Training Of The Student Researcher In Higher Education In Colombia

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Abstract

Human development is a dimension that concretizes evidence adjusted to social demands from a framework of formation of individuals focused on constructing knowledge from different perspectives. In this sense, the formation of the university research student, the motivation for the exercise of science and innovation, and the pedagogical practices by teachers have presented different curricular problems, which are of the total interest in this research. Its general objective is to generate epistemological reflections that articulate the curriculum and processes of resignification of research training in the context of a university with social relevance. It is carried out under a historical hermeneutic paradigm of qualitative type, using the hermeneutic circle, interview and discussion groups as tools for collecting information with university students of the region evidencing and proposing more current pedagogical bets, the importance of research seedbeds and knowing the main obstacles presented in the research praxis.

Keywords: curriculum, research, higher education, pedagogical practice, research culture.

Resumen

El desarrollo humano es una dimensión que concreta evidencias ajustadas a las demandas sociales, desde un marco de formación de individuos enfocado en la construcción de conocimientos desde diversas perspectivas. En ese sentido, la formación del estudiante investigador universitario, la motivación por el ejercicio de la ciencia e innovación, las prácticas pedagógicas por parte de los docentes, ha venido presentado distintas problemáticas curriculares, que son de total interés en esta investigación. Tiene como objetivo general,

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generar reflexiones epistemológicas que articulen desde el currículo, procesos de resignificación de la formación en investigación en el contexto de una universidad con pertinencia social. Se realiza bajo un paradigma histórico hermenéutico de tipo cualitativo, utilizando el círculo hermenéutico, entrevista y grupos de discusión como herramientas de recolección de información con estudiantes universitarios de la región. Evidenciando y proponiendo apuestas pedagógicas más actuales, la importancia de los semilleros de investigación y conociendo los principales obstáculos que se están presentado en la praxis investigativa.

Palabras clave: currículo, investigación, educación superior, práctica pedagógica, cultura investigativa.

1. Introduction

The university as an institution is constituted through a situational framework that integrates teaching, research and extension, understood as necessary dynamics to assume training from a research perspective, not as a function of the academic staff, but as an aspect that should be implicit in the development of those who are trained. The raison d'être of university institutions is framed in the development of research training. For its part, the Colombian university curriculum emphasizes the disciplinary training of the student, integrating research and highlighting the importance of theorizing the training of the student researcher, given the social complexity of the country and the multiplicity of social, political and economic fronts that demand to be addressed from the academic experience.

Indeed, this training begins with the development of research skills, which, of course, are not common to all university students. Moreover, research is a field of action that generates fear among some students and teachers. Since scientificity denotes an exotic, prodigious and genius trait, the need arises to define training strategies for research students willing to develop research problems that represent human and professional development through research work characterized by being a provider of new knowledge, which in itself represents an input and promotion of university training.

In this regard, the Scientific Research Committee- CITEC-OLACEFS (s.f., quoted by Ibáñez, s.f.) states that research "is the search activity that is characterized by being reflexive, systematic and methodical; its purpose is to obtain knowledge and solve scientific, philosophical or empirical-technical problems, and it is developed through a process" (pp. 51-52). For these reasons, research training for students in Colombian universities, standardized in Law 30 of 1992 (Art.19 - 20), establishes that Higher Education must provide guiding elements that encourage the promotion of research training and high-level research throughout the academic community.

Following these regulations, it is necessary for Colombian universities to question their role in research training, according to the approaches and methodologies established in their academic curricula, to transcend training actions and research experiences and contribute to generating new knowledge. Among other verifiable achievements, university research is conceived as the search for new knowledge through the creativity of the act, the innovation of ideas, the application of rigorous methods, validation and critical judgment of peers (Restrepo, 2004).

Given the above and in contrast with previous research, the following problems arise: research training in undergraduate programs is linear and fragmented, evidencing a methodical and procedural scientific knowledge, which ignores the fundamental structure of knowledge as a permanent rational construction, but it is not distant from the essence of the human being, since it requires interaction to consolidate. Therefore, undergraduate research training is the basis to encourage and continuously promote research praxis in professional practice - from the students' work. But, not from its complexity, but from the descriptive and interpretative level of the contexts, according to the interest and projection of the students.

Another problem situation found was that of Williams and Garcés (2018), mentioning that the implementations of projects in the subjects are carried out operatively by undergraduate students; these actions weaken the development of research skills "in the training process affects scientific-student, which can be seen in the quality of the work presented by students in the scientific conferences, hence the importance of drawing pedagogical strategies aimed at the improvement of teachers" (p. 276). In other words, the academy does not facilitate the construction of spaces to integrate all this knowledge in a clear, productive and pleasant way, both for the student and the teacher.

Also, the following consequences were evidenced:

-Students learn for the moment.

-They assume false research techniques.

-They lack assigned hours for research.

-In most cases, there is a lack of space for research.

-Students are demotivated by research.

-They prefer to adopt traditional methods rather than engage in research.

According to the above, it is necessary to understand the formation of the undergraduate university student as a stage provided with a systematic dynamism to assume research as a relevant formative element of learning and application of the scientific method, considering its nature in university spaces and the proactive motivation on the part of the student.

2. Literature Review

This research has a general objective, which is to generate epistemological reflections that articulate from the curriculum, and processes of resignification of research training in the context of a university with social relevance, complementarily three specific objectives are defined, one to characterize the epistemological conceptions, theoretical and methodological that support the pedagogical processes in research training of students in Higher Education, theoretical and methodological conceptions that support the pedagogical processes in the research training of students in Higher Education, second to interpret the processes associated with the research training of university students and their articulation with the research praxis and finally, to reveal from the realities of the curriculum the processes of resignification of research training in university students.

2.1 Evolution and international development of the construction of scientific knowledge and research education

Since the eighteenth century, scholars of social science such as Weber (1974), Foucault (1976) and López (1995), among others, established new forms of knowledge, the conception of science and the scientific method. From an order configured from the Industrial Revolution and adopted the connotation of modernity. Indeed, "all scientific discourse [...] will obey a formal rationality and must be represented in the [...] [coordinates] of time, space and mass through numerical language" (López, 1994, cited by Hurtado & Toro, 2007, p. 26). According to the above, the mathematical and numerical discourse confers verisimilitude and validity to modern scientific discourses and research methods, making them eminently quantitative and placing the hypothetico-deductive method as the current research reference.

According to Comte (1798, cited in Hurtado & Toro, 2007) and positivism Lowy (1974), the evolution of the human spirit leads it to reach a phase that he calls a positive or scientific state, in which the spirit tries to explain the phenomena related to the facts and everything that cannot be reduced to a particular

fact or a general law must be considered unintelligible. Therefore, while applying the method of investigation, the scientist must detach himself from prejudices and presuppositions, separate judgments of fact from value, and science from ideology.

Finally, qualitative research accepts phenomena as they are perceived, experienced and lived by man. Therefore, it is inductive, structuralist, subjective and process-oriented social research. For this reason, research is important and necessary in the educational field because it deals with problems related to the nature, epistemology, methodology and objectives formulated in the search for knowledge.

In this sense, Hernández (1995, cited by Porto & Mosteir, 2016) defines educational research as "the study of methods, procedures and techniques to be used to obtain knowledge, as well as the scientific explanation and understanding of educational phenomena, and the solution of the educational problem" (p. 1) present at a given time. Thus, they accommodate quantitative and qualitative methodological approaches in an educational field, assumed as a field of study.

2.2 Developments that have contributed to the formation of the research culture.

Several studies of understanding in research training (theoretical-practical model and formation of research competencies and related theoretical concepts) were considered for the research development. At the international level, the studies by Guerra (2004), González (2005), Garzón and Gómez (2010) and Aldana (2012) show the guidelines based on research, adopting them as a diagnostic tool to identify the main needs for improvement of university teachers, from the development of their scientific-research skills. They then contemplate the relationship between the total hours per subject and per modality and warn how these differences arise according to the characteristics of the teaching staff (sex, age and experience), the socio-economic context of the population, and their destination institutes.

On the other hand, they show that research training from teaching and learning accuses obstacles such as lack of motivation for research, which demands strategies to develop basic and specialized skills for research, as a resource for comprehensive training, both in teachers and students. Finally, they mention that research training is articulated in the curriculum, interpreting the latter as human praxis-oriented towards the permanent construction of pedagogical reflections.

This is why teaching and research must be articulated since the teacher who teaches research must be a researcher from the praxis of what it means to encourage research in students.

2.3 Epistemological and theoretical construct as an articulating axis in higher education research training

This construct was developed by articulating the foundations that support research training in students in the university context and its implications in the curriculum. For them, research is epistemologically supported by reality and its meaning to study paradigms under the interdisciplinary model.

To complement the above, Ramos (2008, cited in González & Villegas, 2009) and Núñez (2007) establish that when the researcher can perceive, understand, appreciate and apply them in his daily research activity, he is framed within the value system of the phenomena and social processes for decision making.

It is concluded, then, the need for academic training focused on the development of skills for inquiry and self-learning, referring, according to Perrenoud (2008), to some elements that define the scope of action of research skills, as listed below:

- Formulating the research problem, identifying its aspects and dimensions, their interrelation, and the recognition of theoretical and methodological perspectives that conceptualize it.

- Adopt argumentative coherence to build knowledge related to the problematic situation and integrate it into the theoretical framework.
- Develop a systematic and deep bibliographic review of the topic to be investigated.
- Identify theoretically and technically significant methodologies, methods and techniques to address the research problem.
- To design or develop measurement and control instruments.
- Verify statements and formulate conclusions by comparing the results with theoretical references and the opinion of other researchers.
- Constructing and reconstructing knowledge; theorizing and integrating knowledge through models and paradigms.

Research is a creative work that demands skills and abilities to conceptualize, question, reflect and theorize thinking skills. In addition, its dynamic and flexible character demands skills to access information in doing and acting; intersubjective skills to communicate and relate with other researchers in the social construction of knowledge in the area of research, to choose the work methodology that guarantees scientific validity, reliable bibliographic references, budgetary support and time allocation.

2.4 Curriculum: A systemic relationship between Knowledge and Practices.

The historical analysis of schooling involves, among other aspects, the cultural contents taught in educational centers, which denote a systematic distancing of university institutions from reality. These could be addressed through the curricular inclusion of topics related to everyday problems, from elementary school to higher education.

For Kemmis (1998), Stenhouse (2003), and Montero (2021), the curriculum presents a formal or analytical characterization of the curriculum based on a set of elements that establish the basic curriculum. In this way, it represents everything that students have the opportunity to learn in the school institution; the concept focuses on the student's learning experience and encompasses the elements incorporated in their mental and cognitive schemes during their passage through school, including the hidden curriculum. Hence, the project's development during its implementation as a task corresponding to teachers in a complementary way to the design of institutional plans and the daily exercise.

For this reason, the curriculum offers an open character in which the adaptation of each educational context prevails over a general uniformity, the importance of individual differences and contexts, the adoption of some external influences, the optimization of processes and the permanent opening toward a continuous revision and reorganization that admits modifications of objectives, contents and methodological strategies. Likewise, it promotes learning activities on the content of the disciplines, in which the teacher plays a double role as participant and executor in the elaboration of the program.

According to Nozenko and Fornari (1995), curricular evaluation is diagnostic and prognostic, as the diagnosis captures the necessary and sufficiently representative information of curricular applicability, evidencing the characteristics, dimensions and problems that affect its integral or specific execution under the knowledge of the meaning of rural education and rurality, so that such information is assertive and leads to an optimal development in the classroom and in the community.

Therefore, students must learn to question themselves about their context to begin constructing knowledge of interest and In addition, Bachelard (2000) mentions the following postulates:

-Scientific instruments are materialized theories.
-All epistemological studies must be historic, not as a collection of data but as an evolution in time.
-No traditional philosophy taken individually is capable of adequately describing modern physics.

Therefore, the university must build a new academic culture that values scientific research, demands from researchers the responsibility of transferring knowledge from research to other actors (companies, public administrations, schools, etc.) and is concerned about the social valorization of the knowledge acquired. In other words, the university of the 21st century must articulate itself with the surrounding context, providing theoretical and methodological contributions to the external sector to strengthen and develop science from the academic and research point of view.

3. Method:

Methodological approach
This research starts from the hermeneutic paradigm, which according to Gadamer (1988) defined in the following terms: "the understanding and correct interpretation of what is understood is not only a specific problem of the sciences of the spirit, the problem of hermeneutics goes beyond the frontiers imposed by the concept of modern science" (p.8). It is based on a type of qualitative research, which are of a multicyclic nature or spiral development and obey a semi-structured and flexible design modality. Sandoval (n.d., p.11). Meanwhile, qualitative research seeks reality from the personal configuration and captures the particular meaning attributed by the protagonist to the facts.

Categories of analysis
After validating the interview records, the text is divided into lines or paragraphs, and codes are assigned to the emerging concepts and categories and subcategories are created from the data (open coding). This inductive process arises from testimonies.

The deductive categories for the two instruments, the focus group and the interview, based on the theoretical foundations of this research, are themes and lines of research, research pedagogy, visibility, methods and techniques, norms and policies, and organizations.

As an analysis of the instruments, the following inductive categories emerge: strengthening of the lines of research and training of researchers, formation of master's and doctoral programs based on the lines of research, support for graduate student research groups, publications, training products for Colciencias measurements, scientific method, projects to promote research as the main policy, central research committee composed of a faculty representative, research seedlings as the driving force of the groups, bonuses to stimulate research seedlings, a doctoral program and in-depth courses, training in research networks, training in research with central headquarters, formation of interdisciplinary groups and seedlings, divorce between teaching and research, no training in paradigm, training, qualitative methodologies, lack of time for research and grounded theory. Finally, group dynamics emerges as an emerging category.

Participants
The approach to the manifestations of research training of undergraduate students requires subjects located in the academic scenario of the universities of Norte de Santander, such as students, professors, and researchers, since they are selected under the criteria of being "people with special knowledge, status and good information capacity" (Martínez, 2006, p.137). These research subjects include undergraduate students of the university institution, teachers of the disciplinary areas and teachers of the research area, who were chosen intentionally due to the methodological complexity.

The criteria are as follows:

a) Students of the Universidad Simón Bolívar at the Cúcuta campus who are in their eighth, ninth and tenth semesters of the following degrees: Social Work, Psychology, Law, Business Administration and Systems Engineering.

 b) Students who have taken research training courses.

c) Research professors from the following universities: Universidad Francisco de Paula Santander, Universidad de Santander, Universidad Libre and Universidad Simón Bolívar.

d) Teachers who guide research training subjects.

Discussion group instruments

The discussion group is "focal" because it focuses its attention and interest on a specific topic of study and research that is close to its thinking and feeling. Moreover, it is "discussion" because it carries out its main research work through discursive interaction and the recruitment of the opinions of its members (Martínez, s.f., p.1). This focus group will be conducted with professors and researchers from universities in the region. For the development of the groups, two focus discussion groups were conducted between 8 to 10 participants, who are part of a research group, which experts validated.

Interview

The second technique used in the research is the structured interview with informants. According to the author Rodriguez et al. (1996) "emphasize in this technique that the interviewer wants to obtain information about a certain problem and from it, establishes a list of topics concerning which the interview is formalized, who may help to establish certain factor" (p.168). In this, it reveals the characteristics of the curricular administration and the investigative exercise of the undergraduates and students to systematically collect the information under the modality of open dialogue, in which the subjects reveal their point of view in front of the approached topics that represent, in turn, the object of study. The instrument used to collect the information was the interview script, an instrument that experts validated.

Fieldwork

Continuing with the hermeneutic process, the research will be carried out according to Gadamer's (1988) hermeneutic circle, which implies the following:

Phase I. Interpretation: In this phase, the ideas and appreciations of the researcher for the analyzed texts, the interviews and the researcher's visions will be exposed, taking into consideration the context and time in which they will be carried out; likewise, the interpretation fuses what is aspired by the interpreter and what is significantly offered by the text or the human act.

Phase II. Understanding: This phase includes interviews and conversations that lead to the interpretation of the object of study to learn about the administration of the curriculum and its impact on the training of researchers.

Phase III. The application: In this one, the development of the initial ideas will be carried out based on what was extracted from the texts, interviews and reflections; in this case, it will be about the verification of the objectives outlined through interpretation.

Data analysis

This analysis and interpretation process is operationalized through the hermeneutic circle, in which the information becomes important because the words and phrases make sense in their context. Therefore, the content analysis of the information collected is assumed as an essential technique for the composition of the

object of study due to the need to analyze data obtained from research professors and students on the positions interwoven around the formation of the student researcher in Higher Education. Thus, systematization of the information in documentary matrices is generated. Accordingly, a systematization is carried out through the following actions, initiating the categorization process.

In this process of conceptual ordering, coding the information in the analysis matrix began. After this coding process, the units of analysis were extracted, followed by the conceptualization of the data collected, to begin categorizing micro - macro-categories, contrasted with the theory.

Information Triangulation

The triangulation of the information was carried out by interweaving the categories of analysis of the discussion group and the interview with the teachers with the theory. This process is understood as the triangulation with the theoretical framework, as an act of review and reflective discussion of the specialized, the updated and relevant literature on the topic. Some theoretical constructs for understanding research training in students in Higher Education are included.

The following is the development of the phases of content analysis and theorization.

Table 1. Phases of content analysis and theorization

Phase	Description
Collection of information	The information was obtained through interviews and focus groups, transcribed and digitized. In addition, the records are fed back to the informants to validate their veracity and accuracy. The verification of the transcriptions and the interviews are carried out in the academic unit and classroom, considered spaces fluency in communication.
Categorization	After validating the interview records, the text is divided into lines or paragraphs, codes are assigned to the emerging concepts, and categories and subcategories are created from the data (open coding). This inductive process arises from testimonies. Therefore, its construction follows their collection to understand the behavior of the phenomena studied.
3. Analysis	In turn, the categories are grouped as dimensions and subcategories according to their relationships or properties, which allow the establishment of informative patterns of axial coding; the findings are described; through concept maps or graphic schemes, the dimensions are synthesized to form a holistic view of the object of study, the opinions of the key informants are selected to incorporate them as part of the justification of the scheme and support of the information.
4. Interpretation	Interpretation implies reflection and posture; it is derived from emerging indications during the analysis, which indicate the frequency of repetition of situations, concepts, incidents and use of the same words. For the above, contrasting and comparison can change, restructure or expand previous theoretical constructions to formulate new data and knowledge; this theoretical confrontation is fed back to the authors referenced at the

	beginning of the research, generating new contributions and understandings of the object of study.
Theorization	It represents investigative creativity as it integrates and relates the results
	derived from the information provided by the key informants. According to Strauss and Corbin (2002), the process"begins with the first analysis and does not end until the final writing" (p. 158). The integration and relationship of concepts follow it until a central or core category is established (selective coding) that represents the main theme of the study. It also develops a theoretical construction as an epistemological contribution to reflect and understand theoretical elements of the student's formation. researcher, from academic experiences.

Source: (Tesch, 1987; Colas, 1998; Strauss & Corbin, 2002; Martínez, 2012) cited in Rodríguez, Quiles & Herrera (2005).

4. Results

4.1 Reality and emergence of research training in higher education

  "Compression of scientific knowledge is an opportunity for the empowerment of professionals in the 21st century" Hernandez. P. Y (2019)
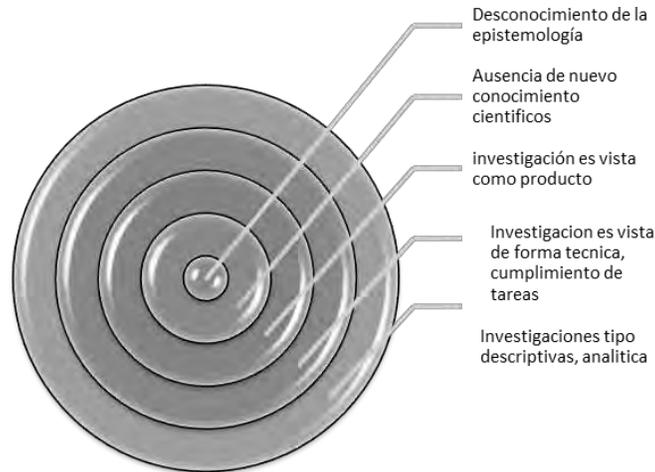
This chapter on results will present categories, subcategories and units of analysis that will allow a better understanding of the results obtained and the characterization of the phenomenon to make visible the voices of the research subjects. Likewise, it is important to identify other categories, such as the disarticulation of research from a fragmented dialectic between academic and scientific discourse, which are evidenced as truths established and accepted at the social level as intellectually and academically assumed, without being analyzed, refuted and historically and culturally contextualized, in the field of higher education.

Epistemological barriers in research training

This category of an epistemological obstacle is defined by Bachelard (1971, cited by Castro, Hernández, & Padilla, 2010) as the"attachment that impedes the advancement of science" (p.2). Those errors, prejudices and opinions of teachers are transmitted to the student, becoming epistemological obstacles. In this regard, it is necessary to relate the integrated vision that manages to consolidate the answer. This information is compiled in the following graph.

    Taking into account the answers given by teachers, it is necessary to specify that if scientific research does not comply with the production of new scientific knowledge and remains in repetitive actions without projections of approaching a field of knowledge where new explanations are consolidated, generating epistemic obstacles, it will provoke that the formative instinct ends up yielding to the conservative instinct."There comes a time when the spirit prefers what confirms its knowledge to what contradicts it when it prefers answers to questions. Then the conservative spirit dominates, and spiritual growth stop" (Bachelard, 1948, p.17).

Epistemological obstacles in research training.

Desconocimiento de la epistemología

Ausencia de nuevo conocimiento cientificos

investigación es vista como producto

Investigacion es vista de forma tecnica, cumplimiento de tareas

Investigaciones tipo descriptivas, analitica

Source. Authorship.

In this sense, if new questions do not arise, new uncertainties, doubts and concerns are not generated, which are inherent to the research process due to their connotation and prevalence in the object under investigation. In fact, the students must preserve the need to question themselves constantly and seek new explanations that allow the opening of new horizons and scientific languages, thus promoting a generation committed to science.

Concerning the analysis of the previous results, another category emerges the disarticulation of research to academic training processes, focusing on its two basic functions, teaching and research. Although the concept of research prior to the nineteenth century was seen as an individual work, it is retaken for the University model, based on Humboldt, saw teaching and research Hernández. (2002).

In line with the analysis of this category, it was found that there is a disarticulation between research and academic training processes.

Figure 2. Disarticulation between research and academic training processes

Proyecto de investigación como un cumplimiento de la asignatura:
Desarrollos empíricos.No rigor, No formación

Formación investigativa vista desde una asignatura:
Creencia equivoca de esta formación exclusiva de algunos

Actividad investigativa sujeta a la intensidad horaria:
Actividades mínimas

Source: Authorship

In view of the above, a dialectic of academic and scientific discourse must be generated, integrating knowledge and guiding the work of the initial training of the researcher in an integrative manner. This interaction must be constant through curricular discussion spaces that mitigate the tensions generated by the individuality and mastery of scientific knowledge. "Elliot and Ebbut, Stenhouse and Kemmis, argue that the capacity for discernment and knowledge generation is possible through the development of the teacher's research on his/her reality" (Michelangeli, 2005, cited in Velásquez, 2007, p. 4).

Likewise, the disarticulation between teaching and research clearly shows no harmonious dialogue between the substantive functions of higher education. On the contrary, this reality shows that developments in this perspective are advancing along different paths. These findings are fundamental for the achievement of the purposes of this research since it must be in the exercise of daily teaching practice where the research culture of the teacher and the student takes shape.

For this reason, the university teacher of the 21st century must break with the traditional schemes of conceiving scientific knowledge and absolute and static truths, which cannot be understood in depth from their scientific construction and decontextualized.

The pedagogical autonomy of each student is vital, which is why autonomy, globally and pedagogically, is a way to develop and guarantee inclusion and coordinate actions toward inclusive, equitable and quality education. Medina, Higueras and García (2021).

The relationship between knowledge, theories and practice from the perspective of hermeneutics as a way for research

In this sense, by involving the student in research actions, empowerment is generated in which he is the protagonist or owner of his learning since being aware of his learning process, he will have a more critical stance towards reality, promoting new arguments, explanations and questions that guide his process of construction of the analyzed contexts.

Figure 3. Research training pathway

• Construción del Conocimiento científico
  • Expreriencia de aprendizaje, argumentacion y proposicion resultado de la pesquisa.

• Vias de compresión del conocimiento científico
  • Experiencia de aula, aprendizaje social, oportunidades permenentes de otras lecturas.

• Dialogo de saberes para compresion de la investigación
  • Trabajo interdisciplinar, dialogo de saberes, relscion comunicacional permanente.

• Semilleros parte del proceso formativo
  • fomento de la cultura de la investigacion, formacion, participacion en experiencias de investigacion, apoyo.

Source. Author's own

In the same vein, it is necessary to highlight the student as a thinking subject with research skills that are innate to human beings and that, on many occasions, have been epistemologically hindered. This hinders the process of research training in students. Therefore, these explanations are addressed in the first chapter of this research. For this reason, promoting in students an interest in being part of the research training process will generate research actions, which will lead them to develop simple research actions up to the development of complex research actions.

4.2 Ways of understanding scientific knowledge

The ways of understanding scientific knowledge are constructed through a cognitive process and consciousness, in which the objects of study are structured and meaning is given to things. These students' answers have a sequence in the sample response of conceiving the methodology isolated from the research process. This is part of the process of understanding, but what generates these obstacles is how the research methodology shows a segmented pedagogical praxis of routine topics, shown as finished contents and without any reflection.

Dialogue of knowledge for the understanding of research

This dialogue of knowledge within the training of research students, and the training spaces, such as the research groups in which they can be active, is achieved if there are no barriers or boundaries to address the knowledge and knowledge in which the participants play a participatory role. Returning to the words of the teacher Freire (2005), where there is equality of conditions in this constant interaction, where cultural knowledge is not distant from the understanding of reality, but part of it, in which "theory is a product of reflection and practice, which constitute a dialectical unit: "Action will become authentic praxis if the knowledge that results from it becomes the object of critical reflection" (Bastidas et al., 2009, p. 107).

Seminars as part of the research training process

In this sense, the research seedbeds are extra-curricular academic spaces in which students and teachers participate with interest in doing research through simple investigative actions, which motivate the student to investigate, to know, to apprehend everyday situations, subject to fields of knowledge that are part of the career they are studying. Initially, they are investigations directed by a researcher, leading them to complex investigative actions where they understand scientific knowledge. These spaces must be re-signified and strengthened over time so that they do not remain in research routines but reflect on this training space for future regional researchers.

4.3 An epistemological approach for the resignification of a pertinent research culture in university students

Indeed, there are several ways to understand the phenomena or the object studied, which ultimately help to give a position and appropriation of the same; from the epistemological component, the concern of how scientific knowledge is constructed should be evidenced, allowing it to contrast with the student's environment. Thus, a two-way construction will be generated, which generates learning that re-signifies that the student is concerned about structuring their conceptual schemes, critically contributing to their positions.

Figure 4. Theoretical approach to research training.

"to promote a pedagogy based on research that allows students to

new ways of dealing with professional problems
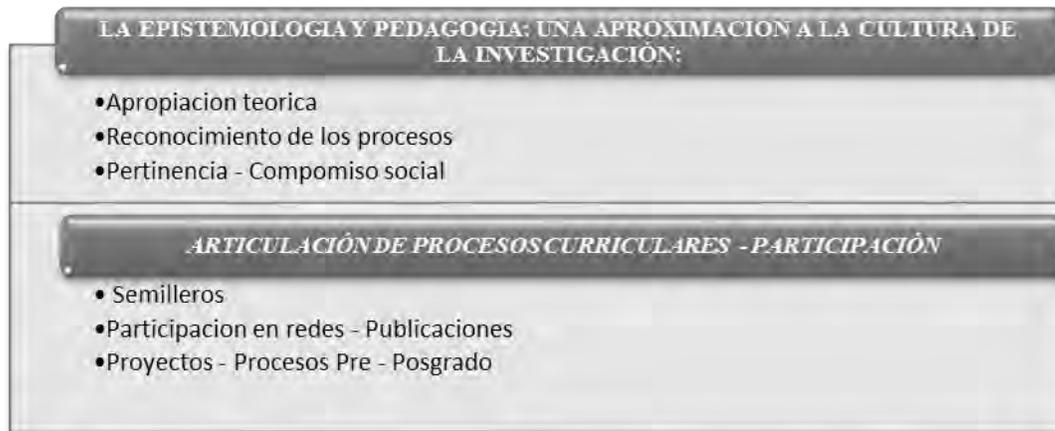
Source. Own elaboration

Epistemology and pedagogy: an approach to research culture
In this sense, the scheme of categories found in undergraduate students' research training shows the focuses that should be addressed and discussed in this chapter. Thus, research training cannot be seen as a subject of the curriculum of professional careers but should be considered as a dialogic training bet in which they are intertwined with each other through research actions that are taken up by the teacher from his work and taken to the classroom providing the student with tools to do research. Indeed, professional practices are another scenario to promote research training in university students through the recognition of contextual problems and the way they are approached.

Finally, since research training is part of the future professional, the curriculum should propose a socio-critical approach, with a research component that articulates the academic approach with pedagogical and research reflections, to develop actions that strengthen the future professional.

Figure 5. Integrating route of research training in academic programs

FORMACIÓN INVESTIGATIVA EN EDUCACIÓN SUPERIOR
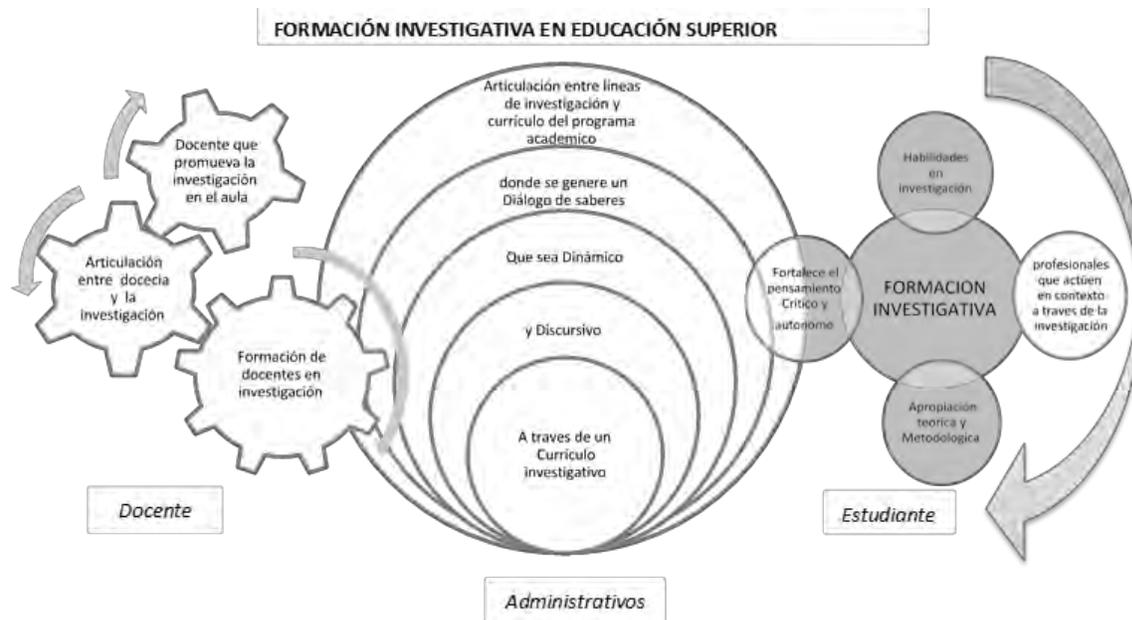
Source: Own elaboration

Resignification of a pertinent research culture in higher education

In the Colombian population of 49,291,609 inhabitants, there are 13,001 researchers in Colombia, corresponding to 0.03% of the total population. In the particular case of Norte de Santander, there are 250 researchers, equivalent to 1.9% of the total number of researchers. Likewise, there are 5,207 research groups in Colombia, of which 122 groups belong to Norte de Santander - 2.34%. This information taken from the Colciencias Data, as of 2017, evidences a very low number of human capital committed to research in the country, but it is even more worrisome when contrasted with the Department of Norte de Santander. Colombia OECD (2014).

The following approaches invite the strengthening of research within universities. In the first place, Human Capital must energize a new commitment to promoting research, universities and research centers. This is an opportunity for economic and professional growth to the extent that research is brought closer to the external sector, where the problems that can be studied emanate.

Articulation between teaching, research and outreach
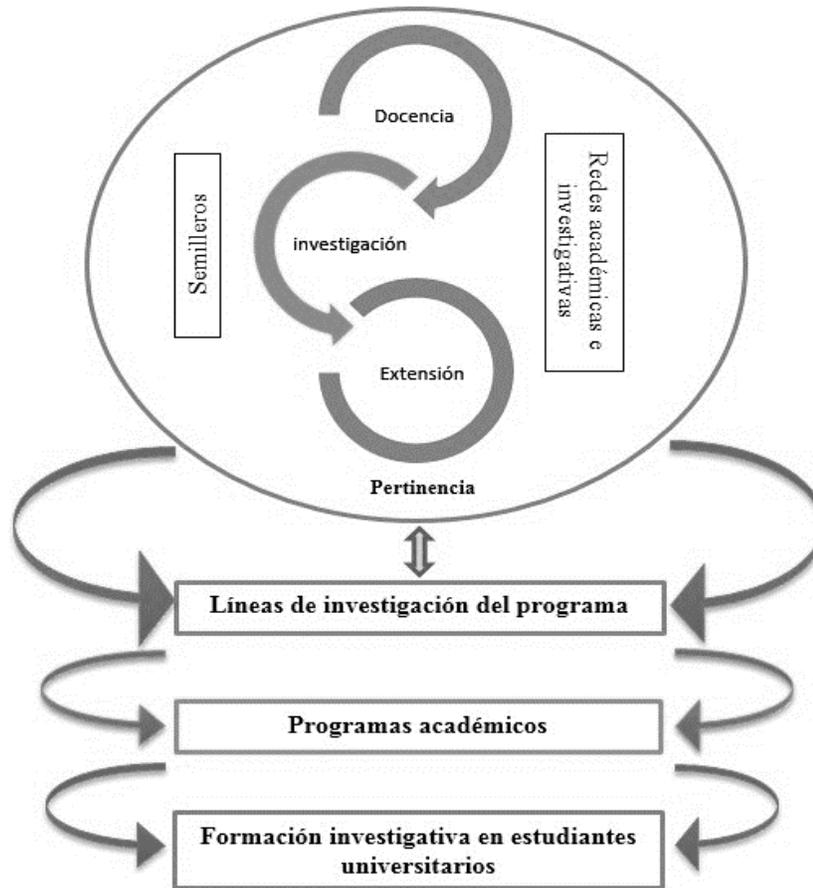
Source: Own elaboration

Meanwhile, research seedlings in a university promote research training in students, which in turn helps in the dynamics of promoting research for the construction of scientific knowledge that impacts the context in which these processes are developed, and foster a scientific culture in academic settings.

Based on the above, the academic community that is part of Higher Education in the country must face the challenges of the quality of education in which research training is a condition of quality, which must be reflected in the curricular commitment of students.

5. Discussion and Conclusions:

This thesis generates epistemological reflections for those articulated to the curriculum in the processes of resignification of research training in the context of a university with social relevance. The following conclusions will be presented.

In research training in Higher Education, obstacles were generated since epistemology impedes the construction of scientific knowledge in students and teachers. However, by implementing repetitive educational practices of concepts isolated from the theoretical context in which they are constructed, it is there where new explanations of concepts and theories are consolidated.

At the same time, the pedagogical practices in which research training is imparted are under a static theoretical posture, remaining in traditional and routine pedagogical practices, without new contributions to scientific knowledge, which re-signifies the contexts. This is evident when research projects are shown as finished products for the fulfillment of a subject, losing the appropriate scenarios to analyze if they have different realities of their context and richness of information to be structured, processed and understood, which develops and is changing over time.

In this sense, research is seen as the final product, fulfilled and demanded, in strategic planning, losing the nature of the construction of scientific knowledge. Thus, the disarticulation of research to academic training processes in the absence of a Dialectic of academic and scientific discourse that integrates knowledge and guides the work of the initial training of the researcher in an integrative way.

In short, it can be concluded that there are opportunities to implement an investigative curriculum in academic programs, in which professional problems are implemented as an opportunity to promote research through simple research actions, being those of interest to students and generating motivation to address the objects of study.

Likewise, the teacher who teaches must do research in the classroom in his or her pedagogical practice in a discursive way, be in constant pedagogical reflection to reflect in his or her pedagogical actions the components of research through conceptual clarity, and motivate students to carry out research actions.

Thus, it can be concluded that the research seedbeds are for the university promoters of research training in students. In turn, it helps in the dynamics of research promotion in favor of the construction of scientific knowledge that impacts the context in which these processes were developed, and, likewise, a scientific culture is promoted in academic scenarios.

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