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Text comprehension at school: Is the application of graphic organizers still important to develop it?

Comprensión de textos en la escuela: ¿Aún es importante la aplicación de organizadores gráficos para desarrollarla?

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Abstract

Research on graphic organizers and reading comprehension has taken up new reins in the knowledge about the reader's mental processes, but it has been avoided to understand the levels in the reading process. The importance of organizers often focuses on the power they demonstrate to allow the reader to analyze and map ideas, especially concept maps and mind maps. In this study, we propose to determine the effects of graphic organizers on text comprehension at the school stage. The study is quantitative of quasi-experimental design. It was developed in 42 students from the primary level of Callao, Peru. The results allow concluding that the graphic organizers improved the comprehension of texts in general. The evidences remit significant differences with scores compared at the literal level. The results of inferential understanding presented data that revealed improvement, although it was minimal at this level. This shows that graphic organizers can make improvements but are unlikely during the inferencing process. This shows that graphic organizers can make improvements but are unlikely during the inference-making process as in critical construction. Their contribution is essential in the literal processes, but it is suggested to replicate the study analyzing the processes of understanding at a higher level, with tests of greater complexity, to overcome the limitations obtained here.

Palabras clave: Reading Comprehension; Literal understanding; Reading process; Written text; Graphic organizers.

Resumen

La investigación sobre organizadores gráficos y comprensión lectora ha retomado nuevas riendas en el conocimiento sobre los procesos mentales del lector, pero se ha obviado comprender los niveles en el proceso de lectura. La importancia de los organizadores suele centrarse en el poder que demuestran para permitir al lector analizar y esquematizar ideas, en especial los mapas conceptuales y mapas mentales. En este estudio, se propone determinar los efectos de los organizadores gráficos en la comprensión de textos en la etapa escolar. El estudio es cuantitativo de diseño cuasiexperimental. Se desarrolló en 42 estudiantes del nivel primaria del Callao, Perú. Los resultados permiten concluir en que los organizadores gráficos mejoraron la comprensión de textos en general. Las evidencias remiten diferencias significativas con puntuaciones comparadas en el nivel literal. Los resultados de la comprensión inferencial presentaron datos que revelaron la mejora, aunque fue ínfima en este nivel. Esto pone de manifiesto que los organizadores gráficos pueden establecer mejoras pero resultan improbables durante el proceso de hacer inferencias. Su aporte es esencial en los procesos literales, pero se sugiere replicar el estudio analizando los procesos de comprensión a nivel superior, con pruebas de mayor complejidad, para superar las limitaciones aquí obtenidas.

Keywords: Comprensión de textos; Comprensión Literal; Proceso de lectura; Texto escrito; Organizadores gráficos.

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I. Introduction.

Text comprehension is the main problem of teaching in the Peruvian school system. This occurs since 2000, evidenced by the application of the international PISA assessment tests, among its results Peruvian students will remain relegated to the last place on the list of students tested in more than 30 countries in Latin America, North America, Europe and Asia. The historical and well-known reality is that until 2004 and later than 2010, the results obtained in the Student Census Evaluation carried out by the Education Quality Measurement Unit (Unidad de Medición de la Calidad Educativa, UMC) of the Ministry of Education de Perú (Ministerio de Educación del Perú, Minedu), demonstrate that the Peruvian student population is very slow to learn to decode sentences from texts of various kinds, informative, expository, narrative, mixed, among others. The problem is that school readers, and even university readers, are devoid of reading strategies that are practical and efficient in the reading process. Although the evidence from the PISA test in the international context and the UMC in the national context deduce the shortcomings of the approach to teaching reading that is carried out in the Peruvian school system (offline or post-reading approach), but: What happens when the strategies are applied during the reading process? What is the score readers get when they resort to organizing text ideas using a graphic device? Will it still be possible to teach understanding by generating text comprehension schemes based on the elaboration of graphic organizers in the reading process or in online reading? These are questions that the following article tries to answer, based on experimental research.

Current evidence continues to show that syllable analysis such as constructing ideas from a text can improve understanding in children with problems understanding messages (Florit et al., 2020; Inga, 2008; Müller et al., 2020). This occurs in contexts where interaction is required through the use of complex languages (Müller et al., 2020; Zhang et al., 2020), when trying to read and understand in other non-mother languages (Mede, 2010), although The phonological and morphological component based on the understanding of sounds and oral reading is not neglected in any of these investigations and in others that apply to different reading populations (Hjetland et al., 2020; Zhang et al., 2020). On the other hand, these evidences can be very important, based on an oral linguistic component that is analyzed in the preschool and school population, depending on the understanding of phonetic routes used to understand the text by familiarizing the text with its lyrical value. However, the position of comprehension through the visual route is still being investigated, giving preference to understanding the text in the digital or virtual environment, using the route of entry of the information in which the organization of ideas (in writing or mentally), usually improves understanding (Amadieu et al., 2010; Cuddihy & Spyridakis, 2012; Danaei et al., 2020; Sullivan & Puntambekar, 2015), as well as generating greater interest in it (Blanc & Syssau, 2018). Finally, it can be asserted that these findings show that no route is more important and much less, it is about arguing that some is more effective, but they are complemented by the use of relational understanding, or relationship understanding of the information.

The theoretical approach that is applied to this research is informational learning (Cassany, 2005), therefore, it is more crucial to understand reading comprehension as a process of text comprehension, coining the term to verification, analysis, and understanding of visual signs (graphics and literals). In this sense, we can define text comprehension as the decoding and constructive process that allows the mental mapping of the explicit and implicit information in the text to be used, and thus construct meaning at different levels of understanding (Holguin & Rodríguez, 2017; Medina & Nagamine, 2019; Ponce & Holguin, 2014). Thus, paraphrasing Hall;

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Holguin & Rodríguez (2017) state that: "... meanings at the cognitive level allow the reader to develop a representational model for understanding" (p. 77). In addition to this, other research supports this perspective, including the factor of the type of text, generally, comparing the narrative and expository type. While one is more complex than the other due to its structure or propositional complexity, this is denoted by Wu et al. (2020), mentioning: “These findings suggest that narrative texts place fewer lexical demands on children than expository texts do. Therefore, children's vocabulary level is an important factor to consider when exploring the possible differences between narrative and expository text comprehension…” (p. 2). Therefore, achieving meaning remains the problem for student understanding. Although it can be accepted that both types of text generate some complexities associated with cognitive overload, text manipulation and analysis, but it is still important to understand written information, in what is found in and within the text.

Some studies propose other processes such as those that allow the meaning of the text to be collected more effectively, to generate more real concepts with respect to the same text that students read, to generate better constructed meanings or that are clearer for understanding (Holguin & Rodríguez , 2017; Ponce & Holguin, 2014; Wu et al., 2020), to establish a greater burden of information recall through interpretation when accompanying cognitive skills are used (Medina & Nagamine, 2019; Munayco, 2017; Niño, 2011; Wu et al., 2020), as well as, to represent the relationship of the information or literal meanings of the text through colorful graphic diagrams (Buzán, 1996; Campos, 2005; Ontoria, 2005). Analyzing this problem, focused on the analysis of the text, the text organizers improve the understanding of the text, its memory, in addition to what is provided by Colliot & Jamet (2018), who argue that the memory of information, hierarchization and Schematic production is crucial to understanding texts: “Results revealed that studying with graphics or outlines, rather than with the text on its own, led to better recall of the represented facts. Moreover, students who studied with graphic organizers performed better on hierarchical relations, coordinate relations and the application of new knowledge” (p. 14). Other studies have already revealed that the experience of constructing mind maps, concept maps and other graphics contribute to the understanding of the information located in the text (Arévalo, 2015; Carcausto & Rojas, 2015; García et al., 2019; Montes, 2014; Sales, 2015; Yussof et al., 2012), but there is still insufficient evidence to contribute in the knowledge of the generation of inferences, the elaboration of a process of relational understanding as part of the relationship of concepts.

Given these events, which have yet to be investigated, the objective is to determine the effects of the use of graphic organizers in the reading process as part of understanding the text at the school stage.

II. Method.

Research approach and design.

The research is hypothetical deductive, of quasi-experimental design, with experimental and control groupings (Ñaupas et al., 2013). The methodological moments of comparison established in the pretest and posttest scheme. In the experimental group, a program for applying graphic organizers for reading was applied, and in the control group, only the measurement tests of the text comprehension variable were administered. The study was hypothetical deductive (Ñaupas et al., 2013, p. 102).

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Sample.

The population was made up of 66 students from a public school at the primary level, located in the Constitutional Province of Callao (Perú). The sample was distributed by 42 students in grade 5A and grade 5B, both attended in the morning shift. Of the above, 57.1% were students who received the application stimulus from the graphic organizers. 42.9 % were selected for the control group, under a decision of order for convenience in their respective educational instances. Boys and girls between 10 and 11 years of age with an average age of 10.41 years (SD = ± 0.12) were considered. All participated accepting their inclusion through the permission granted by the parents, obeying the ethical principles of the Declaration of Helsinki for experimentation with humans. This was mediated by the informed consent signed by each parent.

Technique, Instruments and Application.

The technique was direct evaluation. Applying a text comprehension instrument based on the measurement of reading in your process. This test measured the levels of literal type and inferential type. The validity of the instrument was calculated after the expert judgment and the reliability through the application of a pilot plan. The preliminary results showed that the instrument was adjusted to the reality of the students involved in the study. Texts for the age of students who were in cycle V of Primary Education (10 to 11 years old) were included. The test was structured through the constitution of multiple-choice answers. The visual organizers application program focused on the application of organizational content maps. Figure 1 shows the evidence of the application of mind maps and concept maps in the search for text comprehension, so that they stimulate understanding. It should be noted that this process was carried out individually as well as in a group, this helped the subjects to develop their own techniques to understand the text, but also to use appropriate techniques for the development of their tests of evaluation of text comprehension.

Figure 1. Exemplifications of the development of the strategy in the proposal of graphic organizers applied in the experimental reading workshop.
Source: Research Log.
Note: On the left, use of the mind map, on the right, use of the concept map.

At the end of the application of the program in the experimental group, we proceeded to evaluate the comprehension of texts by applying the instrument in the post-test phase of the experiment. With the data, it was decided to apply the parametric or non-parametric test according to each contrast to be performed. In this case, the prior decision test of comparative analysis tests was Kolmogorov-Smirnov, which allowed us to analyze the normal distribution of these data.

III. Results.

The application of the pretest represented the majority of students in the experimental group at the low level of text comprehension (95%). Likewise, in the control group, a low level of understanding was obtained in 83.3% of all subjects. The posttest results reported that most of the students in the experimental group presented a low level of understanding but in a lower proportion than at the beginning of the experiment (58.3%). In the control group there were no significant variations (81%).

In the description of some indicators that were glimpsed at the end of the experience, 58.3% of subjects in the experimental group established hierarchies and order of concepts. 91.7% learned to create links between concepts, 79.2% adapted their way of constructing words linked to other concepts and 54.2% considered the structure of a concept map or mind map. With the above, it is taken into account that the members of the experimental group acquired new strategies based on the experimental program based on the application of graphic organizers.

The inferential analysis t-Student allowed to determine the comparison of groups in the preste measurement, since averages with non-significant differences between groups were obtained ($M_{(pre-test)} = 3.21$; $M_{(pos-test)} = 3.76$; $p >. 001$), for which both groups presented stability at the beginning of the experience.

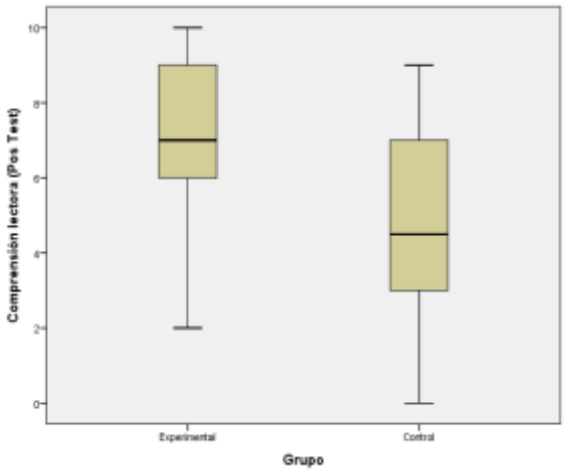

Figure 2. Box diagram of the post-test results of the text comprehension variable.

Source: Research database.

Figure 2 shows a divergent distribution between the data of the experimental group and the control group. This means the difference between the scores obtained by the participants in the experimental group and in the control group (p <.001). These evidences allowed us to report that the graphic organizers increased the comprehension of texts in the experimental sample.

IV. Discussion.

The research objective was to determine the effects of the use of graphic organizers in the reading process as part of text comprehension at the school stage, which was among the most common indicators to analyze during text comprehension, which is why The students were able to: a) hierarchize and order concepts, b) link textual information, c) construct words from the use of

explicit information, d) construct ideas according to the contents of the text. This may allow the existence of stimuli in the literal understanding of the text to be adduced, as has also occurred in other studies that implement this strategy (Colliot & Jamet, 2018; Cuddihy & Spyridakis, 2012; Danaei et al., 2020; Wu et al. , 2020). However, it is necessary to limit that, the experience did not clarify the understanding in the sense that students with high abilities were not found to be able to deduce implicit information. Although, the results show that the understanding was effective since the development of the program, some evidence shows that this cannot be fully accepted.

One of these evidences is to find average scores that only went up to seven or eight, but without reaching the maximum approval limit. This indicates that the test presented would only evaluate a large part of the literal understanding process, but evidence would be lacking to verify progress at other levels such as inferential and critical. On the other hand, time, the development of other linguistic variables prevented further development of text comprehension at a higher level, as also recommended by other findings and proposals (García et al., 2019; Sales, 2015; Sullivan & Puntambekar, 2015; Yussof et al., 2012). This is well known, because the mastery of the basic components of reading can influence the global understanding of the text from the information that students can rescue in the reading process (Florit et al., 2020; Hjetland et al., 2020; Inga, 2008; Müller et al., 2020; Zhang et al., 2020). On the other hand, it is important to understand that the significant differences found only represent a momentary improvement, since it can be concluded that graphic organizers improve part of reading comprehension in the educational process, with certain deficiencies for inferential understanding.

These limitations are based on the achievement of basic skills, which presuppose the development of reading at the early stage of development, so that in schooling higher level skills would be more effective.

V. Conclusions.

According to the research objective, it can be argued that the stimuli of the graphic organizers program allowed determining the improvement and increase of text comprehension skills during reading, allowing momentarily clarification in significant increases in the literal reading process. There is little significant evidence regarding the inferential level of reading, as a basic process to improve the global understanding of the text, here we conclude that its effects were significant but low-level.

The study provides sufficient evidence as forms of scientific contribution to know that text comprehension is a multiple whole in turn in the infant reading process, therefore, its basic processes can be independent between the most superficial and the most superior. For example, by having very well fortified basic reading skills, but at the same time, poorly developed superior skills. Although in the reading process they serve to understand, they are not enough to generate models of reading at the inferential level.

Finally, instruments are needed to evaluate the process of reading inferences in the use of strategies based on the transformation and use of textual information, such as graphic organizers.

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