

MENDIVE

REVISTA DE EDUCACIÓN

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Professionalization of the discipline Preparation for the Defense in the careers of Engineering and Architecture

Profesionalización de la disciplina Preparación para la Defensa en las carreras de Ingeniería y Arquitectura

Profissionalização da disciplina Preparação para os graus de Defesa em Engenharia e Arquitetura

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ABSTRACT

The Technological University of Havana declares in its mission the contribution to the sustainable development of society from the integral formation of professionals of excellence -engineers

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and architects- committed to the Socialist Homeland. The different careers offered in it contain in their base curriculum the Defense Preparation discipline, whose design foresees the response to social demands, based on the theoretical basis and professional practice. Its implementation, taking into account the particularities of the careers, demanded the study that aims to identify the regularities and procedures for the work of the discipline group, based on the professionalization of the teaching-learning process in the training of engineers and architects. From the dialectical-materialist conception, methods of the theoretical and empirical level and techniques were combined, such as the analytical-synthetic, document analysis, interview, pedagogical observation, discussion and review workshop, Concordance coefficient and methodological triangulation. As a result, the qualities of the professionalization concept were identified, as well as the regularities for its implementation, and the discipline preparation for the defense and its group were characterized.

Keywords:

professionalization; Preparation for Defense; teaching-learning process; training of engineers and architects.

RESUMEN

La Universidad Tecnológica de La Habana declara en su misión la contribución al desarrollo sostenible de la sociedad desde la formación integral de profesionales de excelencia -ingenieros y arquitectos- comprometidos con la Patria Socialista. Las diferentes carreras que en ella se ofertan contienen en su currículo base a la disciplina Preparación para la Defensa, cuyo diseño prevé la respuesta a las exigencias sociales, sustentado en la base teórica y en el ejercicio profesional. Su implementación, atendiendo a las particularidades de las carreras, demandó el estudio que tiene

por objetivo identificar las regularidades y procedimientos para el trabajo del colectivo de la disciplina, en función de la profesionalización del proceso de enseñanza-aprendizaje en la formación de ingenieros y arquitectos. Desde la concepción dialéctico-materialista se combinaron métodos del nivel teórico y empírico y técnicas como la analítica-sintética, análisis de documentos, entrevista, observación pedagógica, taller de discusión y reseña, coeficiente de concordancia y triangulación metodológica. Como resultado se identificaron las cualidades del concepto profesionalización, las regularidades para su implementación y se caracterizó a la disciplina Preparación para la Defensa y a su colectivo.

Palabras clave: profesionalización; Preparación para la Defensa; proceso de enseñanza-aprendizaje; formación de ingenieros y arquitectos.

RESUMO

A Universidade Tecnológica de Havana declara na sua missão a contribuição para o desenvolvimento sustentável da sociedade a partir da formação integral de excelentes profissionais - engenheiros e arquitetos - comprometidos com a Pátria Socialista. As diferentes carreiras que nele são oferecidas contêm no seu currículo básico a disciplina Preparação para a Defesa, cuja concepção fornece a resposta às exigências sociais, com base na base teórica e na prática profissional. A sua implementação, tendo em conta as particularidades das carreiras, exigiu o estudo que visa identificar as regularidades e procedimentos para o trabalho do coletivo da disciplina, em termos da profissionalização do processo de ensino-aprendizagem na formação de engenheiros e arquitetos. A partir da concepção dialéctico-materialista, foram combinados métodos do nível teórico e empírico e técnicas, tais como o analítico-sintético, análise de documentos, entrevista, observação pedagógica, workshop de discussão e

revisão, coeficiente de concordância e triangulação metodológica. Como resultado, foram identificadas as qualidades do conceito de profissionalização, as regularidades para a sua implementação, e a disciplina PPD e o seu coletivo foram caracterizados.

Palavras-chave: profissionalização; preparação para a defesa; processo de ensino-aprendizagem; formação de engenheiros e arquitetos.

INTRODUCTION

The mission of the Technological University of Havana "José Antonio Echeverría" (Cujae, 2020) expresses in its content, the contribution to the comprehensive and efficient training of professionals of excellence committed to the Socialist Homeland, in response to the prioritized objectives, endorsed in the study plans "E" from the Basic Document for Improvement, where it is explicit:

(...) To give as a result graduates with a solid political development from the foundations of the Ideology of the Cuban Revolution; endowed with a broad scientific, ethical, legal, humanistic, economic and environmental culture; committed and prepared to defend the socialist homeland and the just causes of humanity with their own arguments, and competent for professional performance and the exercise of virtuous citizenship (Ministry of Higher Education [MES], 2016, p.8)

Despite being a priority of universities and their teachers, their realization becomes difficult due to the deficiencies presented in the direction of the Teaching-Learning Process (PEA) from planning to execution, which causes demotivation students to the discipline, which refer to the distance between this and the profession (MES, 2019) . Such a situation required a study, the results of which favored the professionalization of the teaching-learning process of the Defense Preparation (PPD) discipline, for which seven master's and doctoral theses and 36 scientific articles were reviewed in which a marked interest in research towards teacher professionalization (76.7 %) ; of these is appreciated , from these, only 23.2 % is oriented towards the professionalism of PEA and of these 20 % is contextualized in the training of engineers. Likewise, nine theses and ten scientific articles were reviewed in which the PEA is studied, of which 69 % in the PPD discipline and of these 30 % in the training of engineers. In addition, the following were studied: the discipline program, the 13 study plans and 30 minutes of methodological meetings of the Department at the "José Antonio Echeverría" (CUJAE) Technological University of Havana.

Because of the analysis, it is distinguished that, during the teaching-learning process of the PPD discipline, there is no approach to professional problems that affect the security and defense of the territory and lack of knowledge of the modes of action of the engineers and architects.

Another result derived from the analysis was the role of the discipline group to achieve the professionalization of the process; consequently, differences were seen in the specialization and projection of the professors in correspondence with the career in which they teach, hence the need to characterize the Defense Preparation collective at the University.

The characterization of the discipline group reveals that, regarding the projection, the teaching category and the scientific degree of the teachers, their political and ideological training, the sense of belonging and the preparation in the topics constitute strengths for the development of the pedagogical process related to security and defense; There is weakness in establishing links with the profession.

Regarding specialization, years of experience as professionals and having a group that integrates specialists from various branches of knowledge constitute strengths; the latter is, in turn, the fundamental weakness for the achievement of professionalization in engineering and architecture careers, due to the lack of coincidence with the diversity in the modes of action described in the professional model for each career.

In the "E" plans of the different careers, the projection of the university-company link and the search for the solution of professional problems are distinguished, a requirement that is based on Curricular Theory.

Traditionally the contents selected by the logic of the profession, that is, professional training, have been reserved only for the last training periods and this must be transformed, since professional training must begin from the first moments. First, by way of familiarization and anticipation of the stage where he will have to act professionally. Then, as a way of reaffirming the vocation and progressively, in order to take ownership of the modes of action typical of that profile and to train in the resolution of professional problems. (Sanz, González and Hernández, 2003, pp125-126).

Putting it into practice from the disciplinary group involves observing conditions that allow the orientation of

students to integrate , in the solution of professional problems that arise in the base link, those aspects that contribute to the preservation of the objectives and interests of the Cuban people in any context and moment in which their actions are developed. This motivates the objective of this research: to identify the regularities and procedures for the work of the group of the discipline based on the professionalization of the teaching-learning process in the training of engineers and architects.

MATERIALS AND METHODS

The research was carried out at the Technological University of Havana "José Antonio Echeverría" (CUJAE) during the 2018-2019 and 2019-2020 academic years. We worked with the teachers of the department or Military Education and with the students who received the discipline. In addition, 30 minutes of methodological meetings of the department from 2017 to 2019 were studied.

For the analysis of the professionalization concept, qualities were identified that allowed it to be distinguished from others applicable to the context, and to reorient the actions to fulfill the proposed objective. In a second moment, a characterization of the PEA was recreated in the training of engineers and the discipline and its group, which made it possible to show the conditions and identify regularities and procedures for the development of the methodological work aimed at professionalization.

In order to satisfy the proposed objective, the research assumes the philosophical position of dialectical materialism and methods of the theoretical, empirical and statistical level are combined. Among them is the analytical-synthetic one, which combined with the analysis of documents led to the

determination of the qualities of the professionalization concept. They facilitated the study of 16 theses, 46 scientific articles, 30 minutes of methodological meetings, 13 study plans and the discipline program; in this way, what was essential and stable in the use of the concept was identified and procedures were distinguished according to the context. Likewise, they were used in the characterization of the discipline and the training of engineers and architects and in the determination of the regularities for the profession of the discipline.

In order to identify possible gaps in the development of the teaching-learning discipline, surveys students analyzed Engineering and Architecture careers in 2015 and 2019.

For the characterization of the discipline group, the interview was combined with the document analysis, pedagogical observation and the Concordance Criterion, which allowed obtaining the data from Table 1.

Table 1 - Teachers who teach Preparation for Defense in CUJAE

Carreras	Años en la docencia (%)			Años relacionados con Seguridad y Defensa (%)			Categoría docente (%)			Formación Académica de Posgrado (%)		4** (%)
	≤5	6-15	≥16	≤5	6-15	≥16	1*	2*	3*	MSC.	Dr.C	
Ingeniería	-	50	50	31,2	68,7	-	68,7	33,3	6,2	87,5	12,5	31,2
Arquitectura	16,6	16,6	66,6	16,6	83,3	-	83,3	16,6	-	66,6	33,3	16,6

* 1 Assistant Professor; 2 auxiliary Professor; 3 Associate Professor

** 4 Teachers whose specialization is related to the careers where they teach

The qualitative assessment of the information, obtained from the analysis of documents, the interview and the pedagogical observation made it possible to identify the regularities for the professionalization of the discipline in the training of engineers and architects, through methodological triangulation. In order to verify its

objectivity, a Discussion and Review workshop was held with the heads of discipline groups of the country's universities, whose composition can be seen in Figure 1.

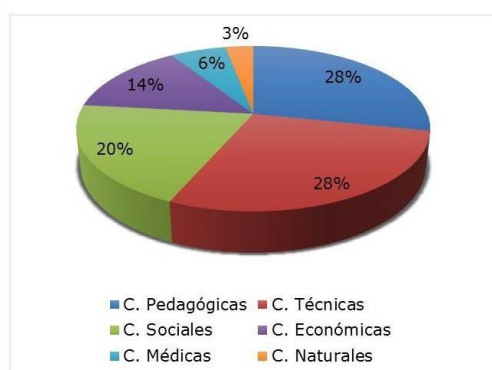


Fig. 1- Composition of the workshop participants

The participation in the workshop of teaching leaders of various specialties allowed the discrimination of the regularity proposals according to the training of engineers and architects, with a Concordance Criterion e"85 %.

RESULT S

A first aspect developed in the research was taking a position regarding the definition of the concept of professionalization with respect to a discipline. In a broad sense, the concept has been worked by dissimilar authors with different points of view, since the last century XX, among which are Barbón, Apao and Añorga (2014); de la Rosa, Guzmán and Marrero (2016); León and Herrera (2010); Palacio and Aguilar (2017); Arteaga, López and Franco (2017); Milián, Gato and Sánchez (2017); Delgado and Gato (2018). All with different points of view, in which the orientation towards the search for improvements in the training of the professional and the human being converges, the domain of specific

contents of the branch of knowledge that sustains the practice, the contextualization and the establishment of a system of relationships that characterizes the study plan of the career; which led to the analysis of the Defense Preparation discipline and its role in the training of engineers and architects.

Characterization of the discipline Preparation for Defense

As part of the basic curriculum in the training of engineers and architects, the discipline Preparation for Defense is included, which, according to the social mandate of the university, is aligned with the professional model, "(...) it is a component part of the comprehensive training of professionals that the country demands; in its curricular design the state and profession-specific contents are integrated, which has a specific expression in each career (...)" (Quesada, 2014, p.4); Its objective projects the relationship between basic knowledge of national security and defense that students must acquire, with professional performance during the fulfillment of their responsibilities as a Cuban citizen and professional (MES, 2017). The discipline is complemented with extracurricular, extension and research activities that contribute to the commitment of students to their responsible and patriotic education.

In the discipline program, it was possible to appreciate the demand of the relationship system in which the object of the profession, the qualities of the professional and the specific contents of the various disciplines that influence the formation of this are intertwined.

The Defense Preparation discipline articulates a system of knowledge, skills and values in national security and defense, with a holistic approach that emanates from the categorical apparatus and its foundations, (...) which are coherently articulated with each of

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the professional profiles, with its mode of action, facilitating inter-multi-transdisciplinary links, which contribute to forming a professional with an integral, creative vision, who is a manager of their own learning, with the integrated value of defending the socialist project from their profession (MONTH, 2017, p.3).

The teaching of this discipline in the training of engineers and architects has characteristics that distinguish it from other university centers in the country with different profiles, which was appreciated as a result of a project that had as its thematic axis the particularities of the teaching of engineering and architecture, developed at the Reference Center for Advanced Education (CREA) of CUJAE, in which 12 particularities were determined (Padrón and Rúa, 2013), among which, due to their involvement in the professionalization process, the following are distinguished:

- Particularity 1. Constant renewal of plans and programs, in accordance with the demands of the profession; Its essence lies in the use of flexibility as a quality of the study plans and improvement from the curricular evaluation, to adopt proactive skills and systematically incorporate actions for the development of skills that respond to the constant dynamics of the context in which the professional should act.
- Particularity 3. Importance of independent and blended activity, in solving teaching problems; that promotes individual responsibility before the teacher's preparation, in bringing these problems closer to professional practice, and of the student, to offer them alternative solutions.
- Particularity 4. Recognition of the need to teach for self-learning; distinguishes the guiding role of the teacher with views to achieve independence and the integral development of the student.
- Particularity 5. Rapid changes in the profession that require very flexible curricula; refers to the presence in the programs of essential content that favor the introduction of actions based on the dynamics caused by the accelerated development of Technical Sciences, and the possibility of adaptation according to the contextualized social demands for each territory where the degree is studied in the country.
- Particularity 8. Teaching of the historical method to determine the antecedents of each unstructured problem; It is based on the modes of action of the engineer and the architect; During the analysis of a problem and the organization of work, solutions, methods, procedures, task approaches, algorithms for the development of solutions, among others, are explored and studied.
- Particularity 10. Need to provide the content with professional significance; It includes alignment with the modes of action, in which diagnosis, modeling, simulation and design are distinguished, and with the solution of professional problems in the context where the engineer or architect will act.
- Particularity 11. Use of the project method as a teaching method; the combination and the use of others, mainly of a productive nature, is not ruled out. Projects are prioritized by the modes of action of these professionals.
- Particularity 12. Emphasis on the practical and investigative components of the educational teaching process, orientation towards the problems of the

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profession based on diagnosis, modeling, design and / or simulation, in search of alternatives that, from proactive positions, give response to practice according to the context in which this professional will act.

Aspects relating to the dynamics of the profession are recurrent in them (this is appreciated both by its development and by the differences in its practice, taking into account the characteristics of the context and the technological potential), the use of specific methods, its relationship with practice and modes of action.

These particularities must be revealed during the fulfillment of the objectives of the Defense Preparation discipline, which indicate the necessary contextualization and alignment with the profession: "Understand the role that corresponds to play in the defense of the homeland, the interests and objectives of the Cuban people from their condition of Engineer and Architect (...)" (MES, 2017, p.2). Discipline contributes to the integral formation of the engineer and / or Architect, and professional practice enriches the discipline and it is projected from the modes of action towards the significant contribution to the security and defense of the country.

The methodological guidelines of the program also distinguish the need to attend to the particularities of professional training.

Whenever possible, National Security and Defense activities should be carried out within the framework of integrative projects and other practical activities and research provided for in career plans (...) use ICT as much as possible (...) facilitate the use of productive and creative methods (...) carrying out integrative tasks and seminars that contribute to the social and professional projection of students in training, paying special attention to the design of guides

for pre-professional practice, presentations to participate in events, extracurricular work, award exams, course work and diploma work (MES, 2017, p.7).

The observance of the particularities of the training of engineers and architects includes the establishment of interdisciplinary relationships; To achieve this, the department's priority is the preparation of teachers and cooperative relationships with teachers who teach the disciplines of their own curriculum, in order to carry out the didactic design of PPD, so that the engineer's modes of action are manifested and the architect during the teaching-learning process.

Professionalization of the Defense Preparation discipline at the "José Antonio Echeverría" Havana Technological University

For the professionalization of the PEA of the discipline, the didactic conception of León and Herrera (2010) was taken as a reference, which is expressed in three basic ideas that direct the actions of the process: the science (discipline) - profession relationship, based on of the role of this science in society; the articulation of the sociocultural and professional dimension in the PEA, transferring knowledge between both dimensions in a reciprocal way; and the concretion of the conception in the epistemology of the PEA. In addition, the assumptions for the development of the teaching-learning process in the university context proposed by Arteaga, López and Franco (2017), in which the interdisciplinary, foundation, systematization and problematization of the contents of the profession are revealed in correspondence with the demands of the professional model and the context in which the student will work once they graduate.

This supports the implementation of the relationship between PPD and

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engineering and / or architecture , taking into account the changes and demands that occur in science and technology, the profession and the context, so that the development of the content is equipped with professional significance. The articulation between the sociocultural and professional dimension establishes a directly proportional relationship between security and defense content with engineering and / architecture.

The didactic conception is specified in the PPD teaching-learning process based on the systematization, foundation and problematization. The systematization generates the integration of the components of the PEA with the production and services process, giving a guiding role to the security problem, which must be solved from the profession. The foundation fosters the relationship with other disciplines, determining the general contents, those that are essential for the training of engineers and architects, and the design of teaching tasks where the link between the discipline and the profession is manifested. Problematization requires the use of productive methods that motivate independent study, research, self-learning, discussion, and problem-based teaching in the integral solution of professional and safety problems.

During the process of curricular improvement for the design of the "E" study plans, the reconciliation of the PPD discipline program with the interests and professional needs of the student was promoted, and with the requirements of the graduate's profile in response to the requirements declared in the basis document for the development of the curricula, so that the program of discipline is evident:

- The science, discipline, profession relationship has an outlet through the materialization of the PPD teaching-learning process. It is executed on the basis of

integration with the projects of the specialty; Conciliation is promoted to integrate the tasks of the discipline during work practice; the interdisciplinary is projected with the disciplines of the own curriculum and by providing the contents with professional significance.

- The objectives of the discipline are aimed at placing greater emphasis on those contents that most affect the career in which it is taught, seeking the impact of the mode of professional performance in the achievement of national interests and objectives, in the identification and reduction of vulnerabilities in the sphere of action in the face of internal and external risks, threats and attacks.
- The establishment of interdisciplinary relationships taking into account that the preparation for the defense constitutes one of the explicit curricular strategies in the Study Plan "E" of the different careers.
- In the methodological guidelines, an increasing use of ICT, problem teaching and other productive methods that favor the search for information, simulation, comparison, design and integration of those objectives that respond, from the discipline, to professional problems is made explicit.

From the normative point of view, the bases for the professionalization of the discipline are observed, but in its materialization the mastery of the teachers is present, which requires directing the methodological work of the discipline group to said process. With this purpose, the regularities were determined for the professionalization of the discipline in the training of engineers and architects, which were presented at a workshop Discussion and Review,

which the consensus on the positive assessment of the following prevailed:

- The pedagogical process of the discipline is conditioned by the particularities of the training of engineers and architects, which means the observance of the modes of action, particularly those that refer to the solution of professional problems on the basis of diagnosis, design, simulation and modeling.
- Professionalization has a humanistic and interdisciplinary nature, oriented to the modes of action of different professionals. According to the philosophical foundations and the principles of education in Cuba, cooperative relations are promoted between the discipline groups of each career, the identification of nodes and / or thematic axes that favor the interaction of the contents, in order to give compliance with the objectives and emphasis is placed on the development of values, particularly in those aspects that are oriented towards security and defense in the context in which the professional acts.
- Is required attention to the context in which the practice of the graduate is performed during the delivery of discipline, taking into account that this is conditioned to scientists- technicians advances, the politics of economic development social development of the country, to the technological potential of the territory, to the possible internal and external risks, threats and aggressions that make it difficult to achieve national interests and objectives. Regularity that will facilitate adequate performance in the professional sphere.
- Coordinated work is required between the PPD discipline group,

the year group, and the career group, which is managed by the main professor of the discipline together with the head of the year group to establish interdisciplinary. , the link with research, scientific, labor and extension activities, as well as other elements that favor professionalization.

- The PEA requires the systematization, foundation and problematization according to the profile of the professional. Mainly if it is borne in mind that the discipline is of general training with basic components for all university careers regardless of the profile, which demands attention to the particularities of each career and the territory in which future professionals will develop.

Likewise, the debate in the Discussion and Review workshop led to the determination of a procedure to materialize professionalization in the PPD discipline.

- Direct the methodological work of the department towards the professionalization of the discipline, attending to the regularities required for this process in the training of engineers and architects. It should start from the problems diagnosed in the PEA and the debate about the common characteristics in the modes of action of these professionals and what is specific in each career, so that the actions to structure the methodological activities are identified, attending to the needs of the teachers in each case and the department in general.
- Rework the analytical program of the discipline in the career. For this, it is recommended to analyze the Study Plan of each career and the general program of

the discipline, as well as the establishment of the necessary coordination with the year group and those of discipline.

- Carry out an analysis of the class system of each of the study topics. This analysis is carried out taking into account the possible points of contact between the classes of the discipline and the problems of the profession in which situations inherent to defense and national security are distinguished; It is derived from the design of a methodological guide in which the relationships with other disciplines of the year or career, comprehensive evaluations, links with research projects, integrative tasks and work practices, the contents of the discipline that The use of problematic, investigative and other methods that enhance debate, class participation and self-learning are fundamental.
- Carry out the preparation of the defense activities in close relationship with the curricular contents, for which the coordination relationships between the groups of the disciplines of the own and optional / elective curriculum are established. Mostly linked to the extension process, to carry out the activities that are included in the University Bastion and in the meteoric exercises, the relationship with the professional exercise will be observed taking into account the particularities of the territory in which the university is located, so that they originate proactive attitudes towards the solution of possible defense and security problems and exceptional situations that the future professional will have to face.

In short, the professionalization of the discipline goes through the link of

the pedagogical process with the profession, the materialization of a system of relationships of the disciplines of the career, taking as its axis the action model, the attention to the characteristics of the context and the methodological work of the group of the PPD discipline, coordinated with the different groups that influence the training of the professional.

DISCUSSION

The concept professionalization analysis was performed to various authors taking as a reference to Añorga (2014), which led to the study of the assumptions made. This author defines professionalization from the conception of Advanced Education. In her development as a researcher, the evolution of the concept is appreciated based on professional experience, the systematization of educational practice and theorization.

The initial definition given by this author identifies the origin of the process in school training and is directed towards the reorientation or specialization of labor resources. Subsequently, he warns that it would be convenient to name any effort aimed at formalizing an instruction that allows the exercise of the subject in a profession through the application of science, technology, administration and social relations. Añorga (2014) defines that it is a "fundamental, continuous pedagogical process that attends to the integrity of the subjects(...)" (p. 21) and points out its impact on professional and human improvement supported by the development of competencies.

In Cuba, professional training does not have skills as its central axis; in the study plans and programs of the disciplines, objectives are declared that derive from the order that society gives to the university.

Based on the improvement of professional and human performance, the vision of Pérez (2001) is perceived, who values professionalization from three dimensions: "The deep domain of theoretical knowledge that sustains the profession, a dialectical relationship between thinking and doing governed by human values and a solid cognitive independence" (Milan, Gato, & Sánchez, 2017, p. 128); where the responsibility of teachers with their performance is perceived, in correspondence with the level at which they are.

Also related to the professionalization of university teaching in Rojas (2017) qualities are distinguished as the manifestation of an ongoing process, specific do by levels and contextualized.

A bibliographic review aimed at the professionalization of the discipline offers the diversity of authors who have worked on it from the basic disciplines in the integral formation of the student, at the technical - professional and university levels of education. A significant number of them assume the school of Advanced Education as a reference and highlight the importance of facilitating the development of professional performance modes from the contents of the subjects, stimulating the interest of students and undoubtedly contributing to their comprehensive training (Palacios and Aguilar, 2017; Delgado and Gato, 2018; González and Fernández, 2017). Likewise, París, Tejada and Coiduras (2014) specify that professionalism implies identity, competencies, access requirements, associated training, professional development and performance evaluation processes; they give a distinctive role to the mastery of skills and the determination of the social recognition of skills.

The disciplinary vision is also offered in Trujillo, Ávila and Cortina (2019), who

propose methodological recommendations for professionalization, seen from the professional model. For this, they focus on the solution of professional problems designed in correspondence with the objectives, contents and attention to interdisciplinary, which contributes to the formation of a professional attitude aligned with the development of science and technology and indicates attention to the territorial particularities during the projection of the problems.

In order to materialize the professionalization of the discipline, it is proposed that in each of these activities, the particularities of the training of engineers and architects be taken into account and that communication between the different departments involved in the training of these professionals be reinforced. Likewise, special attention must be paid to the following aspects:

- Link of the objectives of the discipline with the modes of professional performance.
- Determination of interdisciplinary nodes.
- Presence of the discipline in the integrating projects of each year, work practices and scientific conferences of the faculties.
- Work to reinforce national and humanistic values.
- Greater use of active teaching methods (problem method).
- Greater learning autonomy for students.
- Greater use of the potential offered by Technology of Information and Communications.

Parallel to the teaching-learning process of the discipline, university extension activities are developed that, due to their content and scope, show in practice the essence of the professionalization process, when confronting and / or recovering from an exceptional situation

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and the participation of the students, in correspondence with the professional model and work of humanity. Specific examples are found when the tornado of the January 28, 2019 hit the province of Havana leaving large material losses. In response, university students participated in the recovery stage according to professional profile; among them stood out architects, civil engineers and industrial engineers of the fourth and fifth years, the rest of the students carried out sanitation tasks among others. This experience was used in the teaching of the discipline, assessing the participation of the engineer in civil defense tasks, which raised the acceptance and motivation rate of the students and fostered its enrichment.

The practice in the development of such a process implies the commitment of the engineering and architecture student with the tasks related to national security. In times as turbulent as the one we find ourselves in, in which parallel to the scourge of the Covid-19 pandemic the actions of the empire are increasing to try to drown the Cuban revolution and the Latin American left movements, the students of the Cujae have taken a step forward to undertake hygiene tasks, as volunteers in hospitals, in caring for families, search for solutions to technological problems, readjustment of research topics reoriented towards the Life Task and the use of time for study in home.

In times when the country faces an exceptional situation caused by a health disaster, the role of engineers and architects in civil defense tasks is observed, we can cite, for example, computer and biomedical engineers who have put their knowledge and skills to work of the creation, repair and innovation of computer tools and medical equipment such as the virtual test and vital signs monitors at the service of the health system, an experience that indicates the impact of the

professionalization process on the comprehensive training of the student.

The professionalization of the Defense Preparation discipline responds to the objectives of the training of engineers and architects declared in the study plans of the careers and in the discipline's own program; documents in which the bases for its materialization are established, which gives an important role to the methodological work that must be carried out in the discipline groups, reoriented towards this end.

In the training of engineers and architects, professionalization intertwines attention to the particularities of this process, the interdisciplinary nature oriented towards the modes of action declared in the professional model in which diagnosis, modeling, simulation and analysis design, attention to the socio-historical context and the dynamics and development of the profession with coordinated work between the groups of disciplines and of the year, which is derived from the regularities identified and endorsed in the Discussion and Review workshop are distinguished.

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Tania Céspedes Bordallo: Conception of the idea, coordinator of authorship, literature search and review, translation of terms or information obtained, preparation of instruments, application of instruments, compilation of information resulting from the applied instruments, statistical analysis, preparation of tables, graphs and images, preparation of base of data, writing of the original (first version), correction of the article.

Dargen Tania Juan Carvajal: general advice on the topic addressed, literature search and review, preparation of instruments, statistical analysis, preparation of tables, graphs and images, preparation of base of data, review of the applied bibliographic standard, review and final version of the article, correction of the article.



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