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Model of Activities for the Mastery of Research Skills in Higher Education in Ecuador

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Abstract

This paper presents a model of activities to master research skills in higher education students. Research skills are considered as the construction and reconstruction of knowledge that involves the optimal management of actions derived from the social interaction of the subject with the object of knowledge. Various methodologies were used to obtain information, such as analysis-synthesis to examine the particularities of research skills; and inductive-deductive to systematize the different theories on research skills. As a result of this bibliographical research, it was determined that the research skills that should be worked in Higher Education from the teaching-learning process as a fundamental basis in the different areas of knowledge are the identification of problems, the search for information, the processing of data and the communication of results. University students need to master scientific research to contribute to improving their academic development and likewise for the progress of the country.

Keywords: methodological strategy, higher education, research, teaching and learning process, constructivism

1. Introduction

The training of competent professionals committed to social development is an essential mission of contemporary higher education. This concept has been emphasized by organizations that promote educational policies at the international level such as: the United Nations Educational, Scientific and Cultural Organisation (UNESCO); the Organisation of Ibero-American States for Education, Science and Culture (OEI); the Organisation for Economic Co-operation and Development (OECD),

prioritizing the importance of involving higher education in active participation in research focused on society.

This demand has awakened interest in the university for the improvement of research management, which involves developing the scientific potential of teachers, promoting a scientific culture in the university community that integrates the scientific method into the work of teachers, and, in particular, strengthening research skills at the undergraduate level, which involves the incorporation of students into research in connection with their future profession.

Today it is emphasized that there is no true higher education without explicit and implicit research activity, which forms part of the teaching-learning process and is of great value in professional training. Research is a contextualized process, so it must be linked to global and work-related problems in direct relation to the problems experienced by society. Research is carried out to transform reality and thus contribute to human development and therefore improve the quality of life, which is why it is a very valuable means to achieve any transformation in the professional field.

Nowadays, research is a key process in professional training, in the production of knowledge, and, consequently, in the development of society (Valderrama et al, 2022). Research must become a transversal axis during the training of undergraduate students, initiating them with exercises from the first years, so that they can strengthen their research skills (Salaiza, Joya & Vega, 2022).

The mastery of research skills at a higher level is a social, academic, and personal need, stipulated in international and national constitutional regulations, which govern a training that allows the development of research skills in university students. Freire (2006), pointed out that:

There is no teaching without research and no research without teaching. These tasks are each in the body of the other. As I teach, he continued searching, inquiring. I teach because I search, because I investigate, (...) I investigate to verify, I check, I intervene, by intervening I educate and I educate myself. I investigate to know what I do not yet know and to communicate or announce what is new. (p. 14)

In this aspect, it is specified that the classroom space is one of the most used places to learn to investigate, based on the subject-subject or subject-object interrelation. It is in this space and in the exercise of learning and teaching to research where the need to transform these classes into an interdisciplinary, more participatory, critical, investigative educational environment is reflected, allowing the student to develop research skills from this training context, through the acquisition of methods, techniques, and strategies needed to resolve teaching-learning situations from the praxis in their profession in an original, creative, flexible and independent way.

The mastery of research skills in higher education contributes to the progress of the country and to social welfare. Therefore, universities are the key institutions for the training of the individual in the face of the changes imposed in the scientific, technological, and innovation fields, with the aim of preparing them to find solutions to multiple professional problems in the midst of a complex and constantly changing society.

This requires students to develop logical, creative, critical, and analytical thinking that allows them to go beyond the scientific content taught by teachers during their professional training. They must learn to carry out a deeper study of the different subjects, to dig into their curiosity, concepts, and information, contributing to self-learning with their experience, experiences, in their professional preparation, sharing their results and contributing to society, and understanding that human beings are active beings who construct their own reality.

In the context of Ecuador, limited studies on research skills in higher education have been found. The lack of records of theoretical and/or practical experience stands out. Despite the scarce presence of articles on the subject, the contributions of Aguirre, Hernán & Mera (2023) have been identified, who identify research skills in higher education in Ecuador as crucial for the development of competent professionals who can effectively address the needs of society. Likewise, research by Casanova, Navas, Piñas & Vásquez (2020) mentions the importance of the implementation of sustainability projects in Ecuadorian higher education institutions as a strategy that has facilitated the development of research skills and social learning. Therefore, the priority that should be given to

research in the training of new professionals is essential and requires adequate support, including budgetary improvements, participation of experienced professors, and time dedicated to research activities to improve research skills and effective application of information (Abad, Rodrigo & Romero, 2021).

2. Literature Review

Arcelia et al, (2019) state that research skills are one of the missions of universities. It is a particularly important element in the process of professional training, in the generation of new knowledge, and in the connection with society through its transfer.

According to the conceptual references of the authors who emphasize this theme, an analysis was carried out to determine the research skills that should be developed in students from the teaching and learning process (PEA), based on the following comparative table.

Table 1. Comparison of the essential elements of research skills by authors

Authors	Research skills
Willison (2009)	Enquiry; finding / generating information. Methodology; evaluating information or data.; organising information; nstrumental skills: formal command of language; synthesise and analyse and apply new knowledge; communicating knowledge.
Moreno (2005)	Instrumental skills: mastering basic cognitive operations; methodological construction skills: organisation, systematisation and analysis, ihinking skills, proposals; conceptual construction skills: logically organising, presenting and defending ideas. metacognitive skills: self-regulation, self-questioning, reassessment.
Rojas (2007)	Presentation of ideas; elaboration of questions; academic comments; identify the characteristics of the object; conclusions; evaluation
Chirino (2002)	Problematisation; theorizing; verification
Machado (2005)	Obtaining; processing; communicating
Pereda (2015)	Projection; execution; application of results
Illescas et al. (2016)	Holistic observation; describing aspects of subjectivity; interpret relevant information
Roman et al. (2017)	Search for the problem; planning; implementation; assessment; communication of results

In summary, the aforementioned authors identify the following as essential actions linked to the treatment of research skills:

- Identification of a problem: (Pérez & López, 1999; Chirino, 2002; Rojas, 2007; Roman et al., 2017).
- Searching for information: (Machado, 2005; Willison, 2009).
- Information processing: (Chirino, 2002; Machado, 2005; Moreno, 2005; Rojas, 2007; Willison, 2009).
- Communication of results: (Chirino, 2002; Machado, 2005; Rojas, 2007; Willison, 2009; Illescas et al., 2016; Pereda, 2015; Roman et al., 2017).

These assumptions are what allow us to identify the following as research skills: identifying problems, searching for information, processing information, and communicating results. Moreover, these skills can be trained in different spaces and moments of the teaching-learning process.

Table 2. Analysis of the study of research skills in different contexts by authors

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Authors	Research setting
Valderrama et al, 2022	She conducted her research on university students under the prism model (Preferred reporting items for systematic review and meta-analysis).
Salaiza, Joya & Vega, 2022	Her research focuses on higher education students based on the lack of reading habits and skills for the development of competences in the field of research.
Chirino (2002)	She develops her research in the context of professional training in secondary and higher education.
Moreno (2005)	It focuses its attention on research skills in the medical career.
Machado (2005) y Rojas (2007)	In the undergraduate university in a general sense.
Guerrero (2007)	It also focuses on the undergraduate but through projects.
Reyes (2016)	At postgraduate level through virtual education
Pereda (2015)	Works on research skills in higher education and carries out a comparative analysis between Latin American countries such as Colombia, Brazil, Chile and Ecuador.
Narvaes (2011)	Links research skills as part of research competence.
Illescas et al. (2016)	Studies these skills from the higher education curriculum in a general sense.
Roman et al. (2017)	Develops his research linked to the performance of teachers in general education.

Therefore, the mastery of research skills at a higher level is a social, academic, and personal need, stipulated in international and national constitutional regulations, which govern the training of university students. Freire (2006), pointed out that: There is no teaching without research and no research without teaching (p. 14).

In this aspect, it is specified that the classroom space is one of the most used places to learn to investigate, from the subject-subject or subject-object interrelationship. And it is in the exercise of learning and teaching research that the need to transform these classes into an interdisciplinary, participatory, critical educational environment is reflected, allowing students to develop research skills from this training context. Therefore, universities are the key institutions for the training of the individual in the face of the changes imposed in the scientific sphere.

Another characteristic element of the study on research skills in Higher Education in Ecuador is that, most authors (Illescas, López & Tolozano, 2015; Viteri & Vázquez, 2016; Roman, et al., 2017; Casanova, et al., 2020; Amangara, 2020; Álvarez, et al., 2020), assume it as a response to the demands derived from educational policy; this is expressed by Illescas, López & Tolozano (2015) when they point out:

In Ecuador, in the National Development Plan that includes the National Plan for Good Living of the Republic of Ecuador, period 2009 -2013 numeral 6.5 The transformation of Higher Education (...)it becomes essential that people with more training and research and teaching experience have access to an academic career that encourages training with the highest excellence and the production of research relevant to Ecuadorian problems (p. 2).

An interesting aspect is that among the different areas of knowledge, research skills in the area of medical sciences prevail (Illescas, López & Tolozano, 2015; Bello & Ortiz, 2017), in medical students, Hernández et al. (2018), in the career of Dentistry, Álvarez, et al. (2020), in the career of Biopharmacy, Roman, et al. (2017).

In all these research, social constructivism is assumed as a fundamental theoretical reference. This characteristic is conditioned by the educational policy contained in the normative documents.

Higher education according to the Academic Regulations must: "Develop an education centered on educational subjects, promoting the development of interactive, creative and innovative pedagogical-curricular contexts for the construction of knowledge and knowledge" (Reglamento de Régimen Académico, 2016, p. 4).

This reference is contained from the Higher Education Council (CES) in which didactic qualities of Ecuadorian educational action are expressed, which due to their characteristics are recognized as constructivist actions, to the mission and vision of universities in the country.

It is also recommended to carry out scientific observation of the PEA, to verify how the teacher

deals with the mastery of research skills. To follow up on the application of this model of activities, it is proposed to elaborate an individual worksheet that will allow the collection of information from the students through the execution of each activity.

The unifying element of social constructivism is a social and socializing conception of education:

All knowledge is constructed in close relation to the contexts in which it is used, and, therefore, it is not possible to separate the cognitive, emotional, and social aspects present in the context in which one acts (Coll & Gómez 1994, p. 9).

In this regard, Viteri & Vázquez (2016), by analyzing education policy in the Ecuadorian context, point out that: It is a challenge for education and in a singular way for the university, a training entity of intellectuality, protagonist of a concrete social task: to design and implement comprehensive policies of social and human reconstruction; it is based on making overwhelming information, socially constructed-reconstructed knowledge from participatory educational processes that transform reality and get involved in the scientific-technological-cultural scopes from a humanistic-ecological perspective. (p. 37)

The authors have made relevant and fundamentally practical contributions in recent years, associated with learning from this approach of social constructivism, and there is a growing approval of an education that contributes to the integral and full development of people, where the axis of social change is man, who through a humanist philosophy based on respect and acceptance of others contributes to learning and the progress of people.

Associated with the topic of research skills, they point out that these: "are a set of skills of children and young people that allow them to execute, obtain, process and communicate information to control research activity through scientific methodological construction and curiosity in the solution of problems" (Viteri & Vázquez, 2016, p. 64). These authors establish a classification of research skills from social constructivism and mention among them: "Conceptual construction, methodological construction, social construction of knowledge and metacognitive" (Viteri & Vázquez, 2016, p. 20).

The task of research is not the exclusive function of research groups and must be oriented towards recovering the capacity for questioning, criticism, and construction of knowledge in the classroom, in the library, in the seminar, at work, and in permanent contact with society and its realities (Marrero & Pérez, 2014, p. 63).

Constructivism emphasizes that the different contexts in which human beings develop allow the acquisition of all new knowledge, plus their previous experiences and old knowledge, an essential aspect that sustains learning for its own construction.

Therefore, it should be emphasized that education in recent years has taken a ninety-degree turn and has undergone a series of transformations in which the student is considered a participant in the ASP, guided and oriented in this process by the teacher who contributes to their learning; the student today plays an essential role as a constructor of their own knowledge.

A significant aspect of the research conducted in the Ecuadorian context and the subject of analysis is that all of them support the idea contained in the social constructivism approach, the treatment of research skills in close connection with the practice of the profession.

In this regard, Illescas, López & Tolozano (2015) state that:

It is necessary to generate in higher education institutions, from teaching and research, an articulated relationship between theory and practice in the real scenarios of action of future professionals, with the intention that university students have a development of their research skills. (p. 1).

Therefore, professional training is a fundamental field, particularly for higher education, due to the link that exists between study and work, which allows contact with the object and modes of action of the profession in the context in which it is inserted (Sabala, Rentería & Díaz, 2022).

In this sense, learning is conceived as a construction produced from the cognitive conflicts that occur in the student's cognitive structure, modifying it. Therefore, learning is derived from the

experience that the student has in concrete situations.

The development of research skills will enable students to be more creative, critical and reflective about what they learn and how they learn it, broadening their vision of the problems that exist in society.

The development of research skills is one of the ways to integrate knowledge while serving as a constant self-learning support because they allow self-training and the systematic updating of knowledge, which is an indicator of competitiveness in modern times (Vera, Chirino, Blanco, Ferrer & Machado, 2019).

Synthesizing the characteristic elements outlined above and in an approach to the definition from the context of the training of the education professional, Chirino (2002) states that research skills are understood as: "The mastery of the generalizing actions of the scientific method that empower the individual for the problematization, theorization, and verification of their professional reality, which contributes to its transformation on a scientific basis" (p. 92).

From this definition, it is interesting that the following are identified as essential elements in the development of research skills: problematization, working with concepts, principles, and laws, through reasoning, and particularly the verification of the results achieved in professional practice.

Therefore, the focus of research on science education has shifted from science products (teaching specific content) to science processes (skills and abilities) (Fraiha, et. al. 2018). Therefore, a quality education favors the acquisition of knowledge for life (National Development Plan 2017-2021; A Lifetime).

In this aspect, to achieve quality education, it is necessary to develop research skills in students, which will allow them to train education professionals who face the challenges and problems of the context in which they develop, assuming social constructivism as the main foundation.

Student scientific work is one of the most important teaching activities in the training of higher-level professionals and to achieve an adequate preparation of the graduate to be able to develop a research activity through their professional work, multidisciplinary attention is required to both curricular and extracurricular student scientific activity (Toledo, et. al. 2013). Therefore, research competence is fundamental for building a basic scientific culture. Working on it from early childhood contributes to developing the ability to develop explanations based on inquiry and theoretical construction (Mendioroz, Napal & Peñalva, 2022).

Research skills are manifestations that reflect the student's mastery of the contents that guide the search for the problem and its solution through the application of the scientific method (Espinosa, & Sernaqué, 2021).

From this, it can be deduced that the peculiarity of the student at this educational level lies in his or her object of training. Their work is characterized by the simultaneous attention to various pedagogical, psychological, hygienic-physiological, and administrative activities. In this sense, he/she becomes a transforming agent and is the one who can introduce into practice the advanced experiences, the results of research, awareness, and understanding of the leading role played by the early education professional in the training of learners from zero to six years of age and the family in the community.

The Pedagogical model of UNACH (2014) focuses on scientific research and the cultivation of values that privilege learning, but without neglecting student-centered teaching. The proposed learning includes the development of complex cognitive processes such as: analysis, synthesis, problem-solving, reflection, and other skills and abilities necessary for scientific work.

In the legal basis of UNACH, where the educational, pedagogical, and didactic model is established, it is stated that it is protected by the Constitution of the Republic of Ecuador, the Organic Law of Higher Education (LOES), the Academic Regulations (RRA) and the Statute of the UNACH.

Article 3 of the LOES (2016), in particular, refers to a humanistic, cultural, and scientific higher education, which is a human right and a social public good. In the RRA, Art. 2, objectives f, g, and j, express the need to develop scientific, technological, and humanistic knowledge, committing to the

transformations of society, an education centered on the educational subjects that promote the interactive, creative, and innovative and the democratization of knowledge.

The training of research skills is approached fundamentally from the orientation, execution and evaluation of research work, seminars, workshops, research tasks, course work, as well as integrative projects, contributing to the training of professional, digital, and communicative skills (Estrada, Fuentes & Grass, 2022).

These particularities of higher education students in the Ecuadorian context require the incorporation of some clarifications of research skills; therefore, according to the conceptual references of the authors, an analysis was carried out to determine the research skills that should be developed in students from the PEA, and which are presented below:

- Identify problems: students should explore possible problems related to their profession through scientific observation, in order to identify the needs of their context, related to the contents assumed in the professional training process.
- Search for information: by means of a theoretical documentary analysis to obtain information that contributes to the understanding and solution of the research problem based on scientific knowledge and to organise the information obtained according to the logic of science. A source of information is also the observation of the practice in the institution during the exercise of the profession. This includes the development of instruments.
- Information processing: it is considered important for information processing, cooperative group work and the mastery of skills related to group work. The particularities of the pre-professional practice context should be taken into account in the design and application of activities. In addition, the analysis of the problematic situation should be carried out with real data for its proper interpretation and discussion.
- Communication of results: allows students to acquire a communicative culture during the implementation of the system of activities, in particular the level of creativity, the selection and elaboration of innovative strategies to present the results of the research with their respective strengths and weaknesses, through the exchange of ideas, criteria, and points of view.

To meet these educational requirements, this research proposes a model of activities for the mastery of research skills for the identification of problems, the search for information, the processing of information and the communication of results, which are necessary for better professional performance.

Component of the structure of the model of activities for the mastery of research skills in higher education.

The activity model considers the referents of social constructivism on knowledge and its link with practice, the context, and its influence on knowledge, feelings and values.

The context of execution is the PEA, in which both pre-professional practice and the components of the curriculum linked to research activity in professional training come together.

The model is designed so that the student can identify a problem from pre-professional practice in their educational context, related to the subject established by the subject in question.

It is in the pre-professional practice where the student explores and identifies the problem, developing the instruments for diagnosis, which are modified and applied in this context. Similarly, they apply and evaluate the actions to contribute to solving the problem detected.

The practice brings to the PEA an incalculable wealth of diversity, personal experience for students and flexibility in the treatment of content, and is an excellent scenario for implementing the mastery of research skills, to be consistent with the approach of social constructivism, which is the main foundation of this research.

The scheme shows an open system in which there is interaction between teachers and students, between groups and in pairs. It is based on constructivism (Gergen, 1997; Piaget, 1969), and

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specifically on the social constructivism of Vygotski, Bakhtin and Wittgenstein, where knowledge is constructed in a social and cultural way, considering people's own forms of internal organisation (Wertsch, 1981; Wertsch, Minick & Arns, 1984) and reflecting on the subject among the groups within the system. In this case, the teacher is a facilitator and guide of conversation and analysis around the research topic, and knowledge is co-constructed (Driver, Osoko, Leach, Mortimer, & Scott, 1994; Edwards & Furlong, 1987; Edwards & Mercer, 1987) between the teacher and classmates.

The research skills of university students included in the model: Problem identification (Chirino, 2002); Information search (Pérez & López, 1999; Román et al, 2017), Information processing (Machado, 2005); Communication of results (Machado, 2005) were disaggregated after the ordered analysis of the literature found. Additionally, both the activities identified for each skill and the structure proposed in the model have been created by the authors based on their analysis and experience as university teachers.

This is why the diagnosis is incorporated as a component of the model, being part of this, not only the preparation of students, but also the program of the subjects that have as their central core to train the student as a professional and researcher. The first is to identify the strengths and weaknesses of the students linked to the mastery of research skills and the second to identify the opportunities offered by the program of the subject and, depending on the analysis, to make the necessary adjustments.

The model of activities is made for the context of the ASP. It is proposed to select a subject of professional level from those established in the curriculum of the degree program according to the career to be employed. The design of the proposed activities follows the following structure:

Theme: Where the specific and sequential content to be covered for each activity is established.

Objective: This establishes the goal to be achieved in each activity that will be worked on for the mastery of research skills, taking into account the professional profile.

Organizational methodological guidelines: Process in which students are given general and specific indications on the activities to be used during the development of the theoretical-practical class.

Tasks to be developed: These are determined in correspondence with the situation, the objectives to be achieved in the subject and the actions to be carried out by the students.

Evaluation: It is carried out during the whole process with its due control.

The bibliography must be up to date and linked to the topics of the subject.

Orientation of independent work: Activity that the student carries out at home and allows for the reinforcement of learning.

Independent work must therefore be orienting, it must take into account the time factor as the teacher must plan it in a reasonable time, taking into consideration the complexity of the work and the possibilities of the student to carry it out. It is a possibility to know more objectively the student's progress and to orientate, if necessary, new reinforcement activities.

The model of activities must take into account for its elaboration and implementation the academic period and time for its application, the educational level of the students (pre-professional practice) and the feasibility (access to the group of students for its application). In such a way that they can respond to the academic and professional demands of society in their context.

3. Methodology

We worked from a qualitative approach (Sampieri & Mendoza, 2018), for the theoretical-methodological foundation of the object of the research.

The following research methods were used at the theoretical level:

Analysis-synthesis to examine the particularities of research skills in the context of the training of the university student professional.

Inductive-deductive to systematize the different theories on research skills, the interpretation of the data obtained in the diagnosis, and its practical feasibility.

At the empirical level, a documentary study was applied to analyze the content related to research skills from the Constitution of the Republic of Ecuador, the Organic Law of Higher Education, the National Development Plan 2017-2021 "Todo una Vida", the Regulations of the Academic Regime, the educational, pedagogical and didactic model of the UNACH in the normative documents.

The model created to develop the research skills of university students depended on multivariate analysis, considering the following factors: psychological (Sabala, M., et al. 2022; Piaget J. 1969), attitudinal (Salaiza, F. et al. 2022), scientific (Sampieri, H. 2018) and methodological (Chirino, 2002; Pérez, 1999; Román et al, 2017; Machado, 2005). Social constructivism (Piaget J. 1969; Abbott, J. 1999) and Ecuadorian regulations, in which the construction of knowledge in the classroom is recognized as an essential aspect of the personal growth of university students and therefore of society, were considered as transversal axes of the analysis. Likewise, we identified similar experiences in Cuba, Argentina, and Brazil whose objective is the development of research skills in higher education students. Most of the academic information was obtained from the Scielo, Scopus, and Google Scholar databases.

To carry out the initial diagnosis and validate the activity model in practice, it was chosen the sixth semester with the subject: *Treatment of Basic Notions*. According to the curriculum, this subject is one of the professionalization subjects and its nature, purpose, theoretical and practical contents contribute to the professional training, the achievement of the graduation profile, and the mission and vision of the career. For this research, the population was 130 students with a sample of 41 students, using intentional non-probabilistic sampling. According to Suanes (2004), this sample is representative since it is in the range of (30%-35%) of the population applied to case studies of this type.

4. Results

Results obtained show significant findings that provide new perspectives on the subject studied. First, the priority of identifying the problem within the area of the future professional has made it clear that one of the most appropriate scenarios for this first stage of the research process is the spaces of pre-professional practices. Professional practices imply the first connection to their future profession, having an analysis of it through empirical observation and consultation with experts. Moreover, it is suggested to search for information through a collection of instruments, process the data using different computer tools and triangulation as strategies, and finally the communication of results in conferences / academic congresses, by writing articles, papers, theses, exhibitions, posters, seminars, workshops, online databases, among others. The selection of the publication settings depends on the objectives of the research, the audience, and the policies and practices of the institution or field of study.

Furthermore, it is paramount to mention that these findings should be aligned with previous literature in the research field, but also contribute to new knowledge that expands our understanding of research skills. The following process flow details the results of the study.
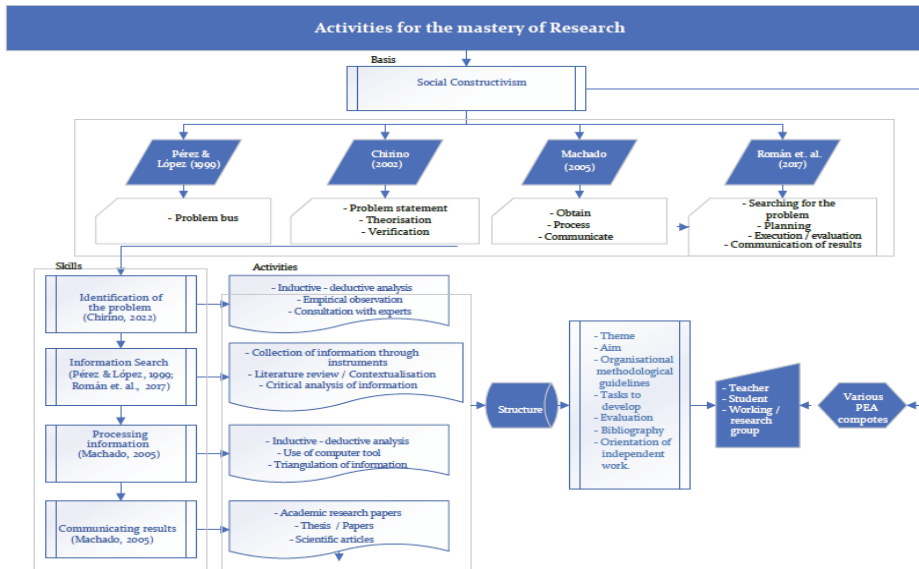
Figure 1. Activities for the mastery of research skills by authors

In this research, a group interview was conducted with 41 students from the Early Childhood Education course, corresponding to the representation of each of the semesters, to obtain criteria about the strengths and weaknesses of the students as individuals and as a group.

As a result of the group interview, it is concluded that, among the main strengths to investigate, the following stand out with a percentage above 90 %: curiosity to learn, the need to successfully complete the work, the commitment to responsibility as a student, persistence in fulfilling what is requested by the teacher.

Among the weaknesses, the following stand out for their percentage above 90 %: lack of knowledge about the moments related to research, lack of interest and demotivation caused by lack of knowledge about how to conduct research, fear of error, lack of time to conduct research, lack of experience and lack of adequate advice from the teacher.

Concerning joint participation in scientific research activities organized by the degree course and the institution (UNACH), 94% said that they only feel accompanied, stimulated, and motivated to participate in some scientific events.

Among the ways most frequently used by teachers to stimulate students' research are the Internet, consultations, and presentations. Thirty-one percent mention that no means are used to search for information.

5. Discussion

In the context of Ecuador, limited studies have been found on research skills in higher education. The lack of records of theoretical and/or practical experiences is striking. Despite the scarce presence of articles on the subject in the Ecuadorian context, those that have been found are: Montes & Machado, 2009; Marrero & Pérez 2014; Illescas, López & Tolozano, 2015; Viteri & Vázquez, 2016; Pérez, Menéndez & Ordoñez, 2016; Bello & Ortiz, 2017; Roman, et al, 2017; Aldas, Tabares & González, 2017; Hernández, et. al., 2018; Amangara, 2020; Álvarez, et al., 2020; Casanova, et al., 2019, which have allowed the authors to systematize some of the characteristics of the treatment of research skills in Ecuador.

The first element that stands out and is also made explicit by the authors consulted is the scarcity of research on the subject (Illescas, López & Tolozano, 2015; Viteri & Vázquez, 2016; Roman, et al., 2017; Hernández, et al., 2018; Aman-gara, 2020).

The research carried out by Illescas, López & Tolozano (2015) provides evidence of the above. As a result of the interviews conducted with the teachers who made up the study sample, it is stated that: "They recognize that teaching the subject Methodology of Scientific Research is not enough to develop research skills in students and point out that the other subjects should continue to carry out research actions that systematize what has been worked on (…)" (p. 157).

It is considered that all those involved in one way or another with the teaching-learning actions in the institutional context, the institution should guide to promote the potential of each student, taking into account the learning styles, the affective, the previous knowledge, the interrelation with their peers and with the teacher himself, so that the student is the protagonist of his own learning and personal growth, so that in the future he manages to be a competent professional. Students are their own builders of knowledge which will later form part of their professional domains.

On the other hand, when comparing the results obtained in the doctoral thesis elaborated by Aldas (2017) on pedagogical strategy for the formation of research skills in students of the Physical Culture Degree at the Catholic University of Cuenca who obtained the following results in the ability to problematize 48% of the students were located at the level of insufficient, In the ability to theorize, 44% of the students were at the insufficient level, who at the end of the strategy moved on to the regular and good levels, and with the ability to verify, 52% of the students were at the insufficient level, who at the end of the strategy moved on to the regular and good levels. This shows an improvement in the three investigative skills. Aspects that served as a reference to deepen the study of the mastery of research skills that should be developed in the context of students in Higher Education.

Consequently, this research assumes the definition of Chirino (2002) who states that research skills are understood as: "The mastery of the generalizing actions of the scientific method that empower the individual for the problematization, theorization, and verification of their professional reality, which contributes to its transformation on a scientific basis". From this definition, it is interesting that the following are identified as essential elements in the development of research skills: problematization, working with concepts, principles, laws, through reasoning, and, in particular, the verification of the results achieved in professional practice.

Among the challenges and strategies to address the implementation of the proposed model of activities is the resistance to change of teachers and students. Training and workshops would be offered to them to understand the benefits of the social constructivist approach and the importance of developing research skills. Another aspect is the lack of integration between theory and practice, in this sense the links between the university and the real professional scenarios should be strengthened through internships, joint projects, etc. The difficulty in monitoring and evaluating the development of skills can also be mentioned, thus it is needed to design evaluation instruments and rubrics to monitor the students' progress. Another challenge in implementing the model is the lack of research culture in the university community, in this sense, awareness and motivation programs for research should be implemented at the institutional level and it is also important to recognize and reward the achievements of students and teachers in research.

6. Conclusions

Social constructivism is the fundamental reference that underpins the study for understanding research skills in higher education in the Ecuadorian context. This approach supports the necessary interrelationship between people and their environment to generate meaningful learning, interactions, knowledge, values, attitudes, and skills in the student, with the support or mediation of the teacher.

Similarly, based on the elements already analyzed in this research, research skills are

understood as the construction and reconstruction of knowledge that involves the mastery of actions derived from the social interaction of the subject with the object of knowledge, made up of the identification of problems, the search for information, the processing of data and the communication of results through the use of various innovative and creative strategies.

In the Ecuadorian context, it is recognized that there is a demand on the University to contribute to training in the field of research that focuses on the mastery of research skills, where students together with their teachers assume a leading role in the teaching-learning process, contributing to the fulfillment of the demands of educational policy and society.

At present, the interest in the Early Childhood Educator's profession has shifted towards infant care, to provide physical and intellectual care as a means of responding to current and future social demands. To this end, the professional must have a command of scientific research that contributes to the improvement of the country from the point of view analyzed.

The proposed model of activities for the development of research skills in higher education students in Ecuador represents an important contribution to strengthening the work of educators and policymakers in this field. This model is based on a social constructivist approach, which highlights the importance of social interaction and context in the construction of knowledge.

7. Recommendations

Universities must integrate research as an essential part of the teaching-learning process. This implies involving students in research activities linked to their future profession from the early stages of their academic training.

It is proposed to focus on the development of key research skills, such as problem identification, information search, and processing, as well as communication of results. These skills should be fostered throughout the entire educational process, from undergraduate to postgraduate.

It is suggested to adopt a constructivist approach that promotes the social interaction of the student with the object of knowledge, as well as the practical application of research skills in the professional context. In addition, the importance of interaction between teachers and students is highlighted, as well as cooperative group work for the development of these skills.

It is advisable to implement the model of activities in the different areas of knowledge as a teaching strategy that strengthens the development of research skills in higher education students, based on the social constructivist approach. This will allow students to be more creative, critical, and reflective about what they learn and how they learn it, broadening their vision of the problems that exist in society related to their training context.

8. Limitations

The model proposed in this research could be significant for the professional training of university students, but the lack of integration between academia and the productive sector may limit the opportunities to carry out applied research relevant to the socio-economic development of the country. Likewise, the lack of adequate training in research methodology is still reflected in the learning environments, which can limit the quality and capacity of the research process.

References

Abbott, J. (1999). Teoría del constructivismo. http://www.cca.org.mx/dds/cursos/cep21/modul

Abad, C., Rodrigo., A & Romero, A. 2021). La titulación profesional como corolario de la investigación formativa en Ecuador.

Aldas, H., Tabares, R. M. & González, Y. (2017). Caracterización de la formación de habilidades investigativas en la carrera de Cultura Física en Ecuador. https://www.google.com/url.

Acellia, O. et. Al. (2019). Desarrollo de habilidades investigativas en estudiantes de enfermería: Nuevos retos en el contexto formativo. Vo. 13 (2). Pp. 107-112.

Álvarez, R. et. al. (2020) Habilidades investigativas en docentes de educación superior: un acercamiento a la realidad. Revista Ciencias Pedagógicas e Innovación, 8(1), 70-77.

Aguirre, P., Hernán, F & Mera, V. (2023). Sostenibilidad en la educación superior en Ecuador- Estudio de caso de la Universidad Técnica del Norte.

Amangara, G. B. (2020). Desarrollo de las habilidades investigativas en la enseñanza de ciencias naturales de la Educación General Básica Superior del Colegio Particular Federico Gauss. [Tesis de diploma no publicada].

Bello, I. G. & Ortiz, E. A. (2017). La autoevaluación de las habilidades investigativas por los estudiantes en la formación inicial del psicólogo en la Universidad Laica Eloy Alfaro de Manabí, Ecuador. Revista Electrónica Formación y Calidad Educativa. Vol 5, No 1.

Casanova ,T., Navas, C., Piñas., B & Vásquez, M. 2020). La educación superior ecuatoriana en el campo investigativo. Destrezas y sociedad.

Casanova, T. et. al. 2019. La formación de las competencias investigativas una habilidad necesaria en el estudiante univer-sitario carrera de Educación Inicial. Ponencia de Evento Internacional. Guayaquil – Ecuador. https://dialnet.unirioja.es/servlet/articulo?codigo=7239517

CEAACES. (2015). Modelo para la evaluación de las carreras presenciales y semi-presenciales de las universidades y escuelas politécnicas del Ecuador. Consejo de Evaluación, Acreditación y Aseguramiento de la Calidad de la Educación Superior. Quito.

Chirino, M. (2002). Perfeccionamiento de la formación inicial investigativa de los profesionales de la educación. [Tesis de doctorado no publicada].

Coll, C., & Gómez, G. (1994). De qué hablamos cuando hablamos de constructivismo. Cuadernos de Pedagogía (221), p. 8-10. https://dialnet.unirioja.es/servlet/articulo.coc.¿'

Driver, R., Osoko, H., Leach, J., Mortimer, E. & Scott, P. (1994). Constructing scientific knowledge in the classroom. Educational Researcher, 23 (7), 5-12.

Edwards, D. & Furlong, V. J. (1987). Teaching and learning as the creation of meanings. En B.M. Mayor & A.K. Pugh (Eds.), Language, comunication and education. Londres: Croom Helm.

Estrada, O. Fuentes, D. & Gras, W. (2022). La formación de habilidades investigativas en estudiantes de ingeniería en ciencias informáticas desde la asignatura de gestión de software: Un estudio de caso en la universidad de las ciencias informáticas, Cuba. Vol. 30 N°1. Pp. 109-123.

Espinosa, D., Sernaqué. M. (2021). Habilidades y actitudes investigativas en estudiantes de maestría en educación. 26 No. Especial 6. Pp 410-425.

Fraiha, S., Paschoal, W., Tabosa, C., Silva, J & Silva, C. (2018). Atividades investigativas e o desenvolvimento de habilidades e competências: um relato de experiência no curso de Física da Universidade Federal do Pará. vol. 40, nº 4, e4403- e4407.

Freire, P. (2006). Pedagogía de la Autonomía: Saberes necesarios para la práctica educativa. Siglo XXI Editores.

Gergen, K.J. (1997). The place of the psyche in a constructed world. Theory and Psychology, 7, 723-746.

Hernández, E. V. et.al. (2018). El desarrollo de habilidades investigativas en estudiantes de medicina. Revista Universitaria con proyección científica, académica y social, Vol 4. No.1 Pp19-33

Illescas, S. López, & Tolozano, (2015). Las habilidades de investigación en estudiantes de Psicología de la Universidad de Guayaquil, Ecuador. Revista de Educación. Vol 9, No. 2 Pp. 151-160

Machado, E. (2005). Transformación-acción e investigación educativa. Investigar en educación: fundamentos y nuevas perspectivas. España: Edición Dilex. Madrid.

Marrero, O. & Pérez, M. A. (2014). Competencias Investigativas en La Educación Superior. RES NON VERBA. http://www.biblio.ecotec.edu.es.pdf.

Mendioroz, A., Napal, M & Peñalva, A. (2020). La competencia investigativa del profesorado en formación: percepciones y desempeño. Vol. 24.

Ministerio de Educación del Ecuador. (2014). Currículo de Educación Inicial. Disponible en: educa-ción.gob.ec>educación-inicial

Ministerio de Educación. (2012). Marco Legal Educativo "Constitución de la República, Ley Orgánica de Educación Intercultural y Reglamento General. En M. d. Educación. Quito, Ecuador.

Montes, N. & Machado, E. (2009). El desarrollo de habilidades investigativas en la educación superior: un acercamiento para su desarrollo. Humanidades Médicas versión Online. http://scielo.sld.cu/scielo.php

Plan Nacional de Desarrollo 2017-2021. Toda una Vida. Secretaría Nacional de Planificación y Desarrollo – Senplades. Ecuador: Quito.

Pérez, M., Menéndez, A. & Ordoñez, R. E. (2016). El desarrollo de las competencias investigativas. Una urgencia impostergable para la Educación Superior Ecuatoriana. https://dialnet.unirioja.es/servlet/articulo.

Piaget J. (1969) Psicología y Pedagogía. Barcelona: Ariel.

Roman, C.; Hernánzaz, RY.; Andrade, D; Baculima, SJ.; Tamayo, T. (2017). Habilidades científico-investigativas de docentes de la Universidad Católica de Cuenca, Ecuador. Revista Panorama Cuba y Salud. No. 1 pp 33-39.

Sampieri, H., & Mendoza, C. (2018). Metodología de la investigación. Las rutas cuantitativa, cualitativa y mixta. En H. S. Mendoza, Metodología de la investigación. Las rutas cuantitativa, cualitativa y mixta (pág. 751). México: McGRAW-HILL. INTERAMERICANA EDITORES, S.A.

Sabala, M., Rentería, E & Díaz, F. (2022). Tendencias en la investigación sobre las prácticas profesionales en educación superior: revisión sistemática desde la Psicología Organizacional y del Trabajo -POT. 25(47), 1-25.

Salaiza, F., Hunton, I & Osuna, L. (2022). Actitud hacia la investigación y hábitos de lectura en alumnos de educación superior. Vol. XXVIII, Número Especial 6. Pp. 170-180.

Suanes, H. (2004). Métodos Estadísticos para las Investigaciones Pedagógicas. Material de estudio del Centro de Investigaciones de la UCPEJV, La Habana.

Toledo, R., Pérez, I., Herrera, R., Ferreira, D., Muramatsu, M., Soga, D & Zottola, D. (2013). Contribución de la física al desarrollo de habilidades investigativas en estudiantes de ingeniería. v. 35, n. 4, 4502.

UNACH, (2016). Reglamento de Régimen Académico. Republica del Ecuador consejo de educación superior.

Valderramma, M. et. at. (2022). Investigative skills in university students. A systematic review. 20th LACCEI International Multi-Conference for Engineering, Education, and Technology.

Vera, D. et. al. (2019). Habilidades, motivaciones e interés por la investigación en alumnos ayudantes en Villa Clara.11(2). Pp117-130.

Viteri, T. A., & Vázquez, S. (2016). Formación de Habilidades de Investigación Formativa en los estudiantes de la Carrera de Ingeniería Comercial de La Facultad de Ciencias Administrativas de La Universidad de Guayaquil. http://scielo.sld.cu/scielo.php?script=sci.

Wertsch, J.V. (1981). The concept of activity in Soviet Psychology. Armonk, NY: Sharpe.

Wertsch, J.V., Minick, N. & Arns, F.J. (1984). The creation of context in joint problema solving. En B. Rogoff & J. Lave (Eds.), Everyday cognition: Its development in social contexts. Cambridge, MA: Harvard University Pre.