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Cognitive Profile and Academic Performance in First Semester Students of the FECYT UTN

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Abstract

The academic performance of the first semester students is usually the best indicator of learning and adaptation to the new university environment. From cognitive psychology, it is known that internal processes of a cognitive nature such as general intellectual capacity and specific skills, as well as non-cognitive processes: the perception of self-efficacy, motivation and expectations, among others, affect learning. The main objectives of the research are focused on knowing the relationship between cognitive profile and academic performance in students of the first semester of the FECYT-UTN, with an N = 395, through an exploratory and correlational study on cognitive processes and their linkage with academic performance. To know the cognitive profile, the CogniFit digital platform was used, through the General Cognitive Assessment, which accurately evaluates a wide range of skills and identifies weaknesses and strengths in the areas of attention, memory, coordination, perception and reasoning. A non-significant relationship of academic performance with the cognitive profile of the students was found, thus opening up a myriad of questions regarding their high academic performance and the cognitive deficiencies found in certain skills and one of them was to make a comparison between groups where a significant difference can be seen. Academic performance

Keys words: cognitive profile, academic performance, university students, cognitive abilities.

Resumen

El rendimiento académico de los estudiantes del primer semestre suele ser el mejor indicador del aprendizaje y la adaptación al nuevo entorno universitario. Desde la psicología cognitiva, se conoce que en el aprendizaje inciden procesos internos de naturaleza cognitiva como la capacidad intelectual general y las habilidades específicas, así como procesos no cognitivos: la percepción de autoeficacia, motivación y expectativas, entre otros. Los objetivos principales de la investigación se centran en conocer la relación entre el perfil cognitivo y el rendimiento académico en los estudiantes del primer semestre de la FECYT-UTN, con una N=395, mediante un estudio exploratorio y correlacional sobre procesos cognitivos y su vinculación con el rendimiento académico. Para conocer el perfil cognitivo se utilizó la plataforma digital CogniFit, mediante la Evaluación Cognitiva General, la cual evalúa de manera precisa un rango amplío de habilidades e identifica debilidades y fortalezas en las áreas de atención, memoria, coordinación, percepción y razonamiento. Se encontró una relación no significativa del rendimiento académico con el perfil cognitivo de los estudiantes, abriendo de esta manera un sinnúmero de interrogantes respecto a su alto rendimiento académico y las deficiencias cognitivas encontradas en determinadas habilidades y una de ellas fue realizar una comparación entre grupos donde sí se aprecia una diferencia significativa.

Palabras clave: perfil cognitivo, rendimiento académico, estudiantes universitarios, habilidades cognitivas

Introduction

Adequate performance in certain cognitive processes makes it easier for the university student to go through the degree training and subsequent professional performance. In this sense, it is interesting to investigate which of these processes could function as predictors of good academic performance at the beginning of the university career. Traditionally, inferences without empirical demonstration have been considered on cognitive processes during the professionalizing stage and there is no background on which processes are predictors of academic success in careers in our country (Álvarez M. Á., Morales, Hernández, & Cruz, 2015).

Lev Vygotsky considered that higher mental processes constitute human psychological systems that develop from other more basic ones that are also shared with animals. They are mediated by symbols and develop from social interaction and as a natural evolutionary consequence of brain development. In neuropsychology, reference is made to brain functions that depend on the integration areas of the cortex (Figueroba, 2017).

There is evidence to support that academic performance is the end product of the interaction between the cognitive processes of students, their family environment and the teaching skills of teachers. (Lassen). In the area of cognitive psychology and neuroscience, identifying these correlations among students can provide information on how to improve student academic achievement.

The present research is an exploratory and correlational study on the cognitive processes of first semester students of the Facultad de educación, ciencia y tecnología of the Universidad Técnica del Norte and its links with academic performance. Since there is no history of direct research

of this type, it was decided to evaluate cognitive processes in a general way, from the most basic to the most complex.

Various authors have investigated the relationships between some of these processes with academic performance. For example, De la Fuente, et al. (2017) found a positive and significant linear association between resilience (metacognitive variable), the deep learning approach and coping strategies, variables that in a complementary way significantly predicted academic performance in student's university. A model of structural equations showed that cognitive skills highly predict school performance, with cognitive flexibility, working memory and reasoning dominating in primary school, as well as language in secondary school (Demetriou, Makris, Tachmatzidis, Kazi, & Spanoudis, 2019).

Duyck, & & De Fruyt (2017) found that antecedents and cognitive factors were predictors of academic performance in most academic disciplines. In a doctoral thesis, Miñano (2009) established a set of cognitive-motivational variables that explained more than 70% of the variance in academic performance in students of ESO (Compulsory Secondary Education in Spain), where in addition to general intelligence and skills The role of learning strategies, self-knowledge, expectations and goal orientation was highlighted. Puerta Morales (2015) in a correlational study on cognitive processes and academic performance in high school students, evaluated numerous cognitive processes using neuropsychological tests, and found that only two of them significantly correlated with academic performance: sustained attention and the nominative function of language.

Scientific studies are needed to deepen and clarify the relationship between cognitive processes and academic performance. Debugging this relationship can yield valuable information for the psychoeducational and administrative treatment of students entering higher education.

On the other hand, the advancement of technology has brought new ways of studying, learning, working and intervening in the different areas in which human beings operate. Cognitive neuroscience has not escaped this vertiginous advance, since platforms for the evaluation and rehabilitation of cognitive functions have been developed, making them very popular. In a review of the main advantages and limitations of these tools, where comparison criteria were established (dissemination, adaptation of barriers and content, data processing, evidence, storage, flexibility), the platforms that achieved the highest scores were ELENA and CogniFit (Pertínez & Linares, 2015). A review of the impact of interactive teaching methodologies on the learning process states that technology-based learning environments should be applied as innovative and interactive methods, and it is discussed whether programs like CogniFit really improve academic performance or their The aim is to motivate the practice of skills (Deo, 2016).

The objective of this research is to evaluate the relationship between the cognitive profile and the academic performance of first semester students at the UTN using the CogniFit platform.

Currently, it is imperative to know through studies the different variables that mediate academic performance in students, in order to identify individual characteristics and relate them to the development of cognitive learning strategies. Along these lines, García, Hernández, & Luján (1998) found that a small number of students used cognitive learning strategies; thus, it is necessary to evaluate and relate the cognitive profile with academic performance.

Theoretical framework

Academic performance

In research carried out by Abarca and Sánchez (2005), cited in Contreras, Caballero, Palacio, & Pérez (2008), it was found that according to what the students mention, a key obstacle to low academic performance is their deficiencies in the cognitive profile, as well as insufficient

disciplinary knowledge. They found two main difficulties, not knowing how to study, finding difficulties in the skills to think and understand versus repeating, memorizing and not knowing how to learn, based on the deficiency of the use of study techniques, especially how to review and understand bibliography.

Considering the cognitive model, each subject presents their own beliefs and strategies that are part of their characteristic profile, these being important to the extent that they collaborate in the processing of information and mental representations of themselves and the environment, this making them adapt to the environment (Beck, 2000). For Lemos, Jaller, González, Díaz, & De la Ossa (2012) the existence of coping strategies, cognitive and behavioral efforts that each individual develops help to manage specific internal and external demands; In other words, each person tends to use the strategies that they master, whether they are due to learning or fortuitous discovery, which contribute to them when they are in an emergency situation and help them configure a coping style; Thus, it can be considered that this identification of adaptive schemes also influences academic performance when they enter a university educational model.

For Meltzer (2002) cited by Sánchez, Pulgar & Ramírez (2015) states that scientific reasoning skills could be one of the determining factors of learning, being important to establish the type of reasoning that each student possesses, this being as Coletta, Phillips, & Steinert (2007) mention that "the level of cognitive development is one of the best predictors of academic success". The management of learning strategies creates possibilities for students to learn to plan and organize their own learning activities and strategies such as taking notes, underlining, summarizing, drawing diagrams, using concept maps, using analogies, etc. This should constitute a need for the student to be able to make strategic use of their cognitive skills and thus achieve better academic performance (Sánchez, Pulgar, & Ramírez, 2015).

Cognitive profile

Several investigations suggest some initiatives that point to the use of cognitive learning strategies in students entering university, to seek to establish the relationship with dropout and the proper use of these strategies as a predictor of optimal academic performance (Rosário et al., 2005, Valle et al., 2006; Carbonero et al., 2006; De la Fuente et al., 2008; Knight, 2008; Rué; 2009).

The neuropsychological evaluation collaborates in the discovery of the development of cognitive skills, so in order to carry out a profile it has been necessary to observe from the real situation of each student how these skills are present. According to the creators of CogniFit they consider that "the alteration of some of the cognitive capacities or the disturbance of any of the areas of well-being may be enough to cause problems in the health and daily life of a person", without neglecting the adequate and optimal development in a learning process.

To know the cognitive profile of the students as a result of the research, the use of the CogniFit digital platform has been considered, which in its General Cognitive Assessment Battery (CAB) devotes great importance to cognitive skills of attention, memory, coordination, perception and reasoning (CogniFit, 2020).

Attention

William James in 1890 mentioned that attention is the process in which the mind takes possession in a vivid and clear way of one of the diverse objects or thought forms that appear simultaneously. The focus and concentration of consciousness are an indisputable part, making thought carry out a kind of withdrawal of various things to efficiently deal with others.

For Luria (1975) cited by Hernández (2012) attention is “the selective process of the necessary information, the consolidation of the eligible action programs and the maintenance of permanent control over their course” (p. 86). It is a source of relationship with other processes and helps the human being to discriminate and select the information that comes from various

sources, without attention it would be impossible to apprehend the world around him, organized and structured thoughts could not be presented.

On the other hand López (2018) affirms that attention "is a cognitive capacity to generate, select, direct and maintain an adequate level of activation to process relevant information" that helps to discriminate environmental stimuli with the internal states of each person, being this limited capacity and that also with the passage of time, stress or certain pathologies can deteriorate.

It is a mechanism that all human beings have to be able to discriminate, among all the stimuli that are received by those that are most relevant and indispensable to it, in education it is recommended not to exceed the maximum limits, because it will produce tiredness or fatigue, later becoming boredom and distraction (Ayuntamiento de Avilés, 2017). Attention protects against information overload in the brain, but prepares it for action, where cognition also plays a very important role. Therefore, "attention is a cognitive selection process that prepares to respond to what is presented to it, giving priority to one or the other stimulus and always in connection with other processes" (Hernández, 2012, p. 4).

Memory

Memory is a vast and widely studied topic, Braunstein (2008) discusses these questions "why the interest so universal, in all disciplines, for the time before and for its lasting effects on the subject and on culture? Why has memory fascinated the philosophical, scientific and artistic imagination ...? From a historical-cultural perspective, great authors such as Luria, Vigotsky, Smirnov, etc., have considered memory from an eminently organic development to the cultural process of conformation. Thus, González, Mendoza, Arzate, & Cabrera (2007) consider it as a process that is constituted through relationships and social practices, where language and

communication play an essential role; “It is a process and product of shared meanings by the joint action of human beings in a historical context” (p.21).

Following this position, memory is related to other processes such as perception, learning, language, thought and problem solving, while in the evocation of a memory the meaning given by a person is also brought into play to information, according to their previous learning, and therefore to their personal history (Hernández, 2012).

Human memory is a brain function that helps the human being to acquire, store and retrieve information about different types of knowledge, skills and past expressions (Cajal, 2019). According to Vásquez & Martín (2015), memory is considered any alteration of an organism that is caused by experience, the main objective being to code, store and retrieve information in an adaptive way in order to function in the environment.

It is a cognitive function that allows you to store information and memories, as well as retrieve the same when necessary, that is, it allows you to keep the processed information to retrieve it when necessary. Therefore, it is the capacity that allows learning, because if memories of the information we access were not developed, knowledge could not be acquired (Catalán, 2016).

Coordination

Coordination is the ability to perform movements efficiently, accurately, quickly and in an orderly manner; that is, it is what allows the human being to move all the muscles involved in an action (for example running) in a synchronized way in the most adapted way possible. The main brain structure related to coordination is the cerebellum, which is responsible for making coordinated movements: from walking to holding a glass. A deficiency in coordination would hinder the activities of daily life, although over time it tends to deteriorate, the best way to keep it as active as possible is through cognitive stimulation, thus helping to maintain a union and coherence between movements and feedback from the senses (CogniFit, 2020).

According to Lorenzo (2006) cited by Robles (2008), it is the set of capacities that organize and precisely regulate all the partial processes of a motor act based on a pre-established movement. It is made up of balance, rhythm, spatio-temporal orientation, motor reaction, kinesthetic differentiation, adaptation, transformation and coupling combination of movements.

Perception

Perception has been conceived as the way in which stimuli received from the outside through the senses are interpreted, however the same stimulus can be interpreted in different ways. Santiago, Tornay, Gómez, & Elosúa (2006) affirm that "all perception presents a certain degree of ambiguity. The perceptual process consists largely of deciding which of the different interpretations of a certain stimulus is the most appropriate in each specific case" (p. 48).

Gibson's ecological approach seeks to defend the theory that perception is a simple process, that is to say that information is the stimulus, without the need for subsequent internal mental processes, in each organism are the intellectual keys of perception as a mechanism of survival, therefore, perceives only what can be learned and is necessary to survive. According to Neisser's classical psychology, it becomes an active-constructive process in which the person who perceives, prior to processing the new information with the data registered in his conscience, constructs an anticipatory informative scheme, which helps him to contrast the stimulus and accept or reject it according to whether or not it fits the need to learn.

Perception, according to Gestalt, is not only subject to the information coming from the sense organs, but is in charge of regulating and modulating sensoriality. The fact of receiving the reality data indiscriminately would imply a constant perplexity in the subject, who would have to be focused on the immense volume of stimuli offered by contact with the environment (Oviedo, 2004).

Perception can be defined as the recognition and interpretation of the information that comes through the senses, also including the way in which such information is responded to, which is taken from the environment to interact with it to make it meaningful (Psychoportal, 2020).

Sensation and perception may seem to be words that assume a synonymous meaning, however, as Montagud (2020) mentions, these are words that, although true, are related to each other, do not have the same meaning, because sensation is the register of a stimulation through the senses and perception is when at the brain level (not only by the senses) an interpretation is given to said stimulus. For this process to take place, four phases are considered: detection, transduction, processing and perception itself.

Reasoning

Reasoning constitutes a basic cognitive process, by which we use and apply knowledge; If the possibility of making inferences did not occur, the human processing system would be obliged to depend on specific and even punctual knowledge for each of the situations presented to it (Psicocode, 2018).

According to Figueroba (2017), he defines it as the cognitive process by which conclusions are drawn, inferences are made and abstract relationships are established between concepts. This process can be inductive in the case that individual rules are used to reach generality, or deductive, because it draws conclusions from the general rule and the abductive that consists of making an inference as simple as possible.

Reasoning is linked to logic, where Díaz-Granados, et al. (2010), conceives it as “the science that establishes the rules by means of which the thoughts that allow reaching the truth or proposing a solution to a problem”, this being the basis to understand the meaning given to the word reasoning Carmona & Jaramillo (2010) in their master's thesis mention that it is “the way of thinking through which new judgments are obtained from others already known”.

Understanding otherwise, it is a mental activity, which occurs in certain situations in which people must associate previous knowledge with new knowledge in order to draw conclusions about it, therefore, building new knowledge (Pachón, Parada, & Chaparro, 2016).

Serna & Flórez (2013) consider that the reasoning is sometimes used for two purposes: to justify a conclusion that has been reached and the other to convince someone else to accept this conclusion; demonstrating in this way that reasoning has an implication in any act in which the human being exerts some kind of influence on the decision of others, being necessary to "be convincing" when expressing an opinion of their own.

In everyday life as well as in the university environment, decision-making is mediated by reasoning, which helps establish coherence between a problem and the solution, making it necessary in any environment that people must reason to defend, argue or refute your own idea and be able to propose solutions that adapt to each context.

Method and Materials

This study was carried out with all the first semester students of the 12 face-to-face courses of the Facultad de Ciencia Tecnología y Educación (FECYT) de la Universidad Técnica del Norte (UTN) from the period October 2019 to March 2020. A total population of N = 395 students from all university faculties with ages ranging from 18 to 33 years (mean of 20.26 years and fashion of 19 years), of which 55.95% are women and 44.05% are males. 41 participants were discarded for presenting problems with their access to institutional email.

For the correlational analysis, the following section is considered as the Null Hypothesis 1 (Ho): There isn´t significant relationship between cognitive profile and academic performance.

The Research Hypothesis 1 (Hi) responds to the following statement: There is a significant relationship between cognitive profile and academic performance.

In the ANOVA analysis of variance, the Null Hypothesis 2 (Ho) responds to this statement: There isn´t significant difference in the comparison between groups regarding the cognitive profile.

The research hypothesis 2 (Hi) for this analysis is: There is a significant difference in the comparison between groups regarding the cognitive profile.

Instrument

Online Cognitive Test: General Assessment Battery (CAB)

A correlational cross-sectional study was based on the results of an initial neurocognitive evaluation, the CogniFit Neuropsychological Evaluation Haimov, Hanuka, & Horowit (2008) performed using Online Cognitive Test: General Assessment Battery (CAB). This versatile and complete online neurocognitive assessment tool is made up of screening online questionnaire, and a general battery of clinical, scientifically validated tasks.

These tasks are designed to detect and quickly evaluate the precise functioning of the different cognitive areas, like attention and concentration, perception, memory, executive function, and coordination, as well as physical, psychological, and social well-being. These general functions were studied together with the general mean of the grades obtained at the end of the first semester.

This cognitive function test lasts about 30-40 minutes. In this time, the user or professional will complete the questionnaire about the different areas of well-being and complete the battery of neuropsychological tasks that are presented as fun brain games. The results from this assessment may be evidence of deficits in different cognitive areas

The General Cognitive Assessment (CAB) from CogniFit, uses patented algorithms and artificial intelligence (AI) technology that allow analyzing more than a thousand variables to obtain a complete cognitive profile with very satisfactory psychometric results.

The CogniFit tool has been validated by scientific studies from various countries. This makes it a robust and reliable tool to train the cognitive state of our participants. Each of the neuropsychological tasks in the General Cognitive Assessment (CAB) has been validated following a scientific methodology. Using transversal researcher designs, the evaluation received psychometric values of about .0, like the Alpha Cronbach coefficient. The Test-Retest tests reached scores of almost 1, showing the high reliability and precision. This makes it possible to guarantee appropriate psychometric characteristics for an effective evaluation of the brain and its general cognitive state. The cognitive profile in the neuropsychological report is received high reliability, consistency, and stability scores (CogniFit, 2020).

Table 1:

Validation Table

COGNITIVE ABILITIES	INTERNAL CONSISTENCY	TEST-RETEST RELIABILITY
Shifting	0,726	0,842
Divided Attention	0,866	0,85
Width of Field of View	0,806	0,998
Hand-eye Coordination	0,779	0,876
Naming	0,687	0,782
Focused Attention	1	0,905
Visual Scanning	0,862	0,922
Estimation	0,761	0,986
Inhibition	0,661	0,697
Auditory Short-term Memory	0,915	0,698
Contextual Memory	0,884	0,775
Visual Short Term Memory	0,866	0,743
Short-Term Memory	0,853	0,721
Working Memory	0,85	0,696
Non-verbal Memory	0,787	0,73
Spatial Perception	0,611	0,907
Visual Perception	0,751	0,882
Auditory perception	0,652	0,904

Planning	0,765	0,826
Recognition	0,864	0,771
Response Time	0,873	0,821
Processing Speed	0,888	0,764

Process

The evaluation was carried out as a group in the FECYT computer laboratory, where an informed consent was first released, which was delivered digitally and the participants had to send this form accepting the information provided by the researchers where they authorized the use of your results and qualifications for as part of the study. Then we proceeded to create the individual profile using the institutional email on the CogniFit platform, to assign the evaluation that was explained prior to the start to each of the participants. Once this evaluation was completed, it was carried out with the recording of the means of the students' grades.

Data were subjected to univariate analysis, descriptive statistics, correlation analysis, and analysis of variance ANOVA between groups (careers) using the standard deviation of the mean difference using the EXCEL 2106 statistical package and SPSS version 22.

The Kolmogorov - Smirnov statistic was used since N is greater than 50 to determine the assumption of normality, where it was identified that cognitive profile has a normal distribution and academic performance does not come from a normal distribution, so Spearman correlations were made , the variables were attention, memory, coordination, perception and reasoning whose mean gives us as a result the data called Cognitive profile (CP), in relation to the academic performance (AP) obtained with the mean of the grades.

Indicators of the cognitive profile factor were used to identify which of these has a relationship with academic performance using a correlation analysis.

For the ANOVA analysis we take Cognitive profile as a factor for comparison and to identify significant differences between university careers.

Results and discution

Table 2:

Normality assumption

Variables	Statistic	Sig
CP	0,039	0,167
Ap	0,106	0

Kolmogorov-Smirnov analysis is used because N> 50

In the first analysis of the assumption of normality, it was identified that P = 0.167 for the PC, so it does not have a normal distribution, and being P> 0.05, the Ho is accepted and, for the AP, the P value = 0.00 in the taking of decision the Ho is rejected. Opting for the use of the Spearman for the assumption of normality when making the correlations.

Table 3:

Correlations

		AP	CP
Mean	Correlation coefficient	1	0,038
	Sig		0,048
CP	Correlation coefficient	0,038	1
	Sig	0,048	

The table shows that (P = .038) so there is no significant correlation between cognitive profile and academic performance, accepting the Ho. 1. These data are not consistent with those found by Hernández and Pozo (1999) to highlight the role of cognitive, affective and motivational variables in academic performance. Difficulties or deficiencies in cognitive processes have a negative impact on the student's academic performance since entering university and constitute an obstacle to their professional development. This is probably due to the academic system in

which the research was carried out, in addition to the motivational and affective variants that will be part of upcoming studies recognized as well-being factors.

Table 4:

Normality assumption

Cognitive Factor	Statistics	Sig
Reasoning	0,053	0,011
Attention	0,079	0
Coordination	0,033	0,200
Perception	0,043	0,07
Memory	0,037	0,20
RA	0,106	0

Kolmogorov-Smirnov analysis is used because N> 50

Because there was no significant relationship in the first study, we chose to perform a correlational analysis between the factors that make up cognitive profile and academic performance. In the assumption of normality, P> 0.005 was obtained with respect to coordination and memory by what we proceeded to perform the correlation with these two values.

Table 5:

Correlations of the cognitive profile factors

		Reasoning	Attention	Coordination	Perception	Memory	Mean
Reasoning	Correlation coefficient	1,000	,693**	,611**	,574**	,656**	-,054
	Sig. (bilateral)		,000	,000	,000	,000	,280
Attention	Correlation coefficient	,693**	1,000	,561**	,618**	,617**	,038
	Sig. (bilateral)	,000		,000	,000	,000	,450
Coordination	Correlation coefficient	,611**	,561**	1,000	,573**	,624**	,047
	Sig. (bilateral)	,000	,000		,000	,000	,354
Perception	Correlation coefficient	,574**	,618**	,573**	1,000	,761**	,087
	Sig. (bilateral)	,000	,000	,000		,000	,084
	N	395	395	395	395	395	395
Memory	Correlation coefficient	,656**	,617**	,624**	,761**	1,000	,065
	Sig. (bilateral)	,000	,000	,000	,000		,194

Mean	Correlation coefficient	-,054	,038	,047	,087	,065	1,000
	Sig. (bilateral)	,280	,450	,354	,084	,194	

In this table we can corroborate how all the factors that make up cognitive profile are directly related in a significant way and this relationship is not evidenced regarding academic performance in this population, opening certain questions about the academic evaluation system to which students are subjected, since that the percentage of means equal to or less than 7 is 5.06%. Accepting the Ho 1 again.

Regarding the means by sex, the 221 participating women presented a mean of 348.02 points in cognitive profile, while the 174 men 353.09 points.

Regarding the results of the ANOVA analysis, significant differences are presented in relation to cognitive profile between groups, referring to the different areas to which the students belong, despite the fact that no significant differences were found in academic performance between groups. Rejecting Ho 2 and accepting Hi 2. In which it is proposed that there is a significant difference in the comparison between groups with respect to the cognitive profile.

Table 5:

General cognitive profile

Rating	Score	Percentage
Excellent	501 - 700	13,92
Very good	401 - 500	21,77
Good	301 - 400	27,09
Regular	201 - 300	23,54
Deficient	201 - 0	13,67
Total		100

The percentages obtained in the deficient and regular range should be better studied and look for more solid evidence that the evaluation system is being rigorously carried out, really trying to value the true professional capacity that the student acquires in the classroom.

According to Álvarez, Morales, Hernández, & Cruz (2015) it can be indicated that students who perform better in the process of general cognitive efficiency will be able to respond more flexibly and creatively to problems. Conversely, when reviewing problem-solving guidelines, students who perform poorly on these factors are more likely to repeat incorrect answers, which affects the overall quality of new responses and reduces the time required to obtain them. this is important in the professional training of the students of the different university careers evaluated.

Conclusions

In this study, a non-significant relationship was found between academic performance and the cognitive profile of the students. These results provide confirmatory evidence to the null hypothesis 1 Ho "There isn´t significant relationship between cognitive profile and academic performance". It was observed that attention, memory, coordination, reasoning and perception are correlated, thus forming the cognitive profile where each of these factors contextualizes a direct relationship, evidencing the abilities and characteristics of each student. However, this does not show a significant relationship regarding academic performance, being important to consider the pedagogical and evaluation system that is carried out with students entering the university, as well as external factors focused on pedagogical technique and experience and didactics of teachers, without neglecting the institutional regulations that intervene in the teaching-learning process and the direct influence with academic results.

The analyzes carried out based on research hypothesis 2 of the comparison between groups Hi “There is a significant difference in the comparison between groups regarding the cognitive

profile", corroborate notable differences in the results of cognitive profiles between the 12 careers participating in the investigation, again being evident that the cognitive profile does not have a significant relationship between groups with the academic performance, because the differences are only in the variable of the cognitive profile and not in the averages of the qualifications belonging to the variable academic performance that are very similar between races.

In addition, it is expected in a future study to define the relevance of the well-being variable (also evaluated in the Test: General Assessment Battery (CAB)) that includes three factors: the physical, psychological and social, as well as a psychological profile of this population for in this way, to be able to have a clearer picture of what is being presented regarding the factors that promote high and adequate academic performance. Also, a high percentage of students with a poor and regular cognitive profile is evident, so it would be important to carry out neurocognitive interventions to improve these skills.

Finally, it is highlighted that the research from a neuropsychological approach motivates so that the researchers interested in the subject can in future studies try to explain the phenomena that appear or manifest in this context.

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