REVISTA CÁTEDRA

Autorregulación del aprendizaje en estudiantes universitarios: un estudio descriptivo

Self-regulation of learning in university students: A descriptive study

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Resumen

Entre las capacidades fundamentales con las que debe contar el ser humano para alcanzar un desarrollo exitoso a nivel personal, académico y profesional se encuentra la autorregulación del aprendizaje. Gestionar los recursos y estrategias en los procesos de construcción del conocimiento resulta indispensable. Solo de esa manera se puede planificar, ejecutar, monitorear y evaluar los desempeños y los resultados formativos orientados a las metas. El objetivo del presente trabajo fue determinar la autorregulación del aprendizaje en los estudiantes de la Facultad de Filosofía, Letras y Ciencias de la

Educación, de la Universidad Central del Ecuador. Esta investigación se desarrolló desde un enfoque cuantitativo y un nivel descriptivo, siendo un estudio de tipo trasversal. Los hallazgos encontrados permitieron concluir que dicho grupo de investigación presentan en su mayoría niveles bajos y medio bajos de autorregulación general. La autorregulación del aprendizaje presenta los siguientes factores: planificación, gestión de la cognición, gestión de la motivación, evaluación de la comprensión y gestión del contexto. En cada uno de ellos se pudo identificar niveles: bajos y medios bajos entre los estudiantes. Se encontraron resultados similares en el análisis por sexo y por nivel de formación. Al contrastar estos resultados con otros estudios se observó coincidencias y contradicciones. Lo cual señala la necesidad de profundizar la investigación de esta variable. Se sugiere generar innovaciones curriculares en la educación universitaria que permitan el desarrollo de la autorregulación de los aprendizajes a lo largo de su formación profesional.

Palabras clave

Autorregulación del aprendizaje, gestión de la cognición, gestión del contexto, estudiantes universitarios, evaluación de la comprensión, planificación, gestión de la motivación.

Abstract

Among the fundamental capabilities that human beings must have in order to achieve a successful personal, academic and professional development is self-regulation of learning. It is essential to manage resources and strategies in the knowledge construction processes. This is the only way to plan, execute, monitor and evaluate performance and goal-oriented training results. The objective of the present work was to determine the self-regulation of learning in students of the Faculty of Philosophy, Letters and Educational Sciences of the Universidad Central del Ecuador. This research was developed from a quantitative approach and a descriptive level, being a cross-sectional study. The findings allowed us to conclude that this research group presents mostly low and medium-low levels of general self-regulation. Self-regulation of learning presents the following factors: planning, cognition management, motivation management, comprehension evaluation and context management. In each of them it was possible to identify low and medium-low levels among students. Similar results were found in the analysis by gender and by level of education. When contrasting these results with other studies, coincidences and contradictions were observed. This points to the need for further research on this variable. It is suggested to generate curricular innovations in university education that allow the development of self-regulation of learning throughout their professional training.

Keywords

Self-regulation of learning, cognitive management, context management, university students, comprehension assessment, planning, motivation management.

1. Introduction

Undoubtedly, in any academic process the main protagonist is and should be the student. The construction and acquisition of knowledge by the learner is the raison d'être of education. Hence the importance of studying the variables involved in the achievement of learning goals. In higher or university education, research interest is focused on the same aspects. Even more, considering the importance of achieving a solid learning that will be reflected in the professional practice. "The current challenges demanded to training in higher education require placing the focus on the evidence of learning achievement in students" (García-Gajardo, Fonseca-Grandón & Concha-Gfell, 2015, p. 2).

Rosário and collaborators (2014, pp. 782-783) point out that differences in student learning outcomes cannot be attributed to intelligence. Cognitive, motivational and behavioral factors are identified. It is increasingly clear that the student has a fundamental role in his or her own learning process. The study of self-regulation in relation to other variables is fundamental to understand the learning phenomenon. In this context and as one of the key elements involved in the student's educational process is self-regulation of learning.

This construct is defined as the set of strategies that the subject possesses that allow him/her to plan, monitor and evaluate his/her learning process. The present study aims to establish self-regulation of learning in higher education students.

The academic performance and the consolidation of learning of students in teacher training is a constant concern of higher education institutions. This motivates the investigation of the dimensions of self-regulation of learning, and to describe the levels that students have in each of them.

The theory indicates that self-regulation of learning is an important mechanism that makes it possible to anticipate academic success among students. As mentioned by Hernández-Barrios and Camargo-Uribe (2017) "its relevance lies in the fact that it constitutes one of the best predictor variables of academic performance" (p. 147). Students who have high levels in the use of various self-regulation strategies obtain better results. Gaeta-González (2006) point out that "students being active participants in their own learning and being able to learn in an autonomous and self-regulated way is considered a fundamental aspect of optimal learning" (p. 2).

Another important motivation of both authorities and teachers is to offer a comprehensive training that equips future professionals not only with knowledge but also with multiple competencies. It is important to consider "the demands of the national and international context to train human resources that are prepared to face the new needs of the labor market and the globalized and multicultural context of our societies, imply a comprehensive education" (Luy-Montejo, 2019, p. 354). Among them, the ability to manage their learning processes will be key to success in the workplace, in an environment that demands to be permanently updated. Having self-regulation of learning is evidence of discipline and control of behavior and cognition, this is characteristic of responsible and committed professionals.

Addressing this research topic allows enriching scientific knowledge based on evidence in university students. Identifying what level of self-regulation of learning do students have, are there differences in this variable between men and women, and what levels do the five factors of self-regulation of learning present, will allow orienting efforts to strengthen the training plans of future teachers. As stated by Hernández-Barrios and Camargo-Uribe (2017) "this information is of central importance when designing and implementing plans, programs and actions in training scenarios that contribute to the advancement of students in their academic studies" (p. 156).

There is little information on self-regulation in higher education in the Ecuadorian context. The Pandemic caused by COVID-19, with the consequent confinement and the lack of instruments adapted to the Ecuadorian context, are identified as obstacles in this study. These challenges were overcome with institutional and participant support.

This article is structured as follows: in section 2, the literature review; that is, the contents related to self-regulation of learning. Section 3 refers to the methods and materials used in the present research, in addition, it was contrasted with research conducted by other

authors. Section 4 details the findings found after the application of the respective instrument. Section 5 details the discussion of results and section 6 describes the pertinent conclusions.

2. Literature review

2.1 The apprenticeship

Learning has been defined from different theories, for example from Behaviorism "learning is understood as those changes that occur in the behavior of people in response to the environment" (Prados, Reyna and Rey, 2014, p. 21). Thus, from social constructivism, it is considered as "the internalization of knowledge or skills through experience, exercise or study, and constitutes an essential process to integrate into society from the first years of life" (Catuara, 2018, p. 73).

Learning is a permanent process in human beings, it does not develop only in childhood, but is present throughout the life cycle. In the evolutionary course, the person makes important changes that allow him/her to integrate into the context in which he/she develops.

2.2 Self-regulation

Self-regulation is the capacity of an individual to control and manage his or her own behavior. Thus, it "implies the modulation of thought, motivation, attention and behavior, through the deliberate or automated use of specific mechanisms and support strategies" (González, 2001, p. 1). Thus, it enables the person to guide his or her goal-oriented actions over time and in different contexts.

The person, at each moment of his life, plans, executes and evaluates actions that help him to fulfill certain objectives in an efficient manner. This process is known as self-regulation.

Self-regulation is, according to Panadero and Alonso-Tapia (2014) "the control that a person executes over his or her thoughts, actions, emotions and motivation through personal strategies to achieve an established learning objective" (p. 451). In other words, all human beings can perform actions at the cognitive, attitudinal and behavioral levels to achieve the objectives they have set themselves.

2.3 Self-regulation of learning

The educational action assumes the educability of the student, his teaching and guidance towards the acquisition of skills and competencies that guarantee his adequate development, personal and professional self-realization. In this regard, López (1992) indicates that "it is important to provide the student with strategies and methods that develop self-regulation and self-control" (p. 111). The development of such capacities provides coherence between behavior and thought; that is, the person has the faculties that allow him to reflect on his actions, and in the event of requiring improvement, he has the necessary actions to correct it.

The term self-regulation of learning dates back to "the early sixties" (González, 2001, p. 4). It emerges through questions about the acquisition, appropriation of knowledge, and the autonomy that students have in their learning process. According to Kauffman et. al. (2006), it has its "beginnings in cognitive psychology, whose origin goes back to the social cognitive learning theory proposed by Bandura, assigns relevance to Reciprocal Determinism" suggesting that learning is the result of personal, environmental and behavioral factors (p. 1063).

Kaufmann et. al (2006) points out "in 1980 Albert Bandura, in his Social Learning Theory, introduces the concept of self-regulated learning, which is applied in all human activities, but specifically in the educational context" (p. 1063). The author supports Bandura's position and considers that self-regulation is a socially influenced process. It is from several investigations that the current conceptions of self-regulation in learning emerge.

González points out that Bandura's initial interest focused on self-control, understood as the capacity to exercise mastery over one's own actions in the absence of immediate external limitations. Later the author introduced the term self-regulation. This implied the establishment of a prior goal, the presence of self-evaluation and the administration of self-reinforcement, in addition to the execution of the learned response. Finally, he highlighted the role of self-efficacy defined as the self-conviction that one can successfully execute the behavior required to produce certain results. (González, 2011, pp. 3-4).

Zimmerman and Martinez-Pons (1998) expressed that self-regulation of learning derives from the metacognitive, motivated and behaviorally active activity of students as participants in their own learning processes. These authors pointed out that:

> In terms of metacognitive processes, self-regulated learners plan and organize their learning activities and self-evaluate themselves during this process. From a motivational point of view, they perceive themselves as self-efficacious, autonomous and intrinsically motivated. From a behavioral perspective, they select, structure, and create social and physical environments that enhance their learning process. (p. 284).

That is, self-regulated students make decisions and use the necessary methods to achieve the learning objectives that are established. When students are motivated, they are effective in accomplishing a task until they reach the goals, they have set for themselves.

From a broad perspective, self-regulation is the process that allows developing strategies for the achievement of goals or tasks, in fact, Zimmerman (2008), considers that "it is a proactive process that students use to acquire academic skills, such as setting goals, selecting and implementing strategies and self-monitoring one's effectiveness" (p. 166). Thus, it is affirmed that the learner develops cognitive processes to achieve academic success.

Castro-Pereira points out that the capacity for self-regulation is not innate, it must be developed. The subject must be empowered with means that allow the identification of maturity, motivation, psycho-social factors or intrapersonal and interpersonal processes that influence his or her behavior. (Castro-Pereira, 1989, pp. 92-93). A self-regulated student who participates in his own learning is considered a competent student.

Certainly, the subject of education is in a constant interaction with the context and information that surrounds him. Hence, Pintrich assumes that:

> *Learners are assumed to actively construct their own meanings, goals, and strategies from the information available in the external environment as well as information in their own minds (the internal environment). Learners are not just passive recipients of information from teachers, parents, or other adults, but rather active, constructive meaning makers as they go about learning.* [Se supone que los alumnos construyen activamente sus propios significados, objetivos y estrategias a partir de la información disponible en el entorno externo, así como de la

> información en sus propias mentes (el entorno interno). Los alumnos no son meros receptores pasivos de la información de los profesores, los padres u otros adultos, sino que son creadores activos y constructivos de significados a medida que van aprendiendo] (Pintrich, 2000, p. 452).

Thus, self-regulation of learning is an active process, in which "the subjects establish the objectives that guide their learning, trying to monitor, regulate and control their cognition, motivation and behavior with the intention of achieving them" (Rosário, et al, 2010, p. 829). (Rosário, et al, 2010, p. 829). Biggs points out that students learn more easily when they are influenced by what they want to learn. The motives for performing a particular learning task determine the strategies to be used, and these determine the learning outcomes (Biggs, 1993, pp. 5-8).

In this regard, Boekaerts and Corno state that "there are no direct linkages between achievement and personal or contextual characteristics; achievement effects are mediated by the self-regulatory activities that students engage in to reach learning and performance goals". [There are no direct linkages between achievement and personal or contextual characteristics; achievement effects are mediated by the self-regulatory activities that students engage in to reach learning and performance goals".] (Boekaerts and Corno, 2005, p. 201). So, learners seek to complete a task by planning what strategies they will use.

However, the learner is not a born regulator of their learning or an expert in strategies so their academic success could be thwarted. "What identifies an individual as a self-regulator of his or her learning is not so much the isolated use of learning strategies, but his or her personal initiative, perseverance on task, and the competencies exhibited, regardless of the learning context." (Bandura, et al, 2001, p. 187).

Self-regulated academic learning emerged, according to Zimmerman (2001) in the mid-1980s. With the purpose of answering the question of how students come to master their own learning processes. Self-regulation of learning refers to the "self-directive process by which students transform their mental abilities into academic skills related to learning tasks" (p. 12).

Zimmerman and Schunk refer to the process by which students personally activate and sustain cognitions, affects, and behaviors that are systematically oriented toward achieving learning goals (Zimmerman & Schunk, 2011, p. 11). By setting learning goals, students create a cyclical process of self-direction by which they monitor the effectiveness of strategies and adapt their work according to their outcomes.

For the purposes of this research, self-regulation of learning is understood as a cognitive process. It facilitates the acquisition of knowledge through the intentional application of metacognitive strategies, the purpose of which is to form autonomous and motivated students in their learning process.

Panadero and Alonso-Tapia emphasize the importance of the phases of self-regulation of learning proposed by Zimmerman. These phases are planning, execution and self-reflection. (Panadero and Alonso-Tapia, 2014, pp. 451-452).

Zimmerman and Schunk point out that self-regulated learning is an effective means to improve student performance, in addition to the fact that students self-regulate in processes that consolidate their learning effectively. Thus, it is assumed that students:

> Implement effective learning strategies such as organizing material, taking notes, or reviewing;

> They set clear learning objectives;
> Monitor and evaluate their learning progress in relation to established objectives;
> They change the environments where they study so that they provide a favorable and productive environment for learning;
> Are able to maintain a sense of self-efficacy for learning;
> Seek help or assistance when needed;
> They exert effort and persistence during the learning process;
> Adjust their strategies when necessary; and
> Set new goals when they achieve any of them. (Zimmerman and Schunk, 2011, pp. 10-12).

In this review it can be seen that a critical aspect of self-regulated learning is that students have options available to make decisions about the task. Tasks require that part of their components be regulated externally (by the teacher or another more advanced student) and others by themselves. Similarly, Pintrich postulates a socio-cognitive perspective that proposes a structure of self-regulation of learning, which he systematizes in four phases (planning, supervision, review and assessment) and, at the same time, in five areas (cognitive, affective-motivational, behavioral and contextual). Helping the integration of the sub-processes involved in self-regulation that interrelate with each other and are executed differentially according to the four moments of the learning process (Pintrich, 2000, pp. 451-453).

The phases mentioned, represent for Pintrich a general sequence, but according to Cruz, et al. (2017), he states that "they do not necessarily occur in that order, but such phases can manifest themselves dynamically or simultaneously" (p. 1). The different models of learning self-regulation propose different assessment tools on learning self-regulation, one of them the ARATEX-R. Which aims to determine the "general strategies of self-regulation, the questionnaire is focused on reading texts, one of the most frequent activities in the life of university students." (Nuñez et. al, 2015, p. 10). The instrument encompasses first-order factors; in charge of addressing the intrinsic and extrinsic of the person.

The ARATEX-R presents five factors of self-regulation of learning: 1) management of planning, 2) management of cognition, 3) management of motivation, 4) assessment of understanding, and 5) management of context. Although there are different models to explain and conceptualize this process, all of them have similar features and characteristics, the factors presented below keep the substance of the postulates expressed by Pintrich and Zimmerman.

The first factor, planning management, according to Pintrich, "establishes the goals, as well as the activation of perceptions and knowledge of the task and the context of the self in relation to the task" (Pintrich, 2000, p. 3). The second factor cognition management or monitoring refers to various "monitoring processes that represent metacognitive awareness of different aspects of the self or task and context" (Pintrich, 2000, p. 3). That is, this factor seeks to have higher cognitive processes arranged in operation for a better outcome in task performance.

The third factor motivation management or control-regulation according to Pintrich alludes that the subject must make efforts to control and regulate different aspects of the self or the task and the context. Zimmerman includes the motivational factor within the planning stage. Although this factor is found in different stages, the authors agree on the importance of the subject's motivation for the achievement of the objectives proposed at the beginning of the task.

Finally, factors four and five, called: evaluation of understanding and context management, are immersed in the reaction and reflection stage according to Pintrich and self-reflection postulated by Zimmerman. These deal with the "various types of reactions and reflections on the self and the task or context." (Pintrich, 2000, p.3) in these the learner must analyze the results obtained and the possible improvements he/she can make in the future in case he/she does not achieve his/her initial goal.

3. Methods and materials

This study was framed within a quantitative research approach, considering that both the ARATEX-R data collection instrument presents the results in numerical values. The data were processed and analyzed using statistical procedures. The sampling technique was intended to generalize the results to the entire population of students of the Faculty of Philosophy, Letters and Educational Sciences of the Universidad Central del Ecuador.

The level of this research corresponded to the descriptive level, presenting the general level of self-regulation of learning, the levels in each of the five factors of this variable, as well as the distribution by sex and by training unit. The results were presented through frequencies and percentages, comparing them with the findings of other studies. The study was of a cross-sectional type, in this case the application of the instrument was carried out between June and July 2020.

The study population corresponded to 4199 students of the presential modality legally enrolled between the first and ninth semester of ten careers of the Philosophy Faculty of the Universidad Central del Ecuador. By means of simple random probability sampling, giving the possibility of participation to all elements of the population, reducing the intervention of extraneous variables that could affect the results.

The corresponding formula was applied and the execution of the operations indicated in equation 1, with a 5% error rate and 95% reliability, resulted in the need for 352 participants. Considering the quarantine situation caused by the health crisis caused by Covd-19, the instrument was applied virtually, which resulted in a significant increase in the final number of participants. After filtering the data and stratification analysis, in order to maintain a constant distribution of results by race, sex and training unit. Finally, we worked with a participant sample of 1576 students, who agreed to give the corresponding informed consent.

$$\frac{k^2 \cdot p \cdot q \cdot N}{\left(e^2(N-1)\right) + k^2 \cdot p \cdot q}$$

Ecuación 1

Where:

K: Corresponds to the 95% confidence level, 1.96.

p: is the proportion of individuals in the population that possess the characteristic under study, 0.5

q: s the proportion of individuals who do not possess that characteristic, i.e., it is 1-p, 0.5

e: the acceptable error 5%.

N: is the size of the population or universe, 4199.

The technique used was the survey through the application of the ARATEX-R questionnaire, this instrument presents 20 items that allow establishing 5 factors of self-regulation of learning and a general score of this variable. The instrument was redesigned digitally and its application was carried out through the Google forms tool, sending the link to the students' institutional e-mails. To establish the reliability of this instrument, a pilot study was carried out and the results were subjected to Cronbach's alpha statistic, from which a score of 0.931 was obtained, indicating high reliability.

The results obtained were automatically tabulated in the same computer tool and then exported to an Excel spreadsheet. After an initial debugging, the required statistical analyses were finally performed in SPSS.

Considering that the asymmetry coefficient where the values in all cases are lower and distant from zero. And the differences between the mean, mode and median are greater, the distribution does not conform to normality. Consequently, it was not possible to categorize the scores by z values, generating cut-off points based on standard deviations.

The direct scores were transformed into percentiles, and five cut-off points were determined in the distribution of each of the factors. The following levels were established: low, medium-low, medium, medium-high and high, in four of the factors of the variable (planning, cognition management, motivation management and comprehension assessment), as well as in the general score of the variable. In the context management factor, due to the characteristics of the distribution of results, it was only possible to generate three levels: low, medium and high.

4. Results

On the self-regulation of learning in general. It was found that 27.0 %, equivalent to 425 students are located in the low level. 20.4 %, that is, 321 students at the medium-low level. 29.8%, corresponding to 470 students at the medium level. 14.8%, or 233 students at the medium-high level. And only 8.1% or 127 students are in the high level. Most of the students do not have a set of adequately developed strategies that allow them to plan, monitor and evaluate their training processes for the achievement of academic goals. Evidencing limitations in the motivation in the achievement of tasks and management of the elements of the learning context.

The results in the levels of self-regulation of learning by sex. It was found among women that 26.7%, equivalent to 278 students are located in the low level. 20.6 %, that is, 214 students at the medium-low level. 29.7%, corresponding to 309 students at the medium level. 14.8%, that is, 154 students at the upper middle level. And only 8.3% or 86 students are in the high level. This gives a total of 1041 women.

Among the men, 27.5%, equivalent to 147 students, were found to be at the low level. 20 %, that is 107 students in the medium-low level. 30.1%, corresponding to 161 students at the medium level. 14.8%, or 79 students at the medium-high level. And only 7.7% or 41 students are in the high level. This gives a total of 535 men. There is no difference in the results of males and females among the participating students in relation to the general group results.

Table 1 presents the results of self-regulation of learning by training units of the education careers. The basic unit is made up of students between the first and third semesters, where 46% of them present low or medium-low levels. The professional unit is made up of students between the fourth and eighth semesters, in which 48% of the participants are between low and medium-low levels. Ninth semester students are part of the degree unit,

where 49 % are located in the low and medium-low levels. These findings show coincidence in that the majority of the sample is located at this level, regardless of the training unit to which they belong.

LEVEL	BASIC		PROFESSIONAL		QUALIFICATION	
	fi	hi%	fi	hi%	fi	hi%
Low	155	25	212	28	58	30
Medium Low	128	21	157	20	36	19
Medium	197	32	227	30	46	24
Medium High	89	14	115	15	29	15
High	46	7	56	7	25	13
Total	**615**	**100**	**767**	**100**	**194**	**100**

Table 1. Level of Self-Regulation of Learning by Training Unit. ARATEX-R Questionnaire

In relation to planning as a factor of self-regulation of learning, Table 2 shows that 20.9% present levels: medium high and high. Observing skills of establishing objectives and structuring a plan of action to achieve the learning results and the acquisition of knowledge in the different subjects in their training process. 32.7 % of the participants present medium level in the planning factor of the studied variable. 46.3 % are grouped between the medium-low and low levels, showing that they have limited skills in organizing sequences of actions and procedures that allow them to achieve specific learning objectives.

LEVEL	fi	hi %
Low	492	31.2
Medium Low	238	15.1
Medium	516	32.7
Medium High	169	10.7
High	161	10.2
Total	**1576**	**100.0**

Table 2. Level of Planning. ARATEX-R Questionnaire

Regarding the management of cognition, as shown in Table 3, 28.3% of the students obtained levels between medium-high and high. Where the use of repetition strategies, elaboration and organization of information to achieve learning is observed. The 36.4 % are located between low and medium-low levels. This allows inferring deficiencies in the use of cognitive strategies, relating new knowledge with previous knowledge. As well as metacognition guiding in a conscious way the decision making in their study processes in order to encode, store, relate and evoke information.

LEVEL	fi	hi %
Low	402	25.5
Medium Low	171	10.9
Medium	558	35.4
Medium High	129	8.2
High	316	20.1
Total	**1576**	**100.0**

Table 3. Level of Cognition Management. ARATEX-R Questionnaire

In reference to motivation management, the findings presented in Table 4 indicate that 21.6% of the student's present levels between medium high and high. Showing interest, expectations and satisfaction both in the learning itself and in the academic process and products. 53.2 % are between low and medium-low levels, showing deficiency in their intrinsic and extrinsic motivation.

LEVEL	fi	hi %
Low	499	31.7
Medium Low	339	21.5
Medium	398	25.3
Medium High	181	11.5
High	159	10.1
Total	**1576**	**100.0**

Table 4. Level of Motivation Management. ARATEX-R Questionnaire

Regarding the evaluation of comprehension, the findings shown in Table 5 show that when adding the high and medium-high levels, 25.4% of the students can be considered self-regulated in this dimension. However, adding the percentages of the low and medium-low levels, 51% are obtained. More than half of the students surveyed present deficiencies in the processes of self-evaluation of the tasks performed when analyzing texts, which limits the decision making that allows them to achieve the comprehension of these texts.

LEVEL	fi	Hi
Low	549	34.8
Medium Low	256	16.2
Medium	371	23.5
Medium High	187	11.9
High	213	13.5
Total	**1576**	**100.0**

Table 5. Level of comprehension evaluation. ARATEX-R Questionnaire

In relation to context management, it is observed in Table 6 that 45.7% of the surveyed students present a low level. This allows us to conclude that they do not plan actions in relation to the context before analyzing a text. 25.3 % have a medium level, which means that their skills to identify and control the environmental factors that may intervene in the execution of the task are in the process of development. 28.9% are at a high level, which

means that they efficiently use strategies for managing individual resources and the context when analyzing a text.

LEVEL	fi	hi %
Low	721	45.7
Medium	399	25.3
High	456	28.9
Total	**1576**	**100.0**

Table 6. Context management level. ARATEX-R Questionnaire

5. Discussion of results

According to the results obtained, it is established that most of the students have a medium-low and low level of self-regulation of learning. A fact that evidences their shortcomings in planning, monitoring and evaluation activities of their training processes and achievement of academic goals. Results that agree with the findings of Hernandez and Camargo, (2017) who state that "only a quarter of the participants (24.9 %) presented high levels in the global test." (p. 14). However, these results differ from what was found by Gravini, Ortiz and Campo (2016) who mention that "the overall results indicate that students mostly possess above average levels in their metacognitive strategies, although some differences are found by programs." (p. 326). This evidences a good level of self-regulation, an adequate active and constructive process in students to establish goals in their learning. By monitoring, regulating and controlling their cognition, motivation and behaviors.

In relation to the levels of self-regulation of learning by sex, there is no significant difference in the results obtained between male and female students. A fact that agrees with the study conducted by Chan and León, (2017) who in general terms mention that "it is neither the gender nor the language of the learners; which led to the development of a level of learning self-regulation" (p. 109). However, these results contradict what was found by Ozan, et al. who found significant differences between female and male students at the general level in self-regulation skills (Ozan, et al. 2012, p. 1810).

In relation to self-regulation of learning by training unit, no significant differences are evident, with the majority of students presenting low and medium-low levels. These results agree with Hendrie and Bastacini, (2020) who mention that: "there are no statistically significant differences in general in the average scores of learning strategies (evaluated with the LASSI) as a function of age" (p. 8).

Regarding planning as a factor in the self-regulation of learning, it is evident that most students do not possess skills related to the organization of activities. Results that coincide with Escorcia, (2010) who states that "less frequently, students evoke objectives in relation to planning (27%) and revision (18%) of writings" (p. 271).

Regarding the management of cognition, it was found that students have deficiencies in the use of cognitive and metacognitive strategies. Results that contradict what was exposed by Ozan, et al. (2012) in their research. Where the study showed that "university students' perceptions of metacognitive self-regulation, time management skills and study environment, and self-efficacy are at an average level" (Ozan, et al. 2012, p. 1810).

In reference to motivation management, the findings obtained indicate that students demonstrate levels: low and medium low in their intrinsic as well as extrinsic motivation. These results contradict those presented by Gravini, Ortiz and Campo (2016) in their study.

Where "it was found that all students in the evaluated programs scored at a high level in both intrinsic and extrinsic motivation" (p. 336).

Regarding the evaluation of comprehension, the findings indicate that adding the percentages of the low and medium-low levels, half of the students surveyed show deficiencies in comprehension when analyzing texts. These results coincide with those presented by Pardo (2015). Where he refers that before, during and after reading, students do not establish adequate processes of exploration, inspection, anticipation and evaluation of their reading process. In this sense, if the student does not use these types of strategies, the effectiveness of the comprehension and learning process through reading will not be determined (Pardo, 2015, pp. 33-36).

In the context management factor, the results evidence that most of the students surveyed do not plan actions, do not monitor, and do not reflect on the reading of a text. Findings that support what was found by Gravini, Ortiz and Campo (2016) who point out that "all the evaluated programs demonstrated a medium level, which means that only in some occasions they program and plan the moments of study by specifically determining a work place." (p. 339)

6. Conclusions

The students of the Faculty of Philosophy, Letters and Educational Sciences of the Universidad Central del Ecuador present different levels of self-regulation of learning in general, finding that most of them are located in the low and medium-low levels. This allows determining that students present deficiencies in the processes of planning, control and self-evaluation of their learning strategies to achieve their academic goals.

It was found that there are no significant differences in the levels of self-regulation of learning by sex. The majority of both male and female students present low and medium-low levels of the variable studied. The results by sex also coincide in the other levels. Coherence was found with the general levels, showing a lack of skills in the students to establish learning objectives, execute actions and monitor academic results.

No differences were found in the levels of self-regulation by training unit. The largest number of students in the basic unit, the professional unit and the degree unit presented low and medium-low levels. These results show that self-regulation is not acquired spontaneously throughout professional training. It is therefore essential to implement educational programs that promote the development of self-regulation strategies for learning.

In the planning factor, an exercise of integration with the scores: low and medium-low, it was found that most of the students are located in this segment. This evidences that they do not have an acceptable capacity to anticipate their actions and to stick them to a program that allows them to achieve their training goals. They fail to establish objectives that guide the execution of effective actions for self-learning.

Most students are located in low and medium-low levels, in the use of cognitive and metacognitive strategies in their study processes and in the achievement of learning. They present a limited capacity to relate contents, use information organization strategies and little use of knowledge construction techniques.

Of the factors of self-regulation of learning studied, the one that presents more deficiencies in the participants is the management of motivation. Most of them clearly have low and medium-low levels. The students lack willingness to make extra efforts in the learning

processes promoted both by internal stimuli and by gratifications. They do not find interest in guiding their actions oriented to internal goals or external benefits.

It was found that most of the students have low and medium-low levels in the use of self-evaluation strategies and evaluation of text comprehension. This points to the difficulties presented by the participants in critically observing their own performance and checking how much they have understood of a reading. This is replicated in the limitations in identifying and analyzing the results of the strategies used for learning.

Most of the students present low and medium-low levels in context management as a factor in self-regulation of learning. The findings indicate that students do not organize the environment, time, resources or supports that would be significant in their learning achievements.

After contrasting these results with those reviewed in similar studies, it was found that there are important coincidences, as well as contradictory results. Both in the general level, distribution by sex, level of education, as well as in each of the factors of self-regulation of learning.

Based on these findings, it is necessary to generate innovations in the training process of university students. Including in the curriculum programs aimed at the development of self-regulation of learning. Thus, contributing to the achievement of their academic and professional objectives. It is also suggested to deepen the relationship between this variable and others that participate in the learning process. For example, the association between the teaching styles of the teachers of this academic unit and the level of self-regulation of learning in the students.

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Bibliography

Bandura, A., Barbaranelli, C., Caprara, G. V., y Pastorelli, C. (2001). Self-efficacy beliefs as shapers of children's aspirations and careertrajectories. *Child Development*, 72 (1), 187–206. https://www.uky.edu/~eushe2/Bandura/Bandura2001CD.pdf

Biggs, J. (1985). The role of meta-learning in study processes. *British Journal of Educational Psychology*,55 (1),185-212. https://www.researchgate.net/publication/229763155_The_Role_of_Metalearning_in_Study_Processes

Boekaerts, M., y Corno, L. (2005). Self-regulation in the classroom: a perspective on assessment and intervention. *Applied psychology: an international review*, 54(2), 100-231. http://sohs.pbs.uam.es/webjesus/motiv_ev_autorr/lects%20extranjeras/self%20regulation.pdf

Biggs, J. (1993). What do inventories of students' learning processes really measure? A theoretical review and clarification. *British Journal of Educational Psychology*, 63, 3-19. https://www.researchgate.net/publication/14732145_What_Do_Inventories_of_Students'_Learning_Processes_Really_Measure_A_Theoretical_Review_and_Clarification

Catuara, S. (2018) Las neuronas espejo. Aprendizaje, imitación y empatía. Ed. Bonalletra Alcompas, S.L.

Castro Pereira. M. (1989), El adulto y su aprendizaje: referencias teóricas y caracterización para el aprendizaje en el contexto de la andragogía, Informe General y Conclusiones de la IX Conferencia Regional Interamericana de Andragogía. Lima, 89-118.

Chan, E., & León, E. (2017). Exploración del proceso de aprendizaje autorregulado de estudiantes universitarios mayahablantes. *Investigación educativa de la REDIECH*, 8(1)91-110. https://www.rediech.org/ojs/2017/index.php/ie_rie_rediech/article/view/37/32

Cruz, M., Cortés, P., Álvarez, N. (2017). El modelo de Autorregulación y el Aprendizaje Matemático. Congreso Nacional de Investigación Educativa, San Luis Potosí, México, https://www.comie.org.mx/congreso/memoriaelectronica/v14/doc/2072.pdf

Escorcia, D. (2010). Conocimientos metacognitivos y autorregulación: una lectura cualitativa del funcionamiento de los estudiantes universitarios en la producción de textos. *Avances En Psicología Latinoamericana*,28(2),265-277. https://revistas.urosario.edu.co/index.php/apl/article/view/1456

Gaeta-González, M (2006) Estrategias de autorregulación del aprendizaje: contribución de la orientación de meta y la estructura de metas del aula. *Revista Electrónica Interuniversitaria de Formación del Profesorado*,9(1),1-8. http://www.aufop.com/aufop/home/

García-Gajardo, F., Fonseca-Grandón, G y Concha-Gfell, L (2015) Aprendizaje y rendimiento académico en educación superior: un estudio comparado. *Actualidades Investigativas en Educación*,15(3),1-26. https://www.redalyc.org/pdf/447/44741347019.pdf

González, A. (2001). Autorregulación del aprendizaje: una difícil tarea. *IberPsicología* 6 (1),1-25. https://www.researchgate.net/publication/28059660_Autorregulacion_del_aprendizaje_una_dificil_tarea/citations

Gravini-Donado, M., Ortiz-Padilla, M. E., & Campo-Ternera, L. A. (2016). Autorregulación para el aprendizaje en estudiantes universitarios. Educación Y Humanismo, 18(31), 326-342. https://doi.org/10.17081/eduhum.18.31.1382

Hendrie-Kupczyszyn, K y Bastacini, M (2016) Autorregulación en estudiantes universitarios: Estrategias de aprendizaje, motivación y emociones. *Revista Scielo,* 44 (1), 1-18 https://www.scielo.sa.cr/pdf/edu/v44n1/2215-2644-edu-44-01-00327.pdf

Hernández-Barrios, A y Camargo-Uribe, A (2017) Autorregulación del aprendizaje en la educación superior en Iberoamérica: una revisión sistemática. *Revista Latinoamericana de Psicología,* 49(1), 146-160. https://psycnet.apa.org/record/2017-54038-008

Hernández-Barrios, A., & Camargo-Uribe, Á. (2017). Adaptación y validación del Inventario de Estrategias de Autorregulación en estudiantes universitarios. Suma Psicológica, 24(1), 9–16. https://reader.elsevier.com/reader/sd/pii/S0121438117300048?token=1B252F329DDB0B6435F5CB19ECED9B3B832FCFB026A72E310B369F7C608347DB69D6CDDE45D0162736D1D3C695AE9667

Kaufmann D., Schraw G., Lehman S., (2006) Self-Regulated Learning, *ResearchGate* 1063-1073,https://www.researchgate.net/publication/229971208_Self-Regulated_Learning

López, S. (1992) Autorregulación y desarrollo de capacidades que incrementan la coherencia entre juicio y acción. *Comunicación, lenguaje y Educación* 4 (1), 111-118. https://doi.org/10.1080/02147033.1992.10821040

Luy-Montejo, C. (2019). El Aprendizaje Basado en Problemas (ABP) en el desarrollo de la inteligencia emocional de estudiantes universitarios. *Propósitos y Representaciones*, 7(2), 353-383. http://dx.doi.org/10.20511/pyr2019.v7n2.288

Nuñez, J., Amieiro, N., Álvarez, D., García, T., y Dobarro, A. (2015) Escala de Evaluación de la Autorregulación del Aprendizaje a partir de Textos (ARATEX-R). *European Journal of Education and Psychology,* 8(1), 9-22. https://www.redalyc.org/pdf/1293/129343965002.pdf

Ozan, C., Kerim , G., Bay, E., & Celkan, H. (2012). Self-regulated learning strategies skills and self-efficacy perceptions. *Social and Behavioral Sciences*, 46 (2012) 1806-1811 https://www.researchgate.net/publication/271881025_A_Study_on_the_University_Students'_Self-Regulated_Learning_Strategies_Skills_and_Self-Efficacy_Perceptions_in_Terms_of_Different_Variables

Panadero, E. & Alonso-Tapia, J. (2014) ¿Cómo autorregulan nuestros alumnos? Revisión del modelo cíclico de Zimmerman sobre autorregulación del aprendizaje. *Anales de psicología*, 30 (2), 450-462. https://www.researchgate.net/publication/260684356_Como_autorregulan_nuestros_alumnos_Modelo_de_Zimmerman_sobre_estrategias_de_aprendizaje/references

Pardo, N. (2015). Estrategias autorreguladoras para la comprensión de textos académicos en los estudiantes universitarios. *Horizontes Pedagógicos*, 17(2), 29-38. https://horizontespedagogicos.ibero.edu.co/article/view/17203/765

Prados, M., Sánchez, V., Sánchez-Queija, I., Del Rey, R., Pertegal, M., Reina, M., Ridao, P., Ortega, F., Mora, J (2014) Manual de Psicología de la Educación. Pirámide https://tecnicasdeaprendizajeefpem.files.wordpress.com/2018/01/manual-de-psicologia-de-la-educ.pdf

Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. En M. Boekaerts, P. Pintrich, y M. Zeidner. Handbook of selfregulation. Academic Press, 452-502.

https://ssrlsite.files.wordpress.com/2018/01/pintrich-2005-the-role-of-goal-orientation-in-srl.pdf

Rosário, P., González-Pienda, J. A., Pinto, R., Ferreira, P., Lourenço, A., y Paiva, O. (2010). Efficacy of the program "Testas's (mis)adventures" to promote the deep approach to learning. *Psicothema*, 22, 828-834. http://www.psicothema.com/pdf/3808.pdf

Rosário, P., Pereira, A., Högemann, J., Nunes, A. R., Figueiredo, M., Núñez, J. C., Fuentes, S., Gaeta, M.L. (2014). Autorregulación del aprendizaje: una revisión sistemática en revistas de la base SciELO. *Universitas Psychologica*, 13(2), 781-798. https://www.redalyc.org/articulo.oa?id=64732221031

Zimmerman, B. J. (2001). Theories of self-regulated learning and academic achivement: An overview and analysis. B. J. Zimmerman & D. H. Schunk. Self-regulated learning and academic achievement: Theoretical perspectives, Lawrence Erlbaum Associates Publishers. (2) 1-38.

Zimmerman, B.J. & Martinez-Pons, M. (1998). Construct validation of a strategy model of student self-regulated learning. *Journal of Educational Psychology*, 80(3), 284-290.

Zimmerman, B. J., & Schunk, D. H. (2011). Self-regulated learning and performance: An introduction and an overview. B. J. Zimmerman & D. H. Schunk. Handbook of self-regulation of learning and performance. Routledge. 1-12.

Zimmerman, B. J. (2008). Investigating self-regulation and motivation: Historical, background, methodological developments, and future prospects. *American Educational Research Journal*, 45, 166-183. https://www.researchgate.net/publication/250184865_Investigating_Self-Regulation_and_Motivation_Historical_Background_Methodological_Developments_and_Future_Prospects

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