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ORIGINAL ARTICLE

Characterization of the motivation towards scientific research in students of the Universidad de La Habana

Caracterización de la motivación hacia la investigación científica en estudiantes de la Universidad de La Habana

Caracterização da motivação para a investigação científica em estudantes da Universidad de La Habana

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ABSTRACT

Introduction: the characterization of student motivation is essential for the work of the Undergraduate Training and Science and Technology directorates of universities, since they manage the professional training and scientific life of the institution. **Objective:** to characterize the contents and components of motivation towards scientific research in outstanding students of the Universidad de La Habana, in order to understand their motivations and derive recommendations for their empowerment in university environments. **Method:** exploratory study, with a qualitative approach and phenomenological design, carried out with a population of career students from the day course of the E Study Plan at said university, during the 2021 academic year. A non-probabilistic sample, made up of 10 students, was selected through a chain sampling strategy, directed by purposes. Primary data were obtained through telephone interviews, in response to restrictions imposed by the COVID-19 pandemic. The components were evaluated: cognitive, affective, self-evaluation and future projection. **Results:** the findings revealed the presence of intrinsic and extrinsic motives of an individual nature. The cognitive component was adequately developed, with a positive affective component; however, the self-evaluation aspect was evidenced between partially and poorly developed, while the future projection component also showed partial development. **Conclusions:** although students present a favorable motivation towards research, it is necessary to strengthen the aspects of self-assessment and future projection for comprehensive development in the scientific field.

Keywords: motivation, scientific research, university students, student scientific activity

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RESUMEN

Introducción: la caracterización de la motivación de los estudiantes resulta fundamental para el trabajo de las direcciones de Formación de Pregrado y de Ciencia y Técnica de las universidades, a partir de que en ellas se gestionan la formación profesional y la vida científica de la institución. **Objetivo:** caracterizar los contenidos y componentes de la motivación hacia la investigación científica en estudiantes destacados de la Universidad de La Habana, con el fin de comprender sus motivaciones y derivar recomendaciones para su potenciación en entornos universitarios. **Método:** estudio exploratorio, con enfoque cualitativo y diseño fenomenológico, realizado con una población de estudiantes de carreras del curso diurno del Plan de Estudios E en dicha universidad, durante el curso académico 2021. Se seleccionó una muestra no probabilística, integrada por 10 estudiantes, mediante una estrategia de muestreo en cadena, dirigido por propósitos. Los datos primarios se obtuvieron a través de entrevistas telefónicas, en respuesta a las restricciones impuestas por la pandemia de la COVID-19. Fueron evaluados los componentes: cognitivo, afectivo, autovalorativo y de proyección futura. **Resultados:** los hallazgos revelaron la presencia de motivos intrínsecos y extrínsecos de tipo individual. El componente cognitivo se mostró adecuadamente desarrollado, con un componente afectivo positivo; no obstante, el aspecto autovalorativo se evidenció entre parcialmente y poco desarrollado, mientras que el componente de proyección futura también mostró un desarrollo parcial. **Conclusiones:** si bien los estudiantes presentan una motivación favorable hacia la investigación, es necesario fortalecer los aspectos de autovaloración y proyección futura para un desarrollo integral en el ámbito científico.

Palabras clave: motivación; investigación científica; estudiantes universitarios; actividad científico estudiantil

RESUMO

Introdução: a caracterização da motivação dos estudantes é essencial para o trabalho das direções de Licenciatura e de Ciência e Tecnologia das universidades, uma vez que gerem a formação profissional e a vida científica da instituição. **Objectivo:** caracterizar os conteúdos e os componentes da motivação para a investigação científica em estudantes destacados da Universidad de La Habana, de forma a compreender as suas motivações e derivar recomendações para o seu empoderamento em ambientes universitários. **Método:** estudo exploratório, de abordagem qualitativa e de desenho fenomenológico, realizado junto de uma população de estudantes do curso diurno do Plano de Estudos E da referida universidade, durante o ano letivo de 2021. Uma amostra não probabilística, constituída por 10. estudantes, foi selecionada através de uma estratégia de amostragem em cadeia, dirigida por propósitos. Os dados primários foram obtidos através de entrevistas telefónicas, em resposta às restrições impostas pela pandemia da COVID-19. Foram avaliados os componentes: cognitivo, afetivo, autoavaliação e projeção futura.**Resultados:** os achados revelaram a presença de motivos intrínsecos e extrínsecos de natureza individual. O componente cognitivo estava adequadamente desenvolvido, com um componente afetivo positivo; Contudo, o aspeto autoavaliação evidenciou-se entre parcialmente e pouco desenvolvido, enquanto o componente projeção futura também apresentou desenvolvimento parcial. **Conclusões:** embora os alunos apresentem uma motivação favorável à investigação, é necessário reforçar os aspetos de autoavaliação e projeção futura para um desenvolvimento integral no âmbito científico.

Palavras-chave:motivação; investigação científica; estudantes universitários; atividade científica estudantil

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INTRODUCTION

Research activity in Cuban universities, as a sphere of action of any discipline, is related to the production of knowledge to find solutions to problems and needs at the local, regional and national levels, as well as to the development of integral professionals.

In coherence with the permanent need to bet on the improvement of training and to stimulate research in university students, in the year 2022, the Ministry of Higher Education[1] proposed as one of the missions of the Curriculum E, to adequately integrate research, academic and work activities, thus favoring student scientific activity. Therefore, the characterization of students' motivation is essential for the work of the Undergraduate Education and Science and Technology departments of the University of Havana (UH), since they manage the professional training and scientific life of the institution. Also, the study of motivation towards research is a contribution of Educational Psychology to social development.

In order to locate the central category of this research, several theoretical references produced in the Cuban context about the concept of motivation have been identified: in the works of Dr. Diego Jorge González Serra since 1977, Luis Alfredo González Collera[2] and Laura Domínguez García.[3] Gonzalez Serra defines: "motivation is understood as the complex integration of psychic processes that performs the inductive regulation of behavior, since it determines the direction (towards the sought goal object or the avoided object), the intensity and the sense (of approach or avoidance) of the behavior".[4]

The concept of professional motivation provided by Domínguez allows understanding and approaching the object of study of the present research: "A formation of the personality, which integrates a set of psychological components, which are referred to the knowledge that the subject has about the content of his future profession, to the affective bond he feels towards it, and also, to the aspects of self-esteem and future projection of the personality, linked to the motivational regulation in this sphere."[3]

Regarding the category Motivation to study, González Collera defines that: "It is a predominantly affective higher psychic process, which manifests itself in the relationship between the needs and dispositions to study and the cognitive reflection of the student's teaching reality, with the objective of regulating the direction, the degree of activation and support of the student's behavior. It is the cognitive assimilation of the contents provided and demanded by the school as a representative of society".[2]

The dimensions of analysis of the mentioned theoretical concepts allowed using the arsenal of categories for the interpretation of the data: contents of motives, components of the structure-function, behavioral regulation and external determinants.

For the present study, motivation towards scientific research is understood as: complex integration of psychic processes that regulates behavior and determines its direction, intensity and sense towards scientific research. The latter is understood as an exercise of rigorous and organized human thought, which implies systematic actions for the description, characterization, prediction, explanation and transformation of reality (a portion of it constituted as an object of study). In this case, the motivation to investigate contains the active, relatively autonomous and creative role of the personality of students and university graduates.[2-4,5] In this article only the dimensions of the contents and the components of the structure-function will be addressed.

On the other hand, systematized researches about human motivation towards study and professional motivation in Cuba, have been related to the study activity in different populations: in several diploma thesis of the Faculty of Psychology; in other researches of the Center for Improvement of Higher Education.[6] These studies have provided results, fundamentally in the diagnosis of motivation, regarding its orienting or content character. In the content-functioning relationship of motivation in university students are the researches of Laura Domínguez[7] and Viviana González.[8] According to the criteria of González Collera[2] diagnostic studies of the contents of personality prevail, but not so much in the aspects of the evaluation of these configurations.

Of the digitized theses carried out at the Faculty of Psychology of the UH, both undergraduate and master's and doctoral, the review covers the period between the years 1999 and 2019. They revealed that the advancement of knowledge has been in charge of the Faculty of Psychology, in liaison with other institutions such as the Central Institute of Pedagogical Sciences, the Ministry of Higher Education and the Ministry of Education, as well as other universities in the country[9] and study centers attached to various instances.

In this search, several fundamental themes have been identified: the first and most frequent is the motivational sphere as part of personality functioning. Professional motivation also appears as a category studied within the framework of educational psychology. González Collera[2] agrees that in the field of education greater efforts have been devoted to the evaluation of learning, with respect to motivational processes.

Regarding the content and functioning of motivation, the most relevant Cuban contributions come from the authors Fernando González Rey, Diego González Serra, Viviana González Maura, Laura Domínguez and Guillermo Arias.[2] Although there is no specific approach to motivation towards scientific research in these national studies, they constitute empirical antecedents of great importance, since they included samples of young people, and developed very useful dimensions of analysis, even for the discussion of the results of the present study.

Regarding the content of motives, there are two classifications with subcategories in which motivations can be grouped: intrinsic or internal and extrinsic or external. The first refers to that which is satisfied in the activity and in the appropriation of knowledge relevant to social life and work. The other grouping is related to objectives that are not part of the activity but which have in it an alternative for their satisfaction. In both of them there are typologies that accompany their meaning to make them more specific according to their orientation: social or personal/individual. There are also combinations of these categories, since human behaviors are pluri-motivated.[4-10] Fernando González[11] explains the relationship of the structure, where the contents appear as a structural component and the functions, understood as indicators of affective bond and personal elaboration.

In the present study, for an adequate methodological approach, two dimensions of analysis were declared, one for the contents and the other for the components. In addition, the following components were taken into account: cognitive, affective, self-evaluative and time perspective; used in the doctoral thesis of Domínguez[12] in which the aspects that characterize professional motivation are explained. Its indicators for evaluation are shown in the following scheme (Figure 1).

COMPONENTS OF PROFESSIONAL MOTIVATION
(Dominguez, 2022)

Cognitive: Knowledge of the profession	Affective: Emotional attitude towards the profession	Self-assessment: Assessment of personal characteristics (study and profession).	Future projection (affective cognitive elaboration of one's prospects for personal development in the professional sphere).
Adequate (appropriate information)	Positive (shows liking or satisfaction)	Development (assessment of personal characteristics with richness of content and through personal elaboration).	Development (sets mediate objectives that reflect professional tasks with emotional application, richness and structuring and determines the pathways).
Partial (incomplete information)	Negative (shows dissatisfaction and rejection)	Partially developed (contents are not presented or remain at a declarative level, reflexivity and flexibility).	Partially developed (sets out mediated objectives with less richness, structuring and level of substantiation, does not argue the pathways)
Insufficient (little information or no knowledge of aspects)	Ambivalent (expresses positive and negative elements	Not developed (reduced to the enumeration of some qualities, negative association)	Not developed (it is reduced to the enumeration of certain objectives without emotional involvement in their achievement, it does not determine pathways).

Figure 1 Indicators for the evaluation of the components of professional motivation

The indicators presented above were also used in García Fonseca's research.[13] His results show poor structuring of these elements in the process of professional choice, although the strong affective bonding of young people with their careers is highlighted.

With this theoretical basis, the objective of characterizing the contents and components of the motivation towards scientific research of a group of outstanding students in this field at the UH during the period 2021-2022 was addressed.

METHOD

The qualitative methodological route was selected, with a phenomenological design, in a process of flexible inquiry. The population was composed by all the students of the daytime course, who were studying the Plan of Studies E at the University of Havana, during the 2021 course.

A non-probabilistic sample was constituted, directed by purposes and in chain or by networks.(5) Ten students from the following careers participated: Psychology, Biology, Tourism, Meteorology, Art History, Communication, Accounting, Visual Communication Design, Computer Science. Only nine careers are listed because there are two subjects that belong to Tourism. The academic years represented were: first year, 1; second year, 5; third year, 3; and fourth year, 1. 3 women and 7 men were interviewed.

The technique used was the semi-structured interview.[5] They were transcribed and proceeded to partial analysis, based on the general categories: level of general information and personal elaboration,[11] as well as those developed by Domínguez[14] for the evaluation of the components of this object.

During this process, the ethical principles of the research were respected, related to aspects such as the protection of the students' identity, access to the sample and to the field, the management of data collection procedures and their processing, the preservation of the results, among other aspects.

RESULTS

Regarding the contents of the motives for research, the university students interviewed expressed intrinsic motives, linked to scientific research, with an individual and social orientation. As an example of intrinsic motivation with individual orientation, cognitive interests towards their careers were manifested in all the interviewed students.

Research as a source of personal satisfaction is another example of motivation with individual intrinsic orientation. The intrinsic social orientation connected with the duty of the profession also emerged: "(...) more for a social contribution. I would like to do research so that the results of this research are useful and can be used in some way" (Psychology student).

Similarly, the existence of intrinsic socio-personal motives is evidenced, with a commitment to social contribution from the profession, which satisfies personal self-realization, distinguished from those oriented to the search for social recognition. Likewise, extrinsic motives with social and individual orientation are identified, specifically social extrinsic motives in three Psychology students of the sample: "I want to be part of a research in which I feel that I can contribute in a stronger way to the country project that is planned".

As individual extrinsic motivation, the search for recognition was expressed, through the obtaining of awards and the benefits derived from them: the scientific merit award is recognized by the students as a good external stimulus for research, as recognition of the research trajectory during the student's life, as a way to obtain a better job placement and to have direct access to a postgraduate program.

Motivation towards research was also expressed as a necessary vehicle to reach the goal of completing studies; that is, to be able to do the thesis: "I am always looking for new tools, to use matrices, that is, new methodologies that help me to improve methodologically and that contribute to the thesis" (Tourism student).

Likewise, it was identified as a way to achieve acceptance by others, to the extent that their value, their contribution is recognized. The students' reflection on extrinsic motivations is very interesting: "(...) many students come to me saying, I want to do such and such a thing to present myself in such and such an event, because that way I want to have good recognition" (Meteorology student).

The students interviewed expressed motives of different types. Despite the presence of social and individual classifications within the two typologies (extrinsic and intrinsic), there is no evidence of the combination. What predominate are extrinsic and intrinsic motifs of the individual type. In all cases, a positive affective association with these motives was observed.

In summary, they were associated with various aspects of the experience in university education such as: cognitive interests towards the career, source of personal satisfaction, the duty of the profession, commitment to the social contribution connected to personal self-realization. They were also related to the usefulness of research for the development of the country; as well as the search for recognition/acceptance, awards (and their benefits) and the goal of study completion.

The following is a presentation of the findings related to the components of motivation for scientific research. Regarding the personal elaboration with which the subjects express the contents, as a tendency, an adequate personal elaboration was evidenced in the interviewed students, since they are able to express their concerns about scientific research and their training process, transcending the descriptive level.

Regarding the cognitive component, it was evidenced in the knowledge that the student manifests about scientific research, its contributions to the exercise of the profession, as well as the qualities/skills/competences necessary to be a good researcher: “Cuba definitely needs scientific research. From the level that I can talk about is the tourism sector and the sector needs research to detect potentialities (...) there is no research that says how they can be developed. In general, things are done without a basis, without a scientific background, in the end what happens is that things are delayed or worsen” (Tourism student).

All the students in the sample expressed an adequate development of this component. They are able to offer solid arguments about the social usefulness of the research carried out by the professions in which they are trained. They also expressed themselves correctly about the value of science for the professional practice they will begin after graduation.

In the affective component, an enjoyment for the content of the activity was identified: “I have always liked to do a lot of research. I have loved research since I was a child” (Meteorology student). The tendency in the group expressed an affective attachment to scientific research in a positive way.

Finally, in the self-evaluative component, a word cloud (Figure 2) was elaborated to represent the qualities mentioned by the interviewed subjects. The size of the letter in the characteristics increases as their frequency of appearance increases, so that those with the largest font number were the most repeated.

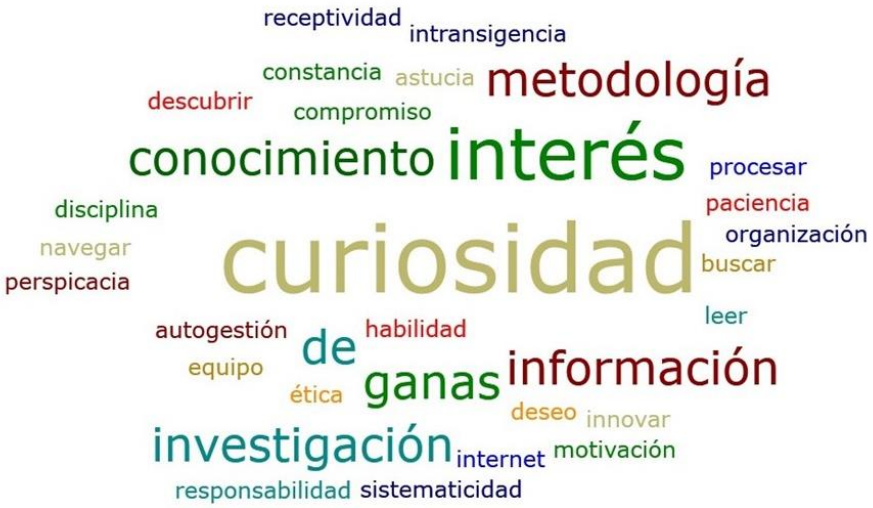

Figure 2 Word cloud with characteristics of a researcher

Receptivity, intransigence, constancy, astuteness, methodology, discover, commitment, knowledge, interest, process, discipline, patience, navigate, curiosity, organization, insight, search, self-management, read, team, ethics, desire, information, desire, innovate, research, internet, motivation, responsibility, systematicity.

In the authors' opinion, the most evident arguments in this sense were expressed by the Social Communication student: “The first thing you have to have is interest, and then comes the question of preparation. Acquiring the tools with which you are going to be able to develop the research process with quality. From there comes the knowledge of research methodology. To be intransigent, to be constant, because practice makes perfect, and it is impossible for research to cover all existing knowledge, because every day new technologies, new techniques, new knowledge emerge that require studies that provide a scientific and credible basis for society, Teamwork. I think this is very important.

Although some referred to the figure of outstanding professors, only one Accounting and Finance student, successful in research, reflected on using an ideal close to him to be compared and self-evaluate his training. In this regard, he said: “I compare myself with the secretary of teaching and research who was there before me, who graduated this year and won the scientific merit award. I compare myself with her and say: I still have a long way to go (...). I compare what I was doing in my first year and I say: “ugh”, how I have learned (...) I feel much more prepared to do and defend a thesis now than I was in my first year”.

The development of this component was also expressed in the student's ability to identify how close or far he/she is from the profile of a good researcher, central to be able to orient himself/herself in terms of self-development. Most of the students interviewed were able to develop self-criticism, identifying the insufficiencies with respect to research training. In the 10 subjects, reflection on unachieved elements predominated. The evaluation was more oriented towards what they still need to learn with respect to the skills or competencies achieved.

In general, there is poverty in the aspects provided and there was no deepening of the aforementioned issues. In addition, they quickly moved from the analysis of the personal situation to a discourse that delves into others, into the students' collectivity.

Difficulties were identified in the awareness of the importance of scientific research in careers, and the recording of the most important results of a study. They recognized deficiencies in the use of scientific language, in the procedures for processing quantitative data and, in particular, in the use of statistical programs. They reported little preparation for access to the field and the use of the instrumental arsenal for data collection. Finally, associated with the communication of results, the writing of articles was found to be an underdeveloped skill.

In summary, as a tendency, the development of self-evaluation in the sample was mostly associated with study contents; only in one case was it oriented towards the profession. In most of the subjects (8 out of 10) there was little personal elaboration in the analysis of research qualities and skills. This also occurred in the case of flexibility, since they did not pronounce themselves on the origins of the negative aspects expressed. Nor did they express the search for improvement to achieve success in the research sphere. The same tendency is expressed for the flexibility indicator.

Finally, the interpretation of the levels of development of this component is offered, for which it is shown below how each subject is qualified according to the categories for the analysis. This makes it possible to present the tendency of the group. It is evident that there is a certain variety among the interviewees with respect to the development of the self-evaluative component. This essentially means that only 2 students achieve an assessment of their personal characteristics and skills formed for the research, also recognizing the aspects not achieved. In four of them a partial development is shown and in the rest little development. This was produced by a reflective and flexible analysis of their needs for improvement.

From the temporal perspective component, results will be presented on the cognitive-affective elaboration of the subject in terms of his perspectives of personal development in the paths of science. This is expressed in the construction of future projects involving research as a means to achieve them. Its structure is determined on the basis of the objectives set, the strategy conceived, the temporality and the foresight of obstacles for the fulfillment of the projects. It is expressed through the subject's elaboration of his or her personal development perspectives in the professional sphere.

All the subjects who participated in this study identified goals linked to the research. These included becoming a master's or doctoral candidate, working in a research center, being part of the faculty/institute faculty, opting for the Scientific Merit Award, joining a faculty research project after graduation, founding a student association or journal, or pursuing a specialization.

It is important to note that some actions were identified to materialize their goals, although there is no certainty regarding the time frame necessary for their fulfillment. On the other hand, there is also no deep reflection on the foreseen obstacles.

An example that integrates all these elements in a summarized form was evidenced in the speech of the Meteorology student: “Yes, I want to be a master and I want to be a doctor. I need research thesis, for one and for the other, for both, And to finish graduating. So research is the constant line. I hope it will be before I'm 30 (...) I'm already soaking up what the credits are. (...) Keep studying, don't lose the rhythm, and don’t lose the vision.”

What are the main obstacles that students foresee that may affect the achievement of their projects? As impediments to carrying out the projects dreamed by the students, most of them have been identified as aspects external to the subjects. Only one young woman out of the 10 students suggests as an obstacle a weakness recognized in her: procrastination. The rest mentioned aspects in others and in institutional processes. Several drawbacks have been described: the effective support of parents in the face of the complex economic situation of the country at present, few possibilities of satisfying the needs with the salary of recently graduated professionals, the concern for the affective climate in work environments, the lack of resources to carry out research and working conditions in the faculties, the lack of institutional support for research in the work entities where the graduates are placed and the difficulty of obtaining the desired job placement.

In general, the obstacles referred to the work life after graduation from the university careers represented by the interviewed subjects: “(...) you cannot work at the same time as the university; you cannot dedicate yourself to something else. Then the economic situation closes (...) I start thinking at home that I want to contribute to my family, that I want to do my own things and I have no way. The lack of resources may limit you in some sense, not having the measurements, data, tools, internet (a full internet) that you may need one day to do a strong research” (Meteorology student).

As mentioned before, the reflection on the four aspects in which this component was organized is getting poorer, in descending order, in the same order in which they have been presented. From the subjects' discourse it was possible to identify the level of development of future projection, using the three categories described in the literature on professional motivation in university students. It is important to emphasize that in all cases a positive affective link with the projects was appreciated.

To mark the tendency of the group, it can be expressed that there was a partial development of this component in all the students interviewed. Beyond some differences, albeit minimal, in the testimonies collected, despite the fact that they stated their objectives, the rest of the elements were presented with poor arguments. The level of substantiation was not adequate and, in addition, there was not total certainty about the actions or the times to be carried out for the achievement of the projects.

DISCUSSION

With regard to the content of the motives, there was a predominance of extrinsic and intrinsic motives, although of an individual type; in both cases a positive affective link with these motives was observed. However, in most of the research that has been carried out since the 1980s on motivation to study and professional motivation, extrinsic motives predominate in relation to study.[7,12,13] A greater diversity of motives is a great strength, and it can be hypothesized that this is a benefit with respect to the consolidation of professional motivation.

With respect to the components, the most relevant information of this study has been represented in the following scheme (Figure 3):

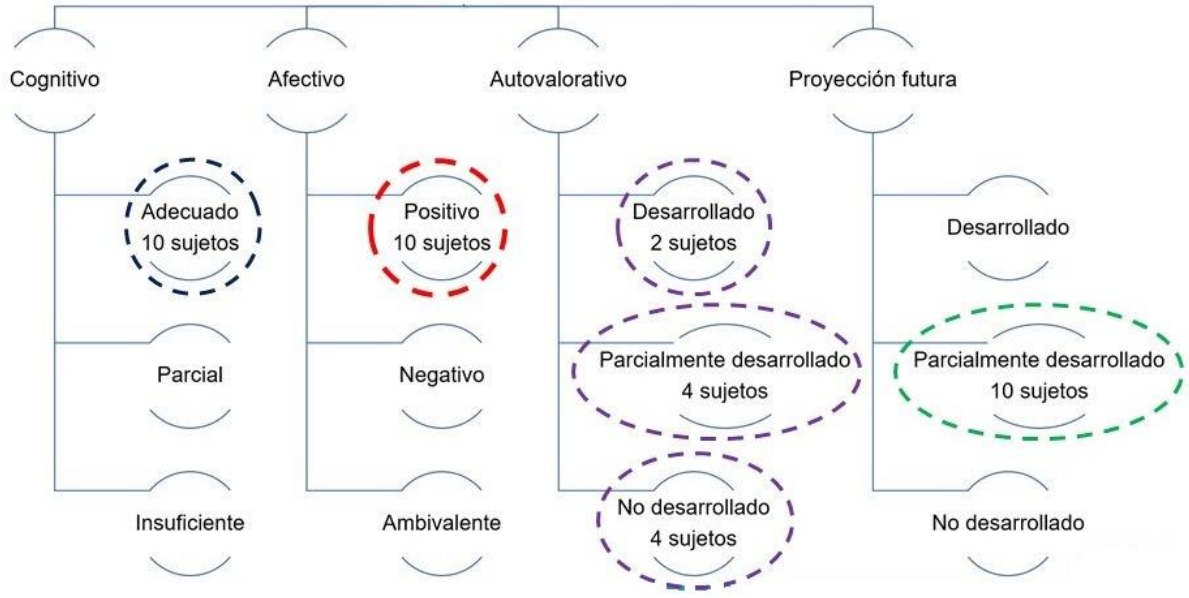

Figure 3 Behavior of the components of motivation in the sample of students interviewed.

Cognitive	Affective	Self assessment	Future projection
Adequate 10 subjects	Positive 10 subjects	Developed 2 subjects	Developed
Partial	Negative	Partially developed 4 subjects	Partially developed 10 subjects
Insufficient	Ambivalent	Not developed 4 subjects	Not developed

As previously shown, the components in which an optimal development was appreciated are the cognitive and affective ones. In this sense, strength was found in the personal development manifested in the knowledge expressed, as well as in the positive affective bond towards research activities and the value of science expressed in the contributions of each profession to the development of the country.

The self-esteem element is where the greatest diversity was expressed and only two subjects showed an adequate development in this aspect. Finally, for the future projection component, a partial development was recorded. In the aforementioned studies, regarding professional motivation, the partial cognitive component was observed, the positive affective component, but it can also be ambivalent or negative, and the self-evaluative and future projection components are not developed.[7, 12, 13]

In the present study, a connection was found with four of the categories proposed for the approach to self-evaluation in González Rey's work.[11] These are: a) humanistic qualities expressed in the desire to contribute to society; b) volitional qualities, which are oriented to the profession such as constancy; c) an adequate intellectual attitude towards research, evidenced by a reflective and scientific attitude; and d) cognitive orientation with the expression of the desire and need to know. Here, a weakness was expressed by the lack of personal elaboration manifested in personal characteristics associated with qualities in the face of research.

On the other hand, in the case of aspects of future projection, the empirical contributions systematized by Domínguez[15] affirm that, in samples of university students, the projects have contents of study and profession, which coincides with the findings of the present research. The strategies to achieve the objectives are not very structured and as for the time of achievement, it is presented in different ways. In this sense, a connection of this study with those results is found, starting from a medium term mentioned (up to 5 years), since during that time the undergraduate training is completed. Finally, the identification of obstacles in the present study is something that coincides with what Domínguez[15] recorded, evidencing a reflection that, in essence, recognizes aspects external to the subject.

In this case, the poor structuring of projects associated with scientific research was identified as a weakness of the students. Personological characteristics that are not in their optimal state, and that determine the development of the components mentioned above, could be trained through educational and professional orientation workshops. This reinforces the value of Educational Psychology in the prevention of problems in teaching contexts.

CONCLUSIONS

Intrinsic and extrinsic motives were identified in the UH students interviewed, predominating in both classifications those of individual type, such as cognitive interests towards the career and source of personal satisfaction.

Of the components of motivation it can be expressed that the cognitive is the only one that is in an adequate state. A positive affective component is also expressed. This is not the case for the self-evaluative aspect, since it only shows a partial to a poor development. Likewise, the future projection component is partially developed.

In addition, new aspects for research appeared that should be addressed, due to the broad connections that the topics of job placement and graduate follow-up, as well as the formation of research competencies with motivation, have.

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