

Training Proposal for Graduate Programs in Latin America in the Era of the Digital Age and Artificial Intelligence

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Abstract

This article corresponds to the research work, carried out within the framework of the Corpas Sana Group of the Juan N. Corpas University Foundation (Bogotá, Colombia), which investigates the educational bets in postgraduate courses in Latin America from the project called "Higher Education: challenges and challenges". The method used was that of bibliographic review, in which several documentary sources contained in books, university repositories and databases related to the subject were consulted, to later make an in-depth analysis, characterizing several categories related to the theme of post-graduate training. The results and conclusions point out the importance of betting on a new type of post-graduate training that is framed in the so-called "education in the digital age", from the proper use of Artificial Intelligence, with strong components of curricular flexibility, training for critical thinking, solidarity research, use of ICTs, motivational methods and autonomy in the learning processes by postgraduate students.

Keywords: Higher Education, Postgraduates, Training, Digital Education, Learning, Artificial Intelligence.

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Introduction

The general panorama of the new graduate programs in Latin America has been presenting a gradual transformation both at the academic and administrative levels, especially in recent years, even more so with the advent of the digital era and the increase of Artificial Intelligence, which increased the questions and concerns about the future of higher education and of the postgraduate programs themselves in the face of the great social transformations. cultural, political, technological, and economic aspects of the Latin American continent.

The growing concern about the issue of efficiency, quality, competitiveness and coverage of the postgraduate courses themselves, place on the table a growing concern that was born after the second half of the previous century and that continues to motivate the search for possible solutions throughout our continent and from the various institutions of higher education, both public and private.

During and after the global pandemic of 2020, statistics indicate that both doctorates and master's degrees in Latin America were forced to face several dilemmas, among which was precisely that of trying to implement new methodologies that emphasized virtual education mediated by the information and communication technologies available in each higher education center or trying to "normalize" the return of students to the face-to-face classrooms, either with good or scarce technological support (Estrada, 2020).

The same queries carried out through bibliographic research in recent years, as well as statistics, show how many higher education centers, especially those in provinces and areas far from large cities, did not have the adequate infrastructure to respond appropriately to the requirements demanded by governments in terms of making a shift towards "virtual education". as was the case with many postgraduate courses, both classic and emerging; Even in post-pandemic times, the fact that a large part of the countries of the Latin American continent requested a return to the so-called "normality" (understood as the return to physical classrooms), was per se a problem not only of an administrative and technical nature, but also of an economic, political and social nature.

Piñero Martín et al. (2021) point out that many of the challenges in recent years at the level of post-graduate education have been reconfigured from three trends that in turn can be grouped into several subcategories: research, curriculum development and management; These authors consider that one of the most pressing challenges in terms of post-graduate training is related to both academic and research quality in the post-graduate programs offered by Higher Education Institutions in our continent.

-Most Pressing Challenges for Graduate Studies in Latin America

According to data provided by IESALC (UNESCO International Institute for Higher Education in Latin America and the Caribbean), at the event held in November 2020, it was concluded that although important progress has been made in terms of access to postgraduate courses in our continent, there are still challenges that must be addressed promptly: improve the enrolment rate, manage scholarships for low-income students, support gender equity in access to post-graduate programmes, especially favouring women and among them those who are in a situation of greater vulnerability, benefit public policies aimed at democratizing access to postgraduate studies in our Latin American countries, Improve administrative processes related to the access and permanence of graduate students, as well as optimize processes to improve the quality of post-graduate education itself and its technological and informational capacities, from an ecological and sustainable perspective.

In relation to this last topic, although important progress has been made in this regard, authors such as Acero, Gómez, and Orduz (2021) state that there is still a long way to go to close the gaps in terms of accessibility, inclusion, and opportunities for technological

use, so that graduate students can assertively use the latest information and communication technologies that would notoriously favor the improvement of their academic and research processes in the field. the field of post-graduate training in their respective Higher Education Institutions or post-graduate training centres.

For Cuéllar et al. (2016), it should also be borne in mind that the propensities in terms of training at the post-graduate level, today, are in line with increasing technological development and scientific production represented both in academic events (seminars, congresses, symposia, etc.), as well as in networks and research groups that generate research products such as scientific articles, collective books, patents and virtual objects derived from the same knowledge. The above elements would help graduate programs to position themselves in the academic field at a national and international level as high-quality benchmarks.

In an article entitled: *Postgraduate Education as a Social Necessity: Trends and Challenges in the Face of the Contemporary Latin American University* (2016), published by the aforementioned authors, it is stated that in the case of Latin America, the tendency is to follow the guidelines and orientations that are being consolidated both in the United States and in Europe; these in particular, They have a lot to do with strengthening postgraduate courses with the business sector, increasing support for innovation, as well as flexibility and new forms of degrees, without neglecting the assumption of new trends in terms of technological surveillance.

Likewise, according to Aguirre, Castrillón and Arango (2019), some issues of capital importance in the current training trends in post-graduate education in Latin America cannot be ignored, such as: the urgency of implementing the "training-research-transfer" model, opting for scientific and business entrepreneurship, as well as the creation of technology-based companies in connection with academic research, as well as interdisciplinary articulation in such a way as to strengthen networks, agreements, research working groups and the production of patents and tangible products that benefit the universities themselves and the communities and social groups in which they are inserted.

In the same way, Toncich (2016), with respect to the previous topics, states that the main particularities that are directly related to innovation and transfer of knowledge and knowledge in the field of postgraduate training in Latin America, are: to favor collaborative work between the various dependencies within the HEIs as well as outside them with different types of companies and other HEIs at the local level, national and international; likewise, favoring partnerships and cooperations with both public and private institutions (NGOs and institutions oriented to social service) that work under the same epistemological and methodological coordinates, especially those that have a high sense of social commitment and the creation of socially responsible companies.

On the other hand, Gómez et al. (2020), in their book entitled: *Comprehensive Training in Postgraduate Studies in Education: Contributions from Humanism, Curriculum, Epistemology and Education 4.0 in Latin America*, state that postgraduate training must be rethought, especially in education at the level of the Latin American continent, opting in a special way for:

- Integrative curricula that assume inter- and transdisciplinarity in their academic, research and management processes, in such a way that they articulate all the knowledge, knowledge, competencies and skills required by future professionals, whether specialists, masters or doctors in their disciplinary fields and work performance.
- A type of training based on the "education 4.0" model, as one of the major trends in the learning itinerary in higher education in the 21st century; This itinerary invites a comprehensive understanding and intervention by HEIs in terms of appropriating the new information and communication technologies exponentially and in various socio-cultural

and educational contexts, in such a way that they can provide assertive responses to the needs of quality coverage in the various postgraduate courses in Latin America.

- To provide an excellent epistemological and methodological foundation, particularly oriented towards the comprehensive training of graduate students; This implies conceiving the person as the principle and foundation of every educational process and as the ultimate goal of the formative ideology in the various post-graduate programs in our continent.

- Follow the guidelines of Nussbaum (2011), in that professionals should not be trained only for the labor market or for the income of a nation, but in essence to overcome the limits of inequalities, as well as to contribute to the growth of humanity with a high degree of awareness and ethical sense, as well as to the creation of new, more just and fraternal societies. To this end, the American thinker proposes her decalogue of capacities (knowing how to live, enjoying good health, possessing bodily integrity, appreciating the senses and imagination, possessing practical reason, showing a sense of filiation, establishing good relationships with other living beings, enjoying play and laughter and possessing self-control), all of them aimed at achieving a higher quality of life. as well as greater equity and social justice.

On the other hand, Cruz (2014) emphasizes the diversity of modalities that have been emerging at the postgraduate level in Latin America, especially in the field of doctorates, where the degrees range from Doctorate in Education EdD, through Engineering Doctorate -EngD, to Doctor in Business Administration -DBA, in the English nomenclature they are called "new route", demonstrating the great diversification in terms of degree possibilities in specific areas of knowledge and that had traditionally been derived from classical master's degrees. On the other hand, Cruz himself warns of how the demands and requirements to achieve post-graduate degrees have also evolved: from the preparation of the thesis accompanied by its respective support, to the growing development of competencies and capacities to perform successfully in the world of work and business, including the management of skills for the management of ICTs. teamwork, real mastery of a second language,

With respect to these last three elements (work skills, ICT management and second language), the previous author affirms that it opens up the possibilities for graduate students to successfully venture abroad, as well as the contingency of graduating with the publication of scientific articles in high-impact journals derived from their fieldwork. even relying on curricular flexibility and with the possibility of a national or international double degree.

-On the training of postgraduate teachers in Latin America

A topic that deserves a separate chapter is related to the training of teachers involved in the training processes of postgraduate students in the various Higher Education Institutions of our continent.

In this regard, authors such as Herrera (2019), mention that one of the fundamental dimensions to achieve an effective change in postgraduate courses in Latin America is related to quality, in this context, the role of post-graduate teachers and trainers is of capital importance due to the significance of their role and leadership as knowledge managers. promoters of research and agents who create new connections and relationships with the socio-cultural environment in which the educational activity of each HEI is deployed. This implies that HEIs themselves must rethink how to improve the protagonism and leadership of postgraduate teachers, optimizing their working conditions, creating friendlier and more supportive work climates, assertively remunerating their invaluable work and ostensibly improving their self-esteem.

To achieve this, according to Mena and Huneus (2017), it is necessary to invest especially in the training of postgraduate teachers, both in their academic and epistemological training, as well as in their human training and in the skills and competencies of their pedagogical work, so that they can carry out their work with success, optimism and a sense of belonging to their institution.

In some countries, such as Colombia, the Ministry of Education has issued some lines of training for postgraduate teachers, establishing some fundamental elements that must be taken into account in all HEIs, both public and private, when addressing this important aspect related to the teaching career, its present and future in the face of an increasingly changing and uncertain world; Likewise, with the commitments at the level of post-graduate training for each level, in such a way that it is specified that:

- At the master's level, teachers who are going to train future master's students in various sciences and disciplines are expected to acquire excellent skills and pedagogical methodologies to assertively guide the teaching-learning processes of their students, knowing how to contextualize knowledge according to their characteristics; Likewise, the ideal is to train a type of teacher who can bet on a multimodal and supportive research ecosystem that continuously redefines the use and place occupied by the pedagogical knowledge and knowledge generated in their academic activity and that are essential to successfully carry out their teaching work.

- At the doctoral level, the same teachers are expected to take on the challenge of building theories and methodologies that contribute to leading processes of fundamental changes and transformations in post-graduate training in their respective institutions, as well as in their regions and countries of origin. Given the high demands of this level, efforts must be made to adequately train future doctors in environments of dialogue, diversity and inclusion, always with the aim of contributing the best of themselves to achieve the advancement of science, technology and knowledge at a global level, as well as the knowledge of each discipline and specific area in which they work.

According to UNESCO (2013), in its publication entitled: "Background and Criteria for the Development of Teacher Policies in Latin America and the Caribbean", it is mentioned in this regard to the training of teachers to practice their profession in postgraduate courses, that an effort should be made by HEIs to:

- Encourage the entry of the best candidates into post-graduate teaching, enhancing the level of requirements to enter the teaching career, according to pedagogical studies in their specific area, as well as in the development of skills and competencies specific to their profession.

- Certify the right of postgraduate teachers to training that is continuous, relevant and up-to-date, in accordance with the ideology of a comprehensive and systemic education, where the learning achieved is highly beneficial for its students; Likewise, ensuring optimal impacts on teacher training, especially on their pedagogical practices, which should be oriented more towards student learning and not only on the teaching of theories.

- To establish pedagogical trajectories in which the technical, professional and scientific development of the graduate teachers themselves is greatly benefited; This would imply knowing how to distinguish several stages in the professional life span of the same teacher, emphasizing the importance of accompanying and encouraging new postgraduate teachers in their entry, permanence and continuous training, in such a way as to support them in achieving a high level of intellectual, human and technical progress. encouraging them not to retire from their magnanimous profession.

- Make significant efforts to make progress in the consolidation of institutional projects that are in line with the training and professional development of postgraduate teachers, in such a way that the bodies committed to their continuous training create networks of cooperation

and development of projects aimed at improving the capacities of teachers in the various areas involved in the exercise of their profession.

- Establish teaching statutes that correspond to the importance of the profession of postgraduate teachers, being clear about the times and merits for their advancement in the teaching career; Likewise, by stimulating clear and fair policies of remuneration and incentives for academic and scientific production, so that the teachers themselves feel comfortable with their profession and identify with their respective institutions of higher education, where they carry out their noble task.

Summarizing this section, the aim is that postgraduate masters who are first-rate co-protagonists in the training process of future specialists, masters and doctors in the various areas of knowledge, feel valued, stimulated and incentivized to successfully and professionally fulfill their training task of high impact in the societies and scientific and academic circles of Latin America.

- On the importance of research and epistemological training for the consolidation of postgraduate studies in Latin America

Throughout the development of this book chapter, emphasis has been placed on the importance of research for the consolidation of postgraduate studies in Latin America. In fact, in previous years, Ghedin (2009) and Schön (1992) had already been reflecting on the need for an optimal post-graduate training based on epistemologies and methodologies specific to the sciences and the specific fields of knowledge of each discipline, as well as on the practical application of knowledge through continuous research exercises, in such a way that knowledge is gradually built thanks to problematization. Analysis and proposal of new alternative solutions in the various fields of scientific knowledge.

In contrast to this ideology, expressed by the previous authors, several studies, including the one carried out by Herrera et al. (2015) entitled: "The place of research in the post-graduate training of district teachers in human Bogotá", show that there are still many elements to be achieved in Latin American countries, the integration of epistemological training and scientific and academic research as key elements in the consolidation of the high-quality postgraduate courses in the Latin American continent. Among the elements that can be highlighted from this study are the following:

- It is common for both professors and graduate students to point out that the programs in which they are inserted still present difficulties in the epistemological and research preparation of the professors who direct the various seminars and research groups, as well as the tutorials and supervision of theses and degree projects. Some teachers even state that they are not researchers in their specific epistemological field or that they do not have sufficient work to dedicate themselves to such research or training work in their epistemological field and also that they lack good training to be tutors or thesis supervisors.

- In some post-graduate programs, several teachers even note the lack of relationship between the severity of the selection processes and the correspondence with the assigned subjects and seminars, as well as the spaces for research training of the teachers does not coincide with the training needs and research orientation of the students themselves. This is because the processes inquire about the inclinations and abilities that teachers have developed and, later, this does not seem to result in the contents or emphasis.

- There are also particular difficulties in teaching the research methodologies proposed by post-graduate programmes; Especially in master's degrees, many students manifest this difficulty, which is especially accentuated when they find themselves in their classes with teachers who have no previous training in research methods, while at the same time they feel the demands at this level in the follow-up of their degree projects. If the postgraduate course that is studied does not offer more elements regarding the problems and methods in research, it constitutes a weakness that will lead to other problems related

to the processes of definition of the research method and the very writing of the post-graduate thesis.

- On the other hand, some professors of several postgraduate courses state that the demands on students regarding the research topic are not the most appropriate, since many times the "pass" or "pass" priority is given to the vast majority to curb the rate of death or student dropout; In the same way, due to institutional pressures related to economic figures. Likewise, there is the situation of many teachers who recognize the lack of professional training in issues of investigative competencies and skills, which are essential to provide good follow-up and advice to the students themselves.

- As a final aspect, it is worth mentioning that in some cases, both teachers and students of post-graduate programs externalize their lack of preparation and training to handle tools of information and communication technologies; even many of them consider that given the boom that is being given to the issue of technological mediations in the context of virtual education, such training is really scarce and there is little support in this regard from the Higher Education Institutions of which the same post-graduate programs are part. suggesting from teachers and students, an adequate training and education for the optimal use of these tools.

On the other hand, in many post-graduate programs, the need for an improvement in the levels of reading and writing and high scientific writing in students' thesis work is also manifested, in addition to what has already been stated by Gómez et al. (2021), regarding the importance of appropriate critical-reflective training in both teachers and graduate students; The success of the thesis and its subsequent support to obtain the postgraduate degree in the respective area of knowledge will depend to a large extent on the good management of the high skills of scientific reading and writing.

Summarizing this section, it can be said that the research element still represents a rather enormous challenge for graduate programs in Latin America, especially since it constitutes the "central axis" and the *raison d'être* of graduate programs and their impact on the society in which they are inserted. Likewise, HEIs urgently need to leave profoundly positive traces related to high research projects that expand, review, deepen and revalue the knowledge already established in both the factual and theoretical sciences, giving the possibility for creative and innovative proposals that are beacons that illuminate the work of many groups, networks and lines of research that are constantly nourished by the contributions of teachers and students of the various research programs. postgraduate studies in our continent.

- Towards a Training Proposal for Graduate Programs in Latin America in the Face of Current Disruption

As stated in the title of this chapter, it is precisely a question of making a proposal that is aimed at optimizing the training processes in graduate programs in the context of the disruption that our Latin American continent is facing. According to statistics provided by the AIU (International Association of Universities), after 2020 and as a result of the global pandemic, 67% of higher education migrated to online teaching, leaving 20% to "hybrid" education and only 13% waiting to "return to face-to-face". Beyond the statistics, the concrete fact is that the great changes generated at all levels in recent years have led higher education, and specifically graduate programs, to assimilate "disruption" as a type of education that tries to break with the established molds to create new methods that improve educational processes. especially learning methods.

Curtis Robinson (2018), author of several works related to disruptive learning, expresses the current need to break with paradigms anchored in teaching alone, texts and rules: according to the English thinker, it is a matter of "forcing" both teachers and students to change paradigms from a new perspective on what education, focused on learning, implies. cognitive and metacognitive processes, as well as with the empowerment of new socio-

affective, cognitive, communicative and technological competencies, in such a way that we can respond correctly to the challenges of education in the contemporary era.

Referring specifically to post-graduate training in our continent, Robinson mentions that the answer must be found in innovation, both in methods, theoretical approaches, as well as in educational formats. In this case, good use must be made of information and communication technologies to support the teaching-learning processes, as well as using Artificial Intelligence correctly, making use of educational gamification that fosters creativity and originality in students, without discarding MOOCs (massive online courses), as well as the techniques of lifelong learning, educational e-learning and many other possibilities offered by educational technology. In essence, some thinkers, such as Robinson, argue that disruptive education supports a break with old paradigms anchored in behaviorism, banking education, rigid discipline and homogenization in learning processes.

The following can be listed as key elements to try to empower disruptive education in the field of post-graduate training:

- A training process that is committed to personalization, with special emphasis on the cognitive and metacognitive processes of each student, as well as on the development of their individual potential at an emotional, cognitive and social level. This implies an adaptation of teaching methods by the teacher, in this case at the post-graduate level, emphasizing the personalized processes of each student, orienting their creative potential.
- A post-graduate education that makes appropriate use of information and communication techniques, as well as current learning methods that use technological tools as a means to achieve learning objectives, in terms of developing the creative and original potential of each student.
- A type of learning linked to practice within the specific field of knowledge at the level of each post-graduate program and inserted in the socio-cultural environment where each student works; This implies that teachers know how to properly guide thesis tutorials and seminars, so that the topics and problems dealt with in their content are not only interesting but also pertinent according to the contexts and socio-cultural environment in which each student works and performs.
- A proposal for post-graduate learning that aims at the flexibility of training and curricular processes; According to Gómez Arévalo (2020), this would imply transforming the curricular structures as well as the teaching-learning processes and accompaniment of students in many graduate programs in Latin America, in such a way that there is room for real flexibility so that students can choose, decide and opt for the way to learn and be able to advance according to their own rhythms and training needs. Likewise, flexibility implies a special ability of each student to adapt to the circumstances of their academic and personal environment, without neglecting the ability to diversify their learning according to their particular socio-cognitive and affective rhythms.
- An educational process that fosters motivational pedagogy and "expanded education" among graduate students, which implies the combination of socio-affective elements, with the use of new information and communication technologies and the disruption of the binomial learning-daily life, in such a way that it is understood that learning is constituted in a "continuum" of permanent training that involves formal elements, informal and non-formal, allowing the integration of personal experiences, daily experiences in society and the connection with "other realities" such as the well-known "virtual reality" and "augmented reality", which, properly integrated into post-graduate educational scenarios, could support the optimization of training processes that promote the development of competencies, skills and abilities necessary in their epistemological and methodological fields. It is clear from this element that the learning processes in postgraduate courses transcend the barriers of educational institutions, inverting

educational asymmetry to give way to innovative pedagogical processes in various scenarios, characterized by inclusion, inter- and transculturality, as well as inter- and transdisciplinarity.

- Finally, a style of education that resignifies the role of the teacher as an accompanist, generator of spaces for dialogue, in permanent interaction with students and propitiator of questions and processes of reflection and argumentation in post-graduate training processes. This implies a renewed vision of the postgraduate teacher as an authentic "creator and transformer" of learning techniques and methods, always open to listening and innovation. It is a vision of the postgraduate teacher as the motivator par excellence and the permanent guide of students who feel accompanied by the experience of a close person who already knows the path because he or she has traveled it with his or her successes, unknowns, uncertainties and hopes.

Conclusions

There are several conclusions that can be drawn from this review of the subject discussed, among which are the following:

- From the reality of education that is led in Higher Education Institutions in Latin America, it is possible to think of several training proposals for graduate programs in the face of the current disruption. This implies rerefecting on the role played by postgraduate courses in the various disciplines and areas of knowledge, as trainers of researchers with high socio-affective, cognitive and affective competencies who are prepared to face the great socio-cultural, economic and political changes throughout the Latin American continent, as stated by Castañeda Cantillo, C; Gómez Arévalo, J.A; Meneses Runza, D; Piñeros Ricardo, A. and Guerrero Pérez, A. (2023).

-The epistemological and methodological training processes of both teachers and students who interact in the various post-graduate programs in the various HEIs of the Latin American continent should be reviewed. This would also lead to the revision of the curricular proposals as well as the processes of flexibility and continuous evaluation of learning outcomes in the specific areas in which the post-graduate program is inserted.

-Training in high research competencies is the central axis of the post-graduate programs, which implies renewing the efforts to address the quality of the research seminars, as well as the linkage and belonging of both teachers and students to the groups, networks and lines of research that are led by the different HEIs and their respective post-graduate programs.

Special attention should also be paid to the training of teachers who lead the pedagogical and research processes in postgraduate courses on the Latin American continent, so that their importance as leaders, accompaniers and professionals of the educational service at the post-graduate level is recognized. This implies that their salary assignments, their job promotions, their permanent training in the fields and areas of specific knowledge, as well as their active participation in the construction and renewal of the post-graduate programs in which they are inserted, are constantly reviewed.

-It is important that postgraduate courses take on board the proposals of the so-called "digital education", as well as the advances in the field of Artificial Intelligence, as an alternative to the accelerated changes that have been generated in recent years in our continent and in the world; especially, in the field of training in current ICTs, in multimodal and flexible learning, in the openness towards an expanded and motivational education, which is characterized by inclusion, inter and transculturality, as well as by inter and transdisciplinarity in its academic and research processes.

-Finally, it is necessary to make a continuous effort to build bridges of epistemological and pedagogical dialogue with post-graduate training centers of other Higher Education Institutions in the other continents of the world, because otherwise postgraduate courses in

Latin America could remain under the "narcissus" effect, where the gaze is only focused on our educational bets, missing out on the valuable learning that implies the encounter with other experiences and other forms of learning, to build science and knowledge, in such a way that we are committed to education for all, as proposed by the Sustainable Development Goals for the current era.

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