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Preparatory technology for entry to doctoral training. A proposal for universities

Tecnología de preparatoria para el ingreso a la formación doctoral. Una propuesta para las universidades

Tecnologia preparatória para ingresso na formação de doutorado. Uma proposta para as universidades

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ABSTRACT
The article is the result of the research project entitled: Improvement of doctoral training and its contribution to development, managed by the University of Pinar del Río, assigned to the Sectoral Program of Higher Education and Sustainable Development and whose objective is: to propose a preparation technology for entry to doctoral training, aimed at the development of scientific-research knowledge and research skills in professionals who graduate from Higher Education (empowering young people), essential for entry to a doctoral training program. The dialectical-materialist method was assumed as the methodological basis and research methods from the theoretical and empirical levels were used, including: systematization, modeling, structural-functional systemic, as well as document analysis, interviews and the comparative method. , used in the theoretical study and in verifying the initial state of the problem. The proposed technology is based on a Preparatory School for Entry to Doctoral Training, which has a general objective, specific objectives, functions, content system, activity system and the final evaluation, aspects that are achieved from its structure and coordination. . Its implementation in practice allowed us to verify significant results in terms of the preparation of applicants, where those enrolled in some of the organized activities graduated from the studies in which they participated and the majority are inserted in different doctoral programs or applying to calls made for admission to doctoral training programs.

Keywords: doctoral training; preparation; income.

RESUMEN

El artículo es resultado del proyecto de investigación titulado: Perfeccionamiento de la formación doctoral y su contribución al desarrollo, que gestiona la Universidad de Pinar del Río, adscrito al Programa Sectorial de Educación Superior y Desarrollo Sostenible y tiene como objetivo: proponer una tecnología de preparación para el ingreso a la formación doctoral, dirigida al desarrollo del conocimiento científico-investigativo y de competencias investigativas en los profesionales egresados de la Educación Superior (potenciando a los jóvenes), fundamental para el ingreso a un programa de formación doctoral. Se asumió como base metodológica el método dialéctico-materialista y fueron empleados métodos de investigación de los niveles teórico y empírico, entre ellos: la sistematización, la modelación, el sistémico estructural funcional, así como el análisis de documentos, la entrevista y el método comparativo, utilizados en el estudio teórico y en la constatación del estado inicial del problema. La tecnología propuesta se sustenta en una Escuela Preparatoria para el Ingreso a la Formación Doctoral, que cuenta con un objetivo general, objetivos específicos, funciones, sistema de contenidos, sistema de actividades y la evaluación final, aspectos que se logran desde su estructura y coordinación. Su implementación en la práctica permitió constatar resultados significativos en cuanto a la preparación de los solicitantes, donde los matriculados en alguna de las actividades organizadas egresaron de los estudios en los que participaron y su mayoría se encuentran insertados en diferentes programas doctorales o aplicando a convocatorias realizadas para el ingreso a programas de formación doctoral.

Palabras claves: formación doctoral; preparación; ingreso.

RESUMO

O artigo é resultado do projeto de pesquisa intitulado: Melhoria da formação doutoral e sua contribuição para o desenvolvimento, gerido pela Universidade de Pinar del Río, vinculado ao Programa Setorial de Educação Superior e Desenvolvimento Sustentável e cujo objetivo é: propor uma preparação tecnologia de ingresso na formação doutoral, destinada ao desenvolvimento de conhecimentos científico-investigativos e de competências de investigação nos profissionais que concluem o Ensino Superior (capacitando os jovens), essencial para o ingresso num programa de formação doutoral. O método dialético-materialista foi assumido como base metodológica e foram utilizados métodos de pesquisa dos níveis teórico e empírico, incluindo: sistematização, modelagem, sistêmico estrutural-funcional, bem como análise documental, entrevistas e o método comparativo, utilizado no estudo. estudo teórico e na verificação do estado inicial do problema. A tecnologia proposta baseia-se numa Escola Preparatória de Acesso à Formação Doutoral, que tem um objetivo geral, objetivos específicos, funções, sistema de conteúdos, sistema de atividades e avaliação final, aspectos que se conseguem a partir da sua estrutura e coordenação. A sua implementação na prática permitiu verificar resultados significativos ao nível da preparação dos candidatos, onde os inscritas em algumas das atividades organizadas concluíram os estudos em que participaram e a maioria está inserida em diferentes programas de doutoramento ou candidatando-se ha concursos realizados para admissão em programas de formação de doutoramento.

Palavras-chave: formação doutoral; preparação; renda.

INTRODUCTION

Today Cuba promotes a government management system based on science and innovation that focuses attention on the economic and social development of the country, which requires the continuous improvement of its human potential, with emphasis on scientific-research training, where they fulfill a fundamental role of Higher Education Institutions (HEIs) and among them, universities.

The permanent training of professionals constitutes an important axis of attention in universities, with emphasis on knowledge management, science, technology and innovation, one of the key priorities for the economic and social development of the country.

Promoting postgraduate training, with emphasis on doctoral training, is a component on which the Ministry of Higher Education focuses attention, not only of university professionals, but also of those who are involved in working for quality in goods. and services that are necessary for the economic and social development of the country. The criteria of Saborido (2017) are shared, when he states that the training of doctors is essential to sustain the scientific potential of the country, with emphasis on universities, the institution in charge of the competent training of professionals in the territory.

The National System of Scientific Degrees in Cuba is in a process of updating and decentralization, starting from Decree-Law No. 372, dated March 25, 2019 and Resolution No. 139/19, of the Minister of Higher Education, where new guidelines are proposed that enhance the training of doctoral students through collective work in groups and in the research project.

Since the conception of these new regulations and taking into account the demand that universities and entities in the territory present today for the doctoral training of their professionals, it is necessary to prepare them for admission to a doctoral program that responds to the needs of their job skills profile.

Different authors have investigated the preparation process of professionals, among them Añorga and Valcárcel (1999) stand out; Bermúdez, Ochoa and López (2012); Bernardo et al. (2017) and García et al. (2018), who identify it as a permanent, systematic, continuous and pedagogical process that significantly influences professional performance, performance and work effectiveness.

Preparation as a process of improvement of professional activity, includes all planned activities, where the subject appropriates the necessary elements to effectively carry out his work and fulfill his functions, which includes, from the current context, the domain of content related to science, technology and innovation. In this way, the professional interested in entering a doctoral program can receive content for their preparation in various spaces, in correspondence with their personal needs and the cognitive deficiencies they have in this regard, which can direct their actions towards the search for knowledge. necessary in a self-determined and/or self-managed manner, based on the different existing postgraduate forms.

Universities have a high responsibility in preparing for entry to doctoral training, as part of the continuous and permanent training of professionals, not only within their faculty, but also in response to the demands of the territory.

Añorga and Valcárcel (1999) stand out, who define it as:

> Permanent pedagogical process that integrates the instructive and educational activities and actions developed by education professionals, in order to perfect professional performance and that will be executed at times when they

> participate alone or within a group. (p.7)

Analyzed from this aspect, the preparation for entry to doctoral training as a pedagogical process must go through the stages of diagnosis, planning, execution and control, becoming a formal space for professional learning, around the contents related to obtaining the scientific degree.

Viewed from this position, preparation allows us to understand the presence of two fundamental components: first, the procedural, linked to the planning of the preparation process for admission, and which is related to how it is conceived, planned and developed, and secondly, the personological, seen as the result of learning content (conceptual, procedural and attitudinal) linked to the doctoral training process and that prepares the subject to apply for admission to a specific program and obtain success.

The studies carried out by De Armas (2003) specify that preparation enables "the implementation of a set of logical actions, with a practical sense, that equip the subject with knowledge, skills and abilities to successfully carry out a certain type of activity." (p. 38). These criteria are shared, as the preparation for entry to doctoral training must be structured by a system of activities aimed at ensuring that the potential applicant appropriates the necessary content to apply to the call for a doctoral program and face it with confidence. the development of skills and competencies that largely ensure the success of your application.

For their part, Bermúdez et al., (2012) analyze the preparation category, as a process and as a result, stating that:

> …is the level of knowledge that a person has about a certain sphere or for a specific purpose or as the set of teachings, advice and practices with which one person prepares another to achieve the physical or psychological conditions necessary to carry out a future action or face an unpleasant or negative situation. (p. 90)

In correspondence with the above, Bernardo, Salcedo and Ginoris (2017), link preparation with the appropriation of knowledge and define it as:

> …the permanent pedagogical process of expanding, updating knowledge and experiences to carry out the work of leading school institutions and solving the problems that arise from this, highlights in this vision its character as an educational process that integrates training and the overcoming. (p.7)

From this point of view, preparation for entry to doctoral training must take into account, not only the modeling of the preparation process based on its current state, but also the preparation that potential applicants have for entry to a program. doctorate, in the field of scientific research and in the topic, they propose to investigate, which determines their preparation needs and possible solution. The studies carried out by Jiménez (2017) point out that in the European context, positive experiences have been obtained in preparation for entry to doctoral programs.

Based on the criteria of García et al. (2018), on the preparation of professionals as part of the pedagogical process, the preparation process for entry to doctoral training must include three fundamental aspects: gradual nature, systematic nature and permanent nature; key factors for the design of the system of preparation activities.

The gradual nature of preparation for entry to doctoral training is achieved by

determining the general objective of preparation, internalized as a long-term goal, which cannot be achieved immediately.

The systemic nature is a pedagogical requirement of preparation for entry, where each planned action must have a logical relationship, and be closely related to each other, to achieve effectiveness in the assimilation of knowledge, the development of skills and the training of convictions related to the doctoral training process.

The permanent nature of the preparation for entry to doctoral training is related to the continuous preparation of the professional, which is not only achieved academically, but also requires practice, which is why the link with the doctoral program is important. , and the agents and agencies linked to the doctoral training process.

The theoretical study carried out made it possible to define *the preparation for entry to doctoral training,* as: *the pedagogical process integrated by a system of instructive and educational activities related to obtaining the scientific degree, aimed at the development of scientific-research knowledge and investigative skills. , in order to enhance professional performance and with it, the possibilities of entry of applicants into a training program* . Below, a group of basic principles are proposed that, in the opinion of the authors of this article, should characterize the preparation for entry to doctoral training:

- Training intention: guarantee the development of research activities (courses, seminars, workshops, among others) where doctoral students are trained as researchers, both in the aspects of their research topics, as well as in transversal topics of common interest. to various programs. To this end, the planning, execution, control and evaluation of the activities of each program must be ensured with sufficient foresight and guaranteeing the communication of the process activities and their results to the entire university community.

- Interdisciplinarity: even when each doctoral program is developed in specific branches of science, the establishment of links of interdisciplinary cooperation and collaboration must be achieved that enrich the training activities, not only between the programs themselves, but between them and other educational institutions. higher education and production and service entities of the territory and the country, with which close relations of scientific and technological exchange must be maintained.

- Scientific rigor: control mechanisms must be established that enable all training activities to be carried out with high scientific and methodological rigor.

Likewise, specialists from other institutions who are experts and knowledgeable about the research topics must participate in the training process to guarantee the enrichment of the scientific considerations made about the research topics, as well as in the assessment of the results. that they are reaching. Of utmost importance, the possibility of enhancing:

- Communication between future doctoral students and with the academic community as a whole and with society in general about their areas of knowledge;

- The ability to promote, in academic and professional contexts, technological, social or cultural advancement within a knowledge-based society,

- Insertion into knowledge and research networks that develop new alternatives for generating knowledge, high-impact joint publications, development programs between institutions from different countries, among others.

Obtaining a scientific degree constitutes a transcendental part of the individual development of professionals in the world and, in particular, in Cuba it has been

incorporated into the country's scientific policy. However, professionals who access training programs do not always arrive with the necessary qualifications. preparation in terms of the development of investigative skills related to access to information, writing scientific text, among other important skills. This has motivated many universities to develop actions to prepare future doctoral students in a way that guarantees greater efficiency in the development of training programs (Castillo et al., 2019).

Cuban universities such as Oriente, Cienfuegos and Pinar del Río, have developed actions to prepare for entry into doctoral training, as part of the strategies aimed at obtaining the scientific degree of Doctor of Science from each institution. However, there are still weaknesses in the conception and development of the process, both from the internal and external point of view, which influence the quality of the preparation provided.

The above allows us to formulate as a research problem: how to improve preparation for entry to doctoral training, so that it positively impacts the quality of the training process?

To solve the scientific problem, the objective of the article is: to propose a preparation technology for entry to doctoral training, aimed at the development of scientific-investigative knowledge and investigative skills in professionals who graduate from Higher Education (empowering young people), essential for entering a training program.

MATERIALS AND METHODS

The dialectical-materialist method was used as a comprehensive approach that starts from general contradictions, when studying the preparation for entry to doctoral training as a process, allowing the determination of its components and its main dialectical relationships. To carry out the diagnosis, the *interview method* was used, with the objective of obtaining information related to the preparation process for admission to doctoral training of professionals at the universities of Pinar del Río, Cienfuegos and Santiago de Cuba.

The interview was applied to 15 professionals linked to the doctoral training process of each of the participating universities, including (3 members of the Scientific Degrees Commission, 4 vice deans of research and postgraduate studies, 3 doctoral program coordinators and 5 tutors).

comparative study was carried out of the existing technologies in the universities of Oriente, Cienfuegos and Pinar del Río, regarding preparation for entry to doctoral training. To carry out this task, the *comparative method* was used with the objective of establishing similarities and differences related to the preparation process for entry to doctoral training in the aforementioned universities, obtaining information necessary for the development of a new technology designed to this end.

The use of this method has its bases in the theories of Comparative Education, which as a science of education is responsible for the study of educational processes, to gather, classify, describe and analyze all the necessary information and determine the regularities of the object of study. analysis (González and Collazo, 2019).

When using the comparative method, the following steps were taken into account for its analysis: (1) Define objectives and key indicators; (2) Identify the elements to be compared; (3) Data collection; (4) Analyze and study the differences and similarities; (5) Look for trends and (6) Interpretation of the results. (Velázquez and Santiesteban, 2019).

The *objective* of the comparative study is: to identify those most innovative aspects, related to the preparation for entry to doctoral training, that are applied in

current technologies in different universities in the country.

The *key indicators* that will be compared are: form of organization; modality; duration; beneficiaries; income requirements; diagnosis of needs and interests; contents and forms of evaluation.

The *elements to be compared* are the different active technologies used by the higher education institutions participating in the comparative study.

RESULTS

100% of those interviewed assured that the University's Doctoral Training Strategy must devise actions aimed at the entry of professionals into the doctoral training process, so that there is a strategic projection of admissions and exits to the programs, which at at the same time contribute to raising scientific potential. In this regard, entry into the programs is conceived as a process that is part of the strategy, where each program is autonomous in deciding the form of entry for applicants, taking into account current regulations.

It was found that in the three universities it is recognized that preparation for entry to doctoral training is a necessity and not all professionals who intend to enter a doctoral program have the research skills to do so, in many cases due to lack of knowledge. have postgraduate training, hence its impact on the quality of admission management, fundamentally, of those applicants who are outside academic activities because they are linked to production or services.

It was confirmed that the University of Cienfuegos has a Doctoral School organized by levels and that includes a Preparatory Level and a Diploma within the framework of the Faculty of Physical Culture, aimed at preparing for entry into doctoral training. The University of Oriente has a Doctoral Training School made up of the joint work of all the actors linked to this process, work with doctoral programs and directs a doctoral training initiation diploma course, for internal and external professionals, mainly to those outside the academy.

For its part, the University of Pinar del Río has a Preparatory School for Doctoral Training that includes actions throughout the year, aimed at the preparation of professionals from the university and the territory and from which a Preparation Diploma for the Income.

These entry preparation alternatives, in none of the cases, are mandatory to enter a doctoral training program but are in correspondence with the level of preparation of the applicants, correspondingly, what should not be missing is a good diagnosis, establish the level of knowledge and experience they have in the area in which they want to pursue the doctorate, aspects that will determine whether or not they require a prior preparation process, which can range from simple training to a master's degree.

Among the main contents that must make up the preparation of professionals for entry to doctoral training programs, the following stand out: the documents that regulate the National System of Scientific Degrees in Cuba (Decree-Law, Regulations and Resolutions of the National Commission of Degrees , among others.); the characteristics of the doctoral training process in the country and particularly in the different training programs in which students can enroll; infotechnological tools for processing information on the state of the art; diagnostic tools and techniques for empirical research; the exploitation of the features of the office package for writing the project and the thesis; and the lines and projects in which they can insert their research topics.

The research project is recognized as the form of organization and control of science,

which corresponds to the fact that 70% of the time in the Doctoral Training Program must be dedicated to developing research. Project work contributes to collective research work, except that participation in projects cannot be formal, it does not mean stating in the application that one participates in a project to cover a formality.

Regarding the postgraduate modalities and forms to be used in preparation for entry to doctoral training, they depend on the results of the diagnosis of each interested professional, since everyone does not have the same learning needs to achieve the objective. ; There will be some who, due to their experience, knowledge and results achieved linked to the topic to be developed, will only need to enter, validate the contents and dedicate themselves completely to research; however; There may be others that, based on the contents they must have and those offered by the doctoral program, will require a larger group of knowledge that they can acquire from a training plan that is organized for them.

The following table 1 shows the results obtained from the use of the *comparative method* , where the technologies used for Doctoral Training at the University of Cienfuegos, the University of Oriente and the University of Pinar del Río were analyzed.

Table 1- Data collection.

	Elements to compare		
Indicators	**Technologies (University of Cienfuegos)**	**Technologies (University of the East)**	**Technologies (University of Pinar del Río)**
Forms of organization	• Doctoral School - Level 1 - Preparatory • FCF-Diplomado: Preparation for entry to doctoral training.	Doctoral Training School • Doctoral Training Initiation Diploma.	Preparatory School for Doctoral Training • Diploma in Preparation for Entry.
Modality	Blended	Blended and Distance.	Blended
Duration	3 to 4 months	6 months	2 months
Beneficiaries	Internal professionals of the university.	Internal and external professionals, in the latter case, fundamentally those outside the academy.	Internal and external professionals.
Income requirements	• University teacher. • Linked to a prioritized area of knowledge.	• Be a university graduate • Perform in areas of teaching, research, production and services.	• Be a university graduate • Not be enrolled in a doctoral program. • Be willing to participate in the preparation. • Administrative authorization.
Diagnosis of needs and interests	Their investigative competence is diagnosed. Student self-assessment.	Your investigative competence is diagnosed to determine the form of preparation to be used.	Their investigative competence is diagnosed based on the contents to be developed at school.
Contents	**Doctoral School (Preparatory Level)** • MIC focused on Theoretical Methodological Design **FCF Diploma** Topic: 1- Epistemological foundations for the training.	**Diploma:** *Two training cycles:* • General formation: General Knowledge About the Doctoral Training Process, Projects and Research	**Diploma:** ***Organized by Modules:*** *Module 1: Doctoral training process.* • Features and Identification of research topics. *Module 2: Scientific information and communication.*

	degree of Doctor of Sciences. Topic: 2- Regulated requirements to obtain the degree of Doctor of Sciences. Topic: 3- Requirements and procedures to achieve the degree of Doctor of Sciences. Topic: 4- Scientific policy of the faculty, lines of research, problem bank, projects and presentation to CITMA.	Lines of the Doctoral Programs of the UO and other HEIs. • Training for Scientific Activity: MIC, ICT, Language, PSCT (Courses and training).	• Scientific information management. • Infotechnological tools. • Diagnostic tools and techniques. • Features of the office package. • Scientific writing. *Module 3: Postgraduate-research relationship* • Research project design. *Module 4: Dissertation Discussion* • Final workshops 20 credits.
Evaluation Forms	Self-appraisal. Defense of doctoral thesis project.	Final work that will include the theoretical methodological design of the topic being projected.	Systematic, linking the content of the courses to the research topic. *Final:* Preparation of the thesis project, through the defense of a thesis.

As a result of the comparison carried out, the following similarities and differences were found, which are listed below.

Similarities:

- The existence of a diploma course, as the most used postgraduate organizational form in preparation for entry to doctoral training.

- Use of the diagnosis of students' investigative skills for their entry into preparation for admission.

- Use of semi-presentiality as a modality of execution of the active technologies in preparation for entry.

- A form of final evaluation is assumed, referring to the presentation and defense of a research design or thesis project, linked to a line of research.

Differences:

- The contents used as part of the preparation for entry to doctoral training have different levels of complexity in each of the universities.

- Only one university (Cienfuegos) uses self-assessment as a diagnostic mechanism for the investigative skills of the professionals who request the preparation.

- Only one university (Pinar del Río) diagnoses research competence based on the contents to be developed in preparation for admission.

- Only one university (Santiago de Cuba) uses the distance education modality in preparation for admission.

Preparatory School for Entry to Doctoral Training

As a new technology and from the integration of good practices from the universities participating in the study, the Preparatory School for Entry to Doctoral Training arises, whose general objective is: to *develop* ***a*** system of preparation activities for professionals who graduate from Education. Higher, empowering young people, related to doctoral training, aimed at the development of scientific-research knowledge and research skills, which contributes to entry into a doctoral training program.

As *specific objectives:*

Respond to the demands for training scientific potential, requested by universities and territorial entities, aimed at the preparation process for entry to doctoral training.

Promote knowledge of current resolutions and regulations, related to the process of obtaining a scientific degree in the Republic of Cuba.

Develop basic research skills in students enrolled in the school, which allows the development of research leading to doctoral studies within the framework of a research project and a doctoral training program.

Promote exchange between students and doctoral programs in the respective areas of knowledge, so that they access information about the training process; system of activities and credits, as well as the lines and research projects available for insertion.

The structure and coordination: coordinator; faculty (teachers of courses, training and diplomas); group of experts (made up of representatives from the areas of science and doctoral training programs) and secretariat

Duration: it is assumed as an open system, students can enter throughout the year, in accordance with their needs and interests and according to the activity(s) in which they enroll and their stay will depend on the duration of the activity(s) in which they enroll.

Features:

1. Diagnosis of the preparation needs of professionals, related to the knowledge, skills and modes of action that are linked to the doctoral training process; results that allow their participation in the system of activities organized by the school.

2. Development of a critical path, which the student will follow during his or her training at school, in response to the results of the previously carried out diagnosis.

3. Management of the system of professional development activities, aimed at preparing for entry into a doctoral training program attached to an authorized institution.

4. Establishment of links with the doctoral training programs of authorized institutions, with the purpose of carrying out joint actions for the preparation of professionals.

5. Evaluation of the impacts of the training process for entry to doctoral training on the school's students, in the short, medium and long term.

Content system:

In the system of activities of the Preparatory School for Entry to Doctoral Training, the contents that make up the same will correspond to the needs and interests of the participants as a result of the entry diagnosis, however, there is a core of basic contents that must be taken into account in the execution of activities.

- Basic knowledge system: scientific policy of the country established by CITMA and its contextualization in the different OACE of the country; characteristics of the conception of the government system based on science and innovation; current resolutions and regulations, related to the process of obtaining the scientific degree in the Republic of Cuba, management for access and processing of scientific information supported by computing; elements of scientific research methodology; competencies in sustainable development techniques.
- Investigative skills system: foundation of the selected research topic; management of information related to the state of the art

referring to the research topic, in databases of international visibility; development of the scientific text in the scientific production derived from the research process; and value system: solidarity, honesty, perseverance, truthfulness, responsibility, ethical values, among others, linked to scientific research.

- Value system: honesty, solidarity, ethics, perseverance, truthfulness, responsibility

From the interview carried out as part of the diagnosis, others can be incorporated such as: competencies in sustainable development techniques, scientific policy of the country dictated by CITMA, government system based on science and innovation, elements of scientific research methodology, among others, always contextualized to the students participating in the School's activities.

The *system of activities* to be developed in the school is related to the established forms of professional development: conferences, workshops, courses, training, and diplomas and has also incorporated meetings with the Committees of the doctoral programs.

The *final evaluation* of the planned objectives will correspond to the form used. For the courses, training and the diploma, the procedure will be as established by the current Postgraduate Regulations, with a certificate issued. In the case of workshops, conferences and other non-main forms, a certificate of participation will be issued without credit approval.

In the case of professionals, who, as part of their preparation, must take the diploma, the evaluations will always be oriented to specific proposals of the institution's Doctoral Programs. Each student will develop the evaluations in correspondence with the topic they propose to work on in their research. Each module or course of the diploma must integrate the evaluation proposal with another in order to seek interdisciplinarity and enhance the research skills of the participants.

The *final work* of the diploma will be related to the presentation of the research topic developed in the diploma, and that can be presented to the project in which it will be inserted related to the research lines of the doctoral programs that you wish to enter. It should lead to strengthening those elements that allow participants to establish: foundation, importance, timeliness, establishment of current legislation and current situation of the proposal, based on the theoretical-methodological design of the research based on the identified topic.

The school must establish a diagnosis-evaluation system that allows it to know the opinion of the participants regarding the quality of the activities, contents, schedules, and teachers who participate in it. To evaluate the school's activities, the following indicators are proposed, among others:

Congruence: balanced and proportionate relationship between all design elements. The validity of the component elements is compared in relation to the general objectives, if they exceed them or contain elements unnecessary to said objectives. It represents a systemic approach to teaching content; a harmonious and dialectical link between its components;

Continuity and integration: represents the appropriate sequence of the topics, units or concepts that constitute the program. The logical-pedagogical articulation (principle of systematicity);

Validity: indicates the correspondence with the current needs of the system and society. It is given by the topicality of the contents, skills and values that it allows to develop;

Feasibility: it is the comparison of the defined objectives in relation to existing resources.

Next, with the aim of having a generalizing view of the proposed technology, a a graphic representation of the Preparatory School for entry to doctoral training:

Fig. 1- Graphic representation of the Preparatory School for entry to doctoral training

Implementation of technology in educational practice

The developed technology had a partial implementation in practice, with one of its actions, specified in the proposal of a Diploma in "Basic Competencies for Scientific Research", more complete activities, given its comprehensiveness based on the objectives of the proposed technology. The diploma course was developed during the months of May to July 2022, with the headquarters of the Postgraduate Center of the University of Pinar del Río "Hermanos Saíz Montes de Oca".

We worked with 39 enrolled students, organized into two teaching groups, one with 26 internal students from the UPR and the other with 13 external students from other organizations (MINED, MINCULT, MINSAP, MINAGRI, Poder Popular and Tele Pinar).

As the first activity, prior to the beginning of the teaching calendar, a diagnosis was applied (to know the preparation of the students in the basic skills of scientific research that allowed determining the main needs of the enrolled students, both from the individual point of view and in Collectively, the results were taken into account by the Diploma teachers in the development of their respective courses.

The completion of the Diploma consisting of four modules and nine courses begins, for a total of 600 hours, equivalent to 20 credits. Each course concludes with a final individual evaluation of its objectives and the Diploma in general concludes with the presentation and defense of the thesis. The application of partial evaluations for each of the courses developed allowed the measurement of the progress of compliance with the objectives.

In general, of the 39 students enrolled in the diploma course, 6 students dropped out, of which 5 came from the OACE (Central State Administration Organizations). Of the total, 33 students met the requirements for the approval of the diploma, which represented 85% compared to initial enrollment and thus met the silver objectives. Subsequently, several empirical methods were applied, the results of which are presented in the following section as a partial evaluation of the short-term impact of technology.

Technology Impact Assessment

The results of the impact evaluation shown below are considered short-term, as they correspond to the implementation in practice of the diploma that is part of the School of Preparation for Entry to Doctoral Training, given the time available for the implementation of the proposal in educational practice.

Some aspects were taken into account that are part of the methodological procedure followed, which allows the determination of the study variable, its indicators, the study group, the instruments to be used and the main results, which we describe below:

Determination of the study variable: the study variable is assumed to be *the Impact of the School of Preparation for Entry to*

Doctoral Training, defined as *the transformations in the intellectual and professional order achieved in the students of the School, as a result of their participation in preparatory activities in response to your needs and interests, to improve your preparation to enter a doctoral training program.*

Determination of the dimensions and indicators of the study variable:

- *Intellectual Growth Dimension (Indicators):*

1. Knowledge of the Country's Scientific Policy.

2. Knowledge of the regulatory documents related to obtaining the scientific degree in the Republic of Cuba.

3. Development of skills related to access and processing of scientific information, through the use of technological resources.

4. Development of basic research skills in the doctoral training process.

5. Development of skills linked to writing scientific texts.

- Professional Growth Dimension (Indicators):

1. Participation in academic and/or scientific networks.

2. Participation in a research project.

3. Preparation of scientific publications in medium and high impact databases.

4. Participation in scientific events.

5. Entry into an academic training program, as part of your doctoral training.

6. Entry into a doctoral training program.

- Satisfaction Level Dimension (Indicators):

1. Relevance of the topics that made up the school's teaching work scheme.

2. Adaptation of the School's contents, depending on the needs of the participants.

3. Update of the knowledge that was taught at the school.

4. Use of the experience of the participating students in the development of the school's activities.

5. Satisfaction with the evaluation system used.

6. Motivation levels in students to enter a doctoral program.

Research methods used: a survey was conducted with school graduates, members of the faculty and other professionals related to the activities carried out, and a group interview with graduates.

The *study group* was made up of 39 students and 9 teachers who participated in the diploma course developed during the months of May to July 2022 and 10 graduates belonging to the last two editions prior to 2022. Of the total number of students, 31 professionals from the University of Pinar del Río and 18 external professionals, corresponding to the organizations MINED, MINCULT, MINSAP, PPM, TELEPINAR and MINAGRI.

The areas of knowledge in this edition were represented as follows: 28 students with research on topics in the area of Educational Sciences, 2 in Economic Sciences, 4 in Forest Sciences, 8 in Agricultural Sciences, 5 in Environmental Sciences Physical Culture and 2 in Technical Sciences.

As part of the methods used, before beginning the application of each instrument, there was a dialogue with the participants, exchanging about the need and importance of the research and consequently the need for the sincere participation of the members of the study

group. The methodological triangulation made it possible to discover possible coincidences and discrepancies, which allowed us to reach more complete conclusions in relation to the indicators and dimensions evaluated in each instrument.

Qualitative analysis of each dimension and the study variable.

Intellectual Growth Dimension

This dimension has four indicators. It was possible to confirm on the part of the student's greater knowledge of the Scientific Policy of the Country and the regulatory documents, related to obtaining the scientific degree in the Republic of Cuba.

There is an intellectual growth linked to the development of skills for accessing and processing scientific information through the use of technological resources that allow one to learn more and obtain better results in working with scientific texts, with citations and bibliographic references and other basic research skills, necessary for the doctoral training process. Likewise, students demonstrate skills linked to writing scientific texts, using appropriate vocabulary from the science they study.

100% of the students in the study group show progress in this dimension, with respect to the results identified in the initial diagnosis carried out.

- *Professional Growth Dimension*

This dimension has six indicators. An increase of 71% in participation in some of the academic and/or scientific networks such as RersearchGate, Mendeley, Academia, Google Academic, among others, was evident.

It was possible to link 94% of the students to research projects, in correspondence with the area of knowledge and the topic they investigate.

In the short time evaluated, after the implementation of technology in educational practice, only 7 scientific publications were found in journals indexed in databases of medium (6) and high (1) impact, but it is valid to highlight the systematic work in the preparation of articles as a result of the content received.

There is greater participation in scientific events of international scope, with the online mode predominating, with presentations linked to the main results of the research topic identified at the school.

Of the total students in the study group, 15 managed to enter an academic master's program, to continue developing scientific skills, necessary for their doctoral training and 19 applied to calls for doctoral programs and 17 managed to enter. This process continues because it depends on the calls made by the programs both inside and outside the university.

100% of the students in the study group show progress in this dimension, with respect to the results identified in the initial diagnosis.

- *Satisfaction Level Dimension*

This dimension has six indicators. It was possible to verify, from the perception that the students have, that the topics that made up the school's teaching work scheme are closely related to each other and are relevant, appropriate depending on the needs of the participants.

Students show higher levels of motivation regarding their admission, linked to updating the contents that were taught at the school and that contributed to their knowledge.

In the different activities developed, students make use of their professional experiences and what it contributes to their personal and professional growth. Throughout the process, people show satisfaction with the evaluation system

used and motivation to enter a doctoral program.

100% of the students in the study group show progress in this dimension, with respect to the results identified in the initial diagnosis.

Main results:

- 100% of the students enrolled in the Preparatory School for Entry to Doctoral Training show knowledge linked to the doctoral training process.

- The professional growth in 100% of the graduates is notable, expressed in the establishment of professional goals and objectives related to obtaining the scientific degree.

- The signs of responsibility, solidarity, perseverance and ethical values present in the generality of the school's students stand out.

- More than 90% of those enrolled in any of the organized activities graduated from the studies in which they participated and more than 70% are enrolled in different doctoral programs or applying to calls made for entry to doctoral training programs.

DISCUSSION

Doctoral studies, as part of the continuous training of university graduates, allow deep and broad growth in a field of knowledge; They develop scientific maturity, capacity for innovation, ability to direct the solution of a scientific problem, independently and; In addition, it allows you to obtain a scientific degree (Martínez, Ramos and Salgado, 2019).

In the development of the technology, the practical experience accumulated in the institutions participating in the project, the results of the theoretical study carried out, as well as the results of the diagnosis and characterization of the initial state of the research object, including the comparative study, have been taken into account. between the universities of Pinar del Río, Oriente and Cienfuegos.

In technology, the integrative nature of the Preparatory School for Doctoral Training proposal stands out, where a system of content and diverse activities is assumed that allows those enrolled in the school to opt for the forms that most closely match their needs.

The actions implemented allowed the participation of a significant number of professionals who showed interest in entering doctoral training programs, but who considered they needed prior theoretical-practical preparation that would allow them to arrive at the programs with better preparation to be able to participate. successfully face the demands of the training process leading to the scientific degree of doctor of sciences.

The results of the impact evaluation carried out in the short term demonstrate the validity of the proposed technology, based on the partial implementation in practice of the built technology, a measurement that must have continuity in the medium and long term in order to demonstrate total validity. of the proposed technology.

REFERENCES

Añorga, J. y Valcárcel, N. (1999). *Educación Avanzada: paradigma educativo alternativo para el mejoramiento profesional y humano de los recursos laborales y de la comunidad*. La Habana, Pueblo y Educación.

Bermúdez, F. A., Ochoa D. y López, A. I. (2012). La formación de profesores para la preparación de directivos y reservas". *Revista Didasc@*lia: D&E. Publicación cooperada entre

CEDUT- Las Tunas y CEDEG-Granma. Cuba.

Bernardo, V., Salcedo, I. M. y Ginoris, O. (2017). El proceso de preparación de los directivos de educación no universitaria en Moxico, república de Angola. *VARONA, Revista Científico-Metodológica*, 65. https://www.redalyc.org/pdf/3606/360657469006.pdf

Castillo, T., González, M. y Barrera, I. (2019). Escuela Preparatoria para la Formación Doctoral: una experiencia en la Universidad de Pinar del Río. En: *Educación y Pedagogía.* Editorial REDIPE. https://redipe.org/wp-content/uploads/2021/04/cidep-2020-2-parte-x-matanzas.pdf

Consejo de ministros. (2019*). Decreto-Ley No. 372. Del sistema nacional de grados científicos*. Comisión Nacional de Grados Científicos. Formato digital.

De Armas, N. (2003). *Caracterización y diseño de los resultados científicos como aportes de la investigación educativa.* Curso No. 85, Pedagogía 2003. Ciudad de La Habana, Cuba.

García, A. M., Nápoles, E., Urgellés, M. O. y Portuondo, R. (2018). Preparación para la actividad profesional: un reto pedagógico de actualidad. *Revista Didasc@lia: D&E.* 4,4. Publicación cooperada entre CEDUT- Las Tunas y CEdEG-Granma, CUBA

Jiménez, M. (2017). Los nuevos estudios de doctorado en España: avances y retos para su convergencia con Europa. *Revista de Investigación en Educación Superior*, *8*(21), 123-137. https://www.scielo.org.mx/pdf/ries/v8n21/2007-2872-ries-8-21-00123.pdf

Ministerio de Educación Superior. (2019). *Resolución No. 139/2019. Organización y funcionamiento del Sistema Nacional de Grados Científicos de Cuba*. Formato digital.

Nuñez, J., Montalvo, L., Pérez, I., Fernández, A., y García, J. L. (2008). *University, innovation and society: Cuban Higher Education in the national Innovation system*. VI Globelics Conference, México.

Saborido, J. R. (2017). Universidad, investigación, innovación y formación doctoral para el desarrollo en Cuba. *Revista Cubana de Educación Superior*, *37*(1) http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S0257-43142018000100001

Velázquez, K. M., y Santiesteban, E. (2019). El método comparativo funcional: una vía para enseñar gramática. *Didáctica. Lengua y Literatura*, *31*, 29-45. https://doi.org/10.5209/dida.65936

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The authors declare not to have any interest conflicts.

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The authors participated in the design, analysis of the documents and writing of the work.

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https://mendive.upr.edu.cu/index.php/MendiveUPR/article/view/3496