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Chapter

Perception of Student-Teachers Regarding Self-Regulated Learning

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Abstract

In this chapter of the book we have described and analyzed what student-teachers understand by self-regulated learning, what they do when applying the different phases of this process and what are the difficulties, they have to regulate their learning. Student-teachers participating in the study are pre-service teachers who are trained to work in the school system as secondary school teachers. The sample consisted of 60 student-teachers from a university in southern Chile. The main findings show that students relate the concept of self-regulated learning mainly with the general organization prior to the study and with the regulation of their emotions. Regarding the process of self-regulated learning, it is suggested that the planning and execution phase are incipient because there is: (i) lack of strategic planning in the planning phase, (ii) lack of motivational self-control processes, which influences the lack of regulation as: disorganization and uncontrolled emotions, (iii) absence of self-records that allow them to compare and monitor the execution of the study. Additionally, it is proposed conceptual model includes components that represent: (i) the understanding of the concept of self-regulation of learning, (ii) development of the process of self-regulation of learning, (iii) lack of regulation and (iv) external agent's antiregulation of learning.

Keywords: self-regulated learning, student-teachers, lack of regulation, study planning, learning process, agents antiregulation of learning

1. Introduction

The Chilean educational system has undergone a process of expansion and transformation of higher education, which has generated a massive entry of students that produces, among other consequences, student desertion, mainly due to the fact that these students fail to adapt to the demands of university life. In this sense, authors such as [9] have studied the evolution of the educational system in Chile through the processes changes of supply and demand, whose results reflect how this phenomenon has led to the need to generate strategies oriented to the retention of students in the different universities. In addition, another factor that has influenced the higher education system corresponds to the growing positioning of the competency-based approach that has been promoted by international entities, such as the World Bank,

the Organization for Economic Co-operation and Development (OECD), the Ibero-American Bank, and the European influence of the Bologna Process [10]. Thus, in this scenario of massive student access to higher education and the focus on skills in university curricula is that autonomy capacity is required in university students, which consequently leads to the need to understand and evaluate how students self-regulate their learning [7, 8, 27]. From the previous background, the following question is relevant: why is self-regulated learning important? Because it is a psychological construct that has been studied in various researches, proving that it is a predictor of academic achievement [3, 31]. Therefore, it is a factor that allows institutions to develop curricular policies and accommodations that decrease student desertion.

In the case of student teacher, self-regulative learning skills are extremely important contributors because student teacher double role in his training: (i) "the teacher as a subject who learns" and (ii) " the teacher in the function of teaching to learn" [6]. Likewise, it is important to point out that from the perspective of the twenty-first century skills [32] the possibility of knowing student-teachers understand the concept of self-regulated learning and how they describe applying the process of self-regulated learning. Studying the ability to learn to learn [32] from the self-regulated learning is based on the fact that future teachers will be the ones who can promote this type of learning in the classroom to their students to foster in them the necessary skills in the society where they will develop. Student-teachers participating in the study are pre-service teachers who are trained to work in the school system as secondary school teachers.

Another motivation to carry out the research is related to the incipient amount of research on the subject in student-teachers in Latin America. A situation that is evidenced in the systematic review conducted by Hernandez and Camargo [19] who report that between 2005 and 2015 only 7 articles were published in Latin America where the participants are student-teachers. In this sense, we find three investigations in Latin America that focus on student-teachers using the qualitative approach to describe through case studies the process of self-regulation of learning [13, 26, 29]. However, none of the previous studies has been done with student-teachers in Chile. On the other hand, in the European context, in Finland, we find the following studies related to self-regulative learning skills in student-teachers [38–40].

Additionally, it is important to indicate that student-teachers need self-regulation skills in their training as teachers and in their role as students in order to learn to reflect on their own learning process. In this way, it is essential for student-teachers to understand the concept of self-regulation of learning and the stages of the process of self-regulation of learning so that when performing their work in the classroom they can design interventions that promote self-regulation of learning in their students [38]. In this sense, it has been suggested that for a teacher to be strategic in encouraging self-regulated learning in the classroom, he must first have been a self-regulated student during his training as a teacher [6].

This chapter gives an account of the results of a preliminary investigation, of a descriptive type, that addresses the perception that a group of student-teachers has of the concept of self-regulation of learning and the process of self-regulation of learning. In effect, the research aims to analyze and describe what student-teachers understand by the concept of self-regulation of learning, what they do when applying the different phases of this process and describe what are the difficulties, they have in carrying out this process. A conceptual model that represents the understanding of student-teachers regarding the self-regulation of learning is also presented. In this sense, it is important to point out that the pedagogy students' understanding of self-regulation of learning, incorporates different perspectives from four dimensions: (i) the understanding of the concept of self-regulation of learning, (ii) development of the process of self-regulation of learning, (iii)

difficulties to regulate their learning named lack of regulation and (iv) anti-regulation agents of learning.

Next, two sections are presented, one to explain self-regulation of learning and the cyclic process of self-regulation and then a section of self-regulated learning in teacher training.

1.1 Self-regulated learning

In general terms, the self-regulation of learning is defined as: the control that the subject carries out over his thoughts, actions, emotions and motivation using strategies that allow him to reach the objectives that he has established [24].

In the field of research on self-regulated learning, several models are distinguished. Six were analyzed in [23] and are the models of [2, 11, 17, 25, 31, 35]. In this research uses the Zimmerman model in its latest version [37] because this model has been the most widespread in the scientific literature in the field of educational psychology [24] and to include a process of cyclical self-regulation that explains in detail in the 2009 version. In this version, it is detailed the three phases of self-regulated learning that can be considered as an "ideal process" with which to contrast the perceptions of teachers-students regarding this process. The three phases of the model proposed in [37] are explained:

Planning Phase: it is the initial phase that is made up of the process of "Analysis of the task and the self-motivating Beliefs". For example, when a student faces a task for the first time, he/she should carry out two processes: (1) to establish the objectives to be achieved and (2) to perform strategic planning. These two processes allow carrying out the analysis of the task. In the case of self-motivating beliefs, it is established that five types of variables influence: (1) self-efficacy, (2) result expectations, (3) task value, (4) interest and (5) goal orientation. These variables are personal and allow generating the motivation to carry out the activity.

Execution phase: it consists of two processes: (1) self-control and (2) self-observation. The first is defined as the process to maintain concentration and interest through metacognitive or motivational type strategies. On the one hand, metacognitive self-control is established by choosing a specific strategy, for example, when making a summary. On the other hand, motivational self-control refers to encouraging interest, for example, by using reminder messages about the goal. The second process is defined as the comparison between what is being done with respect to an ideal execution model.

Self-reflection phase: this phase is composed of the self-judgment process and the self-reaction process, which interact with each other. On one hand, self-judgment is the process that allows the student to judge his execution. In this way, the student can perform a self-assessment that allows them to assess his/her work, based on the quality criteria that should have been clearly established at the beginning of the activity by the teacher. Also, the student will perform causal attributions that imply how self-explains success or failure in the activity. On the other hand, the process of self-reaction refers to the student's reactions to their self-judgments. Thus, their self-reaction can be of satisfaction, affection, adaptation or a defensive reaction.

1.2 Self-regulated learning in teacher training

Teacher training has focused on teaching specific disciplinary content to some area [6, 14]. In addition, teaching in the classroom has been based on the role of the teacher as an exhibitor, who in this context usually applies expository, masterly or theoretical classes to convey the disciplinary content that he acquired in his training as a teacher [6]. Therefore, research evidence in the field of self-regulation of learning in pre-service teacher training is low in Latin America [19] and especially in Chile.

In this context, we agree with [5] who point out that one of the reasons is the lack of dissemination of theories and/or models of self-regulated learning in teacher training.

Likewise, research findings in Finland show that self-regulative learning skills are extremely important contributors in student teacher learning [38–40]. Another aspect that has been studied and that may be related to the self-regulation of learning and the training of student-teachers is the importance of thinking about their double role, is to say "the teacher as a subject who learns" and " the teacher in the function of teaching to learn" [6]. Therefore, student-teachers require to know and understand the concept, theories and models of self-regulation of learning. Also, they need experiential knowledge about promoting self-regulation of learning.

The theoretical knowledge about the theories and/or models of self-regulation of learning is important for the students of pedagogy because it allows them to know and understand the concept of self-regulation of learning from different perspectives. With this theoretical knowledge the students of pedagogy may have "awareness of the importance of self-regulation of learning" to later perform actions that allow them to adjust their thoughts and/or actions and/or emotions and/or motivation to self-regulate their learning. In addition, they will be able to understand why they have difficulties or deficiencies to self-regulate their learning [6, 39].

The experiential knowledge about self-regulation of learning would help to train the teacher as a subject who teaches how to learn. Because he could apply systematic interventions or case studies in the classroom that include one or some aspects of self-regulation of learning [33].

From the previous background, this chapter analyzes and describes what student-teachers understand by self-regulation of learning, what they do when applying the different phases of this process and what difficulties they have in carrying out this process.

2. Method

To carry out this research and understand the perceptions of a group of student-teachers regarding the concept of self-regulated learning, the process of self-regulated learning and it difficult to regulate their learning. The qualitative research approach was used according to [18] through a case study. Student-teachers participating in the study are pre-service teachers who are trained to work in the school system as secondary school teachers. Our interest is student teachers' understanding of self-regulated learning, and how they themselves regulate their own learning. We opted for the interview method because it is a technique that allows a conversation on topics that are complex. In addition, the characteristic of the group interview is that as a group instrument it is more than the sum of its parts according to [28]. This allows participating subjects to reinforce ideas that are complex to transmit in individual interviews.

2.1 Research design

The design is non-experimental descriptive cross type, that is, it aims to categorize and provide a view of the phenomenon under study.

2.2 Research questions

The questions formulated to guide the investigation were:

1. What do (student-teachers) understand about the concept of self-regulated learning?

2. What do (student-teachers) describe about the different phases of the process of self-regulated learning from the perspective of the Zimmerman model?

3. What are (student-teachers) the difficulties in regulating their learning?

2.3 Participants

For the selection of the sample, the non-probabilistic sampling technique was considered, given that the participants were selected intentionally. The criteria for the selection were:

a. being in second, third or fourth year of pedagogy and

b. voluntarily participate in the study.

Six group interviews were conducted with pedagogy students. Each group was composed of 10 subjects. Thus, the sample was constituted by 63% of people of female students and 37% of male students. The subjects' age ranges between 19 and 27 years with an average of 20.3 years and standard deviation of 2.5 years. The total sample was 60 subjects. It should be noted that participating students have not had a degree of prior contact with respect to the concept of self-regulated learning.

2.4 Process

The procedure consisted of applying the group interviews in groups of 10 students in a classroom. Before starting the group interview, the students were told that there would be no debate or interaction between them, but only the response of each one was expected independently. In this way, the question was asked, and each student responded in turn to the question. Each group interview was recorded and then transcribed.

2.5 Instruments and procedure of data analysis

To collect the information, a set of questions was generated and applied in each of the group interviews according to the procedure described above. The questions applied to the students in the group interviews are:

1. What do (student-teachers) you understand by self-regulation of learning?

2. How do (student-teachers) you plan your study?

3. How do (student-teachers) you study?

4. How do (student-teachers) you verify if they are doing well and/or properly their learning?

5. How do (student-teachers) identify or specify what they should learn?

6. If you have obtained poor results, what actions do (student-teachers) you take to study better?

7. What difficulties do (student-teachers) you have when you are ready to study and during your study?

Six group interviews were conducted where participants answered the questions without interacting with each other, nor generated debate. The questions that were applied in the group interviews focused on the following dimensions: (1) concept of self-regulated learning, (2) phases of the process of self-regulated learning according to the Zimmerman model and (3) difficulties in the self-regulation process. The information collected was transcribed and processed using the QDA Miner software in its free version v1.4.5. The software was used in stages of content analysis [1].

For the content analysis, the model for the development of inductive and deductive categories was applied according to [22]. The model of inductive categories consists in determining the categories from the text obtained in the research process, that is, from the answers to the questions. In this case, it was applied to the category of self-regulated learning and to the category lack of regulation. In this way, the concept category of self-regulated learning was specified from the data, giving rise to the following subcategories: regular emotions, general organization prior to the study, metacognition. Likewise, for the category lack of regulation, the following subcategories were specified from the data: disorganization and distractors, uncontrolled emotions, demotivation.

In the case of the phases of the self-regulated learning process, the subcategories were determined using the deductive model. For this, the Zimmerman model was used, from which the following subcategories are used: planning phase, execution phase, and self-reflection phase.

3. Results and discussion

The research was developed under an interpretative paradigm in the modality of descriptive investigation. The data analysis is elaborated in two phases; the first phase is qualitative for the definition of categories and subcategories of analysis. The second phase sample the result of the frequency count for each subcategory is shown in the graph of **Figure 1** at the end of the description of each of the categories and subcategories. Finally, **Figure 2** represents a proposal of a conceptual map showing the relationships between categories. It should be noted that the categorization of student responses allowed the possibility that a student, with the same
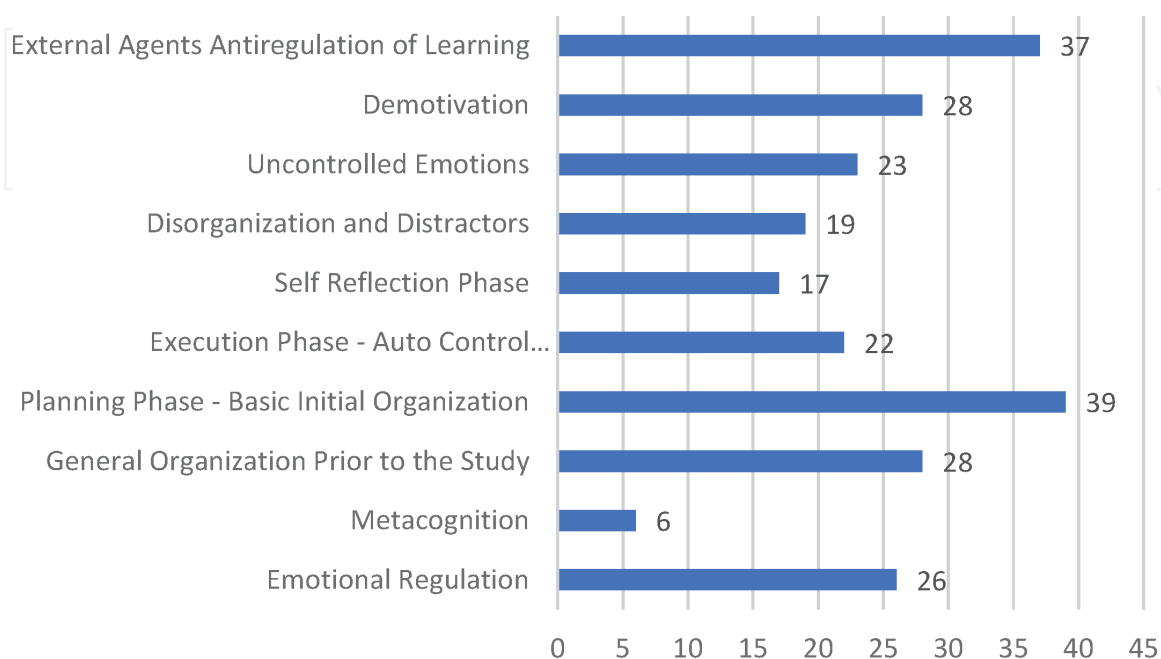

Figure 1.
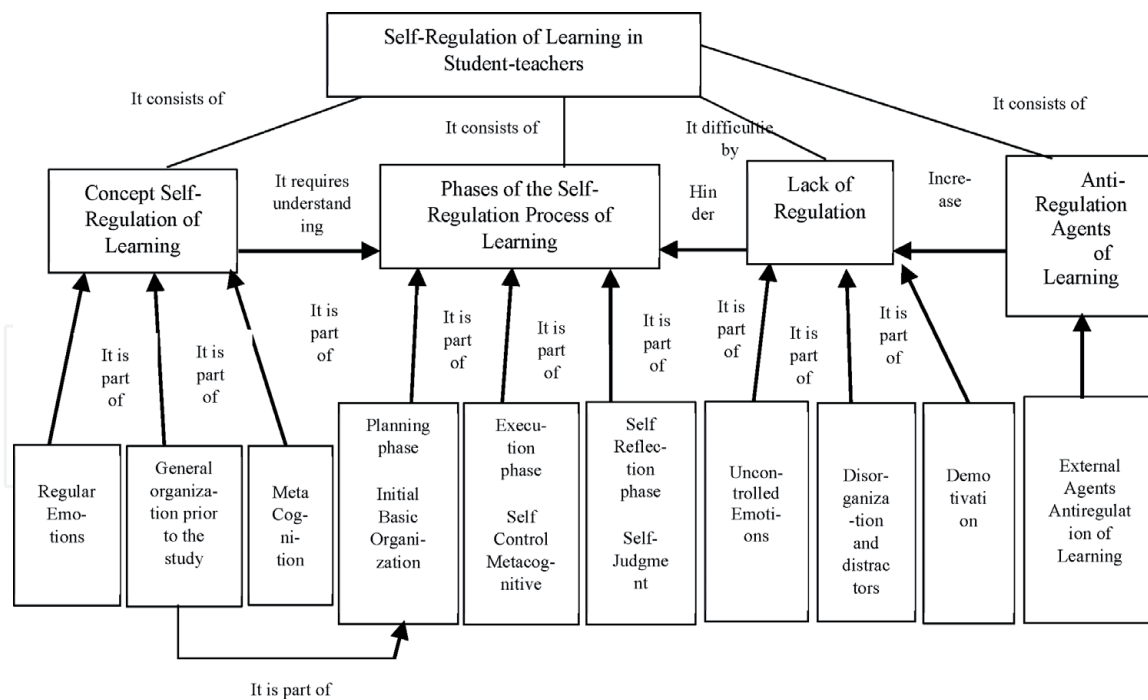*Graph of total frequencies by subcategory.*

Figure 2.
Proposal of a conceptual model showing the relationships between study categories.

Dimension	Categories	Subcategories
	Concept of self-regulated learning	General organization prior to the study Emotional regulation Metacognition
Self-regulated learning	Phases of self-regulation process of learning	Planning phase—basic initial organization Execution phase—auto control metacognitive base Self-reflection phase
	Lack of regulation	Disorganization and distractors Uncontrolled emotions Demotivation
	Anti-regulation agents of learning	External agents antiregulation of learning

Table 1.
Dimension self-regulation of learning, categories and subcategories.

question, include information to be collected in two different subcategories. This is the case, for example, for the answers to the question, what do you understand by self-regulated learning?, because students pointed out as a response the general organization prior to the study what can be labeled as self-regulated learning concept and as part of the planning phase.

3.1 Self-regulated learning dimension

The dimension self-regulated learning allows to describe the perceptions of the participants in relation to four categories that are: concept of self-regulated learning, phases of the self-regulation process of learning, lack of regulation, and anti-regulation agents of learning. It should be noted that the lack of regulation and anti-regulation agents of learning is categories that emerged spontaneously in the discourse of the participants, even before consulting about the difficulties.

Table 1 shows the self-regulated Learning dimension, its categories and subcategories.

3.1.1 Category concept of self-regulated learning

The self-regulated learning concept category answer the following research question ¿what do (student-teachers) understand about the concept of self-regulated learning? In this context, this category refers to the perception of the student-teachers regarding the concept of self-regulated learning through the elaboration of a self-definition that explains the concept. In this sense, the concept of self-regulated learning has been associated with the following concepts that define three subcategories: emotional regulation, general organization prior to the Study and metacognition. **Tables 2–4** present some fragments of answers related to these three subcategories.

3.1.1.1 Subcategory emotional regulation

This subcategory indicates that student-teachers can define self-regulated learning through the regulation of emotions. Some fragments of answers are presented in **Table 2**. It is important to note that this definition obtained the second place of frequency in the concept category of self-regulation. In this sense, it is relevant that the students are aware of the importance of controlling emotions as pointed out by [4, 20, 21, 40] among others, since as future teachers they will have to intervene in classroom situations of deregulation of emotions of their students.

This result contributes to the literature on pre-service teachers' emotions by demonstrating their importance and the key role of controlling emotions to maintain self-motivation in a task during the execution of it and thus maintain interest and concentration [40, 42, 43].

3.1.1.2 Subcategory general organization prior to the study

The general organization subcategory prior to the study indicates that the student-teachers can define self-regulated learning through the conception of

Frequency	Emotional regulation
26	"... to regulate emotions, to regulate my emotions is for me to self-regulate my learning is as a condition for me to regulate my learning ..." "... self-regulating my learning is to regulate my uncontrolled emotions and thus self-regulate ..." "... and I must regulate my emotions to self-regulate my learning, the problem is that I do not know how ..."

Table 2.
Fragments of responses from participants related to the emotional regulation subcategory.

Frequency	General organization prior to the study
28	"... self-regulation of learning is how I organize myself. I make a list of the things that I have to do daily. If I have to study ... how much I dedicate to this or something else, that is my way of self-regulating learning ... "

Table 3.
Fragments of responses from participants related to the subcategory general organization prior to the study.

the general organization that they perform prior to the study. For this reason, it is noticed that it is not a specific, strategic planning for the development of an academic activity. Thus, they define a general way of ordering themselves.

This result is related to the control of the action, that is why the strategic planning in the planning phase is key because it is an action that allows to effectively control the progress of the objectives related to what is required to learn [4, 39].

This subcategory obtained the first place of frequency in the concept category of self-regulated learning, which suggests that the participants understand, for the most part, that this type of general organization could define the self-regulation of learning. However, it is suggested to work for an effective control of the action through strategic planning [4, 39].

In **Table 3** some representative fragments are shown.

3.1.1.3 Subcategory metacognition

This subcategory indicates the possibility of defining self-regulated learning using the concept of metacognition that refers to the process of self-reflection that subjects perform when judging their actions and reacting to their own self-judgment [37]. In this research only two student-teachers indicated as a possible definition of self-regulated learning to metacognition.

Metacognition is related to the control of thoughts that has been based on the strategic control of cognitive processes, this ability is important for student-teachers [11, 37]. Therefore, it is suggested that it is very important to incorporate in the training of thematic teachers related to metacognition.

Table 4 presents fragments of responses from participants related to this subcategory.

3.1.2 Category phases of the self-regulation process of learning

The category phases of the self-regulation process of learning answer the following research question ¿what do (student-teachers) they describe about the different phases of the process of self-regulated learning from the perspective of the Zimmerman model? Therefore, it presents itself the perception of the student-teachers regarding the process of self-regulated learning. To carry out the analysis, reference will be made to the cyclic model of self-regulation phases of learning by [37]. These authors conceive self-regulated learning as a cyclic process of three phases: planning phase, execution phase and self-reflection phase. **Tables 5–7** present some fragments of responses related to each phase of the self-regulation process.

3.1.2.1 Subcategory planning phase

The processes of the planning phase are task analysis and self-motivating beliefs. In relation to the first process it is shown that the students declare to make a planning oriented to the goal of obtaining a grade to pass a course. This coincides with

Frequency	Metacognition
6	"... Self-regulation of learning is for me the self-evaluation and reflection that I do of my academic results once I have the grades and at the end of the semester to think about what is wrong and to be aware of that, in order to improve ..."

Table 4.
Fragments of responses from participants related to the subcategory metacognition.

Frequency	Planning phase
39	"… I agree I plan and establish my goal associated with the note because I have to approve my courses…" "… the planning I do is designed to achieve the grade I need to pass and obtain the benefits of scholarships that I have, and I need them …"

Table 5.
Fragments of responses from participants related to the subcategory planning phase.

Frequency	Execution phase—auto control metacognitive base
22	"… But with the courses in which I do well is pure memorization and what I have to apply is just that. For the same theme of the strategy that I execute that is to repeat and memorize, but I never knew if I learned with those courses … " "… For me what works are the summaries as I had said before …" "… My friends lend me their summaries … or we do them together in the central library … but like the rest I must admit that I do not know my study technique" "… The one that could indicate that I occupy is the summary when I study …" "… We always worry about the final result, about the qualification and so the summaries help a lot, it's the synthesis of what I have to memorize …"

Table 6.
Fragments of responses from participants related to the subcategory execution phase.

Frequency	Self reflection phase
17	"… The way I measure whether I'm learning or not, is like putting myself to the test if after a while I remember what I was learning, it's funny because it happens in many courses where I'm relatively better student, but it's not the one that I have learned the most, is only the one that I memorized the most for the test … " "… Analyze the results, the factors. If you do not study or study late there is nothing to analyze. Take advantage of the hours given by the teacher to review the answers and ask directly what went wrong and thus correct the mistakes … " "… See what is wrong, review the evaluation, rewrite down what is wrong and revise everything, to understand it again and things like that, study more for the next evaluation …"

Table 7.
Fragments of responses from participants related to the subcategory self reflection phase.

what was proposed by Panadero and Alonso-Tapia [24] who point out that at this stage the student "analyzes the task, values their ability to carry it out successfully, establishes their goals and plans" (p. 451). However, it is noted that students do not plan strategically thinking about their learning, but they do it in a general way and thinking about obtaining a grade that allows them to pass their subjects, this result is similar to [33].

The foregoing is shown in **Table 5**, which presents representative fragments of participants' responses in relation to the planning phase.

It should be noted that planning is a predictor of the success that will be achieved in the task, so the longer the planning time the better results will be obtained [31]. Indeed, several studies point out that the biggest difference between expert and novice apprentices is due to the time they devote to planning [12, 34]. In the case of students participating in this research, there is no awareness that good strategic planning, both short-term and long-term, that is geared to learning, can benefit them in the context of twenty-first century skills specifically in the ability of learning to learn [36]. In short, it is noted that there is no strategic planning, but a basic organization prior to the study.

From the perspective of self-motivating beliefs, students are not aware of the importance of the variables that generate and sustain their motivation to carry out an activity, such as self-efficacy and expectations, among others. This is because the statement or description of self-motivation for learning is absent in their answers. However, their motivation is extrinsic and oriented to the goal that is manifested by declaring that they develop their academic activities to obtain a grade that allows them to pass their subjects. It is important to indicate that there is empirical evidence that students with learning goals choose and use strategies that direct them to deep learning, have reflection processes, recover before academic failures and their motivation is intrinsic [15, 17]. It is therefore important that students work in a lesser degree for a grade and focus mostly on their learning process.

3.1.2.2 Subcategory execution phase

Two processes are distinguished in the execution phase: self-observation and self-control, as pointed out by [37]. In this sense, students declare to use metacognitive self-control processes when they indicate that they use specific strategies such as underlining a text or making a summary when studying. However, they do not declare to carry out effectively the process of motivational self-control. For this reason, responses that have to do with obstacles to self-regulated learning that are related to disorganization, distractors, lack of control of emotions and demotivation appear recurrently. Nor do they declare that they carry out the self-observation process that implies a comparison between what is being developed and the ideal execution model.

In this sense, it is frequent that the student does not perform the process of self-observation during the execution of an activity which could be due to the following reasons: (i) in many cases the student does not have or does not know how to choose a model to follow to compare its development, (ii) the student is not aware of the importance of reviewing their learning process, (iii) the evaluation made by the teacher is the final product, in this way, the process is left behind or forgotten. In sum, the students participating in the study do not perform a monitoring process during the execution of their study. **Table 6** shows representative fragments of participants' responses related to the execution phase associated with metacognitive self-control processes, in which the summary appears as the study technique because it allows them to memorize what is most important for a test.

3.1.2.3 Subcategory self reflection phase

According to the model of Zimmerman and Moylan [37], the self-reflection phase consists of the process of self-judgment and self-reaction. In this sense, the results related to this phase show that the students reflect on their learning process by making self-judgments at the end of the process when they already have the grade and can review the test. Self-judgments are the processes by which the student judges their execution and which influence their self-reaction [24]. **Table 7** shows fragments of representative responses related to the self-reflection phase.

3.1.3 Category lack of regulation

The category lack of regulation answer the following research question, ¿what are (student-teachers) the difficulties in regulating their learning? In this sense, this category refers to the perception of the student-teachers regarding the difficulties they have to regulate their learning that has been called the lack of regulation has been associated with the following subcategories: disorganization and distractors, uncontrolled emotions and demotivation. This category was created due to the

recurring description by students of this type of difficulty to regulate their learning. The foregoing is in accordance with what was stated in the execution phase category, where a lack of the motivational self-control process was evidenced.

The lack of regulation could be due to a lack of volition activation, especially in the case of disorganization and distractors and demotivation. In this sense, volition is the strategic control necessary to carry out the process of executing a task and can be learned to control strategically [41, 42].

An alternative to help reduces the lack of regulation is co-regulation because it encourages self-regulation of learning. In this sense, Hadwin et al. [16] have suggested that a strategy to develop self-regulated learning of students is through interaction that plays a central role. The interaction allows the co-regulation of learning that refers to the "temporal coordination of self-regulation among others" [16] (p. 68) and therefore implies planning, monitoring and evaluation of learning in collaboration with others [16, 44].

3.1.3.1 Subcategory disorganization and distractors

The results associated with this subcategory are related to the difficulties that student-teachers have in relation to their own organization and that have a negative influence on the regulation of their learning. **Table 8** shows representative fragments of participants' responses related to disorganization and distractions; the results coincide with those presented in [33].

3.1.3.2 Subcategory uncontrolled emotions

In this subcategory the answers referred to the difficulty to control emotions are associated. The control of emotions is fundamental for the regulation of learning because in cases where they are not controlled there will be interference with learning, as pointed out by [4]. **Table 9** shows representative fragments of the responses of the participants related to the lack of control of emotions.

3.1.3.3 Subcategory demotivation

This subcategory represents the results associated with the demotivation problems described by the study participants. Motivation plays an important role in the self-regulated learning because it represents the motor that mobilizes the student to take actions and make decisions that allow him/her to achieve his/her goals or objectives. In this sense, the control of motivation has been studied by [20, 21] who emphasizes the role of emotions and how these can hinder the start of tasks or activities that the student must perform. **Table 10** shows representative fragments of the responses related to demotivation and that coincide with what was stated by [21].

3.1.4 Category anti-regulation agents of learning

The category anti-regulation agents of learning answer the following research question, ¿what are (student-teachers) the difficulties in regulating their learning? This category refers to the perception of the student-teachers regarding antiregulation agents of learning that are unforeseen and/or factors outside of them as students and that affect them in some way in their regulation of learning. Students describe being aware of these external factors and that they cannot control. This category has a single subcategory that is external agents antiregulation of learning. **Table 11** shows representative fragments of the responses related to external agents antiregulation of learning.

Frequency	Disorganization and distractors
19	"... When I study at home ... I lose a lot of time, I want to do anything, so I'm studying the last day ... I'm a mess ..." "... I want to comment on what happens for the evaluations ... we dedicate the previous night, "centralazo" with coffee all night, as much quantity and quality is not usually so bad when the pressure is so much. But the quality of life is the one that goes down ..." Observation: "centralazo" refers to the central library

Table 8.
Fragments of responses from participants related to the subcategory disorganization and distractors.

Frequency	Uncontrolled emotions
23	"... Many times, I love the course, I understand everything, but the evaluations arrive and I'm doing very badly. I think I do not control the anxiety. I forget everything. But then I realize that I know everything, and I do not understand why it did not go so well and maybe it's because sometimes more things affect the results in the evaluations such as concentration and emotions ... "

Table 9.
Fragments of responses from participants related to the subcategory uncontrolled emotions.

Frequency	Demotivation
28	"... I am discouraged because many courses are demotivating. They have no sense of utility, which is what gives meaning to a subject, when it is established so that it serves you something and why it is in your formation..." "... When you do not know what is useful for you, you may lose interest in the class and that will distract you ... " "... Listening to the professor without doing anything else is demotivating ..."

Table 10.
Fragments of responses from participants related to the subcategory demotivation.

Frequency	External agents antiregulation of learning
37	"... I want to add something that are unexpected events, for example, I regulate myself, I want to stop being stressed, but an external situation arrives that alters all that rhythm ..." "... It's an external factor that I cannot control, for example: room changes at the last minute, teachers who do not upload the material on time and that... force me to permanently change my planning ..."

Table 11.
Fragments of responses from participants related to the subcategory external agents antiregulation of learning.

Table 12 shows the summary of subcategories and frequencies where it is observed that the frequencies are low in relation to the total of participants that are 60 subjects. Then, **Figure 1** presents a graph of total frequencies for each subcategory in order to summarize the qualitative analysis described above. Thus, in **Figure 2** the subcategory metacognition has the lowest frequency and that the subcategory general organization prior to the study has the highest frequency. Both subcategories belong to the category self-regulated learning concept and the results obtained indicate that the student-teachers understand, in the first instance mostly, that the general organization they perform represents the concept of self-regulated learning. However, it should be noted that the three subcategories of the self-regulated learning concept are part of the self-regulated learning, but the students did not indicate the three together as a concept, but they did it separately.

Subcategories	Frequency
Subcategories of concept self-regulation of learning	
Emotional regulation	26
Metacognition	6
General organization prior to the study	28
Subcategories of self-regulation process of learning	
Planning phase—basic initial organization	39
Execution phase—auto control metacognitive base	22
Self reflection phase	17
Subcategories of lack of regulation	
Disorganization and distractors	19
Uncontrolled emotions	23
Demotivation	28
Subcategories of anti-regulation agents of learning	
External agents antiregulation of learning	37

Table 12.
Summary of subcategories and frequencies.

Regarding the phases of self-regulated learning process, in **Figure 2** it is observed that both the planning phase and the execution phase have the highest frequencies. This happens because the student-teachers indicated in their majority to execute a general planning and to use techniques like underlining and summaries during the execution of an academic activity. However, in both phases the development that they declare is incipient in relation to: (1) lack of strategic planning in the planning phase, (2) lack of processes of motivational self-control which influences the appearance in their discourse of difficulties to regulate their learning such as: disorganization and distractors, uncontrolled emotions and demotivation, (3) absence of self-records that allow them to compare and monitor the execution of their learning.

In sum, the major lack of learning are the lack of control of emotions and disorganization, followed by demotivation, which coincides with the approach of Kuhl [20, 21]. Kuhl points out that students who do not regulate their emotions can be oriented to the state and not to the action. In this way, they remain in states of worry or other emotional states that do not allow them to initiate, advance or execute their academic activities. It is important to note that defining the concept of self-regulated learning is complex because of the multidimensional nature of its construct, and although there are several models that help to understand the concept of self-regulated learning, none of them fully explains it [24]. Therefore, this research has used two models, Zimmerman and Kuhl to support the understanding of the phenomenon under study.

Figure 2 presents a proposal of a conceptual model that shows the relationships between the categories generated in the study. It is observed that the category anti-regulation of learning agents is related to the category phases of the process of self-regulation of learning through the relationship of hindrance. In addition, the self-regulated learning concept category is related to the category phases of the process of self-regulated learning by means of compression, this means that it is not possible to apply the phases of the self-regulated process adequately, but rather, there is awareness and understanding of the concept self-regulated learning.

Therefore, it is necessary to teach students how to learn through the knowledge of the models that explain how self-regulated learning should be done in such a way that they are aware of what it means to learn, what faults they have and how they could improve. In this way, this skill is encouraged since they will require it for the rest of their lives in the current context of society [30].

It should be noted that in **Figure 2** the category self-regulated learning concept shows three subcategories that are: (1) regulate emotions, (2) general organization prior to the study and (3) meta-cognition. However, despite the fact that the relationship that links them to the concept is called "it is part of" no student indicated a description using the three components to refer to the concept of self-regulated learning. Then, the relationship between the concept of self-regulated learning and the phases of the self-regulated learning process is "it is required to understand" what it implies, as mentioned above, that in order to go deep into the detail of each of the phases of the self-regulation process, first It is necessary to have a clear notion of what the concept means.

In the case of the phases of the self-regulated process of learning, in **Figure 2**, it is observed that it is composed of: (1) planning phase with basic initial organization, (2) execution phase with metacognitive base self-control and (3) self-reflection phase with self-judgment. In this sense, it is important to note that there is a difference with the Zimmerman model because students do not declare or describe processes such as the motivational self-control of the execution phase and the meta-cognitive self-control, they name is elementary. For that reason, it was denominated "base metacognitive self-control".

Then, the anti-regulation agents of learning category is related to the lack of regulation through the relationship "increase" because are external agents antiregulation of learning that can increase lack of regulation and in consequence obstruct the learning process of the student at any stage of the process.

In short, it should be noted that it is necessary for students to understand the concept of self-regulated of learning so that they can, through the approaches proposed by the models, be aware of the processes and strategies they can carry out to improve their own learning. In this way, in addition to improving the effectiveness of the study, the efficient use of time could also be improved, provided that the metacognitive process of self-regulation is significant for students, avoiding the practices and study strategies that lead to considering the learning as the result of the reproductive action of the knowledge and content of the subjects, fostering, through awareness, a reflective process about what is learned and how it is learned.

Regarding the conceptual model presented in **Figure 2**, its contribution is that it represents three components of self-regulated learning that are at the same level and that are related to each other. The first component is the concept of self-regulated learning that is related to the phases of self-regulated learning through the understanding of the concept. Then, lack of regulation influence the phases of the process of self-regulated learning, hindering one or more of the phases of the process of self-regulated learning. In this way, the model includes the understanding of the concept, development of the process, lack of regulation and external agents that hinder the development of the process. Other models studied are focused on the cognitive-motivational process [2, 11, 16, 25, 31, 35] and do not include components such as the understanding of the self-regulated learning concept, lack of regulation and external agents that hinder the development of the process.

In this sense, we agree with Hernández and Camargo [19] who point out: "the task of characterizing the Ibero-American university students is essential in order to identify their dimensions as self-regulating subjects of their learning process. This information is of central importance when designing and implementing plans, programs and actions in the training scenarios that contribute to the advancement

of students in their academic studies, as well as the promotion of guidelines for the generation of student autonomy understood as self-regulated learning" (p. 156).

Additionally, we agree with Saariaho et al. [40] that: "clear and personally valuable goals for learning, a sense of control over one's own learning activities, as well as an ability to reflect individually and with others are the key elements in active, intentional, and engaging teacher learning." (p. 552). Therefore, including activities that encourage co-regulation is key in teacher training because they enhance learning and positive emotions [40].

Finally, it should be mentioned that the study has limitations such as the size of the sample that considered 60 subjects and the fact that the study was conducted only under the qualitative paradigm. However, these limitations can be remedied in future investigations that are carried out using self-report instruments with samples of more than 300 students and qualitative studies with samples of students from other areas. This is because the same guideline of questions in this study can be used, which has had the purpose of being applied as a pilot to direct the following investigations that will allow the diagnostic processes in freshmen students. Also, it is interesting to mention that there are researches in university students in the engineering area that have shown equivalent results [33] in relation to the lack of planning and monitoring of their learning process but they do not describe lack of regulation and external agents that hinder the development of the process.

4. Conclusions and recommendations

The conclusions of this chapter are:

1. It is proposed conceptual model includes components that represent: (i) the understanding of the concept of self-regulation of learning, (ii) development of the process of self-regulation of learning, (iii) difficulties to regulate their learning named lack of regulation and (iv) external agents antiregulation of learning.

2. The proposed conceptual model can be further improved so that it serves as a basic guide in the training of independent professors of the level. That is, in the training of secondary school teachers or higher education teachers.

3. The improvements of the conceptual model can be oriented to collect more data through group and/or individual interviews to raise more categories and empirical subcategories. Then, methodological and/or strategic recommendations for the promotion of self-regulation could be suggested.

4. For the research question, what do (student-teachers) understand about the concept of self-regulated learning?

    i. In relation to the understanding that participating students have about the concept of self-regulated learning, it is noted that they refer mainly to the general organization prior to the study and the regulation of emotions. In this sense, it should be noted that the organization they carry out is not aimed at the purpose of their learning but is aimed at obtaining a grade.

    ii. The understanding of the concept of self-regulation of learning by teachers allows us to analyze what their weaknesses are with respect to

understanding to work on a process of continuous improvement of your abilities.

5. For the research question, what do (student-teachers) describe about the different phases of the process of self-regulated learning from the perspective of the Zimmerman model?

   i. It is concluded that the students do not carry out a strategic planning and that, when executing an academic activity, they mostly use the summaries. However, it is suggested that they have not developed each of the phases exhaustively, since, for example, the planning phase is not strategic. Additionally, in the execution phase it is not common for them to carry out self-registrations that allow them to compare the previous actions with the new execution.

   ii. In summary, the planning and execution phase are incipient in relation to: (i) lack of strategic planning in the planning phase, (ii) lack of motivational self-control processes, which influences the appearance in their discourse of descriptions of lack of regulation such as: disorganization and lack of control of emotions, (iii) absence of self-records that allow them to compare and monitor the execution of their learning. Therefore, the participating students do not describe a monitoring process during the execution of their study.

6. For the research question, ¿what are (student-teachers) the difficulties in regulating their learning?

   i. Two are proposed, which are:

      a. lack of regulation

      b. external agents antiregulation of learning

   ii. The lack of regulation is the difficulties to regulate their learning. In this sence, it was obtained that uncontrolled emotions, disorganization, constitute impediments that hinder learning. However, it should be noted that students are aware and reflect on these obstacles.

   iii. In relation to the understanding have about the other difficulties to regulate their learning, the student-teachers when studying pedagogy understand and have "conscience" of the characteristics of the educational system. In this way, they perceive and describe the subcategory external agents antiregulation of learning.

7. Finally, it is important to conclude that for student-teachers it is essential to understand the concept of self-regulation of learning and the stages of the process of self-regulation of learning so that:

   i. Apply self-regulation of learning to be self-regulated student-teachers.

   ii. When they perform their work as teachers in the classroom, they promote self-regulation of learning in their students through:

      a. Teaching strategies that promote metacognition.

b. Using strategies that allow them to learn to strategically plan their study to become aware of their learning process.

c. Using instruments that allow self-registration to compare and monitor the execution of their learning, among others.

d. Applying strategies that encourage the co-regulation of learning.

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