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Research Internships as a Strategy for Strengthening Doctoral Programs at the University of Panama

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Abstract

The article presents the University of Panama as one of the five official accredited universities in the country, which has implemented strategies to make its scientific production visible in accordance with the scientific and technological advances that society demands. The purpose of the study was to propose an intervention strategy to strengthen research skills in doctoral students of the Doctorate in Education at the University of Panama, in order to achieve the comprehensive training of doctors in the research skills necessary to manage projects and disseminate them to the scientific Community, companies and society as a priority. A methodology with a qualitative approach, exploratory level and a participatory action research design was used, applying information hermenensis as a technique of analysis and interpretation. Selecting as key informants an intentional sample of 20 students from the last cohort of the Doctorate in Education program offered by the Faculty of Education Sciences. It was concluded that the defense of the doctoral thesis becomes one of the main obstacles for graduation in these programs. In addition, an intervention strategy is proposed, international research internship and follow-up, to strengthen investigative skills and stimulate the defense of thesis in one of the doctoral programs of the University of Panama, strengthening the development of four fundamental investigative skills such as the approach of the problem, theoretical framework, methodological design and scientific innovation. Likewise, it was evidenced that the 20 participants in the intervention defended their doctoral thesis and 91.0% of the study cohort graduated.

Keywords: *higher education, student mobility, research skills, Qualitative Analysis*

Introduction

Higher education in Panama, mainly university, has undergone important changes both in the number of official and private institutions, as well as in the quality of their administrative structures and the services they offer: teaching, research, extension, production and service; in correspondence with the political, economic, social, cultural, scientific and technological challenges of the country (Corre, 2016; Brunner 2010; Tunnermann, 1999).

In this regard, the University of Panama (UP), one of the five public universities, accredited by the National Council for University Evaluation and Accreditation of Panama (CONEAUPA, 2022), has been committed to Panamanian society since its creation in 1935 (Bernal, 2001), influencing the development of the country, through the training of professionals and their link with the resolution of problems that society demands (Law 24 of 1995, Organic Law of

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the University of Panama, Article 1).

The University of Panama, in its commitment to promote the generation of scientific knowledge and the dissemination of scientific production, has designed various strategies to strengthen scientific research, including: the training of qualified human resources at the doctoral level, the annual opening of calls for research funds and the increase of indexed scientific journals (UP, 2022a; UP, 2022b; Farnum & Contreras, 2018). The doctoral programs at the UP (See table: 1) correspond to the fourth level of the postgraduate system; at this level, researchers are trained, with the necessary skills to manage projects that affect both the scientific community and civil society (UP, 2007).

Table 1: Current Offer of Doctoral Programs at UP-2022.

Area	PhD Programs	N° of Cohorts	Year of Approval	Credits	Subject Exigible
Health Sciences	Doctorate in Nursing with an emphasis in International Health	1	2020	67	Work Internship
	PhD in Biomedical and Clinical Research	1	2016	88	
	Doctorate in Preventive Medicine and Public Health	3	2011 2016 2018	64	Work Internship
Natural Sciences and Technology	Doctor of Natural Sciences with an Emphasis in Entomology	1	2019	60	Research Internship
	PhD in Business Studies	4	2006 2009 2016 2019	64	Research Internship
	Doctorate in Education	3	2011 2014 2018	67	
	PhD in Social Communication Sciences	1	2022	65	
Social Sciences and Humanities	Juris Doctorate with an emphasis in -Civil Law - Labor Law	3	2009 2011 2017	66	
	PhD in Humanities and Social Sciences	2	2011 2018	66	
	PhD in. Spanish Linguistics	1	2021	6666	International Research Internship
	PhD in English Linguistics	1	2021		International Internship

Source: Authors' Own Elaboration Based on Data from the Office of the Vice-Rector for Research and Postgraduate Studies, UP (2022).

The study plan of these programs is weighted at 60 credits or more, each credit equals 16 theoretical hours or 32 practical hours. The curricular structure of the 11 current doctoral programs of the UP, according to table 1, is made up of: Fundamental subjects, specific to the area of knowledge; support subjects, which include a set of activities, including internships, participation in conferences, among others; leading to the acquisition and strengthening of research competencies and the doctoral degree thesis, in which the doctoral student, guided by

a tutor with a doctoral degree, develops research aimed at solving a theoretical or practical problem.

According to Toro et al. (2022) an internship is a term whose conceptualization and typology has varied over time; For the purposes of this article, a research internship is a short stay, in which an intern (graduate student) carries out different activities in spaces external to the usual academic ones of their institution, with the aim of strengthening research competencies in the area of knowledge or specialty for knowledge management.

In the same line of thought, research internships at the University of Panama are based on Law 30 of July 20, 2006 and the Regulation of Graduate Studies (UP, 2007), in which they are described as a characteristic of the Doctoral and Postdoctoral Programs. The Doctoral Program in Education offered by the Faculty of Education Sciences (FCE) is among the five programs that currently do not present the research internship as a compulsory academic subject or activity; This program lasts five semesters, with a weighting of 67 credits, distributed in 21 subjects: Fundamental Subjects (9), Optional Subjects (3), Thesis Seminar Subjects (3), Educational Research Subjects (3), Support Subjects (3) and the defense of doctoral thesis.

In relation to the 2009 Regulations, to date three cohorts have been opened approved by the Research Council of the University of Panama; However, the graduation rate of the cohorts is very low (less than two students after the date of completion of the study plan), in addition, there are no scientific publications in indexed journals or journals of scientific impact.

Likewise, for the year 2021, in a focus group meeting organized by the coordination of postgraduate programs of the FCE, it was identified that the students (22) of the third cohort of the Doctoral Program in Education had not pre-defended their doctoral thesis work one year after the end of the study plan. Just as they were not clear about how to pose a scientific research problem, search for and interpret information in specialized search engines, they did not have published scientific articles of their authorship or co-authorship related to their degree work (interview).

From the problem situation described above, the following question arises: How to boost the graduation of these doctoral students with the scientific research skills required for the presentation of complex projects that affect the social and educational reality of Panama? To answer this question, this study was carried out with the aim of proposing an intervention strategy to strengthen research competencies in doctoral students of the Doctorate in Education FCE.

Materials and Methods

The present study was assumed from the qualitative approach, which according to Hernández and Mendoza (2018, p.9) "tries to identify, basically, the deep nature of realities, their dynamic structure, the one that gives full account of their behavior and manifestations, product of techniques to collect information, such as the review of documents and their interpretation". From this epistemic position, it is located at the exploratory level that, in the opinion of Arias (2012 p 23), "(...) it is carried out on an unknown or little-studied subject or object, so that its results constitute an approximate view of the object; that is, it represents a superficial level of knowledge." In addition to this method, a participatory action research design or method is adopted, defined by Sandín (2003) as a social research method through which the full participation of the community or research group in the analysis of its own reality is sought, in

order to promote transformation through intervention for the benefit of the agents involved in the process.

Following this operational sequence, information hermeneusis was used as an analysis and interpretation technique between September 2021 and October 2022. A purposive sample of 20 students from the last (third) cohort of the PhD in Education program offered by the Faculty of Education Sciences was selected as key informants. For its application, the following data collection instruments were designed: a collation sheet and a questionnaire aimed at doctoral students, professors of the doctoral program at FCE and FCE university authorities. An intervention strategy was also designed that included two phases: an International Research Internship and a follow-up to the research work proposed by the interns.

For context, it is pertinent to point out that the international research internship was held at a higher education institution located in a city in Florida, United States of America, from November 15 to 20, 2021, 40 hours; with the participation of 20 PhD students, 2 facilitators of the Doctoral Program in Education, UP and 4 tutors specialized in Scientific Research Methodology belonging to a research institute, headquarters of the internship.

In the same line of action, the programmatic contents were distributed in 5 thematic axes: (a) Statement of the Research Problem: Foundations of the Scientific Problem, From the Contextual Problems to the Research Objectives. Common Errors in Research, (b) Methodology of Research in Social Sciences, (c) Ethics, Fraud and Plagiarism in Scientific Research, (d) Scientific Research and the Decision to Use Statistics, (e) Complex Thinking in Scientific Research. To this end, different methodological strategies were used, including: the immersion method (Londoño, 2016), in which research ideas, problem statement and research design were discussed. The second phase, which lasted six months after the international research internship, consisted of the follow-up of the research papers presented by the interns during the internship.

Two a priori categories were considered for this study: research competencies and educational intervention. (See table: 1).

Table 1: Category Analysis Matrix.

Categories	Sensitizer Concept	Subcategories
Investigative Competencies	Set of knowledge, skills, abilities, attitudes to record, develop and disseminate scientific research	Problem Statement
		Theoretical Framework
		Methodological design
		Innovation in teaching or scientific progress
Educational Intervention	Program designed to strengthen research competencies in FCE doctoral students	International Research Internship
		Academic follow-up

Source: Authors' Own Creation (2023)

Two techniques were used to measure the effect of the study's intervention: the SWOT Analysis Technique (Pérez, Véliz, & Lorenzo, 2015) to identify the strengths, weaknesses, opportunities, and threats of the educational intervention used in the study, and the indicator doctoral thesis defense rate, the quotient between the number of doctoral interns who defended their doctoral thesis at the end of month t and the number of doctoral students enrolled in the third cohort of the Doctorate in Education.

Results and Discussion

The results have been organized into three sections: Research Competencies identified in the interns during the research internship, SWOT Analysis of the Intervention and Doctoral Thesis Defense Rate.

Identification of Research Competencies in PhD Students of the Third Cohort

The doctoral thesis represents the culmination of the training of the doctoral degree, it is the final document with which the doctoral student evidences the research skills that allowed him: to recognize a complex problem of scientific research, to draw up a study design, to obtain, discuss and disseminate the results with all the scientific rigor before an academic community, with personal style (Carlino, 2005; Lopez, 2019).

See Table: 2 where the research competencies identified in the doctoral students surveyed in this study are listed. The level of development of research competencies was measured based on a checklist, in which three levels were established: Developed, underdeveloped, undeveloped.

Table 2: Competency Profile in Doctoral Students of the Faculty of Education Sciences-2022.

Competences	Level of development	Finds
Problem Statement	Underdeveloped	- Lack of delimitation of the work in such a way that the execution of the research is feasible. Lack of justification of the research from a theoretical, methodological, technological, social, economic or legal point of view.
Theoretical Framework	Underdeveloped	- Absence of background information on national and international investigations. -Poor theoretical review related to the research problem
Methodological Design	Underdeveloped	- Lack of link between the research questions and the objectives set for their development. - Lack of relationship between the objectives and the study methodology Absence of stages for the development of the research. -Lack of description of the criteria for choosing the population, sample or informants of the research.
Innovation in Teaching, or Scientific Advancement	Not developed	Doctoral projects do not have the same impact on the communities or institutions where the doctoral theses will be developed
Note	Level of competence development	Developed, underdeveloped, undeveloped

Source: Authors' Own Creation (2023).

The competency profile shown by the doctoral students at the beginning of the intervention suggests that the training received during the doctoral training (Study Plan) is more aimed at strengthening competencies for the exercise of teaching than for scientific research; Specific training (Intervention) is necessary to alleviate this training and skills deficit.

SWOT Analysis of the Intervention

Table 3 shows the strengths, weaknesses, opportunities, and threats of the research.

Table 3: SWOT Analysis -2022.

Strengths	Weaknesses
Training Area -Human Resources: researchers with a PhD degree and experience in doctoral thesis tutoring. Availability of physical spaces, facilities and suitable real estate for internships Exchange Area -Immersion methodology: contents and use of strategies and methodologies focused on Methodology for thesis project presentation. Multidisciplinary group of researchers available to supervise and guide doctoral theses in a similar proportion to interns.	Institutional bureaucracy for administrative procedures
Opportunities	Threats
The UP's Institutional Development Plan 2022-2026, which states: Strategic axis 2 Research, technology, Innovation, development and postgraduate studies: Strengthen links with the scientific community, business and society. Strategic axis 4 University Internationalization: promote changes in teaching models through the integration of research and extension. -UP Postgraduate Regulations UP Doctoral Programmes: with high standards that manage academic and research mobility through the review, updating and creation of new doctoral programmes under the quality standards standardised by the Vice-Rector for Research and Postgraduate VIP, UP. - Signing of specific agreements between institutions and institutes.	Attitude of the doctoral student, in which he/she goes to third parties for the preparation of the doctoral thesis report.

Source: Authors' Own Creation (2023).

The strengths and opportunities described in Table 4 are similar to those reported by Ballesteros (2010), Sánchez de Mantrana (2005) and Toro (2019), who point out that internships respond to a principle of individualization of the teaching-learning process and that the intern, when opting for this strategy, faces a different type of learning management than the usual one in a university classroom.

However, in this study, the following strengths and opportunities of the PIFGU Internship program are added: 1 Group Workshop for analysis of the progress of doctoral thesis projects. 2. The 1:1 availability of tutors to follow up with interns in their doctoral thesis project. 3. Experienced tutors to strengthen organizational and communicative skills. 4. The Institutional Development Plan, Strategic Axis Research and Innovation gives the opportunity to offer the Internship program to other interns at the level of doctoral programs, under conditions similar to those presented in this study.

Follow-up of PhD Students

Once the face-to-face internship was completed, the doctoral students were assigned an expert tutor, based on a letter of understanding established between the two institutions involved in the development of the activity. Each external tutor guided and guided the research projects of the interns in collaboration with the internal tutor achieving the results shown. (See table:4).

Table 4: Results achieved in the Doctoral Programme.

Category	Description
Number of theses defended	20
Organization of Research Groups	1
Linking Researched Problems to Social Needs	All the defended and pre-defended theses present in the chapter Problem Statement the justification of the study linked to the context of the country.
External tutor/intern relationship	1:1
Publication of a Scientific Article in an indexed journal	20

Source: Authors' Own Creation (2023).

The results indicate that the graduation rate of the doctoral students after the end of the intervention of the third cohort was 91.0%, possibly these findings reflect the fact that the interns were able to strengthen the research competencies to execute a research project and prepare the doctoral thesis report.

Conclusion

The final conclusions presented below result from each of the findings evidenced and generated in the results of the research, these come from the analysis of the opinions of the key informants, theoretical confrontation and interpretation of the revealed reality carried out on the epistemic and methodological aspects that guide the study and according to the proposed purpose.

According to what was established in the purpose, an intervention strategy was proposed to strengthen research competencies in doctoral students of the Doctorate in Education of the University of Panama, evidencing relevant aspects such as research competencies achieved by the doctoral students, review of the competency profile based on its objective in the study plan, it is necessary the implementation of the intervention (Internships and follow-up) as a strategy to transform the reality under study, generating theory from reflection and action, monitoring and tutorial accompaniment (Tutor - tutored) by expert research professionals, guaranteeing multidisciplinary teamwork and allowing the completion of the doctoral thesis as a result of the process, its publication in indexed journals promoting its dissemination and institutional visibility in the knowledge society.

Among the scope of research competencies by doctoral students, it was corroborated that they can recognize a complex problem of scientific research, draw up a study design, obtain, discuss and disseminate the results with all the scientific rigor before an academic community, with their own style and linked to the problematic situation of the country.

Other no less important aspects of the research is the curricular revision in terms of the competency profile aimed at teaching and not the area of scientific research, a necessary requirement for that level of study and addressing the different problematic situations present in their environment and in the country.

In addition, the graduation rate of the doctoral students of the third cohort of the Doctoral Program in Education, after the intervention, was 91.0%, managing to strengthen the following research competencies: search and organization of information, methodological design, and socialization of information, preparation of the report and scientific article.

It is necessary that the implementation of the proposal of intervention, research internship and follow-up, for the strengthening of research competencies, due to its systematization and personalized nature, dynamizes the presentation of the doctoral thesis report of the doctoral students, who simultaneously manage to defend their work and obtain the degree with the academic degree of doctor.

Consequently, the elements generated from the research process that contemplate the theoretical, epistemic and methodological is a competitive advantage for the university sector since the intervention strategy and its application can be used as a university policy of the country's Ministry of Education.

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