

Self-efficacy, Learning Styles and Academic Performance in Students from Three Universities in Peru, by Gender

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Resumen

El estudio tuvo como objetivo determinar las diferencias significativas en los estilos de aprendizaje, autoeficacia y rendimiento académico percibido en estudiantes de tres universidades públicas de Perú según género, asimismo se buscó establecer las diferencias en las dimensiones de los estilos de aprendizaje: observación reflexiva, conceptualización abstracta, experiencia concreta y experimentación activa. La muestra estuvo constituida por 474 estudiantes de Educación y Psicología de las universidades públicas de Lima, Huánuco y Cuzco, 326 mujeres y 148 hombres seleccionados aleatoriamente. El diseño fue descriptivo comparativo, los instrumentos fueron la Escala de Autoeficacia Percibida Específica de Situaciones Académicas (EAPESA; Palenzuela, 1983) adaptado por Ecurra, (1989), el Inventario de Estilos de Aprendizaje construido por Kolb en 1975 adaptado por Ecurra (1992) con confiabilidad de 0.91. El rendimiento académico se determinó con los promedios percibidos de calificaciones semestrales 2017-I, de los estudiantes de la muestra. Los resultados establecieron diferencias significativas en autoeficacia según género, con un tamaño *d* de Cohen de 0.312 (IC95%:0.131-0.494) y en rendimiento académico con 0.278 (IC95%:0.096-0.459) siendo el tamaño pequeño; mientras que en los estilos de aprendizaje y sus dimensiones no se encontraron diferencias significativas

Palabras Clave: Estilos, Aprendizaje, Autoeficacia, Rendimiento Académico

Abstract

The objective of the study was to determine the significant differences in the learning styles, self-efficacy and academic performance perceived in students of three public universities of Peru according to gender, as well as to establish the differences in the dimensions of the learning styles: reflexive observation, conceptualization abstract, concrete experience and active experimentation. The sample was constituted by 474 students of Education and Psychology of the public universities of Lima, Huánuco and Cuzco, 326 women and 148 randomly selected men. The design was comparative descriptive, the instruments were the Scale of Specific Perceived Self-Efficacy of Academic Situations (EAPESA, Palenzuela, 1983) adapted by Ecurra, (1989), the Inventory of Learning Styles built by Kolb in 1975 adapted by Ecurra (1992) with reliability of 0.91. The academic performance was determined with the average percentages of semester grades 2017-I, of the students in the sample. The results established significant differences in self-efficacy according to gender, with a size of Cohen *d* of 0.312 (95% CI: 0.131-0.494) and in academic performance with 0.278 (95% CI: 0.096-0.459) with small size; while in the learning styles and their dimensions no significant differences were found.

Key Words: Learning Styles, Self-efficacy, Academic Performance

Introduction

Higher education is analyzing the multidimensional variables that are related to student learning who also during their professional training, set certain goals and face various challenges to successfully complete their career. However, one of the central problems in education is the current educational paradigm that still continues to focus the curriculum, teaching and assessment in knowledge of immediate application and not in the long term, nor does it prepare the student to develop useful skills for the student management of professional complexity in what is being formed.

Castañeda (2008) points out that the quality of academic results can be substantially improved if advances in understanding the mechanisms responsible for efficient learning are used in educational practice. Therefore, the

educational intervention can improve learning outcomes if evaluation procedures are incorporated to identify risks and prescribe improvements in mechanisms that encourage efficient student learning.

On the other hand students have their very particular ways and styles of learning and in higher education should adjust their styles to the forms of knowledge in the chosen career, since the guidelines vary in terms of structure of knowledge, technologies and products, criteria of academic excellence, methods of teaching, evaluation and research. The educational system guides in advance a series of rules that determine the skills, competences and interests that the student must possess and develop (Kolb and Kolb, 2005).

Learning styles are described as a series of cognitive, affective and physiological qualities that, by remaining relatively invariable over time, make it possible to know the

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way in which people perceive, respond and interact in learning situations (Keefe, 1988). The styles present in the students of higher education intervene in their academic adaptation and are configured mediated by multiple factors such as sex, age, orientation of the received secondary education, educational level and profession of the parents, among others (Juárez, Rodríguez and Luna, 2012; Said, Díaz, Chiapello and Espíndola de Markowsky, 2010; Silva, 2009).

All these aspects become important, where the student will adapt their predominant styles to that required by the career. Thus academic success would depend on the distance between the specific combination of styles demanded by a particular discipline and the configuration expressed in the student (Kolb, 1976). Other evidence indicates that the styles are molded during the student's passage through the university (Camarero, 2001).

It is evident one of the issues that takes strength in higher education is the research in learning styles, since it is related to student dropout rates, improve teaching practices, increase the academic performance of students and position the institution with good results in state tests that evaluate the quality of institutions and programs or careers; in this sense, information about the learning styles of students will allow designing and implementing teaching strategies that facilitate the teaching-learning process and optimize academic performance, so it is also important to demonstrate whether or not there are differences in the academic performance and the style of learning used by the student, considering gender.

An important reference is, Kolb, 1976, quoted by Kazu (2009, p.87) developed his theory of experiential learning, which is based on two dimensions: perception and processing. This author considered that people, as part of their learning process, first perceived and then processed the perceived. Kolb distinguished two types of perception, through concrete experience or through abstract conceptualization; and also considered two types of processing, through active experimentation or through reflexive observation.

As a result of the combination of the type of perception and the type of processing, four different styles are identified: accommodating, divergent, convergent and assimilating. According to Kolb, (1984), cited by Kazu (2009), learning styles are measured using a scale known as the Learning Style Inventory (LSI), which measures different forms of learning based on four types of related learning processes with others. The LSI in its original format was composed of 9 items, which was subsequently modified to a version of 12 items. The questionnaire asks the respondents to order four final phases that correspond to each of the four learning styles. The instrument scores reflect the relative emphasis of the people in the four learning orientations and allows categorization according to the corresponding learning style (Cassidy, 2004).

In Spain, extensive research has been conducted on learning styles, from diagnostics to correlation, causal and explanatory studies to determine the effect of various factors. Among some of the works carried out in Spain are those developed by Ordoñez, Rosety-Rodríguez and Rosety-Plaza (2003) and García Cué and Santizo (2008).

Said, Díaz, Chiapello and Espíndola (2010) conducted a study to determine the learning styles of 575 medical students who showed a moderate-high preference in the theoretical learning style, and moderate in the other learning styles.

Romero and Salinas (2010) in Bogotá, Colombia, worked with university students based on the theoretical model of Kolb (1984) and found that the dominant learning style of the students is divergent, characterized by their interest in others and their ability to see things from different perspectives as opposed, the grid of analysis of quantitative content used in the virtual platform of Moodle showed that the design of the course privileges the style of convergent learning.

Maureira and Bahomondes (2013) used Kolb's Learning Styles Inventory to determine learning preferences for 254 first and fourth year physical education students at UMCE and UISEK in the city of Santiago de Chile. The most frequent style of students in both universities was the divergent one. In the first year the UMCE shows a preference for the divergent and the UISEK for the divergent. There are no differences between the sexes of both institutions. It is interesting to see how professional career training guides students towards a preferred way of learning that is compatible with the profession, even when the income is different in two institutions of different nature as private and state entities.

Guillen and Perez (2016), conducted the study to determine the relationship between learning styles and academic performance of the students of the Stomatology career of the Universidad Peruana del Oriente, in 2016, where the learning style prevalent in the students were the divergent (57.1%) followed by the adapter style (24.7%), the assimilating style (11.7%) and the convergent style (6.5%). In academic performance 24.7% had a good average, 66.2% regular average and 9.1% low average. In conclusion, the results of the variable learning styles have no relation with the variable academic performance.

The second category of analysis is related to self-efficacy, since students in higher education set goals and face various challenges to meet the academic demands of their careers and for this the student must possess the skills or competencies required by the students tasks, however, possessing them is a necessary but not sufficient condition.

The concept of academic self-efficacy does not refer to the skills available to the subject, or personal resources that allow you to master the changing circumstances of the academic environment, but to the opinion that this has about what you can or cannot do with them (Bandura, 1995). This process constitutes the idiosyncratic evaluation that mediates between the situation or task, the activation of the student and his / her performance, thus at a higher level of expectations of the personal academic efficiency, the greater the effort deployed and the time dedicated to achieve the learning goals by the student of the subject (Puente, 2005).

Therefore, when talking about self-efficacy we should refer to Bandura (1997), with his "Theory of Self-efficacy" who defines as "the beliefs in one's capacity to organize and execute the actions required to handle future situations". The question we ask ourselves is whether the beliefs and

feelings that students possess regarding their own conceptions, abilities, abilities and skills lead to high or low levels of academic achievement, taking initiative in the actions they carry out and execute their actions safely and effectively.

Self-efficacy in students has an important impact on their motivation and behavior in achievement situations, because they are more easily engaged in tasks, use strategies of self-regulation of their emotions and behavior, they are persistent and have higher achievements than students who are less sure of his abilities for success (Bandura, 1997, Pajares, 1996). Low levels of self-efficacy, which involve personal goals, have to do with behaviors that inhibit the interpretation of information, indecision or hesitation, distraction, and postponement in the development of various tasks (Bandura, 1989).

Alegre (2014) conducted an investigation where he related self-efficacy and academic procrastination in university students from the city of Lima in Peru. The objective of the study was to establish the relationship between self-efficacy and academic procrastination in university students. The sample was established under the incidental non-probabilistic method and consisted of 348 university students, being 50.6% male and 49.4% female, and 70.1% belonged to private universities, while 29.9% belonged to state universities.

The Self-Efficacy and Academic Procrastination Scales were applied and the results obtained were that there was a significant negative correlation between both study variables, which meant that the higher the levels of self-efficacy of the people, this is to perceive that they have the skills and abilities to perform a certain task tended to procrastinate to a lesser extent.

Lucas-Carrasco and Salvador Carulla (2012) attributed that the degree of satisfaction that people had regarding their life was closely related to the variable of self-efficacy; This means that the degree of perception a person has regarding their abilities, skills and potentials will greatly influence the achievement of goals and objectives with the subsequent satisfaction that a person may have with respect to their own life.

On the other hand, Vinaccia, S., Quiceno, JM, Fernandez, H., Contreras, F., Bedoya, M., Tobon, S., & Zapata, M. (2014)., They stated that self-efficacy is a trial mental and does not refer precisely to the resources and skills that a person has, but to the opinion you have about what you can do with those capabilities.

In the concept of self-efficacy, three factors interact dynamically, such as personal, behavioral and environmental factors. Each person assesses their ability and ability to perform certain tasks, activities, behaviors within the framework of a specific situation and with a level of difficulty planned (Bardales, Díaz, Jiménez, Terreros and Valencia, 2006).

Bandura (1999) concluded that people perform a self-referential thought as a key aspect to have a good psychological and social functioning, these self-referential thoughts determine their levels of motivation and their way

of acting. People who set goals and strive to achieve them, would develop in different aspects of their lives, execute their actions in the time proposed and contribute to generate value to their personal lives and the organizations of which they are a part. The mental elaboration done by an individual regarding their abilities to perform a task is very important because it contributes to really having effectiveness in the activities that a person performs, favoring their personal development.

Perceived academic self-efficacy is defined as personal judgments of one's own abilities to organize and execute courses of action that lead to the types of designated educational executions (Bandura, 1977). In terms of functioning, the level of self-efficacy refers to the variation along different levels of tasks, such as mathematical problems of increasing difficulty; generality refers to the transformation of beliefs of self-efficacy to different activities, such as different academic subjects; The strength of perceived effectiveness is measured by the degrees of certainty with which one can perform certain tasks.

Some of the unique properties of the self-efficacy construct are implicit in the evaluation methodology.

- Self-efficacy implies judgments of abilities to execute activities and not personal qualities such as physical characteristics or psychological traits.
- Efficacy beliefs are multidimensional and not only contemplate one or simple disposition, they are linked to different domains of functioning.
- As there are many influences not directly dependent on a skill that can hinder or facilitate the execution of skills, self-efficacy measures are context-dependent.
- A characteristic of self-efficacy measures, related to the force dimension, in its dependence on a normative criterion or other different criteria.
- Self-efficacy is measured before students perform the relevant activities.

Bandura (1977) postulated that self-efficacy beliefs influence the level of effort, persistence and selection of activities. Students with a high sense of effectiveness to complete an educational task will participate with greater willingness, will strive harder and persist for longer than those who doubt their abilities in the face of difficulties. The global findings of sectional, longitudinal and experimental studies coincide in demonstrating that beliefs in personal efficacy enhance effort and persistence in academic activities. According to Edel (2003) one of the most important dimensions in the teaching-learning process is the student's academic performance. However, this is a very complex construct that tends to be related to others such as academic performance. Academic performance is the evaluation of knowledge acquired in the educational field, in other words, it is a measure of the student's abilities, which expresses what he or she has learned throughout his or her educational process.

Jiménez, 2000, cited by Edel (2003) considers that one of the indicators of the student's academic performance is the

result of the evaluation of their learning. However, this evaluation could be insufficient. Another indicator of academic performance is school grades and that is why many studies are used. In the opinion of Edel (2003), one of the variables most used or considered by teachers and researchers to approximate academic performance are the grades. On the other hand Garbanzo (2007), considers that the academic performance integrates several factors that affect the apprentice and that has to do with the student's achievement in the academic tasks, measured in terms of the grades obtained by the student in a school period. In turn, Rodríguez, Fita and Torrado, 2004, cited by Garbanzo (2007) consider that the grades obtained are an indicator that can certify the achievement and therefore, academic performance.

However, it is important to note that the grades as a measure of the teaching results are the result of both factors related to the student and related to the teacher, as well as related to the institutional and social context. In contrast, De Miguel, 2001, cited by Garbanzo (2007), warns that a distinction must be made between immediate academic performances, referred to qualifications, and mediate, referring to personal and professional achievements.

In studies carried out Prieto (2003), states that to ensure optimal performance in students is necessary to assess the learning styles as a work element at the beginning of a course to optimize the type of academic interactions that are usually maintained between students and teachers, taking into account that these interactions favor or not the performance of the apprentices, based on whether they are positive or negative.

It is from these approaches our interest to study the variables learning styles, self-efficacy and academic performance in university students to check if there are differences according to gender, for this we set ourselves the following objectives:

1. Determine the significant differences in learning styles between male and female college students.
2. Determine the significant differences in self-efficacy among male and female university students
3. Determine the significant differences in academic performance between male and female college students.

Method

The design used in this research is comparative descriptive, because it characterizes academic performance, self-efficacy and learning styles with their dimensions: reflexive observation, abstract conceptualization, active experience and concrete experience and compares them according to gender

Participants

The sample consisted of 475 students of Psychology and Education from three Public Universities of Peru: Lima, Huánuco and Cuzco, where 260 women were randomly selected representing 54.74%, while the men evaluated were 215 representing 45.26% of the total sample.

Data Collection Techniques

The instruments used were the Scale of Specific Perceived Self-Efficacy of Academic Situations (EAPESA, Palenzuela, 1983) consists of ten items with four response options ("Never", "Sometimes", "Quite a few times" and "Always"); as the score progresses, academic self-efficacy increases.

Validity and Reliability

For the systematization of results the V of Aiken was used (Aiken, 1980, Escurra, 1989), which was complemented with the use of confidence intervals, a method currently required by international standards (Penfield and Giacobbi, 2004). The analysis of the data was carried out using the ad hoc program proposed by Merino and Livia for the calculation of confidence intervals for the V of Aiken (Merino and Livia, 2009). Valid, therefore, those items whose confidence interval was above 0.50, as a minimum retention criterion (Cicchetti, 1994). And the maximum, 0.938. Likewise, confidence intervals far exceed the minimum level of 0.50, and the most demanding of 0.70.

The Inventory of Learning Styles built by D.A. KOLB in 1975 (Kolb, 1979) taking as conceptual base its experiential model. Evaluates the preference for a specific learning style, comparing the relative prevalences of a particular modality of learning among all the possible modalities defined by the model and in our environment was adapted by Escurra, M. (1992) noting that it has Content Validity by Judges criteria and Construction Validity. For the present work a linguistic adaptation was carried out, and the psychometric analysis obtained a reliability of 0.91.

The academic performance was determined with the percentages averaged of semester grades 2017-I, of the students in the sample.

Procedures

In the first place, coordination was carried out with the Directors of the education and psychology careers of the National Universities of Lima, Huánuco and Cuzco to determine the sample and set the evaluation dates.

The instruments were administered together collectively to the students in their classrooms. Before the students responded to the items, they were asked to carefully read the instructions for each test. They contributed to the application of the tests, undergraduate students trained in the application and qualification of the tests. The participants collaborated voluntarily and anonymously, signing the informed consent that guarantees the reliability of the data provided. The data was collected between the months of August and October 2017.

For the comparative analysis we used the t test for equality of means and the Cohen d to establish the size of the effect. The data obtained were analyzed by means of the statistical package SPSS version 22.

Results

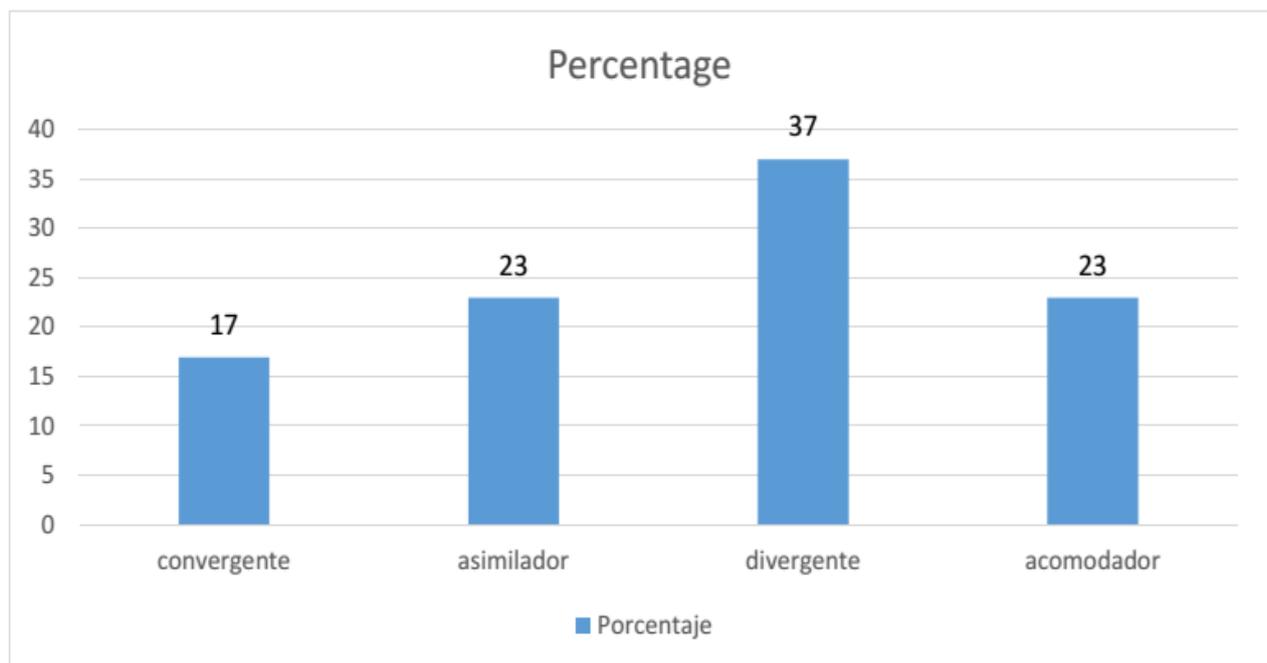
After having processed the data, the results are presented below according to the objectives of the study.

Table 1. Comparison of means on the Learning Styles, according to Gender

Variables	Gender	N	Media	Standard deviation
Reflective Observation	Woman	260	13.30	3.833
	Man	215	14.46	3.961
Conceptual.Abstract	Woman	260	15.61	3.946
	Man	215	15.49	3.996
Active Experience	Woman	260	15.56	3.989
	Man	215	15.65	4.147
Concrete Experience	Woman	260	15.45	3.974
	Man	215	15.56	3.961

In Table 1, the dimensions of the learning styles are observed, where the means are slightly higher in the female students in abstract conceptualization to differences of the

male students have slightly higher means in the dimensions of reflexive observation, concrete experience and active experimentation.

Figure 1. Percentage of Psychology and Education Students of the Universities of Huánuco, Lima and Cuzco, according to Learning Styles

Source: Results of the Learning Styles Questionnaire

In Fig.1, the percentage of students in the sample according to the learning styles is observed, where the highest percentage 37% of students present the divergent learning style, the assimilating and accommodating styles are located in a 23% respectively, being in a lesser percentage, the convergent learning style with 17%. According to the dimensions of the learning styles indicated in the study, the average is higher in active experimentation with 15.52, followed by 15.50 in abstract conceptualization, 14.62 in concrete experience and lower in reflexive observation with

14.42. Table 2 shows that on average perceived and self-efficacy the averages are higher in male university students, unlike female students.

According to the Table. 4, it is shown that there are statistically significant differences in the variables of self-efficacy and academic performance among male and female university students and according to the cohen's d, the size is small. However, in the dimensions of learning styles there are no significant differences.

Table 2. Comparison of means in perceived average and self-efficacy, according to Gender

Variables	Gender	N	Media	Standard deviation
Reflective Observation	Woman	260	13.30	3.833
	Man	215	14.46	3.961
Conceptual.Abstract	Woman	260	15.61	3.946
	Man	215	15.49	3.996

Table 3. Sample evaluated according to gender

Statisticians	Self-efficacy		Obser.Ref.		Conc.Abst.		Exp.Act.		Exp. Conc.	
	F	M	F	M	F	M	F	M	F	M
Media	18.31	19.81	14.30	14.46	15.61	15.49	15.56	15.65	15.45	15.51
Des.Estand.	5.10	4.39	3.83	3.96	3.94	3.99	3.98	4.14	3.97	3.96
Asymmetry	-0.071		-1.065		-1.144		-0.95		-0.948	
Curtosis	0.222		2.274		2.375		2.375		1.900	
Minimum	0		0		0		0		0	
Maximum	31		22		24		24		24	

Table 4. Test "t" of independent samples

Variables	t	gl	Sig (bilateral)	d Cohen	IC95% of Cohen	Size
Self-efficacy	-3.452	475	0.001	0.312	0.131-0.494	Small
performance	- 3.094	475	0.002	0.278	0.096 -0.459	Small
Academic Observ.Reflex.	-0.434	475	0.664			

Discussion

After having analyzed the data in relation to the first objective if there are significant differences in the learning styles among university students according to gender, it was found that the means are slightly higher in female students in abstract conceptualization, while male students present average slightly superior in the dimensions of reflexive observation, concrete experience and active experimentation. However, statistically, these differences according to gender are not significant.

One of the approaches that has been given to the study of learning styles is precisely the search for differences due to gender, age and cycle (Barrio and Gutiérrez, 2000). In the university field, the study of the differences in learning styles and strategies associated with gender produce matching results. The exploratory studies point out few differences in relation to the learning styles and, when they appear, they indicate a certain superiority in the theoretical style in males (Camarero, 1999, Cano, 2000, Luengo and González, 2005, Schmeck, Ribich and Ramanaiah, 1977). ; Severiens and Ten Dam, 1994).

The studies carried out with the variables gender and learning styles made by Severiens and Ten Dam (1994) only find differences in some style. Other authors do not find significant differences according to gender (Schmeck, Ribich and Ramanaiah, 1977).

In Lima, in the study conducted by Alvarez and Dominguez (2001) found significant differences among postgraduate students of a particular university according to sex, only in the dimension of concrete experience, in which women score higher than in the present study women obtained the highest score in abstract conceptualization.

Regarding the predominance of learning styles, the divergent style is higher with 37%, which indicates that the students show dominant skills that are observed in the areas of concrete experience and reflective observation,

essentially all the opposite of the convergent ones. . People with this learning style are good at capturing the whole picture and organizing small pieces of information into a coherent and meaningful whole. The divergent are usually emotional and creative, enjoy a rain of idea to reach new concepts. Artists, musicians, advisors and people with a strong interest in the fine arts, humanities and free arts often possess this style of learning.

The convergent style is that of the lowest percentage. 17% possess predominant skills in the areas of abstraction, conceptualization and Active Experimentation. However, according to psychologist David Kolb (1984), our individual learning styles emerge due to three causal factors: genetics, life experiences and the demands of the environment, for which these styles are also influenced by the educational dynamic in training such as opportunities, strategies for teaching students. The self-efficacy perceived according to the academic condition, the results showed a significant relationship, finding a high average of perceived self-efficacy and an association with gender and age variable.

Bandura (1977) postulated that self-efficacy beliefs influence the level of effort, persistence and selection of activities. Students with a high sense of effectiveness to complete an educational task will participate with greater willingness, will strive harder and persist for longer than those who doubt their abilities in the face of difficulties.

As also pointed out by Zimmerman, Kitsantas & Campilla (2005) that students' own beliefs about their ability to learn or perform effectively in a given situation, activity or task will allow for optimal learning, since self-efficacy in a mental trial as accurate. In the analysis of each of the variables there are important contributions because it allows us to know the levels in which each of the dimensions of these variables are found, thus the level of self-efficacy is adequate for the students in the sample.

In relation to the predominant styles of learning is the divergent type which shows that they perform better in

concrete things (CS) and reflective observation (OR). Its strongest point is the imaginative capacity, it stands out because it tends to consider concrete situations from many perspectives and that students work well in situations that demand the production of ideas such as demands in university education.

The average of the academic performance perceived of the students of the professional careers of Psychology and Education of the Universities of Huánuco, Lima and Cuzco, has been of 14.59, being the average in the male students of 14.64 and of the female students of 14.57. On Self-efficacy in the students of the sample, it was 19.19, being the average higher with 20.15 in the male students, unlike the female students of 18.81.

In relation to learning styles, the highest percentage 37% of students present the divergent learning style, the assimilating and accommodating styles are located in 23% respectively, being in a lower percentage 17% of the convergent learning style.

Conclusions

With the results presented, it should be considered so that in the teaching activities can be strengthened through teaching strategies, the development of cognitive processes and learning that at the same time promote the optimization of academic performance in university students. Equally in taking into account the multidimensional variables among them the cognitive, self-regulatory strategies as well as the affective aspects that influence the learning of the university students and that the evaluation of the learning outcomes in Higher Education should not only be in function to the curricular contents in an isolated way but in function to the achievement of competences according to the professional profiles in each career. Teachers' teaching strategies should be oriented towards developing and responding to the different learning styles of students, which guarantee academic success, fostering favorable professional training environments that propitiate the mastery of knowledge and the skills of skills that allow transferring learned in the university classrooms to the daily work and life itself.

Finally, promote research that allows to know and develop the agentive and non-agentive factors in the training of psychologists and educators.

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