

Educational management of career guidance towards the choice of exact sciences careers

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ABSTRACT

The research presented here emphasizes the search for new perspectives for the educational management of professional orientation towards the choice of exact sciences careers, in order to articulate this process, for the balance between individual interests and social demands. It is based on an initial diagnosis whose purpose is to know the potentialities and limitations presented today by the educational management of professional orientation towards the choice of exact sciences careers in Guantánamo, pedagogical ways are offered to solve these limitations. It's practical usefulness was evaluated through surveys and interviews.

Keywords: Career guidance; Educational management; Choice; Management group

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 career; supported by an adequate professional orientation, 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.

Therefore, faced with the challenge imposed by social demands in Cuba, immersed in the updating of its socioeconomic model and committed to the fulfillment of the objectives contained in the 2030 Development Agenda; professional guidance as a multifactorial process aimed at vocational education, which establishes support relationships through which the student is offered ways, methods and procedures for the search and finding of a suitable place within the system of professionals to learn to choose one in a self-determined and conscious manner in line with social urgencies, assumes a leading role in the development strategy of the nation.

In this sense, educational management for professional choice in the 21st century, assuming the challenges of scientific and technological development in the era of knowledge and the challenges to face global changes that threaten the survival of humanity, it is necessary to articulate the process of Professional Orientation, hereinafter (OP), and achieve a balance between individual interests and social demands, related to scientific and socioeconomic development of each territory, through the weighting of a professional pyramid which responds to these.

In the specific case of the process of PO in the Pre-university Vocational Institutes of Exact Sciences (hereinafter IPVCE) has been insufficiently addressed, which, in the opinion of these researchers, requires a look from science, to respond to the demands of professionals in the area of exact sciences, which is a priority of today's Cuban society.

It is revealed then, as a problem still unresolved, the poor projection of actions in the IPVCE that allow the development of the OP in students, as a way to favor their self-determination to continue studies in careers in the exact sciences profile.

Due to the importance of the PO process, the following scientific problem is posed: How to manage the PO process towards the choice of exact sciences careers in IPVCEs? And the objective is: to propose pedagogical ways for the educational management of OP towards the choice of exact sciences careers in the IPVCE.

Development

The starting point for the development of this research was an initial diagnosis of twelfth grade students of the IPVCE “José Marcelino Maceo Grajales”, in the province of Guantánamo, during the 2022-2023 school year, as well as teachers who teach subjects in the area of Exact Sciences and Natural Sciences and family members of the selected students. The objective pursued with this diagnosis was to know and establish regularities on the educational management of OP towards the choice of exact sciences careers in the institution.

Evaluation of the application of the diagnostic study

The diagnostic study was carried out with 60 twelfth grade students, 5 teachers who teach subjects in the area of Exact Sciences, and an equal number in the area of Natural Sciences, since they are within the pedagogical group, the teachers who, from the study program itself, teach contents referring precisely to managing the process of OP towards careers in the area of Exact Sciences; in addition, these subjects have extracurricular activities such as: laboratory practices, scientific societies, circles of interest, optional courses, as well as 10 families of the selected students.

From the empirical inquiry where empirical methods such as surveys and interviews were designed and applied to the different sample units, whose results allowed the authors of the research to verify how the PO of the students behaves on the self-determined and conscious choice towards careers in exact sciences in the IPVCE “José Maceo” in Guantánamo.

It was found that there are still insufficiencies in the methodological theoretical order, since 6 of them, which represent 53.3% of the cases, recognize having limitations in relation to the mastery of the fundamental aspects (character, functions) of the PO, as well as the ways and means to materialize it in the educational practice.

A total of 8 professors, representing 84.3%, recognize that the methodological preparation carried out in the institution does not offer sufficient orientation on how to take advantage of the potential of the contents of the programs to develop the PO.

In the case of the students, it was found that 22 of them (83.3%), regarding the forms of management in the search for knowledge about the exact sciences careers, recognize that

they manage the knowledge about the different careers in a personal way, motivated by their own interests and those of their relatives.

On the other hand, although 57 of them (90%) recognize that there are PO actions in the institution, they also state that they consider them not very interesting and illustrative. Therefore, in reality, they do not manage to awaken a real interest in the careers that are the focus of these actions.

When asked if they knew about the exact science careers, 42 (73.3%) of them stated that they did not know them, at least not in their totality, nor did they recognize their importance for the scientific development of the country in all its magnitude.

From the quantitative results, it was found that 58 students, representing 93.3% of the selected sample, contemplate requesting among their 10 options for university careers those related to the exact sciences, none of them among their first three options; while the 60 students, who make up the sample, none show interest in selecting these careers as their first option.

During the application of the instrument to the parents, it was found that 100% of them show a lack of influence on their children towards the choice of careers in exact sciences, since in most cases they try to prioritize “their preferences” and impose their criteria in this respect, they use methods that sometimes create conflicts and unpleasant situations in their children, they also use inadequate educational methods to treat the students in the family context, with a predominance of authoritarianism.

The vast majority of the families interviewed showed an insensitivity to understand the territorialization of careers and the hierarchization of careers in the area of exact sciences. They consider that the programs of the Revolution solve a great problem, but that is for those who are left without a career because they do not have the required index, however, they recognize the lack of preparation to help their children in this area and that they are in urgent need of help.

In general, both the students and their families showed an insufficient level of professional information; lack of knowledge of the exact sciences careers considered as priorities of the country and the territory.

The diagnosis corroborated that the process of OP towards the choice of exact sciences careers in the students of the IPVCE “José Maceo Grajales”, presents potentialities and insufficiencies.

Potential:

- Understanding and interest of the teaching staff on the importance of the educational management of OP towards the choice of science careers at IPVCE.
- Knowledge about the content of careers in the exact sciences.

Inadequacies:

- The OP towards the choice of careers in exact sciences does not always enable the student to experience, through dialogue, debate and reflection, experiences associated with scientific production that arouse their interest.
- There are insufficient exchanges of scientific experiences of teachers and students with projects, scientific societies, successful and unsuccessful circles of interest (learning through error), which enable them to have first-hand information and a protagonist learning about scientific production in their community.
- Poor affective bonding of students with exact sciences careers.

Theoretical underpinnings of the investigation

“Vocational Professional Guidance is a systematic socio-educational task of society, the family, the student and the school, the latter being the context of significant performance of the student, which coincides with the institution made responsible by the State and the Government, to conduct the formative process” (Matos, 2003, p. 23).

Therefore, when taking into consideration the importance of the PO in the current era, it cannot be distanced from social demands, without failing to take into account individual needs; although from the psycho-pedagogical point of view, the former should guide the latter. In this dialectic, the work of the school is irreplaceable, which is why the present research is contextualized in the IPVCE and the rescue of the founding principles of these institutions.

From the philosophical point of view, the foundations of Marxist-Leninist philosophy are assumed, its conceptions about the laws that govern the processes of nature and society, as well as the dialectical categories, the Dialectical Materialist Theory of knowledge and the theoretical and practical conceptions about contradictions as a source of development, in particular, what refers to the categories of activity and work as a form of productive activity.

The ideas put forward by Marx and Engels, cited by Dueñas, (2018), related to work are assumed. Engels, already in 1876 stated that work is the basic and fundamental condition of all human life. In analyzing work, Marx stressed as a fundamental moment the fact that man, unlike the animal, projects in his brain the ends he pursues in transforming nature. It is also based on the Philosophy of Education as universal knowledge of educational processes and actions, present in all of Fidel Castro's oratory, about education in general and the formation of future men of science in particular:

To train the new generations and all the people in the scientific conception of the world, that is to say those of dialectical and historical materialism; to develop in all their human plenitude the intellectual, physical and spiritual capacities of the individual and to foment in him, elevated feelings and aesthetic enlightenment; to convert the ideological, political and moral, communist principles into personal convictions and habits of daily conduct (...) the future of our society is in the hands of the men of science. (Castro, 1972, p. 10)

From the psychological point of view, the foundations of Vigotsky and his followers are assumed, essentially in what Vigotsky (1987) called “Zone of Proximal Development”, since his theory postulates the determination of the historical-cultural nature of psychic processes, and makes it possible to understand the essential relationship established between culture, education, development and learning. Man has the possibility of learning in the social environment, in interaction with others.

The personal growth theory of Bermudez and Pérez (2004) is also assumed. This theory addresses aspects related to the way in which the individual interacts with the environment, with others and with himself. In this sense, it is connoted that these aspects cannot be seen outside the expectations, demands and social requirements, those that guideline the parameters within which these interactions are established, such as the norms that regulate the way the subject projects himself (...), “which manifests the balance, between the social and the individual, between the social needs and demands and those of the subject” (Dueñas, 2018, p. 53).

In this sense, these ideas are fundamental to understand the need to match the interests of students with the demands and needs of the country and in accordance with the actions carried out in the National Education System for the rescue of the founding principles of the IPVCEs.

In this line of thought, it is meant that the studies of Santiesteban (2013), Esquivel (2018) and Heredia (2021), are contextualized references to the educational management of OP towards the choice of exact sciences careers in IPVCEs.

On educational management, essentially focused on and from educational institutions.

Pedagogical paths for the educational management of professional orientation towards the choice of exact sciences careers in the IPVCE.

It is considered necessary for the educational institution to trace the following guidelines for the integration of educational influences in the PO towards the choice of exact sciences careers in the IPVCE:

- Identify from the school context and as part of the institutional, community and territorial work the student's winners of contests and with declared personal and motivational interests towards exact sciences careers, for their stimulation and recognition.
- Promote the constitution of a management group with representatives of various agencies and community and territorial socializing agents, who are sensitized and involved in a collective work process of OP towards the choice of exact sciences careers of the identified group.
- To guarantee the adequate preparation and self-preparation of the management group for this orientation work.
- Determine from the group work the socio-cultural particularities of the community and the territory in general, and in particular those associated with these careers.
- To recognize the greatest potentialities for the OP towards the choice of exact sciences careers in the community and the territory and the role to be played by the agencies and the socializing agents.
- Identify the educational needs of the students involved and sensitize them to their personal and professional development and growth, in accordance with the founding principles of the IPVCEs.
- Systematize PO actions towards the choice of planned exact sciences careers, with constant feedback on their quality and impact.

Constitution of the management group for the educational management of professional orientation towards the choice of exact sciences careers in students at the IPVCE "José Maceo".

Instrumentation: Selection of the forms and spaces to carry out the preparation of the management group for this PO work.

The management group will be integrated by people (natural and community leaders, members of political and mass organizations, as well as workers of the existing labor entities in the context referred to scientific work), who join together to solve the problem related to the PO of students towards the choice of careers in exact sciences, to carry out an activity, based on the needs and the real labor possibilities that exist, (CITMA, Guantánamo University, Provincial Directorate of Education and the educational institution).

The following are suggested as the main members of the management group:

- IPVCE Director: is the main figure through whom, the socializing agents and agencies are linked to the educational work, which is carried out by the school. He/she allows his/her institution to take responsibility for managing the participation and preparation of all those involved in the educational strategy, to develop the main tasks, as well as to guarantee the participation of the students in the process being managed
- Psychopedagogue of IPVCE: specialist in charge, together with other school subjects, of providing counseling to students, starting from determining their aspirations, motivations, needs, in relation to the choice of a career in exact sciences, and its influence on their school and social development. In the proposed educational strategy, he/she plays a decisive role as an advisory leader of the management group.
- Institutional leaders: those managers of labor entities that exist in the community (workers of CITMA, Guantánamo University, the Provincial Directorate of Education, among others), who can favorably contribute ideas and actions, for the work of OP towards the choice of exact sciences careers, offering their facilities as formative spaces based on social demands, are considered.
- Leaders of the Popular Council: includes various factors such as: president of the Committee for the Defense of the Revolution (CDR), delegate of the Federation of Cuban Women (FMC) in the area, Secretary of the PCC nucleus in the area and other community leaders (formal or informal), who can contribute criteria to the strategy, encourage the participation and collaboration of neighbors with more experience in the performance of these careers, which typify the need to train men of science and for science, as a rescue of a founding principle.

Awareness-raising and training workshops for the development of career orientation towards the choice of exact sciences careers.

Workshop 1

Objective: To sensitize the agencies and socializing agents with the educational intentions towards the students' choice of exact sciences careers, guaranteeing their training in various topics as a basis for the development of the proposed educational strategy.

Technique to be used: group reflection and open dialogue.

Contents to be addressed:

- The community socio-cultural and its influence on the formation of students.
- The PO towards the choice of exact sciences careers in students, particularities in the educational context (IPVCE) and the role of the different socializing agents.
- The management group in the OP towards the choice of exact sciences careers in students. Official nature of the management group for the development of the Strategy.
- Developmental communication. Dialogue, as a resource to promote reflection and self-reflection of students towards the choice of exact sciences careers.
- Workshops and participatory techniques.

Person in charge: Psychopedagogue

Participants: Management group

Initial diagnostic reflection workshop

Objective: To identify the socio-cultural potential of the school institution, the community and the territory, as well as the educational needs of the students towards the choice of careers in exact sciences and to sensitize them to their personal professional development and growth.

Technique to be used: Group reflection. Brainstorming

Contents to be addressed:

- Risk factors that from the social context and the family affect the educational process in reference to the process of OP towards the choice of exact sciences careers in students.

- Potentialities of the different socializing agencies offered by the territory and the community.
- Diagnosis as a basis for orientation. Projections to deepen the diagnosis of selected students.

Responsible: Psychopedagogue

Participants: Management group

Workshop on diagnostic extension

Objective: To identify the educational needs of the students towards the choice of careers in exact sciences and to sensitize them to their personal professional development and growth.

Techniques to be used: Reflection, open dialogue

Content to be addressed:

- Personal and professional interests, motivations, aspirations and projects.
- The careers in exact sciences. Characteristics.

Person in charge: Psychopedagogue.

Participants: Management group and group of students.

Assessment of the results of the implementation of pedagogical path ways for the educational management of professional orientation towards the choice of exact sciences careers in IPVCEs.

The pedagogical paths were inserted in the strategy for vocational training and professional orientation designed in the educational institution, which also responds to the National Strategy of differentiated attention to the IPVCE, directed specifically to twelfth grade students, during the 2022-2023 school year. In the month of January 2023, the 60 students who were initially diagnosed were interviewed to know their motivation for the choice of careers in the filling out of ballots (to be carried out in the next month of February of the same year).

95.8% of those interviewed revealed that they felt more prepared and motivated to choose careers in exact sciences, because they considered that the educational management carried out by the institution and led by the management group had been positive and effective.

Meetings were held with family members, CITMA, Guantánamo University and members of the community, in which experiences and criteria were exchanged about the foundational rescue of the IPVCEs and their social purpose: to create men of science and for science and its reflection in the professional fulfillment of students.

Conclusions

Educational management in the process of OP towards the choice of exact sciences careers in the IPVCEs reveals the actions of community and territorial managers, facilitators of their training, located in the identification of deficiencies, limitations and weaknesses of OP towards the choice of exact sciences careers in the students, according to their motivational state and the internalization of the needs they have on the expansion and deepening of knowledge about the content of the various exact sciences careers.

To the extent that students know themselves and adequately assess their professional intentions and aspirations in accordance with the founding principles of the IPVCE, they can set objectives and goals that lead them to a projection of the future in accordance with the real possibilities of the community, territorial and socioeconomic context where they are located.