate programs, which follows the US pattern in which there are more undergraduate than postgraduate gerontology programs (Kunkel, 2008). In other countries, such as Chile, there are no undergraduate programs at all, as in most European countries (Aartsen, 2011; Van Rijsselt, Parkatti, & Troisi, 2007). Some countries, such as Brazil or Argentina, have a fairly limited undergraduate programs that is far lower than the number of postgraduate programs.

The analysis of the programs’ disciplinary content indicated that gerontology, as taught in Latin America, is conceived as a multidisciplinary field of study. Social, behavioral, and health-related contents appear in most programs, and no field seems to clearly dominate over the others. As our results indicate that most programs are multidisciplinary in nature, gerontology does not appear to have achieved the status of a distinct discipline in Latin America. There, gerontology does not appear to be a predominantly interdisciplinary approach to the field of study among Latin American educational institutions, if we define interdisciplinary, as Ferraro and Chan (1997, p. 374) proposed,

as involving “a plurality of disciplines where disciplinary boundaries are often muted and the joint contributions of the synergy are highlighted.” In the programs that we analyzed, contents seem to be organized and offered in separate courses, according to their association with a discipline. There are some contents (categorized under “other gerontological contents”) that may contribute to such interdisciplinarity, but they do not represent the majority of contents and are not present with the same weight in all the programs, if they are present at all. For instance, the category “gerontological theories,” which many authors would consider key to building a disciplinary approach to gerontology (Lowenstein, 2004), appears in barely one out of five programs. Another example is “competences in interdisciplinary team work,” which would help to offer real integrative care to older adults and make a difference with respect to other professionals (Goldberg, Koontz, Rogers, & Brickell, 2012). However, this category is present in just 14% of the analyzed programs, and is not included in any undergraduate programs.

The great diversity and number of contents (even within each disciplinary area) and the fact that they tend to be very program-specific, with the most common contents shared by just half of the programs under analysis, suggest a low degree of standardization of gerontological training in Latin America. It is not clear which contents should and should not be included in a gerontology program. This may result in a wide range of competences being acquired by gerontology professionals, depending on which program they studied. As some of the contents of gerontology programs (particularly undergraduate programs) overlap with the syllabus of courses such as psychology, nursing, medicine, or social services, it is hard to clarify the professional status of the gerontologist. This difficulty has been highlighted by the literature (Haley et al., 2012).

The diversity is even greater in postgraduate programs. A low number of specific, specialized programs that are focused on a single discipline (particularly social sciences or health sciences) seem to coexist with other programs that are more generic and multidisciplinary. In this latter case, in countries where undergraduate and postgraduate programs are offered at the same time, there is a risk of offering overlapping contents and competences in undergraduate and postgraduate programs.

Internships are common on undergraduate programs, but just a minority of postgraduate programs include these periods. In other regions of the world, such as Europe, the offering of diverse, relevant internships under expert supervision has been identified as a key element to assess the quality of a training program, particularly if it is designed to train professionals (Molinari & Ellis, 2013; Villar, Giuliani, & Serrat, 2016; Von Dras & Miller, 2002).

The study has a number of limitations, which need to be taken into account when interpreting the results. First, the number of programs varies from year to year, since many of them are only offered if there is enough demand.

Second, we used open information published on the internet as a data source. This information may be outdated in some cases, and the level of detail provided is very variable. For instance, while the entire syllabus of all the courses was accessible for some programs, others just published the titles. This could have biased the content analysis, since the title of a course does not necessarily reflect its contents exactly. As mentioned earlier, the overall study plan of the program was missing or not accessible in 24 programs.

Finally, it would have been interesting to describe and analyze indicators of quality, such as the training level of academic staff, the methods for evaluating the attainment of competences, the profile and number of students attracted by the program, or the academic performance of students. These factors would have been very useful to suggest improvements, but in most cases such information was not publicly available.

Despite these limitations, this paper presents the first overall description of gerontology training in Latin American universities. It shows that although there are relatively few gerontology programs, they have increased in number and are now spread over most countries of the region. The study offers indicators of the great diversity of programs (with undergraduate and postgraduate programs coexisting in some countries), the lack of homogeneity of their contents, and the multidisciplinary approach to gerontology that they generally convey.

In the light of our results, we have discussed some challenges to an area of training that has growth potential, due to the future aging of the population in the region. In particular, we have underlined the need for greater similarity among programs of the same level (and particularly among undergraduate programs), clearer differentiation between the contents and competences associated with undergraduate and postgraduate levels, the need to provide more internship opportunities for students as a standard for every program (and particularly in postgraduate programs), and the need to increase the presence of interdisciplinary contents in programs' syllabuses, to break the boundaries between disciplines.

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