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Metacognition and motivational strategies, self-learning: Dynamics of learning to learn

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Abstract--The brain can predict thanks to metacognition, it helps reduce the uncertainty of what might happen in different situations and contexts. There are two metacognitive components, one of a declarative nature that refers to metacognitive knowledge and another of a procedural nature that describes metacognitive control, since both are important for learning. To carry out this work, a bibliographic review of books, articles, manuals, institutional reports, and other documents was carried out, which offered reliable information in the interest of delving into the subject studied. The objective of this work is to get the students to develop different types of learning strategies according to the abilities of each one, it was obtained as a result that by applying the teaching strategies, the students in their task of learning to learn may be able to Create an effective study method for your learning.

Keywords—metacognition, learning, cognitive skills, strategies.

Introduction

The brain is a predictive machine that helps reduce the uncertainty of the environment. Thanks to the brain and the nervous system, the world can be understood. Among many mental abilities, those related to mental processing stand out, such as learning, memory, language, thought and metacognition (Montes & Machado, 2011); (Gago & Elgier, 2018).

Metacognition is one of the research areas that has contributed the most to the configuration of new conceptions of learning and instruction. As the constructivist conceptions have been imposed, a growing role has been attributed to the conscience that the subject has and to the regulation that it exerts on the subject. knowledge (Glaser, 1989).

Metacognition is also known as the theory of mind, due to the innate ability it has on people when it comes to understanding, predicting behavior own and the environment, this refers to all cognitive processes such as thinking about one's own thinking and learning to regulate it. It develops in an environment at 4 years of age and human beings are the only ones who have the capacity (Crespo M., 2004).

There are functions of the theory of mind that are born and others that are developed, such as metacognition that helps people develop by giving them the ability to understand the mind and when it is not developed, pathologies such as autism can appear (Echeverry, 2010); (Vazquez, Leon, & Rodriguez, 2006).

Different investigations show that a student who does not have the necessary motivation to learn may be due to the fact that they have not experienced or do not know how to manage their learning process. This implies that the lack of self-regulation negatively influences their self-efficacy expectations. Motivation becomes the engine of learning, a spark that allows it to be turned on and encourages the development of the process.

Promoting motivation requires that the teacher highlight the possible interest of learning and establish reasonable expectations of success and develop an accompanying support, as outlined (Sole, 2001), when a learning environment is created in which cooperation prevails over competition, in which it is normal to ask for, offer help and in which it encompasses the possibility of making mistakes and learning from one's own mistakes. Fluid and respectful communication, fair and personalized treatment is perfectly compatible with a moderate demand that translates the teacher's confidence in the possibilities of their students.

Children understand what is going on in the minds of others where they speculate about how a similar situation would behave for them. That is, the child first develops an ability to observe himself and by analogy, interprets the behavior of other human beings (Harris, 1994).

In the educational vision for the education of the 21st century, the student role in the teaching-learning process is highlighted, attributing great importance to the management of teaching strategies that allow them to successfully face the

requirements of their studies and the demands of the society for problem solving, teamwork, entrepreneurship, autonomous learning and citizen training.

Various investigations carried out on the application of learning strategies in students have provided knowledge about their link with the development of intelligence and self-confidence. To fulfill the roles of a student-centered education, the help of the teaching staff is needed, not only providing information and control with the discipline but also as a mediator between the student and the environment where the great capacity that the educator has as a guide is demonstrated. for students in the course of teaching (Carbonero, Róma, & Ferrer, 2013); (Parra, 2011).

Metacognition or theory of mind is present in areas such as education and psychology, since it is related to the way of thinking and learning. Metacognitive knowledge has procedural and declarative information called from memory that guides cognitive activity. It is made up of beliefs and knowledge gained through different life experiences and is compiled in long-term memory (Crespo, 2000).

The objective of this work is to get students to develop different types of learning strategies according to the abilities of each one, to create cognitive skills that allow understanding the category of information with the realization of schemes that associate knowledge to remember better.

Method

The research was based on a review work, which according to the objective, is descriptive, for which the inductive method was applied since it understands, interprets and analyzes the aspects related to the learning strategies that have been defined by some authors as complex cognitive abilities, which lead an individual to carry out activities through mental processes in order to identify, understand and adopt information for their learning. These techniques can relate to their own experience through cognitive, metacognitive, and affective-motivational components.

Different investigations show that a student who does not have the necessary motivation to learn may be because they have not experienced or do not know how to manage their learning process. This implies that the lack of self-regulation negatively influences their self-efficacy expectations (Baez & Tapia, 2017).

A bibliographic review of books, articles, manuals, laws, regulations, institutional reports and other documents was carried out, which offered reliable information in the interest of delving into the subject studied, for which the Desk Research method was applied, (IMEC, 2019) that allowed to obtain data effectively and systematically review documents, where metacognition and motivational strategies, self-learning and its derivations for personal development at different ages are explained.

Discussion

Metacognition as a cognitive capacity in education

There are two mechanisms in metacognition, one of a declarative nature that refers to metacognitive knowledge and the other of a procedural nature that describes metacognitive control due to its importance for learning.

Metacognitive reasoning refers to the understanding of the individual that is presented as the intellect that possesses an apprentice of certain potentialities, cognitive restrictions and other particular properties that have the possibility of harming performance in a task, which influences its greater or lesser complexity. Understanding is quite fundamental since it helps the learner to choose the appropriate tactics. that will allow you to work on how they will be applied and the conditions under which the different tactics will be more effective (Ullauri & Ullauri, 2018).

Regarding metacognitive control or self-regulated learning, the basic idea is that the competent learner is an intentional and active participant, capable of initiating and directing his or her own learning and not a reactive learner. Self-regulated learning is always goal-directed and controlled by the learner (Arguelles, 2010).

There are different types of metacognitions linked to different cognitive abilities that help in the planning, optimization and organization of thought. The types of metacognitions are shown in figure 1.

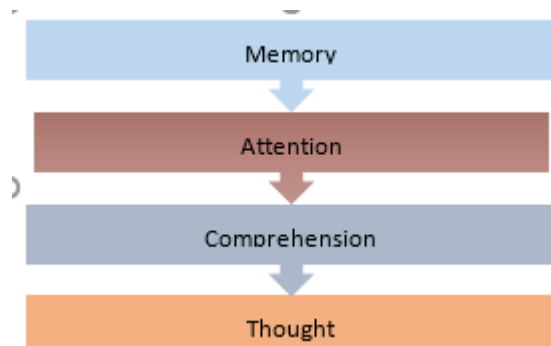


Figure 1. Types of metacognitions

According to (Flavell, 1993) metamemory is the understanding of memory, where important issues are addressed such as knowledge of the capacities, limitations, and resources to memorize and remember the control of forgetting.

The student must present sensitivity to discern when there is a need to memorize information in order to be able to remember it. The person variables are the differences between children and adults such as between knowing and not knowing; strategy variables, where the child observes the maneuver that facilitates memorization and task variable, so that the infant has to learn that there are data that are difficult to remember (Flevell, 1987).

Metacognitive knowledge such as the understanding or beliefs that learners have about the factors and variables that act and interact affecting the development and production of cognitive activities is the information that the learner acquires about language learning or knowledge about language learning. (Flavell, 1971). Metacognitive thinking is the ability to inspect mental activities, recognizing in them the sequenced actions that are performed. It is to be aware of mental processing by having control of it (Lancon & Ortega, 2008). Metacognition helps to self-monitor mental activity where decisions are made regarding the improvement and control of the elements that can favor or hinder it (Sinatra & Taasobshirazi, 2018).

Predictive ability and metacognition strategies in learning

The brain can predict thanks to metacognition, a fact that helps reduce the uncertainty of what might happen in different situations and contexts.

In learning, it allows self-education and the development of metacognitive strategies that help make better decisions in each situation. (Ausabel, 1918), psychologist and pedagogue, talks about significant learning versus rote learning. Significant learning tries to make the person make sense of the information received, relating concepts and building new information based on what has been previously learned. On the other hand, when rote learning is used, the person makes associations, memorizes concepts and facts without the need to understand the information. It is passive learning since new content accumulates in memory without being associated with what is already known, so this information is more likely to be forgotten.

The ladder of metacognition is the process of learning based on thought present in four phases that are represented in figure 2.

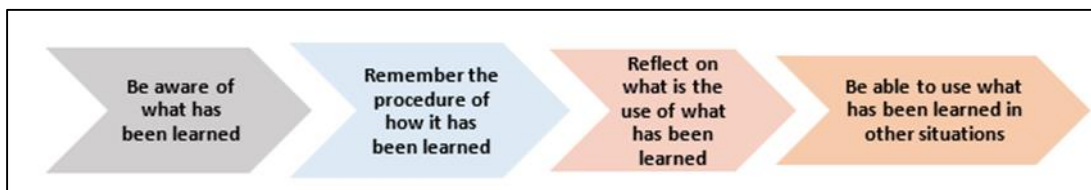


Figure 2. Metacognition ladder

The metacognition ladder is an evaluation technique in which the students participate directly, since the main objective is self-assessment, it represents a ladder of four steps and in each of them there is a question about the learning process that the students must respond to go up little by little through it. This method can be used from infancy to high school, but at the infant level it can be done more informally, through dialogue, while the primary and secondary versions of the ladder must differ in how the ladder is conducted. reflection, adapting to the cognitive level and vocabulary of the students

Metacognitive

Strategies metacognitive strategies influence information processing and allow learning to be regulated; however, one strategy is not always good for everyone, which is why it is important to teach students to be aware of their thoughts and to be able to plan, control and evaluate learning.

Some examples of metacognitive strategies are related to performing self-assessment exercises after having learned something in particular, trying different ways of performing the same activity to assess which strategy works best, or making conceptual maps to relate different concepts, among many other examples, strategies metacognitive tests approve understanding and efficiently developing the acquisition of knowledge.

Motivational Strategies

Learning requires the student to present a set of demands for those who have a series of resources. The possible discrepancies between demands and resources lead the student to experience positive or negative emotions. Motivational learning strategies that help the student to meet their life goals or fail.

In the report (Delors, 1996), the challenge posed to education is defined, preparing students for the new times, promoting in them learning to know, doing, and living with others and learning to be.

In this way, the importance of training the student towards continuous learning is summarized, with a transformative, creative character and with a clear inclusion in the social group or groups where he interacts.

Today, the need for didactics centered on the learner is recognized, which requires guiding teaching as a process of alignment with learning. Motivational factors play a significant role in the initiation, direction and maintenance of the student's efforts in the self-regulation of their learning processes. For this reason, it is necessary to deploy an educational teaching process that promotes the development of motivational learning strategies, with the aim of favoring the development of a strategic learner.

(Montes de Oca & Machado, 2011) point out that by referring to the need for a didactics centered on the subject who learns, it requires directing teaching as a process of learning orientation, where conditions are created so that students not only appropriate of knowledge, but to develop skills, form values and acquire strategies that allow them to act independently, committed and creatively to solve the problems they will have to face in the personal and professional future

Learning

Strategies learning strategies are a conscious and intentional decision-making process that allows the control, selection and execution of methods and techniques for information processing and planning, evaluating, and regulating the cognitive processes involved in learning. the process that are used

intentionally as a flexible tool to learn effectively solve problems and academic demands.

Learning strategies constitute a decision-making process that trains the student in self-regulation processes that begins when there is a need, an objective to achieve and the ways to achieve it in the planning stage, continues when the plan is made. in the execution and control based on the demands of the task and ends with the evaluation and self-assessment, which allows the control, selection, execution of methods and techniques for information processing and planning, evaluating and regulating cognitive processes that intervene in the process, that are used intentionally as a flexible instrument to learn effectively, solve problems and academic demands (Martínez & Berridi, 2017).

To assume a definition of learning strategies, emphasis is placed on the conception formulated by (Gargallo, 2000), who enunciates it as the organized, conscious, and intentional set of what the learner does to effectively achieve a learning objective in a given social context to form affective motivational, supportive, metacognitive and cognitive elements.

The construct proposed by (Gargallo, 2000), is broad and inclusive and includes essential elements such as awareness, intentionality, and the management of diverse resources. In turn, it is understood from a dynamic perspective, which emphasizes the strategic use of the various components that are mobilized to learn effectively.

Taxonomy of learning strategies

Some authors such as (Díaz & Hernández, 2007), point out that classifications can be found based on how general or specific the learning strategies are, for the knowledge and type of instruction that they favor, among others. It classifies them as macro strategies of organization, regulation, affective and motivational, and micro strategies that are repetitive and elaborate.

Cognitive strategies are aimed at information processing, while metacognitive strategies guarantee the regulation of a support process for learning, made up of auxiliary procedures that include emotional self-control, time management, etc., (Castellanos , 2016).

Other authors such as (Gargallo, 2000), propose an integrative classification composed of three dimensions related to learning that are will, capacity and autonomy, grouped into two scales, affective strategies of support and control and cognitive strategies directly related to the processing of The information, this author exposes, includes the components of academic motivation such as the value, expectation and affective of the model (Pinitrich L., 2000); (Pinitrich & Groot, 1990), to complete his proposal within the affective strategies of support and control.

To achieve a thought that promotes the independent and creative execution of the student, this must be prepared, for this the teaching of learning strategies is revealed, which constitutes a path that creates favorable conditions to achieve

this purpose, by equipping the student with of the necessary instruments for their learning, in addition through this process the student becomes aware of how he learns from the elements that he is using during it, as the way of understanding, analyzing and learning from the means defined by each one stands out. one.

Every learning task requires the student a series of demands for which resources will be available. The possible discrepancies between the required demands and the available resources lead the student to experience either positive or negative emotions and some concern about their own performance in the face of that task. In this way, it is observed how emotions triggered by the conditions of the activity influence the behavior of the individual, who launches a group of motivational strategies that help him to achieve success in its realization, which is minimally affected by the consequences of failure. (Sherry & Garolfo, 2012).

Motivation in the human being is an internal process determined by biological, cultural, social, cognitive and learning aspects, which impel a subject to initiate and develop a behavior. According to (López, 2009), human motivation is a variety of physiological factors that initiate, sustain and direct the behavior that is the result of the internal state of an organism, which drives and directs it towards an action in a certain direction. Motivation is a process that is closely related to the achievement of objectives aimed at sustaining or improving the life of an individual and that is determined by sociocultural learning and cognitive characteristics.

Strategies and motivational factors Strategies and motivational

Factors have a direct impact on the initiation and maintenance of effort during the learning process, these are a set of processes involved in the activation, direction, and persistence of behavior that frame procedures used to promote emotional states. adaptive in those situations that affect personal well-being.

It is considered that the management of motivational learning strategies allows the student to maintain a state conducive to learning by optimizing concentration, reducing anxiety, directing attention, organizing activities and study time. In the same way, they can vary depending on factors, both personal and contextual, allowing strategic learning.

There are different types of motivational strategies related to self-esteem and self-concept, expectations and attributions, interest and value, as well as goal setting that encompasses a set of planned actions in order to motivate students to carry out activities in the process. of teaching and learning.

- Strategy of praising others, which consists of students protecting their image against poor academic results, highlighting the academic results of their classmates.
- Defensive pessimism strategy, which resides in the fact that the student activates negative experiences, which is used to find himself in the situation of having to increase his level of effort in order to alleviate said situation.
- strategy Self-handicapping is defined as the creation of obstacles to success in order to maintain self-worth and positive self-schemas.

- Self-affirmation strategies, which is based on the search for a positive evaluation in a domain that allows you to maintain your positive image and your self-worth. Students resort to superficial learning rote techniques seeking only achievement with a disinterest marked by the dedication of time and effort.
- Strategy of overriding others, which avoids comparison with other students about their ability not to be harmed, minimizing the results of their classmates, being able to see themselves as competent.
- strategy Sand-baggin is based on showing a low level of ability with the aim that others generate low expectations about their performance.
- Internal and external attributional strategy, controls motivation through the adoption of a certain type of beliefs, the student can use an adaptive attributional strategy when he attributes success or failure to the effort he uses or maladaptive when he does not assume responsibility for his failures . Academic expectations are fundamental in the first courses of higher university studies, since students may initially present high expectations that later fail to be fulfilled satisfactorily.
- Strategies to exalt the value of utility, achievement and cost that it gives to the student who highlights characteristics of the task that can bring benefits in the academic future, where it generates perceptions that the work allows him to confirm his abilities and the effort spent that considers the cost, time, effort and work involved in carrying out a given task.
- Strategy of involvement in the task, seeks that the student is involved in the performance of the task and does so through approaches to daily life.
- Avoidance goal generation strategy, used to establish as a reason for the development of a certain task to try to overcome it, but working on it as little as possible and avoiding difficulties.
- Learning goal generation strategy, whose objective is to lead the learner to develop a certain task for the search of learning and interest.
- Exaltation strategy of intrinsic value allows highlighting the interest, the challenge, the curiosity and the novelty offered by the activity. Therefore, it has a greater capacity to activate long-term cognitive and motivational resources.
- Strategy for establishing academic goals, which can be established during the development of the task or at the end of it. Task-oriented goal-oriented students are concerned with their learning process, in which they learn and solve problems to develop their own skills that are related to it. In the affective component are those strategies that help the student to manage and control the affects that arise and influence during the development of learning tasks.
- Anxiety control strategy, the student tries to control the anxiety that arises before the tasks or before the exams. You can use different techniques such as generating positive thoughts and avoiding negative ones.
- Social evaluation strategy lies in the fact that the student seeks recognition for his effort and his ability to avoid negative evaluations so as not to feel frustration or sadness. They usually ask questions when they are sure that they will receive praise, but they can also use the so-called self-reinforcement and be the ones who praise their ability.
- Comparison strategy consists of students using performance goals in their learning. The comparison is established if the student obtains better performance than his peers, achieving feelings of satisfaction, worth and pride.

Learning strategies are the organized, conscious and intentional set of what the learner does to effectively achieve a learning objective in a given social context, integrating affective, motivational, metacognitive and cognitive support elements. Motivational learning strategies directly affect the initiation and maintenance of effort during the learning process, which mark procedures used to promote emotionally adaptive states and manage those situations that affect personal well-being.

The metacognitive tools described in the work are faithful to self-assessment mechanisms for students who progress, enriching their autonomy and efficiency in knowledge construction processes, allowing to detect changes that take place in the cognitive structure in a certain period of time, since whether before or after the instruction, quantify the results of their learning progress, the achievement of significant learning that contributes to improving their self-esteem, by feeling ownership of their own knowledge and abandoning common practices that lead to mechanical learning.

Conclusion

Applying teaching strategies, students in their task of learning to learn may be able to create an effective study method for their learning, setting goals to meet and achieve their goal of creating skills, as well as developing different types of strategies for learning. learning according to the abilities of each one.

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