



Original article

The formation of investigative competence in the Technical Council of the Pre-University

La formación de la competencia investigativa en el Consejo Técnico del Preuniversitario

A formação da competência investigativa no Conselho Técnico do Pré-Universitário

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ABSTRACT

Cuban education is focused on a series of transformations, named as the Third Improvement of the National Education System. The Pre-University is no exception due to the importance it has as a prelude to the university, the preparation of its teachers is necessary with emphasis on the formation of research competence to achieve the goal and objectives of the educational level. The article aims to socialize the diagnosis on the formation of research competence in the "Eduardo García Delgado" Urban Pre-University Institute, in the Trinidad municipality, Sancti Spíritus province. The result of the diagnosis on the formation of investigative competence in the Technical Council of the Pre-University was based on the theoretical study and the systematization of lived experiences about how the investigative work of teachers was conceived and their abilities to fulfill their scientific-research function. . The educational context in which the diagnostic study took place was the "Eduardo García Delgado" Urban Pre-University Institute, Trinidad municipality, Sancti Spíritus province. Theoretical methods such as analytical-synthetic and inductive-deductive and empirical methods such as document review, systematization of experiences, survey and interview were used. In addition, the descriptive statistics method was used to process the data obtained from the application of the diagnostic instruments. The results obtained allowed us to identify the strengths and weaknesses of the Pre-University Technical Council on the formation of investigative competence and to design proposed solutions, through the use of the scientific method.

Keywords: professional competence; diagnosis; improvement; education system.

RESUMEN

La educación cubana está centrada en una serie de transformaciones, nombradas como Tercer Perfeccionamiento del Sistema Nacional de Educación. El Preuniversitario no es la excepción por la importancia que reviste como antesala de la universidad, se hace necesario la preparación de sus docentes con énfasis en la formación de la competencia investigativa para lograr el fin y los objetivos del nivel educativo. El artículo tiene como objetivo socializar el diagnóstico sobre la formación de la competencia investigativa en el Instituto Preuniversitario Urbano "Eduardo García Delgado", en el municipio Trinidad, provincia Sancti Spíritus. El resultado del diagnóstico sobre la formación de la competencia investigativa en el Consejo Técnico del Preuniversitario se basó en el estudio teórico y la sistematización de experiencias vividas acerca de cómo se concibió la labor investigativa de los docentes y sus habilidades para cumplir su función científico-investigativa. El contexto educativo en que tuvo lugar el estudio diagnóstico fue el Instituto Preuniversitario Urbano "Eduardo García Delgado", municipio Trinidad, de la provincia Sancti Spíritus. Se emplearon los métodos teóricos como el analítico-sintético e inductivo-deductivo y los empíricos como la revisión de documentos, sistematización de experiencias, la encuesta y la entrevista. Además, se empleó el método de estadística descriptiva para procesar los datos obtenidos de la aplicación de los instrumentos del diagnóstico. Los resultados obtenidos permitieron identificar las fortalezas y debilidades del Consejo Técnico del Preuniversitario sobre la formación de la competencia investigativa y diseñar propuestas de solución, a través del empleo del método científico.

Palabras claves: competencia profesional; diagnóstico; perfeccionamiento; sistema educativo.

RESUMO

A educação cubana está focada em uma série de transformações, denominada Terceira Melhoria do Sistema Educacional Nacional. O Pré-Universitário não foge à regra pela importância que tem como prelúdio da universidade, é necessária a preparação dos seus docentes com ênfase na formação de competência de investigação para atingir a meta e os objetivos do nível educativo. O artigo tem como objetivo socializar o diagnóstico sobre a formação da competência de pesquisa no Instituto Pré-Universitário Urbano "Eduardo García Delgado", no município de Trinidad, província de Sancti Spíritus. O resultado do diagnóstico sobre a formação da competência investigativa no Conselho Técnico do Pré-Universitário baseou-se no estudo teórico e na sistematização de experiências vividas sobre como foi concebido o trabalho investigativo dos professores e suas capacidades para concretizar sua pesquisa científico-científica. função. O contexto educativo em que se realizou o estudo diagnóstico foi o Instituto Pré-Universitário Urbano "Eduardo García Delgado", município de Trinidad, província de Sancti Spíritus. Foram utilizados métodos teóricos como analítico-sintético e indutivo-dedutivo e métodos empíricos como revisão documental, sistematização de experiências, levantamento e entrevista. Além disso, utilizou-se o método da estatística descritiva para processar os dados obtidos a partir da aplicação dos instrumentos diagnósticos. Os resultados obtidos permitiram identificar os pontos fortes e fracos do Conselho Técnico Pré-Universitário na formação da competência investigativa e desenhar propostas de soluções, através da utilização do método científico.

Palavras-chave: competência profissional; diagnóstico; aperfeiçoamento; sistema educacional.

INTRODUCTION

The formation of professional skills constitutes a challenge in today's contemporary world. The complexity and nature of the problems in Cuban education require solutions with a more comprehensive and multifaceted approach, which demand a transformation in the functioning of educational institutions and modalities at different levels and types of education. The changes that are aspired to are adjusted to the current development of Cuban society and the search for self-regulation mechanisms of the educational process with the participation of different educational agents, as required by the society we are building. In this sense, the formation of investigative competence in the members of the Technical Council, as an advisory body that directs the scientific-methodological work of educational institutions, acquires vital importance in the solution, through science, of the problems identified in the pedagogical practice.

Currently, education must face the challenge of developing research as a fundamental pillar of teaching; which pressures institutions to organize the curriculum around competencies: intellectual abilities, skills and attitudes.

In the bibliographic search carried out, it is possible to see that different scholars have delved into the topic of research in the educational field, which denotes the importance given to it. For this study, the works of: Samaja (2003), Tamayo (2003), Aular de Duran et al. (2009), Hernandez et al. (2014), Zabalza (2015), Aguiar and Rodríguez (2018), Pastrana-Gómez and Oquendo-González (2020), Barriga- Ubed et al. (2021), Navarro et al. (2021), Reynosa and Peña (2015), Aular de Durán, J., Marcano, N., & Moronta, M. (2009).

According to the interpretations of Samaja (2003), it can be stated that a process implies, on the one hand, the notion of progress, development, or progress of a transformative action; and on the other

hand, it is recognizing the existence of a certain sense of systematization that is present in every process that, in turn, allows it a certain degree of order, a concept that is shared in this research.

Therefore, when talking about the investigative process, we are implying the different stages that enable the search for information, the exploration of reality, the construction of new knowledge or the solution to the different problems that arise in the educational field.

According to Tamayo (2003), the fundamental characteristic of research is the discovery of general principles. The search for new knowledge, which is not simply about organizing what is known, but needs to be verified and verified in reality. This process is through a systematic and orderly search, data is collected for systematization, analysis, interpretation and subsequent dissemination of the research results, through a report or written document.

Aular de Duran et al. (2009) state that to develop competencies it is necessary to develop the qualities that individuals possess to function in the context, facing challenges, according to the circumstances and challenges of their daily lives with transfers of their mental and organizational capacity.

Hernández et al., (2014) define that research is a set of systematic, critical and empirical processes that are applied to the study of a phenomenon or problem. That is, research is a systematic, critical and necessary process through which it seeks to achieve, through the search and collection of information and data, the answer to a question, the solution to a problem, and also, a greater understanding of a phenomenon, which promotes effective change in practice.

In correspondence with what was stated, the authors of this article propose that the research:

- It originates from a question or a problem.
- It requires a specific objective.
- Follow a specific plan.
- It usually divides the main problem into several subproblems.
- It is guided specifically by the problem, question or hypothesis.
- It is open to criticism.
- It is cyclical by nature, or spiral.

As Zabalza (2015) says:

The success of the educator lies, in the first instance, in the real knowledge he has of the problems that affect his students, which do not always have their origin in the teaching-learning process, nor are they limited to the school environment. Hence, research is an unavoidable function for the projection of instructive and educational work, both group and individual, acting as a pivot of the methodological and guiding teaching functions.

According to Aguiar and Rodríguez (2018), the modifications in the educational field generate the need to delimit the competencies that the teacher needs to adequately develop their functions, basic tasks and roles derived from this new scenario of professional performance; posing as an unavoidable task to review the continuous training process that the pre-university teacher must accredit in this new context that is being configured, all based on the competency profile of this professional.

Training by competencies goes beyond training guided by the content of the different disciplines by considering the transformation of the contextual-conceptual representations that the student projects on the levels: cognitive (knowing how to know and knowing how to do), affective (knowing how to be). and

social (knowing how to be), guiding the teaching process through a structuring logic towards professional performance (Barriga- Ubed et al., 2021).

According to Navarro et al. (2021):

Educational research can be assumed as a process of analysis and assessment of a problem by scientific methods to reach results that can positively transform its state. This research, due to its scientific nature, has a group of characteristics, including objectivity, rationality, systematicity, generalization and flexibility. (p.6)

As Reynosa and Peña (2015) state about the challenge of school organization and scientific activity in Pre-University educational centers:

The activities designed in the institutional project must be included in the work of the methodological competence with the objective of perfecting and improving the pedagogical process, by introducing the results of educational research in different contexts. This procedure implies the leading participation of all the actors in the process, and consequently, the commitment to the transformation. The results of the research, in addition to achieving the desired transformation of the educational reality, generate new knowledge, and with these new scientific problems are revealed that influence the comprehensive training of the high school graduate. (p.3)

In all cases the authors attach great importance to the role of research in educational centers. In the aforementioned works there are theoretical and methodological references that were assumed for the diagnostic study carried out at the "Eduardo García Delgado" Urban Pre-University Institute, in the Trinidad municipality, Sancti Spíritus province.

The objective of the article is to socialize the diagnosis on the formation of research competence in the "Eduardo García Delgado" Urban Pre-University Institute, in the Trinidad municipality, Sancti Spíritus province.

MATERIALS AND METHODS

The materialist-dialectical approach was followed, the educational research methodology used is essentially qualitative in nature, where methods from the theoretical and empirical levels are articulated.

The theoretical level methods used were the analytical-synthetic and inductive-deductive, and the empirical level: document review, systematization, survey and interview. The application of empirical methods allowed us to determine strengths and weaknesses in the process of training investigative competence.

Among the strengths were detected:

- Motivation and interest in the formation of investigative competence,
- willingness to contribute to research,
- adequate socio-psychological climate in the institution for the formation of skills,
- appropriate to the Cuban context when considering the Political, Economic and Social Model of the country based on science and innovation,

- ability to reflect on the importance of science from a personal and social perspective.

Weaknesses were identified:

- Low level of knowledge in relation to investigative competence,
- deficiencies in training due to curricula that are not designed for the formation of skills,
- low levels of their capabilities, attitudes and investigative skills, related to working with sources of scientific information,
- to the design of the research, to the development of the investigative work, to the evolution of the results and their communication,
- There is a lack of precision in the methodological orientation for the formation of research competence, which becomes a barrier that affects the quality of education.
- limitations to explain phenomena through the use of the scientific method and insufficiencies to design scientific research.

These methods allowed the study of the theoretical positions that underlie the investigative competence in the Technical Council at the pre-university level, as well as its behavior in practice.

From the collection, processing and analysis of the data obtained with the application of empirical methods, it was possible to determine the level of training of investigative competence in the Technical Council at the "Eduardo García Delgado" Urban Pre-University Institute of the Trinidad municipality, in the province of Sancti Spíritus.

The population was made up of the 8 members of the Pre-University Technical Council during the 2022-2023 school year. Empirical methods were applied, such as the review of documents about the problem of the formation of research competence in the Technical Council of the Pre-University, to analyze the main results obtained by

different researchers in the scientific literature consulted, as well as the main trends in their study, which corresponds to the current demands of the Third Improvement of the National Education System.

From the application of the empirical method, through the review of regulatory documents of the Central Institute of Pedagogical Sciences, resolutions of the Ministry of Education, Manual of the Director of the Pre-University, to verify how the training of professional skills and specifically of the investigation. For this purpose, a document review guide was developed that took into account the concepts derived from the analyzed literature.

The above was complemented with the results of the survey and the interview with the Pre-University Technical Council. With the results obtained it was possible to make the diagnosis. From here, the best experiences are assumed and the criteria set forth regarding the formation of investigative competence in the Pre-University Technical Council are taken into account.

The survey made it possible to obtain and process data quickly and efficiently. It was carried out with the objective of collecting the appreciation of the Technical Council of the Pre-University regarding the formation of investigative competence, their level of training, attitude and ability to solve practical problems. with the use. It was applied to the 8 members of the Pre-University Technical Council, which represents 100%.

The interview was carried out with the 8 members of the Technical Council (100%), its objective was to delve into the criteria obtained from the survey and the reflections derived from the formation of the investigative competence of the Technical Council of the Pre-University, also suggesting planning and delivery of various scientific-methodological activities such as workshops, seminars,

methodological preparations, training programs that support the level of training of investigative competence as proposed solutions to the identified problem.

The descriptive statistical method made it possible to process the data obtained from the application of diagnostic instruments, systematize the experiences, which facilitated making predictions, making decisions and obtaining conclusions about the study carried out.

RESULTS

As a result of the application of theoretical methods, it was possible to analyze the scientific literature available before and after the Third Improvement of the National Education System, with respect to the formation of research competence in the Technical Council at the "Eduardo García Delgado" Urban Pre-University Institute of the Trinidad municipality, Sancti Spíritus province.

The essential trends were detected from the study, which are summarized in the following ideas:

- The importance of the formation of investigative competence in the Pre-University Technical Council,
- attention to the development of investigative skills of the Pre-University Technical Council,
- the interest and motivation for research of the members of the Pre-University Technical Council,
- The investigative work of the Pre-University Technical Council constitutes a fundamental pillar in professional development.

These results were essential to determine the main theoretical foundations for carrying out the diagnosis and the projection of solution proposals to achieve an adequate level of training of investigative competence in the members of the Pre-University Technical Council.

The review of documents showed that the formation of investigative competence constitutes a priority in the professional development of the members of the Pre-University Technical Council. The materials developed that serve as the basis for the Third Improvement of the National Education System, as well as the Pre-University Director's Manual, establish the formation of professional skills as a challenge of current education and for its fulfillment it is necessary that:

- The members of the Pre-University Technical Council achieve the formation of professional skills with emphasis on research, allowing them to perfect intellectual development and fulfill the teaching and research function.
- The members of the Pre-University Technical Council must take into account the foundations of historical-cultural theory, promote the Zone of Proximal Development, based on its strengths and potential,
- achieve investigative competence that allows them to solve the pedagogical problems that arise in the educational practice of the institution.

The survey provided essential information. The most significant criteria are stated:

- Investigative competence is important and necessary in the Pre-University Technical Council,
- They are motivated by scientific research,
- They consider educational research interesting,

In the interview with the members of the Pre-University Technical Council, the evaluative criteria of the members of the Pre-University Technical Council regarding the formation of research competence and the exchange of ideas about it were very enriching. They referred to the reasons why it is important to be prepared to conduct scientific research that provides

solutions to problems in the educational reality; this was attractive to the members of the Pre-University Technical Council.

They also offered ideas about how it is possible to form investigative competence. Among the main approaches, the need to socialize the best experiences related to the formation of research competence was highlighted, proposals were made for scientific-methodological activities to be carried out and the development of research projects was proposed.

In general sense, the results of the methods applied offered a diagnostic vision of the behavior of the formation of research competence in the Technical Council of the Pre-University, during the 2022-2023 school year, at the "Eduardo García Delgado" Urban Pre-University Institute, from the Trinidad municipality, Sancti Spíritus province.

DISCUSSION

Regarding the diagnosis carried out, one of the weaknesses was detected as the Low level of knowledge in relation to investigative competence and deficiencies in training due to study plans that are not designed for the formation of competences.

Regarding the profile of the members of the Pre-University Technical Council, they state that the deficiencies come from previous stages of their training and educational process in which neither the passion nor the habit of scientific research was generated; However, the training of research competence is a strength that the members of the Pre-University Technical Council consider essential to become a comprehensive teacher.

From this situation, it becomes more difficult to develop investigative skills related to reading, searching for information, analyzing complex contents, writing scientific documents and texts, as well as incorporating them into master's

degrees, doctorates, participation in municipal, provincial, national and international events, scientific societies, among others.

The discussions have not delved into the relationships between school and higher education in continuous training, referring to the processes of educational innovations focused on the construction of professional skills for life, with emphasis on research.

As Yero and Acosta (2015) state about the challenge of school organization and scientific activity in pre-university educational centers:

The activities designed in the institutional project must be included in the work of the methodological competence with the objective of perfecting and improving the pedagogical process, by introducing the results of educational research in different contexts. This procedure implies the leading participation of all the actors in the process, and consequently, the commitment to the transformation. The results of the research, in addition to achieving the desired transformation of the educational reality, generate new knowledge, and with these new scientific problems are revealed that influence the comprehensive training of the high school graduate. (p.3)

Kobinger (1998) defines competencies as: "a set of socio-affective behaviors and cognitive, psychological, sensory and motor skills that allow the proper performance of a role, a function, an activity or a planned task" (cited by Martínez and Fariñas, 2012, p.

Del Valle and Mejía (2016) define it "in the educational debate (...) as the ability to act, know and know how to do in certain contexts."

The coincidences with the literature that was consulted are illustrated below:

Buendia et al. (2018) also consider that there are several investigative competencies: observational, formulating questions, reflective, purposeful, technological, procedural and communicative. When analyzing educational research as a process, one agrees with these authors, since it is impossible to face it if one is not prepared in each of its components that are based on permanent scientific observation, where problems, seeking purposeful answers from reflection, are For this purpose, it uses the collection of information, based on the use of techniques and the use of software for data analysis, and the results are communicated, both orally and in writing.

For his part, Reiban, RE (2018) alludes to a very important aspect within the research competence, which falls within the pre-university teacher, but which according to the criterion that was expressed before is transferable to this professional of any educational level. It's the theory. In this regard, he states:

Theory plays a significant role in understanding reality from its deductively and analytically ordered propositions. It allows a consistent interpretation and transformation of the phenomena that are studied in reality, the subjects and thought. (p.76).

And adds:

The theoretical framework is linked to a theory or theories that facilitate the framing of the research. This is where

its importance lies as a theoretical assumption to analyze studies on the research competence of university teachers and their assumed theoretical positions. The theoretical frameworks are directly related to the conceptual frameworks created by the authors for the treatment of certain terms necessary to use in the research (Reiban, 2018, p.80).

From the conception assumed in the research, within the investigative competence that the teacher must develop, the educational context and the theoretical aspects of the investigative competence that serve as a basis for the proposed solution play an important role.

There is no doubt that the educational context and the theoretical aspects of investigative competence constitute pillars to achieve the development of this competence, since it is closely linked to the professional activity of the teacher and even more so in the case of the members of the Technical Council, whose work It is group based and takes place within the educational center and its analyses, reflections and derived solutions are directed to this group of teachers.

For their part, Velázquez et al. (2019) allude to the need to develop investigative skills in professional training. Therefore, it is inferred how indispensable they are also for the members of the Pre-University Technical Council. That is, this author recognizes it as an essential competence in professional activity.

According to the authors of this article, the research activity that takes place in the Pre-University School is decisive for the director to ensure that the center's management structure is not limited to supporting him in the material security that the school needs, but also , get involved in the transformation, as protagonists of the

scientific-methodological work on an active basis so that they can form investigative competence.

The aforementioned author proposes an ordering of the knowledge of the internal components of investigative competencies: knowledge (knowing), knowing how to do and knowing how to be. It also includes, as a significant component, knowing how to live together. It also alludes to the fact that this competence can transform your aptitude into an investigative attitude, related to your specific environment and specifically to investigative competence (Velázquez et al., 2019).

These authors offer a very complete definition of investigative competence, when they express:

Investigative competence is that internalization that is achieved in a research subject, of what he knows and has made his own (knowledge), to develop the search for solutions to problems, with the use of scientific procedures, techniques and methods (know-how), which allows individualized actions (knowing how to be), from their ethical responsibility with the profession and science, within social relationships (knowing how to live together) in a given context. (Velázquez et al., 2019 p.17).

Special significance of a methodological nature that can be taken into account in the proposed research result are the stages that these scholars take into account for the conception of the development of the research competencies of teachers: Diagnosis, training in theoretical-methodological foundations e Identification of the influence of preparation on the development of investigative skills. Likewise, the foundation of the dimensions

to be considered in said application and its methodological development, these dimensions are assumed, which are contextualized to the practice of the functioning of the Pre-University Technical Council.

It is important to consider the investigative competence of this advisory body in the stage of development and consolidation of the changes in which the transformations of the Third Improvement of the National Education System are found. The objective is to maintain the stability and consolidation of changes, turn them into achievements, take measures to make them sustainable and project education towards a qualitative leap (Navarro et al., 2021).

Juárez, D. and Torres, CA (2022). refer that it is important to characterize basic research competence as that which covers the aspects identified as fundamental to carry out the work of research, that is, that competence background that constitutes a first step to carry out research activities. In this sense, although it is outside the scope of this work, advanced research competence could be considered as a next step in university training for research, and integrate methodological aspects of a more formal order, such as techniques and methods of scientific rigor that They are systematically applied in research processes.

In a general sense, the study presented constitutes a theoretical result available for consultation by the Technical Councils of other educational institutions.

The authors of this article understand that it is necessary to continue deepening the diagnosis of investigative competence in the Technical Council of the Pre-University to develop proposals for solutions using the scientific method, so that the development of investigative competence can be offered in the members of the Pre-University Technical Council.

The need for the training of professional and research skills, particularly in the Technical Council of the Pre-University, is considered so that it is reflected in the quality of the teaching-educational process and, in general, in the quality of all the processes that are developed in the Pre-University. , tempered with the implementation of the Third Improvement of the National Education System, whose objective is to maintain the stability and consolidation of the changes, convert them into achievements, take measures to make them sustainable and project education towards a qualitative leap (Navarro et al., 2021).

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The authors declare not to have any interest conflicts.

Authors' contribution:

The authors participated in the design and writing of the article, in the search and analysis of the information contained in the consulted bibliography.

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