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METHODOLOGICAL STRATEGIES TO STRENGTHEN FORMATIVE RESEARCH IN UNIVERSITY TEACHERS

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Abstract

Formative research is necessary for teachers by allowing them to reflect on their practice, improve their pedagogical skills and develop strategies for the benefit of their students, the objective of the research was to propose methodological strategies to strengthen the inquiry in teachers. A non-experimental, descriptive, and explanatory methodology was used from a quantitative and cross-sectional approach, with a sample of 96 teachers and managers, as well as 275 students, adding a total of 371 participants, to whom the questionnaire was applied to analyze the two variables. research. The results showed that the level of application of the methodological strategies was 35% always, 58% sometimes and 7% never. The result was that 59% always practice this type of research, 41% sometimes; A significant relationship was also observed between the two variables, which leads to the conclusion that the adequate implementation of methodological strategies contributes to strengthening the competences in formative research that teachers acquire, and these transmit to students, for which it is proposed consider implementing this strategy.

Keywords: *Strategies, Methodology, Research, Training.*

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1. Introduction

Higher Education plays a fundamental role in society, since it has the responsibility of training young people in the professional skills necessary for their future career and thus contributing to their job performance. In the graduate profile, the study plans must include, among other aspects, the promotion of investigative skills such as analysis, interpretation, application, synthesis, organization, management and evaluation, which are developed through of the investigation.

A global need for 70 million teachers has been identified to ensure the education of students worldwide UNESCO (2021), however, many of the practicing teachers present deficiencies in their competencies that leave them behind in relation to changes in educational processes. UNESCO and the governments of different countries are implementing training programs with the aim of reducing the existing gap and training teachers to be up to date with the latest educational trends.

The Economic Commission for Latin America and the Caribbean (ECLAC, 2022) has highlighted an important challenge in relation to research training at the university level in this region. A marked disparity has been observed compared to European and US institutions in terms of the number of research publications by Latin American and Caribbean institutions. This situation is attributed to several factors, such as the lack of use of active methodological strategies by teachers to promote research, the limited strategies of universities to promote the importance of research among students, and the lack of vision by part of the students to consider research as a profitable activity that can boost economic and professional growth.

In Ecuador, formative research tends to be carried out mainly at higher levels, be they technical or university. In this context, the teacher plays a motivating role by providing the necessary theoretical and practical knowledge, while the students are responsible for carrying out the research process following the methodologies indicated by the teacher. However, this dynamic presents several deficiencies that hinder the development of adequate research training, including the didactic strategies used, the lack of detailed information provided to

students and the limited skills of the teachers in charge of research training, Sosa et al. (2017).

The research was justified by being of a practical nature by offering teachers to improve the methodological strategies used in research training, by proposing options that contribute to teaching and learning, thus improving the perception of students and their willingness to carry out Research according to your interests and demands. From a theoretical point of view, the justification was based on the confirmation of the validity of the theories used, supported by the results found. In methodological terms, this study contributes to expanding research in other branches of science, providing a frame of reference for other researchers. Finally, the study is relevant since it seeks to understand the didactic strategies used by teachers, aligned with formative research, which is essential to improve these strategies and propose the implementation of activities that strengthen teachers' competencies.

The research aims to propose a plan of methodological strategies to strengthen formative research in university teachers, determine reflexive methodological strategies to strengthen formative research in teachers of a university, identify active methodological strategies to strengthen formative research in teachers of a university, Identify the methodological strategies according to the type of product to strengthen the formative research in teachers of a university.

The above is intended to answer the following questions:

What are the methodological strategies to strengthen formative research in university teachers, what are the reflexive methodological strategies to strengthen formative research? what are the active methodological strategies to strengthen research? what are the methodological strategies according to the type of product, to strengthen formative research? What are the characteristics of the proposed methodological strategies that seek to strengthen formative research in teachers?

The conceptualization of the variables is a decisive element that allows the theoretical foundation of the investigation. In this sense, a comparison between research and formative research is established, beginning with an

epistemological analysis. Altrichter (2022) defines research as an activity that aims to discover and develop new knowledge through a logical process that involves the use of various scientific techniques. It is an approach that allows the dissemination of knowledge and its assimilation by students within the teaching-learning process. Ancco (2021), seeks to integrate research into teaching and learning. This form of research can be carried out by a teacher as part of their academic responsibility, or it can also be carried out together with the students themselves as part of their professional training.

The development of formative research implies several aspects or components Espinoza (2020). First, a review of the curricular proposal must be carried out to ensure its alignment with the study program and academic management; In addition, the development of investigative skills is required in terms of planning, execution and evaluation. Turpo et al. (2020) points out that teachers must possess the necessary competencies to carry out formative research. This implies having knowledge in information management, analytical and systematization skills, as well as pedagogical skills to be able to adequately explain the topics in the classroom.

The postulates on which the two variables of research strategies and research training are based are the following:

Plato's theory of education, defined by Bazaluk (2019), alleges that education is a way in which human beings develop their knowledge, acquiring capacities that allow them to better understand their environment, nature, and science, and apply this knowledge into practice. This theory highlights that education promotes the increase of knowledge through research, since it works with the discovery using basic techniques such as observation, demonstration, inquiry, deduction and reflection, in order to draw conclusions in relation to an investigation.

Another theoretical basis for this study is Ausubel's Theory of Significant Learning, as mentioned by Adhikari (2020). It is a process in which knowledge is continuously increased and updated, constantly expanding, and perfecting it. In addition, this knowledge tends to specialize according to the tasks and functions that are

developed. In this way it occurs when the new knowledge relates to the previous cognitive structure of the student. According to this theory, methodological strategies promote the organization and relationship of information that are effective in promoting meaningful learning (Agra et al. 2019).

Vygotsky's sociocultural learning theory, mentioned by Marginson and Dang (2017). According to this theory, learning is achieved through interaction with social groups, where people absorb knowledge and knowledge from those around them. That is why team activities contribute to improving the structures of thought and behavior, by assuming the norms and regulations that govern the society in which they find themselves. Lev Vygotsky and cited by Xu (2019). From a constructivist approach, he says that students build their own knowledge through experience and reflection. According to this theory, methodological strategies that encourage exploration, discovery, and collaboration are effective in promoting constructivist learning.

Another theory that supports the variable methodological strategies is the Theory of Teaching for Understanding, formulated by Howard Gardner and defined by Stewart (2021). This theory, developed by the Harvard research team led by Gardner, posits that the primary goal of education should be the development of deep and lasting understanding in students. According to this theory, methodological strategies that promote the connection between concepts, the transfer of knowledge and reflection are effective in promoting understanding.

In this way, the teaching-learning strategies are considered the methodological strategies according to the conceptualization of Miller et al. (2018) to the planned activities carried out by the teacher with the purpose of imparting knowledge and ensuring that students acquire it in a significant way. In this sense, Cotán et al. (2021) highlight that the types of strategies provide the guide, guidelines, and criteria necessary to achieve sustained learning. Therefore, it is essential that teachers have a broad domain in the application of these methodologies, which is achieved through the development of specific skills. For this, it is important to carry out an adequate structuring of the methodology, clearly establishing its beginning and end, as well as defining the

implementation times, the necessary resources, the required materials, and the dynamics that will be used. In addition, it is crucial to encourage reflective analysis by students to reaffirm what they have learned.

To apply the methodological strategies, it must be planned, with a defined objective and provide the resources so that the students are the ones who take the main role of their own learning, the teacher becomes a guide helping through the formative evaluation to advance in these investigative processes Delgado et al. (2018).

The dimensions related to Reflexive Strategies, according to Kurniawan and Suganda (2020), refer to a process in which a teacher reflects on his approach to planning and carrying out a class, with the purpose of documenting it in writing, through Through this process of objectification, the teacher can become aware of how he teaches and understand the repercussions that this has on the learning of his students. As a result of this reflection, the teacher may experience changes in their conceptions, perceptions, and current behaviors.

Active strategies, according to Yoo et al. (2019), are the methods or resources used by the facilitator during the teaching/learning process, which imply constant participation by the facilitator. These methods cover essential aspects such as practical skills, teamwork and collaboration, effective communication, and leadership, as well as strategies according to the type of product, according to the definition of Amaya et al. (2020), refer to those strategies applied with the purpose of creating a specific academic product, such as articles, reports, or other documents.

2. Materials and Methods

The research carried out was classified as applied, which implies, according to what was indicated by CONCYTEC (2020), that its objective was to develop a specific activity or proposal that addresses a specific problem, the study presented used a quantitative, descriptive and explanatory approach. , Arias & Covinos (2021) describe a phenomenon, identifying its distinctive characteristics and differentiating it from others and the explanatory approach seeks to determine the origin of the situation in question and provide a definition of what is really happening, in addition,

Galarza (2017) points out that cross-sectional studies are carried out at a specific time and have the limitation of not considering the temporal change of the variables. The design was also used on-experimental, according to the definition provided by Galarza (2017). In this type of research, their relationship is explored in their natural environment, without any manipulation.

In this process, the variables and their operationalization in the study are established. According to Gutiérrez et al. (2018), methodological strategies are those that allow the identification of principles and criteria through the application of methods, techniques and procedures organized in a planned sequence. In this way, the construction of knowledge is promoted during the teaching-learning process. On the other hand, according to Freire (2020), in contrast, formative research focuses on the use of research as a tool for the teaching and learning process. Its main objective is to disseminate existing information and make it easier for students to integrate it as knowledge and learning. Table 1 shows population considered.

Table 1: Population of Teachers and Principals

Participants	Frequency	Percentage (%)
managers	46	10,60
teachers	390	89

The inclusion criteria refer to the conditions that students and teaching and administrative staff must meet to be considered in the study. That is, be enrolled in the institution and have a current contract, as well as not be on vacation, leave or medical leave. In addition, the willingness to participate in the study is considered as an inclusion criterion. On the other hand, the exclusion criteria are the same as the inclusion criteria but expressed in a negative way. This implies that those people who do not meet any of the inclusion criteria must be excluded.

According to the statements of Pastor (2019), it is understood that a sample refers to a statistically selected portion of a population. In the specific study, the sample will be made up of a total of 96 study subjects shown in Table 2.

Table 2: Sample of Students and Teacher's Qualitative Level

Participants	Frequency	Percentage (%)
Managers and teachers	96	100
TOTAL	96	100

3. Sampling

The present research study has used a non-probabilistic sampling method to select the participating teachers and students. According to Hernández (2021), this type of sampling is based on the convenience of the researcher when selecting the sample units. To collect information on both variables in this study, a survey has been used that aims to obtain the perceptions and opinions of the respondents in relation to said variables. Questionnaires will be used that will include a Likert scale made up of a total of 21 questions related to the variable in question.

In this research study, descriptive statistical analysis was applied to examine the collected data. First, we sought to understand the characteristics of the population, as well as the relevant variables and dimensions, and the instruments used for data collection. Subsequently, the information organized in graphs was presented and Pearson or Spearman statistical tests were performed to contrast the hypotheses, depending on the results of the Kolmogorov-Smirnov normality tests. To process the information, different statistical programs were used, such as Microsoft Excel and the SPSS version 25 software, which facilitated the presentation of the results in a clear and concise manner.

4. Results and discussions

Los resultados encontrados se presentan en función de los objetivos planteados siendo los mostrados en la figura 1.

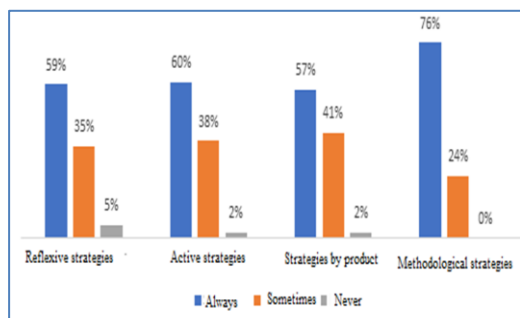


Figure 1: Level of Methodological Strategies in Teachers and Administrators

The data presented in Figure 1 reflect the opinions expressed by teachers in relation to the implementation of methodological strategies in teaching processes, considering each of its dimensions. Regarding reflexive strategies, it is observed that they are always applied in 59.4% of

the cases, sometimes in 35.4% and never in 5.2%. Likewise, for active strategies, they are always applied at 60.4%, sometimes at 37.5% and never at 2.1%. In relation to the strategies by product, teachers apply them in 57.3% of the cases, sometimes in 40.6% and never in 2.1%. Finally, methodological strategies in general are always applied by 76%, sometimes by 24% and never by 0%.

Figure 2 shows the level of formative research seen by teachers and administrators.

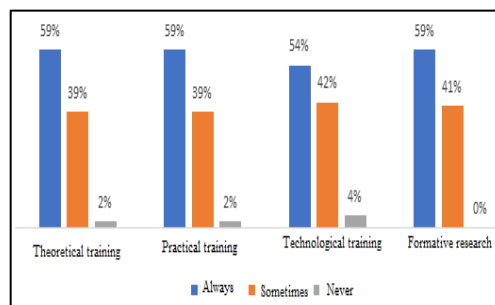


Figure 2: Level of Formative Research According to Teachers and Administrators

According to the results presented in figure 2 on the levels of application of formative research by teachers, the following is observed: Regarding theoretical training, 59.4% of teachers always apply it, 38.5% apply it sometimes and only 2.1% never apply it. In relation to practical training, 59.4% always apply it, 38.5% apply it sometimes and 2.1% never apply it. For the technological training dimension, 54.2% always do it, 41.7% do it sometimes and 4.2% never do it. Regarding the general variable of formative research, 59% carry it out constantly, 41% do it sometimes and 0% do not do it.

5. Correlational analysis

Figure 3 shows the correlation analysis of the variables for teachers and students.

Table 3 shows the correlational analysis for teachers and students.

Table 3: Correlation Analysis of the Variables for Teachers and Students

Description	Correlation	significance
Reflexive methodological strategies to strengthen formative research according to teachers	0.468	0.000

Active methodological strategies to strengthen teacher training research	0.769	0.000
Methodological strategies according to the type of product to strengthen formative research according to teachers	0.722	0.000
Methodological strategies to strengthen formative research according to teachers	0.893	0.000

It is observed in the correlation analysis of the methodological strategies variables and the formative training it is observed that the correlations in all cases are positive, this being direct and significant in the perception of both teachers and students, however there is a decrease of the intensity of the correlation on the part of the students, referring to the fact that the application of the strategies does achieve an effect on the training but with less interference.

In relation to the fourth specific objective, a proposal for methodological strategies was developed, consisting of a program of ten sessions. This proposal aimed to strengthen the knowledge of teachers in the field of formative research. From this intervention, it was concluded that, considering the identified need, it is advisable to carry out the implementation of the following proposal.

6. Research proposal

The proposal is characterized by being flexible and adaptable, which gives the teacher the possibility of improving, modifying or adjusting the different cases or exercises that are addressed during the workshops. Similarly, this methodology's main objective is to encourage teachers to develop their own learning process, receive feedback on their knowledge and can share their results with their peers. To meet these objectives, the following scheme is presented.

7. Operating model

The model is based on the purpose that teachers obtain knowledge in formative research, therefore, the following scheme will be considered to monitor their progress. Figure 3 shows the steps to follow in the proposed methodology.

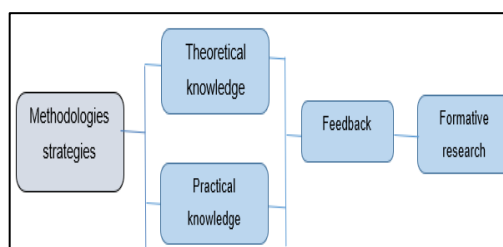


Figure 3: Steps to Follow to Apply the Proposed Methodology

8. Description of the phases of formative research

The first moment is considered as a preliminary phase, in which self-reflection techniques are used to become aware of emotions and feelings, as well as to explore the level of knowledge of the topic to be addressed. They reflect on the emotional state and plan how to act in case of not being in the best conditions. A personal evaluation of knowledge is also carried out through questions such as what is known about the subject and what is desired to learn. At the end of this learning cycle, a list will be drawn up that lists the knowledge acquired.

In the second moment, independent learning is encouraged. During their training and development of research skills, students will carry out autonomous learning processes. To achieve this, teachers will encourage them through the presentation of practical cases or other techniques, addressing topics that students must investigate and collect information. In this process, students will take control of their own time and apply good study habits, avoiding distractions that may hinder their progress and concentration during the self-study process.

The collaboration between individuals in the learning process implies the complementation of the knowledge acquired by each participant, who compares it with that of their peers. In general, this approach is associated with teamwork, for which the teacher forms work groups based on the cases presented. It is essential to designate a leader within each group, in charge of organizing and supervising the progress of the work, encouraging interaction among members. It is recommended to form teams with different abilities or intelligences to achieve a better integration and enrichment of the topic that is being addressed.

The transfer and dissemination of knowledge will be carried out through the presentation and exposition of the results and conclusions reached by the work team. In addition, this phase can contemplate the publication of presentations or videos on a web page or on social network platforms, which have been prepared by the participants in relation to the topic under discussion.

9. Conclusions

The first conclusion refers to the achievement of the general objective, which consists of developing a proposal of methodological strategies aimed at teachers with the purpose of improving their skills in formative research. This proposal has been presented to the educational institution for its implementation in order to promote the growth of knowledge among collaborators in the educational field.

In relation to the first specific objective, the result of determining the use of methodological strategies has been achieved. It was found that reflective strategies are used consistently by 59% of teachers, which indicates that these types of strategies are widely used by most teachers. However, it is necessary to provide reinforcement and support to the 35.4% of teachers who use them occasionally and to the 5.2% who do not use them at all.

Regarding the second specific objective, the result was obtained that 60.4% of teachers use active strategies constantly, which indicates that most teachers use these strategies in their educational practices. However, it was observed that 40.6% of teachers use them occasionally or never use them. Therefore, it is considered necessary to implement the proposed methodological strategies to promote the broadest and most effective use of active strategies in the educational process.

Regarding the third specific objective, it was observed that 57.3% of teachers use the strategies by product on a regular basis, which indicates that this type of strategy is commonly used by teachers. However, it was identified that there are 42.7% of teachers who do not use these strategies constantly. Therefore, it is recommended to implement the proposal developed in this study to promote the broader and regular use of strategies by product in the educational field.

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