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Analysis of Cognitive Learning Strategies Focused on the Acquisition of Information in Elementary School Students

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Abstract

This article analyzes the cognitive learning strategies focused on information acquisition used by secondary school students, aiming to identify the levels of appropriation and effectiveness in the learning process. The research, based on a quantitative descriptive design, was conducted with a sample of 150 secondary school students from an educational institution in Montería, Colombia. The ACRA questionnaire, designed to evaluate cognitive learning strategies, was used as the primary data collection instrument. The results indicate that information acquisition strategies, such as rehearsal and information organization, are used with moderate frequency, suggesting a partial application of deep learning processes. The need to strengthen training in learning techniques focused on self-regulation and active information processing is highlighted. The findings provide valuable insights for the implementation of pedagogical interventions aimed at improving academic performance and student autonomy.

Keywords: *Cognitive Strategies, Information Acquisition, Learning, Secondary Education, Self-Regulation.*

Introduction

The learning process in basic secondary education is a fundamental aspect for the academic and personal development of students. Within this process, cognitive learning strategies play a central role, as they facilitate the acquisition, organization and retention of information, directly influencing school performance and content comprehension (Monereo & Pozo, 2003). The ability to effectively use such strategies is a major determinant of learning success, as it allows students to transform information into meaningful knowledge.

Information acquisition strategies include techniques such as repetition, elaboration and organization of content, which facilitate the encoding and retrieval of information (Beltrán, 1996). Despite the relevance of these strategies, previous studies have shown that elementary school students tend to use superficial strategies, such as mechanical repetition, which limits their deep understanding and ability to apply knowledge in diverse contexts (Mateos et al., 2008).

In the Colombian context, research on the use of learning strategies in basic education has shown mixed results, evidencing the need to strengthen training in self-regulated learning techniques and the use of more elaborate cognitive strategies (Flórez, 2014). The lack of adequate instruction in these skills can lead to reading comprehension difficulties and poor academic performance that are manifested in national and international standardized tests (ICFES, 2020).

This study focuses on analyzing the cognitive strategies for acquiring information used by elementary school students from an educational institution in the city of Montería, Colombia. The importance of this research lies in its ability to identify patterns of strategy use and generate inputs that contribute to the formulation of more effective pedagogical interventions, focused on promoting meaningful learning and self-regulation of learning.

The article is structured as follows: first, a theoretical framework is presented that addresses cognitive strategies and their relevance in learning processes. Then, the methodology used is described, followed by

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the presentation and analysis of the results obtained. Finally, the conclusions and recommendations for the implementation of pedagogical practices that promote more autonomous and in-depth learning are presented.

Theoretical Foundations

Learning is a complex process that involves the interaction of cognitive, emotional, and contextual factors. Among these factors, cognitive learning strategies play a determining role, since they allow students to acquire, process, and retrieve information efficiently (Beltrán, 1996). In this theoretical framework, cognitive learning strategies focused on the acquisition of information and their impact on significant learning processes will be addressed.

Cognitive Strategies and Their Classification

Cognitive strategies are mental procedures that students use to process and organize information in order to optimize learning (Pozo & Monereo, 2003). These strategies can be classified into three main groups:

- **Information acquisition strategies:** These include techniques such as repetition, focused attention and information organization, whose objective is to promote the initial coding of the content (Beltrán, 1993).

- **Retention strategies:** They involve processes such as the elaboration and association of ideas, facilitating the prolonged retention of content in long-term memory (Ausubel, 2002).

- **Retrieval strategies:** They focus on the recall of previously acquired information, such as self-assessment and review (Mateos et al., 2008).

This study focuses specifically on acquisition strategies, as they are the initial phase of information processing and determinant in the quality of learning.

Information Acquisition Strategies

Information acquisition strategies are those techniques used by students to capture and record new knowledge. Among the most commonly used in school environments are:

- **Repetition:** It consists of the constant repetition of information to facilitate its memorization. Although effective for simple learning, it is insufficient to promote deep understanding (Weinstein & Mayer, 1986).

- **Organization:** Includes techniques such as the elaboration of diagrams, concept maps and summaries that allow the information to be structured in a hierarchical and visual way (Novak & Gowin, 1984).

- **Elaboration:** It refers to the generation of significant connections between new information and prior knowledge, promoting conceptual integration (Mayer, 2014).

These strategies, when applied together, can promote meaningful learning and improve academic achievement.

Importance of Self-Regulation in Learning

The appropriate use of cognitive strategies is closely related to self-regulation of learning, a process by which students plan, supervise, and evaluate their own learning processes (Zimmerman & Schunk, 2011).

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Self-regulated learners not only use cognitive strategies, but are also able to adjust their methods according to the demands of the task and the results obtained.

Various studies have shown that students who apply self-regulated learning strategies obtain better academic results and have greater autonomy in the training process (Pérez & Vila, 2017).

Empirical Evidence on the Use of Strategies in Students

Previous research carried out in educational contexts in Latin America has shown that many elementary school students have difficulties in applying advanced information acquisition strategies. For example, a study by Flórez (2014) in Colombia showed that a high percentage of students mainly use repetitive strategies, limiting their deep understanding and critical capacity in the face of academic content.

These results suggest the need to develop pedagogical interventions that promote the use of more effective and contextualized strategies, especially in environments with low academic performance.

Cognitive strategies for acquiring information are fundamental in the learning process, as they allow the initial codification of knowledge and facilitate long-term retention. However, their effectiveness depends on the correct implementation and teacher training to promote them effectively in the classroom. The present study seeks to analyze how these strategies are used by elementary school students, contributing to the improvement of pedagogical practices.

Methodology

Approach and Study Design

The present study was carried out under a quantitative, descriptive approach, with a cross-sectional non-experimental design. The purpose was to analyze the use of cognitive strategies focused on the acquisition of information in elementary school students, describing their frequency and effectiveness in the educational context.

The descriptive design allowed to characterize the cognitive strategies used by the sample without manipulating the variables, offering a detailed overview of the learning habits in the population under study (Hernández Sampieri et al., 2014).

Population and Sample

The population was made up of elementary school students from an educational institution in the city of Montería, Colombia. A simple random sample of 150 students was selected, representative of the total school population.

This sample size allowed for a representative analysis of the cognitive strategies used at the different levels of junior high school.

Data Collection Instruments

The ACRA Questionnaire (Román & Gallego, 2001) **was used for data collection** , a validated instrument widely used in Spanish-speaking educational contexts to assess cognitive learning strategies. The questionnaire is composed of four scales, with the **information acquisition scale** being the one used in this study.

This scale assesses the following dimensions:

- Repetition of information.

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- Content organization.
- Elaboration and connection with previous knowledge.

The ACRA questionnaire uses a five-point Likert scale (1 = never, 5 = always), which allows the frequency of use of each strategy to be measured.

Procedure

The data collection process was developed in several phases:

- *Application:* The instruments were applied collectively during the school day in a controlled environment. Participants were instructed on the purpose of the study and how to answer the questionnaire.
- *Collection:* The questionnaires were collected anonymously, guaranteeing the confidentiality of the data.
- *Data Analysis:* The data obtained were processed through descriptive statistical analysis, using frequencies, means and standard deviations to describe the frequency of use of each strategy.

Data Analysis

Data analysis was performed using SPSS statistical software (version 25). The following statistical tests were carried out:

- *Descriptive Statistics:* Calculation of frequencies, means and standard deviation.
- *Percentage Distribution*: Identification of the percentage of students who frequently use each strategy.
- *Normality Tests:* Kolmogorov-Smirnov to verify the distribution of the data.

This analysis allowed a detailed description of the patterns of use of learning strategies in the sample studied.

Results

Descriptive Statistics of Cognitive Strategies

The descriptive analysis of the data obtained through the ACRA questionnaire allowed us to identify the levels of frequency with which students use cognitive strategies for information acquisition. The general results in terms of mean and standard deviation for each strategy evaluated are presented below:

- *Repetition of Information:*

Average: 3.8

Standard deviation: 1.2

- *Content Organization*

Average: 3.4

Standard deviation: 1.1

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- *Elaboration and Connection with Prior Knowledge*

Average: 3.1

Standard deviation: 1.3

These results reflect a moderate use of the strategies of repetition and organization of the content, while the elaboration strategy shows a lower frequency of use compared to the other dimensions evaluated.

Frequency of Use by Dimensions

The frequency analysis allowed the sample to be classified into three levels of strategy use: **high, moderate, and low**, which provides a more detailed view of the learning patterns in the sample:

- *Repetition of Information*

High: 45%

Moderate: 35%

Low: 20%

- *Content Organization*

High: 38%

Moderate: 40%

Low: 22%

- *Elaboration and Connection with Prior Knowledge:*

High: 30%

Moderate: 37%

Low: 33%

These results indicate that, although the repetition and organization of content are used more frequently, the elaboration strategy is still one of the least applied, which could reflect a tendency to use more superficial strategies in learning.

Comparative Analysis by Degrees

A comparative analysis was carried out between the three grades evaluated (seventh, eighth and ninth), showing a progressive decrease in the frequency of use of more complex cognitive strategies:

- *Seventh Grade:* Greater use of repetition (Mean = 4.0) and less use of elaboration (Mean = 3.3).
- *Eighth Grade:* Slight reduction in repetition (Mean = 3.7) and organization (Mean = 3.2).
- *Ninth Grade:* Lower scores in all dimensions, especially in elaboration (Mean = 2.9).

This suggests that as students progress through junior high school, the application of deeper learning strategies decreases, which could negatively impact academic performance.

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Correlation between Cognitive Strategies

To evaluate the relationship between the different strategies, a Pearson correlation analysis was performed. The results were as follows:

- *Repetition and Organization of Content*: $r = 0.52$, $p < 0.01$
- *Repetition and Elaboration*: $r = 0.41$, $p < 0.05$
- *Organization and Elaboration*: $r = 0.49$, $p < 0.01$

The analysis showed moderate positive correlations between the strategies, indicating that students who tend to use one strategy frequently also apply others in a complementary way, although not necessarily with the same intensity.

The results show a prevalence of the use of basic strategies, such as repetition and content organization, while elaboration strategies, more complex and associated with deep learning, are used less frequently. This trend could be associated with teaching practices focused on memorization and not on critical comprehension and meaningful learning.

Discussion

The results obtained in this study reflect a predominant pattern of use of basic cognitive strategies, such as repetition and organization of content, while more elaborative strategies, such as connecting information with prior knowledge, are used less frequently. These findings are consistent with previous research (Beltrán, 1996; Mateos et al., 2008) that show the prevalence of mechanical strategies over those that promote deep understanding in traditional school contexts.

Analysis of the Frequency and Quality of Strategy Use

Moderate use of strategies such as repetition and organization suggests a tendency for students to focus on memorization processes rather than critical understanding of the content. The low frequency in the elaboration strategy indicates a limited application of metacognitive skills, which can negatively impact long-term retention and knowledge transfer (Weinstein & Mayer, 1986).

This phenomenon can be explained by traditional teaching practices focused on the memorization of facts, which may be insufficient to develop meaningful learning, especially in elementary school students who are in a formative stage where the development of critical thinking is crucial (Pozo & Monereo, 2003).

Comparison between School Grades

The comparative analysis between seventh, eighth, and ninth grades showed a progressive decrease in the use of cognitive strategies, especially elaboration, as students advance in their academic career. This decrease could reflect a lack of continuity in the explicit teaching of learning strategies throughout schooling, which highlights the need for sustained interventions throughout the educational cycle (Flórez, 2014).

Correlation between Cognitive Strategies

The correlation analysis showed moderate positive relationships between the strategies of repetition, organization and elaboration, which indicates that students who use basic strategies tend to partially combine other forms of information processing. However, the correlation was not strong enough to conclude a balanced use of all the dimensions evaluated. These results reinforce the importance of promoting the teaching of more advanced and self-regulated learning strategies from early stages (Zimmerman & Schunk, 2011).

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Educational Implications

The findings of this study have important pedagogical implications, highlighting the need for a more active and constructivist approach in the classroom. The implementation of the following training actions is recommended:

- *Teacher Training*: Training in didactic strategies to promote deeper learning, with emphasis on the explicit teaching of techniques for the elaboration and organization of content.
- *Design of Didactic Sequences*: Incorporation of activities that promote self-regulation and active processing of information, such as concept maps and cooperative learning techniques.
- *Formative Assessment:* Use of assessment tools that assess not only the retention of information, but also critical understanding and the application of learning.

Limitations of the Study

Among the limitations of this study is the application of the ACRA questionnaire in a single institution, which restricts the generalization of the results to other educational contexts. Also, being a cross-sectional descriptive design, it does not allow establishing causal relationships between the use of strategies and academic performance. Longitudinal studies and studies with larger samples are suggested for more in-depth analysis. In summary, the results of this study reflect the importance of strengthening the teaching of advanced cognitive strategies in secondary education. Although the basic strategies of repetition and organization are frequently used, it is essential to promote more elaborate strategies for comprehensive and meaningful learning.

Conclusions

The results obtained in this study show that the cognitive strategies for acquiring information used by elementary school students in the city of Montería are mainly focused on the repetition and organization of content, while the more elaborate strategies, such as the connection with previous knowledge, have a lower frequency of use. This pattern indicates that students tend to use superficial learning strategies, which could limit deep understanding and the ability to apply knowledge in diverse contexts. In addition, a decrease in the use of these strategies was observed as students advance through the different school grades, suggesting a lack of continuity in the explicit teaching of metacognitive tools throughout the educational trajectory.

The correlational analysis showed moderate relationships between the different strategies, especially between repetition and content organization. However, these associations were not strong enough to conclude a balanced and integrated use of all the dimensions evaluated. This highlights the need to promote pedagogical interventions that strengthen self-regulated learning strategies, particularly those that foster conceptual elaboration and connection, as these have proven to be essential for meaningful learning and long-term retention.

The findings obtained provide valuable information for the improvement of pedagogical practices, emphasizing the importance of teacher training in didactic strategies that promote deeper learning. The implementation of teacher training programs and the incorporation of didactic activities that stimulate critical thinking and self-regulation, such as concept mapping, cooperative learning, and formative assessment, are recommended. Likewise, it is essential to carry out comprehensive evaluations that value not only the memorization of information, but also the ability to analyze, interpret and transfer the knowledge acquired.

However, it is important to recognize some limitations of the study, such as the application of the questionnaire in a single educational institution, which restricts the generalization of the results to other

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school contexts. In addition, the cross-sectional descriptive design does not allow establishing causal relationships between the use of strategies and academic performance. Future research with longitudinal designs and larger samples is recommended to deepen the relationship between the use of cognitive strategies and learning outcomes in different contexts.

In summary, this study underlines the importance of promoting the implementation of diversified cognitive strategies adapted to the needs of the educational context. A pedagogical approach focused on self-regulation and critical understanding will not only improve students' academic performance, but also promote more autonomous and meaningful learning in the long term.

References

Ausubel, D. P. (2002). The acquisition and retention of knowledge: A cognitive view. Springer Science & Business Media.
Bandura, A. (1997). Self-efficacy: The exercise of control. Freeman.
Beltrán, J. (1993). Learning processes, strategies and techniques. Editorial Síntesis.
Beltrán, J. (1996). Learning strategies. Ediciones Síntesis.
Bjork, R. A., & Bjork, E. L. (2011). Making things hard on yourself, but in a good way: Creating desirable difficulties to enhance learning. Psychology and the Real World, 56-64.
Flórez, R. (2014). Learning strategies and their impact on academic performance: An analysis in elementary school students. Revista Colombiana de Educación, 67(1), 45-62.
Hernández Sampieri, R., Fernández Collado, C., & Baptista Lucio, P. (2014). Research Methodology (6th ed.). McGraw Hill.
Mateos, M., Martín, E., & Cuevas, I. (2008). Learning strategies and academic performance: A comparative study. Revista Española de Pedagogía, 66(2), 325-340.
Mayer, R. E. (2014). Cognitive theory of multimedia learning. The Cambridge Handbook of Multimedia Learning.
Monereo, C., & Pozo, J. I. (2003). Strategic teaching: Teaching to think and about thinking. Ediciones Morata.
Novak, J. D., & Gowin, D. B. (1984). Learning how to learn. Cambridge University Press.
Ortega, R., & Rodríguez, L. (2015). Learning strategies and their impact on school performance in secondary school. Ibero-American Journal of Education, 70(2), 123-140.
Pozo, J. I., & Monereo, C. (2003). Strategic learning: Teaching how to learn from the curriculum. Ediciones Morata.
Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. Handbook of Self-Regulation, 451-502.
Román, S., & Gallego, D. (2001). ACRA Questionnaire on Learning Strategies. TEA Ediciones.
Schunk, D. H., & Zimmerman, B. J. (1997). Social origins of self-regulatory competence. Educational Psychologist, 32(4), 195-208.
Sweller, J. (2011). Cognitive load theory. Psychology of Learning and Motivation, 55, 37-76.
Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. Harvard University Press.
Weinstein, C. E., & Mayer, R. E. (1986). The teaching of learning strategies. In M. C. Wittrock (Ed.), Handbook of research on teaching (pp. 315-327). Macmillan.
Zimmerman, B. J., & Schunk, D. H. (2011). Self-regulated learning and academic achievement: Theoretical perspectives. Routledge.