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Diferencias en el uso de estrategias de aprendizaje en estudiantes universitarios de educación

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Abstract

Given that university students may have different ways of organizing themselves to learn, the use of learning strategies in students belonging to three education careers at the University of Cuenca was investigated. A quantitative approach was used, the CEVEAPEU questionnaire was applied to evaluate 25 learning strategies to a sample of 305 university students and the differences that may exist in the use of strategies were analyzed among: careers, year of study and gender of the students. It was found that there were significant differences in the use of 14 learning strategies among the three careers investigated; that men used more motivational and affective strategies, while women handled learning skills better; and that in the first year of studies there was a greater use of motivational strategies and those that favor memoristic learning. It is important to know how students use learning strategies, because this facilitates the design of educational strategies according to the context of the groups investigated.

Keywords: learning strategies, education careers, CEVEAPEU, gender, Ecuador.

Resumen

Dado que los estudiantes universitarios pueden tener distintas formas de organizarse para aprender, se investigó el uso de estrategias de aprendizaje en estudiantes pertenecientes a tres carreras de educación en la Universidad de Cuenca. Se usó un enfoque cuantitativo, se aplicó el cuestionario CEVEAPEU para evaluar 25 estrategias de aprendizaje a una muestra de 305 estudiantes universitarios y se analizó las diferencias que pueden existir en el uso de estrategias entre: carreras, el año de estudios que cursan y el género de los estudiantes. Se encontró que habían diferencias significativas en el uso de 14 estrategias de aprendizaje entre las tres carreras investigadas; que los hombres usaron más estrategias motivacionales y afectivas, mientras, las mujeres manejaron mejor las habilidades para aprender; y que, en el primer año de estudios hubo un mayor uso de estrategias motivacionales y de las que favorecen el aprendizaje memorístico. Es importante conocer cómo los estudiantes emplean las estrategias de aprendizaje, porque esto facilita el diseño de estrategias educativas acordes al contexto de los grupos investigados.

Palabras clave: estrategias de aprendizaje, carreras de educación, CEVEAPEU, género, Ecuador.

1. Introduction

High school students often lack compelling reading and study habits, instead relying on memorization and mechanical problem-solving, which hinders their understanding of the tissues. Therefore, they do not develop their critical and reflective capacity (Colonia & Mejía, 2015). Young people often limit themselves to following instructions given by the teacher, and this dependence does not allow them to have control over their study methods. Navarrete and López (2024) explain that there is still a predominance of the active figure of the teacher and the consequent passivity of the student.

Once young people enter the University, they find themselves in a new environment where the teacher no longer gives them instructions or guides them in their studies; they must self-regulate the pace of their preparation and learn independently. Navarrete and López (2024) indicate that teachers often overlook what happens in the classroom and to the students. Colonia and Mejía (2015) explain that these problems can cause students to experience difficulties with their academic performance, leading them to fail or drop out of their university studies.

However, during this transition, they do not know how to organize themselves to study; they are familiar with procedures that are not very efficient in achieving quality learning. In this regard, Huamán et al. (2024) mention that new university students do not have a good understanding of what they read, and soon after, they no longer remember it, nor do they have a good command of technology, which makes it difficult for them to integrate into higher Education. Bravo et al. (2020a) note that some students have low self-esteem, little confidence in their abilities, and do not possess adequate techniques to study and memorize subjects, which hinders their ability to achieve satisfactory academic performance. Therefore, Contreras (2021) says that students must adapt to the new demands of the University, learning more efficient ways of organizing themselves to achieve significant learning.

In college, Bravo et al. (2020b) explain that some careers and subjects are very rigorous and challenging; this forces young people to learn new ways that are more efficient to study, to change their study habits, and to organize themselves to make their efforts, they understand that many factors can affect their studies. They must be strategic to achieve quality learning. Aldana-Rabanales (2022) notes that the use of learning strategies becomes important as individuals gradually learn them through interaction with their peers, acquire new study methods, regulate their efforts, and employ efficient strategies to achieve their academic objectives.

Regarding learning strategies, Acevedo (2016) notes that they are mental processes that students plan to apply to a specific topic, enabling them to understand it, give it meaning, and learn from it. For Masso and Fonseca (2024), learning strategies are deliberate and planned activities that guide the actions to be taken to achieve the set objectives. When students learn to employ learning strategies consciously, they can achieve their academic objectives more efficiently and engage in meaningful learning (Rodríguez et al., 2024).

López del Río and Artuch (2022) explain that there is no single learning strategy that is inherently better than another; instead, these must be adapted to each specific task or activity intended to be performed. Vásquez (2021) suggests that students should plan and monitor their learning process, regulating the appropriate use of strategies to achieve their goals. When rational learning strategies are employed and supported by motivation and cognitive factors, students achieve better academic performance (Gavín-Chocano et al., 2024).

Gargallo et al. (2009) proposed an instrument that integrates various proposals of the time in search of a comprehensive questionnaire, which they called CEVEAPEU. This questionnaire was designed to evaluate learning strategies among

university students and was applied in Spanish universities to validate its effectiveness. Chiner et al. (2020) explain that this proposal overcomes the limitations of previous questionnaires by adapting them specifically to higher Education and integrating motivational, metacognitive, and cognitive strategies.

In its structure, the CEVEAPEU questionnaire proposes three major dimensions related to learning: wanting, deciding, and being able. The first dimension, according to López et al. (2018), is related to the student's motivation, capacity to learn, physical state, mood, and the control they can exert over anxiety and stressful situations. For Rodríguez et al. (2024), these strategies initiate the learning process and sustain the student's effort to learn. Masso and Fonseca (2024) explain that motivation helps students learn and achieve better academic performance.

The second dimension investigated by the questionnaire, deciding to learn, according to Vera et al. (2019), are strategies that are related to the recognition, control, and self-regulation that students have of their ways of learning, i.e., that they manage to monitor their progress and make adaptations to their ways of learning to achieve the academic goals they have set for themselves. Regarding metacognitive strategies, Rodríguez et al. (2024) explain that when students use them, they can monitor and control their cognitive processes. According to López et al. (2018), the use of these strategies enables students to identify their strengths and weaknesses and then decide how to optimize their learning.

The third dimension, being able to learn, implies a series of strategies that enable the student to acquire skills, process information, and better understand it, ultimately having the capacity to generate the required responses (Huamán et al., 2024). These strategies are also referred to as cognitive and involve the student's use of processes such as codification, comprehension, and evocation of knowledge for learning (Masso & Fonseca, 2024). In the CEVEAPEU questionnaire, this dimension is subdivided into two: the strategies that help students obtain quality information and those that enable them to process and use the information (López et al., 2018).

This research aims to investigate whether there are differences in the use of learning strategies among university students concerning three variables: the career to which they belong, the year of study, and the student's gender. López-Aguado (2011) justifies the need for teachers to adapt their teaching methods to the specific characteristics that their students may have, and to demonstrate this, she studied how they used learning strategies and whether there are differences in their use in the variables: career to which they belong, year of study and gender.

López-Aguado (2011) also evaluated the use of learning strategies and autonomous work and found that there are significant differences between the careers he investigated; thus, those in Engineering go deeper into their studies, those in Work Sciences use collaborative strategies, those in Education make an effort to conceptualize and are participative, those in Biology are planners, while those in Law prepare more for their exams. Regarding the career they study, Chiner et al. (2020) explain that there are differences in the use of learning strategies according to the type of studies they pursue. Also, López-Aguado (2011) found these differences in the use of learning strategies between science and education students.

Regarding the use of strategies according to the year in which they study, López-Aguado (2011) found that there is a decreasing use of extension strategies as students advance in their studies; that is, as they progress, there is less effort to delve deeper into the topics. Aldana-Rabanales (2022) explains that students transition from school learning, where they focus on memorizing and mechanically reproducing topics, to the conscious use of learning strategies and the achievement of learning based on the construction of meaning. For their part, Chiner et al. (2020) suggest that university students, as they progress in their studies, employ increasingly effective strategies.

Regarding the gender of students and whether there are differences in the use of learning strategies, Romero et al. (2024) found differences in their use between men and women. Romero (2017), in his doctoral thesis, identified eight publications that revealed differences in the use

of learning strategies based on the gender of the students. Doná et al. (2010) found differences in the use of learning strategies between men and women, especially in those related to information processing.

2. Methods

The purpose of this research was to determine whether there are differences in the use of learning strategies among university students in the following variables: degree program, year of study, and gender. For this purpose, we worked with a quantitative approach, a non-experimental cross-sectional design, and a correlational scope (Hernández et al., 2010).

2.1. Participants

The research was conducted at the University of Cuenca, Ecuador, with students from three education programs: pedagogy of national and foreign languages, basic education, and

pedagogy of mathematics and physics. The three careers totaled a population of 786 students. A random sample of 305 students was taken, which represents a confidence level of 95% and a margin of error of 4.4%. The sampling technique used was stratified, which according to Lind et al. (2008) is intended to ensure that each group of interest is represented in the sample. It was considered to obtain a sample where the three careers investigated, the gender of the students and the different years in which they are studying are represented, those students who are not regular and simultaneously take subjects at different levels are denominated as credits (Table 1).

Table 1: Characteristics of research participants
Source: Own elaboration.

Program	Gender	Año en que cursan sus estudios				Credits	Total
		First Year	Second Year	Third Year	Fourth Year		
Pedagogy of National and Foreign Languages	Men	9	6	6	7	3	31
	Women	17	10	11	10	6	54
Basic Education	Men	6	7	8	5	3	29
	Women	14	13	20	11	9	67
Pedagogía de Matemáticas y Física	Men	11	18	5	9	7	50
	Women	14	27	8	15	10	74
Total		71	81	58	57	38	305

2.2. Instrument

The research proposed the use of a questionnaire called CEVEAPEU to evaluate learning strategies in university students. This questionnaire was proposed, validated, and used by the researchers Gargallo et al. (2009), who developed it in Spanish and have widely applied it in research on this topic. The questionnaire is structured to assess three dimensions: wanting, deciding, and being able. The dimension of wanting, according

to Ortega and Mello (2020), is related to the group of motivational strategies and affective components. The second dimension, power, relates to the metacognitive strategies employed by the student and the control they have over decisions to self-regulate their learning (Beltrán, 2003). The third dimension assessed by the questionnaire, power, is related to the way students select, process, and use information to learn (López et al., 2018).

The CEVEPEAU questionnaire comprises three dimensions, divided into six subscales, which encompass 25 learning strategies and are evaluated using 88 items (Table 2). Each item is answered through a Likert scale with five response options. The questionnaire is available in the article published by Gargallo et al. (2009).

For the analysis of results, the answers given were transformed into scores, as stated in the research by López et al. (2018), as follows: strongly disagree (1 point), disagree (2 points), undecided (3 points), agree (4 points), and strongly agree (5 points).

Table 2: Structure of the CEVEPEAU questionnaire
Source: Gargallo et al. (2009) questionnaire..

Dimension	Subscale	Strategy	Item No.
Willing	Motivational strategies	Intrinsic motivation	1,2,3
		Extrinsic motivation	4,5
		Task value	6,7,8,9
		Internal attributions	10,11,14
		External attributions	12,13
		Self-efficacy and expectations	15,16,17,18
		Intelligence as modifiable	19,20
	Affective components	Physical and emotional state	21,22,23,24,
		Anxiety	25,26,27,28
Deciding	Metacognitive strategies	Awareness of objectives and evaluation criteria	30,31
		Planning	32,33,34,35
		Self-evaluation	29,36,39
		Self-regulation	37,38,40,41,42,43
	Context control, social interaction and resource management	Context control	44,45,46,47
		Social interaction and learning with peers	48,49,50,51,52,53
Being Able	Search and information selection strategies	Knowledge of sources and information search	54,55,56,57
		Information selection	58,59,60,61
	Processing and information use strategies	Information acquisition	66,67,68
		Elaboration	62,63,64,65
		Organization	69,70,71,72,81
		Personalization and creativity, critical thinking	73,74,75,76,77
		Storage. Memorization. Use of mnemonic resources	80,82,83
		Storage. Simple repetition	78,79
		Transfer. Use of information	86,87,88
		Resource management for using acquired information	84,85

2.3. Procedure

The CEVEPEAU questionnaire was transcribed into the Google Forms program, which allows users to answer surveys through digital devices. The questionnaire was administered to the students after informing them of the research's purpose, explaining the use to be made of the data they provided, requesting their voluntary participation, and obtaining their informed consent. The students completed the questionnaire

on their computers or mobile devices and took between 15 and 30 minutes.

The information was processed using the SPSS V27 package. In the analysis, it was determined that the data were not normal, so nonparametric tests were applied. To compare the two groups, the Mann-Whitney U test was applied, which was used to compare the use of learning strategies between men and women. According to Webster (2000), this test is used to contrast the equality

of two populations when the assumption of normality is not met.

To compare three or more groups, the Kruskal-Wallis test was used to compare the use of learning strategies in the three different careers

and also to compare the use of learning strategies in the different years of study. For Levin and Rubin (2004), this nonparametric test establishes whether there is equality or a difference between groups when more than two independent populations are involved.

3. Results

Regarding the use of learning strategies in the three careers investigated, Pedagogy of mathematics and physics, Basic Education, and Pedagogy of national and foreign languages, it was found that there are significant differences in 14 of the 25 learning strategies analyzed by the CEVEAPEU questionnaire, it should be considered that the score can be between a minimum of 1 and a maximum of 5 points. The analysis is presented below.

Concerning the dimension of wanting to learn, the students of the Mathematics and Physics Pedagogy career reached the highest score in three strategies: Value of the task (4.56), this implies that they give much importance to the subjects they learn; also in the strategy Self-efficiency and expectations (4.20) which indicates that they are confident in their abilities to achieve the goals they set for themselves; and, in the strategy Physical and mood state (3.33) where they consider that they are well, that they rest enough and stay encouraged to learn. Regarding the strategy of External Attributions (2.85), it is observed that some students in the Pedagogy of Foreign National Languages program believe that their success depends on chance or third parties.

On the dimension of deciding to learn, which refers to the control they have over their learning process, the students of Mathematics and Physics Pedagogy and Basic Education show a better level of use of the strategy Knowledge of objectives and evaluation criteria (3.99 for both), meaning that the students are aware of the objectives

of the subjects they take and how they will be evaluated; while, in the strategy Self-evaluation (3.86) the students of Basic Education reach the best score, indicating that the students know what their strengths and weaknesses are for studying and learning.

When analyzing the dimension of learning, which refers to the use of techniques and tools to learn, the Mathematics and Physics Pedagogy students achieve the highest score in two strategies: Knowledge of sources and search for information (3.57). This indicates that they know where to find sources of information to study, and the strategy of selecting information (3.75) evaluates the student's ability to focus on relevant information.

In the six remaining strategies, the students of the Basic Education program achieve the best scores, which reflects a higher level of use of these strategies: Acquisition of information (3.79) which indicates that students relate their notes with information obtained from other sources; Elaboration strategy (4.27) means that they read their notes and information until they achieve a good understanding of the topics they study; in the Personalization, creativity and critical thinking strategy (3.88) explains that they reflect on what they are learning in order to reach a deeper understanding of the topics.

Basic Education students also achieved the highest score in the strategy Storage, memorization and use of mnemonic resources (3.80), which indicates that they use specific techniques to

easily remember specific topics; the strategy Transfer and use of information (4.13) explains that they can apply what they have learned in real life situations, and the strategy Management of

resources to use the acquired information (3.98) means that in order to speak or write, they first structure and give form to their ideas. All this can be seen in Table 3.

Table 3: Learning strategies that have significant differences with the other careers.

Source: Own elaboration

Dimension	Learning Strategy	Pedagogy of National and Foreign Languages (Mean)	Basic Education (Mean)	Pedagogy of Mathematics and Physics (Mean)	H Kruskal-Wallis	(p)
Willing	Task value	4,19	4,5	4,56	29,76	<0,001
	External attributions	2,85	2,44	2,6	9,86	<0,010
	Self-efficacy and expectations	3,96	4,07	4,2	6,5	<0,050
	Physical and emotional state	3	3,12	3,33	9,27	<0,010
Deciding	Knowledge of objectives and evaluation criteria	3,54	3,99	3,99	23,22	<0,001
	Self-evaluation	3,61	3,86	3,83	7,04	<0,050
Being Able	Knowledge of sources and information search	3,06	3,4	3,57	22,3	<0,001
	Information selection	3,51	3,71	3,75	6,7	<0,050
	Information acquisition	3,18	3,79	3,57	23,93	<0,001
	Elaboration	3,99	4,27	4,14	9,55	<0,010
	Personalization, creativity, critical thinking	3,57	3,88	3,72	9,53	<0,010
	Storage, memorization, mnemonic resources	3,69	3,8	3,41	11,33	<0,010
	Transfer, use of information	3,79	4,13	3,95	11,63	<0,010
	Resource management to use acquired information	3,82	3,98	3,74	7,33	<0,050

When analyzing the use of learning strategies in the different years of their studies, six were identified that showed significant differences. It stands out that the highest scores for five of them were achieved in the first year.

In the dimension of wanting to learn, the strategy Intrinsic Motivation reaches the maximum value in the first year with 4.56, meaning that they arrive at the University with interest and curiosity to study and learn; the strategy Extrinsic Motivation, with a maximum of 3.59 in the first year, explains that, especially at the beginning of their university studies, they feel supported by those people who support them and are attentive to their studies.

In the dimension of learning, the strategy of information acquisition reaches its maximum value of 3.65 in the first and second years, indicating that students connect their notes with information obtained from other sources to broaden their knowledge of the subject they are studying. In the strategy of Storage, memorization, and use of mnemonic resources, they achieved the highest score of 3.75 in the first two years of their studies, which suggests that, especially at the beginning of their studies, they must memorize certain topics and apply specific techniques to aid them.

The strategy Storage and simple repetition have their highest value in the first year, reaching 3.35, which indicates that they arrive at the University with the habit of learning by heart the topics

without understanding them; with time, the use of this strategy decreases to 3.14 in the second year, 2.87 in the third year, and 2.86 in the fourth year, that is, they stop memorizing and start using strategies that favor critical thinking. The strategy management of resources to use the acquired information has the highest score in the second

year, reaching 4.02. This strategy is related to how the student prepares to use the information previously. No significant differences were found in the dimension of deciding to learn, related to metacognition and self-learning, across the different years of study (Table 4).

Table 4: Learning strategies with significant differences according to the year in which they are studying

Source: Own elaboration

Dimensión	Estrategia de Aprendizaje	Primero (Media)	Segundo (Media)	Tercero (Media)	Cuarto (Media)	H Kruskal Wallis	(p)
Querer	Motivación intrínseca	4,56	4,35	4,45	4,33	10,21	<0,050
	Motivación extrínseca	3,59	3,34	3,33	3,11	10,5	<0,050
Poder	Adquisición de la información	3,65	3,65	3,32	3,6	12,66	<0,050
	Almacenamiento, memorización, rec. mnemotécnicos	3,75	3,75	3,28	3,64	11,62	<0,050
	Almacenamiento, simple repetición	3,35	3,14	2,87	2,86	10,18	<0,050
	Manejo recursos para usar información adquirida	3,89	4,02	3,28	3,75	10,16	<0,050

When the use of learning strategies was analyzed by student gender, it was found that significant differences existed in seven of the 25 analyzed strategies.

In the dimension, wanting to learn, three learning strategies have significant differences in their level of use; in the first two, men achieve the highest score; in the strategy Self-efficiency and expectations, with 4.17, which has to do with the conviction they have of their ability to learn and achieve what they propose; the other strategy, Physical and emotional state, with 3.28, has to do with the level of rest and the feeling of wellbeing they have.

In the remaining five learning strategies, it is women who achieved the highest scores and level of use, as follows: on the Anxiety strategy, which assesses the reaction that students have to situations that cause them stress, women achieved a score of 3.67, indicating that women tend to be more nervous when taking a test or giving a presentation.

In terms of learning, women generally exhibit a higher level of utilization of these strategies than men. In the Elaboration strategy, they achieved a score of 4.21, indicating that students read their notes and other documents to understand the topics. In the Organizational strategy, they achieved a score of 3.79, indicating that they effectively underlined, used summaries, elaborated on graphic organizers, and employed other techniques to understand the topics they studied.

Regarding the strategy of Storage, memorization, and the use of mnemonic resources, women with a score of 3.78 have a higher level of use of this strategy, which means that they organize information more effectively to achieve effective learning. Regarding the strategy for managing resources to utilize the acquired information, they achieved a score of 3.93, which translates to better preparation before using the information. No significant differences were found between men and women in the dimension of Deciding to learn, related to self-learning and metacognition (Table 5).

Table 5: Learning strategies that have significant differences according to gender.

Source: Own elaboration

Dimension	Learning Strategies	Men (Mean)	Women (Mean)	U Mann-Whitney	(p)
Willing	Self-efficacy and expectations	4,17	4,05	9186	<0,050
	Physical and emotional state	3,28	3,11	9043,5	<0,050
	Anxiety	3,46	3,67	8442,5	<0,050
Being Able	Elaboration	4,03	4,21	9083	<0,050
	Organization	3,35	3,79	8076	<0,001
	Storage, memorization, mnemonic resources	3,32	3,78	7764,5	<0,001
	Resource management to use acquired information	3,68	3,93	9278	<0,050

4. Discussion

When analyzing the research findings concerning the career variable, it was found that significant differences existed in 14 of the 25 learning strategies assessed by the CEVEAPEU questionnaire.

The strategies with the highest use in the mathematics and physics course were five: Value of the task (4.56), Physical and mental state (3.33), Knowledge of objectives and evaluation criteria (3.99), Knowledge of sources and search for information (3.57) and the information selection strategy (3.75). Those with the highest use in the Basic Education course were nine: Self-efficacy and expectations (4.07), Knowledge of objectives and evaluation criteria (3.99), Self-evaluation (3.86), Acquisition of information (3.79), Elaboration (4.27), Personalization, creativity and critical thinking (3.88), Storage, memorization and use of mnemonic resources (3.80), Transfer and use of information (4.13), and the strategy of Management of resources to use information (3.98): Pedagogy of national and foreign languages had the highest score in the strategy of External Attributions (2.85).

It is observed that, in the Mathematics and Physics Pedagogy course, as in the Basic Education course, there are five strategies with the highest use in the three dimensions investigated; in the

Basic Education course, there are nine strategies most used in the three dimensions, and in the National and Foreign Languages Pedagogy course there was one with the highest score. In this regard, López-Aguado (2011) explains that many elements of the educational process, including methodologies, approaches to learning, and the way young people study, which are specific to each career, are considered in the career variable. He also found that students in technical careers are not as strategic as those in education careers and that the latter make better use of learning strategies (López-Aguado, 2011). Coincident with these results, Chiner et al. (2020) conducted their research in three careers: early childhood education, primary Education, and architecture, and found significant differences in eight learning strategies, with architecture students having a lower level of use of these strategies.

Concerning the variable, year of study, significant differences were found in six learning strategies, five of them with the highest level of use in the first year of study: Intrinsic motivation (4.56), Extrinsic motivation (3.59), Acquisition of information (3.65), Storage, memorization and use of mnemonic resources (3.75), and Storage, simple repetition (3.35), and the strategy Management of resources to use acquired information (4.02) with a higher level of use in

the second year of studies. For these six learning strategies, there is evidence of higher use in the first years of study, among them two that involve rote learning. No significant differences were found for the remaining 19 strategies.

The results of this research align with those presented by Chiner et al. (2020), which found that first-year students employed memorization strategies more frequently. Meanwhile, it differs from the findings of López et al. (2018), who found that, when comparing students in the first five semesters with those studying in the last five semesters, the latter had a higher level of use in 24 of the 25 strategies. Additionally, they conclude that young people are able to learn strategically throughout their studies. For their part, Romero et al. (2024) found no relationship between the year of study and learning strategies in their research.

When analyzing the students' gender variable, significant differences were found in seven learning strategies out of the 25 investigated; two had a higher level of use among men, and five among women. Thus, the strategies of Self-efficacy and expectations (4.17) and Physical and mood (3.28) were used more by men. In contrast, Anxiety (3.67), Elaboration (4.21), Organization (3.79), Storage, memorization, and use of

mnemonic resources (3.78), and Management of resources to utilize the acquired information (3.93) had the highest levels of use in women. Women scored higher in the Anxiety strategy and the last four strategies related to information processing, indicating that they know how to obtain, process, and utilize information more effectively to learn.

In the research of Lopez et al. (2018), females employed the External Attributions strategy, as well as three strategies related to information processing: planning, Organizing, and Managing resources to utilize the acquired information. In males, the Anxiety strategy scored the highest. López-Aguado (2011) explains that, in her study, women achieved a higher level of use of the strategies of collaboration, conceptualization, planning, exam preparation, and participation than men.

Regarding learning strategies, López et al. (2018) suggest that teachers should promote activities in their students that address individual differences and favor learning and academic achievement. For this, it is essential to understand how they learn and the strategies they employ so teachers can plan activities that maximize their students' learning and academic achievement.

5. Conclusions

From this research on the use of learning strategies by university students, the following conclusions are drawn:

Concerning the career they study, significant differences were found in 14 of the 25 strategies, highlighting that, in the career of Pedagogy of Mathematics and Physics, the strategy, value of the task, reaches the highest score with 4.65/5, which indicates that the students are motivated and give great importance to the topics they have to learn as part of their training. In the Basic Education course, the strategy of Elaboration stands out above the other courses, with a rating of 4.27/5,

indicating that students make an effort to deepen their understanding of the subjects they are learning. In the course of studying the pedagogy of national and foreign languages, the highest score among the other courses investigated is for the strategy of external attributions, with 2.85/5, indicating that students consider their results to depend on chance or third parties and do not trust their abilities.

When analyzing the variable 'year of study, significant differences were found in 6 of the 25 learning strategies investigated. Five strategies have a higher level of use in first-year students:

intrinsic motivation with 4.56/5, which explains the interest they have in pursuing their studies; the extrinsic motivation strategy with 3.59/5, indicates that they have people who support them and are attentive to them; the information acquisition strategy with 3.65/5 means that they study from various sources of information to improve their understanding of the topics. The strategy of Storage, memorization, and use of mnemonic resources received a rating of 3.75/5, indicating that they employ various techniques to memorize specific topics. Similarly, the strategy of Storage and simple repetition, with a rating of 3.35/5, means that they learn through successive repetitions without fully understanding the topic. The strategy of managing resources to utilize the acquired information reached a score of 4.02/5 in the second year of studies; this is related to how the student prepares for an exam or a presentation. No significant differences were found in the use of metacognitive strategies for this variable.

Regarding the gender variable, significant differences were found in 7 of the 25 learning strategies investigated. Men achieved the highest score in two strategies: self-efficiency and expectations, with 4.17/5, which means that they are confident in their abilities to succeed in their studies, and the second strategy, physical and mental state, where they achieved 3.28/5, where they consider that they sleep and rest sufficiently, and are encouraged to study. Women, on the

other hand, achieved the highest score in five strategies: anxiety with 3.67/5 indicates that they become more nervous when they have to take a test or make a presentation; in the elaboration strategy, they reached 4.21/5 this indicates that they carefully read their notes to understand the topics they study; in the organization strategy with 3.79/5 it means that they make graphs, diagrams and summaries which makes it easier for them to understand what they study; the strategy of Storage, memorization and use of mnemonic resources reached 3.78/5, which explains that they use specific techniques to memorize some topics; and, the strategy of resource management to use the information acquired with 3.93/5, which indicates that before answering a question they remember what they have studied and order their ideas.

It is crucial to understand how students organize themselves to study and the learning strategies they employ, as this enables teachers to design educational strategies that cater to the specific characteristics of their students.

This research was conducted in three careers of Education at the University of Cuenca. It is essential to deepen the investigation of learning strategies in order to understand how students learn in different careers that involve other areas of knowledge.

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