

***La elección de carreras de ciencias exactas. Un modelo de
gestión educativa para el IPVCE***
***The choice of exact science careers. An educational
management model for the IPVCE***

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RESUMEN: El trabajo de orientación profesional hacia la elección de carreras de ciencias exactas en el Instituto Preuniversitario Vocacional "José Marcelino Maceo Grajales", se fundamenta en la exigencia social de formar hombres de ciencias. El artículo centra su análisis en cómo perfeccionar dicho proceso y propone un modelo de gestión educativa para su desarrollo. Se asume una concepción metodológica -dialéctico materialista- con el empleo de métodos generales de la investigación, como el histórico- lógico, analítico- sintético, inductivo deductivo, la modelación, la entrevista, entre otros. La valoración de los resultados, y la implementación en la práctica, demuestra su pertinencia y viabilidad.

Palabras clave: Orientación profesional; Elección de carreras; Área de ciencias exactas; Modelo de gestión educativa.

ABSTRACT: The work of professional orientation towards the choice of careers of exact sciences in the Vocational Pre-University Institute "José Marcelino Maceo Grajales", is based on the social demand to train men of science. The article focuses its analysis on how to improve this process and proposes an educational management model for its development. A methodological conception is assumed -dialectical materialist- with the use of general research methods, such as historical-logical, analytical-synthetic, inductive-deductive, modeling, interview, among others. The evaluation of the results, and the implementation in practice, demonstrate their relevance and feasibility.

Keywords: Professional orientation; Choice of careers; Exact sciences area; Educational management model.

Introduction

In today's world there are dissimilar changes that have an impact at the social level, affecting unequal economic situations, accelerated scientific-technical development, and the strengthening of the knowledge society. In a context such as the one described above, there is a need to train professionals not only with a solid preparation, but also fully identified with their profession; supported by an adequate professional guidance, so that they not only contribute to social development, but also, as individuals, reach their full personal realization, as well as the satisfaction of their needs.

The dynamics of contemporary society makes the work of the agents and socializing agencies that are in charge of carrying out Professional Guidance (PG) and achieving a balance between the interests of each individual, as far as their professional realization is concerned, and contributing to their development, more complex.

Vocational Guidance is a systematic socio-educational task of society, the family, the student and the school, the latter being the context of significant student performance, which coincides with the institution made responsible by the State and the Government to conduct the training process (Matos, 2003, p. 19).

When taking into consideration the importance of Vocational Guidance in the present time, this cannot be far from the social demands, taking into account the individual needs; although from the psycho-pedagogical point of view, the first must guide the second. In this dialectic, the work of the school is irreplaceable, which is why the present work is contextualized in the IPVCEs and the rescue of the founding principles of these institutions, which is why the sociopersonological approach gains value.

The aforementioned explains why the choice of a profession is a social concern of the family, the school and the student. This is a process that requires psycho-pedagogical treatment from the earliest ages of life, since the achievement of continuity of studies, after having finished the pre-university level, becomes a requirement, both for the student's realization and for the development of society.

The aforementioned is evident as a result of the trend shown in the last five years, in which only an average of 4.18% of the total enrollment of IPVCE graduates in Guantánamo opted for careers in

the area of exact sciences; This, together with the professional experience of the author, with thirteen years in the educational sector, eleven of them at the pre-university level, as well as the results of visits and exchanges carried out in the center with directors and teachers, allow us to confirm that a process of Professional Guidance (PG) towards the choice of careers in exact sciences has not been effective in students since 10th grade, since there is evidence of ignorance of the purpose of the institution in which they are, in addition to the limitations they present in the methodological order to influence the treatment of such a complex process.

In order to contribute to solve the previous problem, the objective of this work is to propose a model of educational management of professional guidance towards the choice of exact sciences careers in the IPVCE "José Marcelino Mateo Grajales" of Guantánamo.

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Development

The category model is as old as the very existence of man, it comes from the Latin modulus which means measure, rhythm, magnitude and is related to the word modus: copy, image.

The author agrees with Marimón and Guelmes, 2004 when they consider that model "is a formal theoretical construction that scientifically and ideologically bases the pedagogical process, which favors the interpretation, design and adjustment of the pedagogical reality that takes place at different levels and responds to a specific historical need" (30).

The author agrees with the criteria of the aforementioned researchers, since their definition allows interpreting or explaining the theory or part of the scientific theory, bringing the abstract closer to the concrete or the theory closer to reality.

Taking into account the theoretical systematization carried out and the experience of the author of this research, the model for the educational management of professional guidance towards the choice of exact sciences careers in the IPVECs is defined as the process developed by community managers in an integrated manner from the leadership of the IPVCE, which involves the identification of the needs and potentialities of the students, the community and the territory, as a basis for planning, organizing, executing and controlling a system of coordinated actions and relationships, oriented to the socialization and collective reflection on the professional profile of

the exact sciences careers, which favors their conscious and committed choice, taking into account their interests, personal characteristics and the characteristics of their own community and territory.

This work has its legal support in the Constitution of the Republic of Cuba, which in its postulates, takes into account the foundation of the educational and cultural policy in the advances of science and technology, the Marxist and Martí ideology, the Cuban and universal progressive pedagogical tradition. It is identified in the Economic and Social Policy Guidelines of the 7th Congress of the PCC where it is specified what is related to vocational training and professional orientation, as well as in the Ministerial Resolution 170/2000 that governs the work of vocational training and professional guidance

For its elaboration, some requirements are taken into account that distinguish the educational management process to be modeled, as well as the principle of functionality of the proposed model:

- The role of the IPVCE as the most important cultural center of the community, from where the constitution of a management group is promoted with the involvement of several socializing agents of the community and the territory.
- The understanding of the management group as a support network for IPVCE students, which integrates interests, objectives and contextualized actions towards the choice of careers in the exact sciences, in order to favor that the context acquires meaning and significance in those oriented.
- The preparation and self-preparation of the management group for the development of the activities in function of the professional orientation towards the choice of exact sciences careers, as a process of formation-self-formation.
- The constant feedback of the process that is developed for readjustment as required.

Integrative principle of educational influences in career guidance towards the choice of exact sciences careers at IPVCE.

The starting point is to recognize the multiple views and conceptualizations of principles, from Philosophy, Psychology and Pedagogy, among other sciences that deal with them. Regardless of the particular foundations, it is generally recognized that principles, within a scientific theory, have a logical-gnoseological, practical-methodological and axiological function. They constitute guiding ideas that guide the development of a natural or social phenomenon. In this regard, it is stated that:

Principles act as regulatory and normative elements of heuristic conduct and as links leading to higher and more complex totalities; both in theoretical and practical expression, since the latter governs the conduct of men in their transforming activity (Addine, González and Recarey; 2002, cited by Heredia 2021, p. 39).

In this sense, the principles act as a guide to the goals that the student must achieve through his activity, for the transformation and creation of the new, a process through which the student not only transforms the environment, but also transforms himself, hence its gnoseological function. These authors Addine, et al. (2002) define the principles of pedagogy as "fundamental theses of the psychopedagogical theory on the direction of the pedagogical process, which become norms and procedures of action that determine the essential pedagogical foundation in the process of education of the personality" (45).

From these theoretical assumptions, the integrating principle of educational influences in the professional guidance towards the choice of exact sciences careers in the IPVCE that is proposed, expresses the necessary link that must be achieved between the different agencies and socializing agents of the community and the territory, for the development of a conscious, contextualized and cohesive work, aimed at sharing with the students of these educational institutions knowledge and practices around the different exact sciences careers, which promote in them interests and elective motivations towards these in function of their personal, professional and social development..

The integration of educational influences as a principle reveals a work philosophy, through the way of thinking of the managing group, a thinking with an interdisciplinary approach, which takes into account the potentialities of each community and territorial area and of the agents and socializing agencies, it is therefore, the awareness of the internal obstacles that oppose integration and the consideration of the possibilities to achieve synergy between them, as an expression of coordinated and interconnected work.

As a process, this integration in the management group translates into the search for methods, ways and the approach of actions that favor the proposed guidance purposes. This principle has essential features among which are: humanistic sense, interfactorial link, socioeconomic feasibility, programmed and systematic character of its actions.

The fundamental logic is given in the establishment of the relationships that the management group promotes between the institutions of the community and the territory: IPVCE, Popular Councils and

Circumscriptions, Industrial Sector, CITMA, University and other entities that employ and promote scientific work, which require the actions of community and institutional managers as a unit of analysis, where the system of influences is adequately structured to allow the systematization of content on the various careers and professions of the exact sciences, taking into account the demands, purposes and personal and social needs.

Graphical representation of the educational management model of professional guidance towards the choice of exact sciences careers for IPVCE.

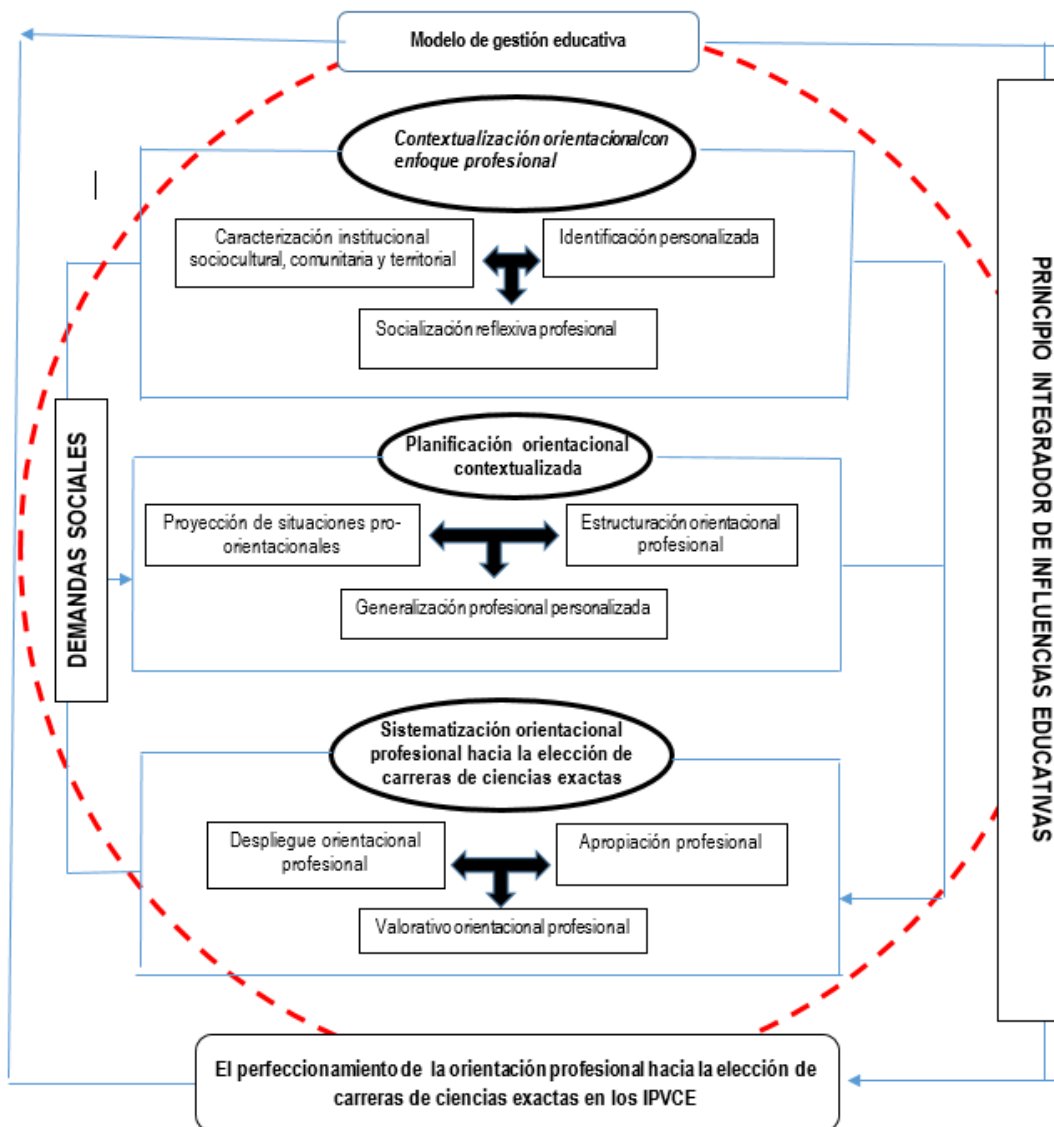


Figure: 1 Model for career guidance towards the choice of exact sciences careers in the IPVCEs.

Source: self elaboration, adapted from Heredia, 2021.

Its uniqueness lies in proposing new relationships of educational influences between the managing group in correspondence with the educational management for the professional guidance towards the choice of exact sciences careers in the IPVCEs based on the social demands and the foundational objective of these types of centers.

Model subsystems

The educational management model for the professional guidance towards the choice of exact sciences careers in the IPVCE is articulated from the following subsystems: guidance contextualization with professional approach, Contextualized guidance planning and Professional guidance systematization towards the choice of exact sciences careers.

It starts from arguing the subsystem: Guidance contextualization with professional approach that integrates the components: institutional, sociocultural, community and territorial characterization with professional approach, personalized identification with professional approach and professional reflexive socialization.

In this subsystem, social demands are considered a central element, since they are based on the requests and contribution to society of these types of centers, from the purpose of the management process that considers the integration of educational influences of various agencies and socializing agents in the context of the IPVCEs, through the construction of a management group, that from different alternatives provide students with the necessary information to make decisions about their professional future consciously and responsibly towards the choice of careers in exact sciences in accordance with the rescue of the founding principles of the IPVCEs and as a priority of the current Cuban society.

In this subsystem, educational management promotes, from the group level, the reflection and understanding of the particularities of the territorial community context, as a basis for entering into the content of the professions of the exact sciences profile related to the territorial context and the constructed social imaginary, where IPVCE students have lived and developed, based on their personal, family, social needs and interests and the reality of the territorial community context in which they live, taking advantage of the potentialities offered by the agencies and agents, as resources and sources for professional guidance towards the choice of exact sciences careers.

The educational management for the professional guidance towards the choice of exact sciences careers in the IPVCEs, is not only explained from the orientation contextualization with

professional approach as a subsystem, it is required to plan and organize actions and required community and territorial influences, so it is revealed as another subsystem the contextualized orientation planning.

In this subsystem a dialectic relationship is established between the following components: Projection of pro-guidance situations, Professional guidance structuring and Personalized professional generalization.

Contextualized guidance planning is linked to an important aspect related to the optimization of resources linked to the conception and projection of actions of the process to be transformed, where the leaders of the management group are considered key entities within the process of professional guidance towards the choice of exact sciences careers in the IPVCE. In this subsystem, management is taken into account, with a marked interactive and exchange character, promoted from the technical and management bodies, in synergy with the management group.

For the efficient performance of the leaders, it is required that they have the adequate preparation and work with responsibility, based on the needs and requirements of the community and territorial context in which it is developed, following up the process to provide an adequate updating and linkage of the social actors existing in the territory.

The members of this management group must fulfill the functions of: organizing, directing and controlling in the community and territorial context, the actions that respond to the formative needs of the students, in accordance with the diagnosis carried out, in which the socio-educational agents and the subjects themselves were involved, where the main guidance actions fall. This makes it possible to clarify ideas as to what should be done, when, how and by whom, taking into account the diversity of professional options of the exact sciences profile that are developed in the community and territorial context where they are located.

The relationship between the components of this subsystem reveals the guidance projective function, in which actions are directed to place the students in a position that favors in them a process of apprehension of the contents and profiles of the different professions of the exact sciences careers, based on the reality, possibilities of insertion and development of the community and the territory where they are located, taking into consideration the diversity of institutions and job offers that exist, linking to these the individual needs, motivations and interests that they have.

Therefore, the relationships within this subsystem propitiate the gestation of the educational and self-educational processes that take place in the managing group and the oriented group, and among them.

Between the subsystems orientation contextualization with professional approach and contextualized orientation planning, relationships of subordination, coordination and integration are established, which allow diagnosing the sociocultural, institutional, community, territorial and professional personal aspects, as well as projecting professional orientation actions towards the choice of exact sciences careers in the IPVCE.

These two subsystems analyzed above are synthesized in the subsystem Professional guidance systematization towards the choice of exact sciences careers. This expresses how the projected actions are concretized in practice, the process in which the understanding, internalization and appropriation of professional knowledge and values take place, the emotional experiences that arise in the different spaces of educational exchange are expressed, the personal possibilities and the professional projects directed towards the choice of exact sciences careers that have been built by the students as a result of the educational management developed are valued.

This subsystem runs through the relationship between the components: Professional guidance deployment towards the choice of exact sciences careers; professional appropriation towards the choice of exact sciences careers and professional guidance valuative.

The professional orientation deployment towards the choice of exact sciences careers is linked to the work of the management group in the realization of the various activities and actions planned, together with the students involved in the orientation process towards the choice of exact sciences careers. It is a collective process of multiple interactions and relationships.

In the process of professional orientation deployment towards the choice of exact sciences careers, the management group must remain alert, since in each activity there may be emerging orientation conditions or situations, as an expression of the dynamic and changing reality, which leads to restructure certain actions or adjust them to the needs and requirements that appear in the development of the process.

In this sense, as the professional orientation unfolds towards the choice of exact sciences careers, the professional appropriation towards the choice of exact sciences careers takes place, as another component of the last subsystem to be modeled. It is distinguished by the conscious assimilation

by students of the content of the various professions of the exact sciences profile, with greater prospects for development in the territory and the community. From reflective positions, each student of the oriented group is approaching the motivational understanding of a given career in exact sciences and its expression in the working and professional world of their context and in accordance with the founding principles of the IPVCE.

This management process reveals the role of collaboration and its formative impact, favoring the formation of IPVCE students to the same extent that the community and territorial managers themselves are formed, it favors the awareness of development, which involves the managing group and in the oriented group, an analysis within themselves, self-criticism and self-knowledge, in order to make proposals and take actions that imply active participation, personal involvement and transformation of all in favor of the achievement of the proposed goals, in full coherence with the functions of the IPVCEs.

The educational management in the process of professional orientation towards the choice of careers in exact sciences in the IPVCEs is projected from the actions of the management group in the formation of themselves and others. To the extent that students get to know themselves better and the environment becomes meaningful to them, they can set objectives and goals that lead them to a projection of the future according to their personal needs and possibilities and those of the community and territorial context where they are and in coherence with the actions for the rescue of the founding principles of the IPVCEs, which are currently being carried out throughout the country.

The subsystems of the Model are characterized by having distinct functions, however, the link and dialectical relationships among them express the importance of the integration of coordinated actions to bring about the desired changes in the students of the IPVCEs involved.

In this theoretical analysis, the guiding principle referred to the integration of educational influences in the professional guidance towards the choice of exact sciences careers in the IPVCEs is revealed. The general logic of the Model of educational management for the professional orientation towards the choice of exact sciences careers in the IPVCEs.

Conclusions

The Model of educational management for the professional guidance towards the choice of exact sciences careers in the IPVCE, argues this process through the relationship between the subsystems

Guidance contextualization with professional approach, contextualized guidance planning and professional guidance systematization, which allows understanding how the constitution and performance of a community and territorial management group, led by the educational institution, leads the group of students to become involved in a system of actions that socializes knowledge and values on the content of the various exact sciences careers.

The modeling carried out allowed revealing the integrating principle of educational influences in the professional orientation towards the choice of exact sciences careers in the IPVCE, which expresses the necessary link that must be achieved between the different agencies and socializing agents of the community and the territory, for the development of a conscious, contextualized and cohesive work, aimed at sharing with the oriented group knowledge and practices around the various exact sciences careers, which promote in them interests towards these as a function of their personal, professional and social development.

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