



Use of pictograms for pre-reading in high school children

Uso de pictogramas para la prelectura en niños de preparatoria

Ana Lucía Andrade-Carrión
ana.andrade@unl.edu.ec

Universidad Nacional de Loja, Loja, Loja Ecuador
<https://orcid.org/0000-0002-6570-9438>

Michellé Ivanova Aldeán-Riofrío
michelle.aldean@unl.edu.ec

Universidad Nacional de Loja, Loja, Loja Ecuador
<https://orcid.org/0000-0003-3538-4377>

Gabriela Estefanía Román-Celi
gabriela.e.roman@unl.edu.ec

Universidad Nacional de Loja, Loja, Loja Ecuador
<https://orcid.org/0000-0002-5734-0140>

María Luisa Díaz-López
luisa.diaz@unl.edu.ec

Universidad Nacional de Loja, Loja, Loja Ecuador
<https://orcid.org/0000-0001-6129-8910>

ABSTRACT

The objective of this study was to determine the effectiveness of the use of pictograms for pre-reading in high school children at the Bernardo Valdivieso Millennium Educational Unit in the city of Loja, Ecuador. A quasi-experimental design was chosen. The results obtained after the implementation of the intervention based on the use of pictograms in the initial phase of pre-reading reveal a significant change in the level of reading aptitude in high school children. The dramatic 62% increase from an initial 7% to an impressive 69% of children considered reading literate conclusively indicates the positive and notable effectiveness of this strategy in the development of pre-reading skills, accepting the affirmative hypothesis and rejecting the null hypothesis. This innovative approach represents a significant step toward building a solid foundation for the literacy journey.

Descriptors: reading instruction; reading programmes; reading promotion. (Source: UNESCO Thesaurus).

RESUMEN

Se expresa el objetivo de determinar la efectividad del uso de pictogramas para la prelectura en niños de preparatoria en la Unidad Educativa del Milenio Bernardo Valdivieso de la ciudad de Loja, Ecuador. Se optó por un diseño cuasiexperimental. Los resultados obtenidos tras la implementación de la intervención basada en el uso de pictogramas en la fase inicial de la prelectura revelan un cambio significativo en el nivel de aptitud para la lectura en niños de preparatoria. El drástico aumento del 62%, pasando de un inicial 7% a un impresionante 69% de niños considerados aptos para la lectura, indica de manera concluyente la efectividad positiva y notable de esta estrategia en el desarrollo de habilidades relacionadas con la prelectura, aceptándose la hipótesis afirmativa y rechazándose la nula. Este enfoque innovador representa un paso significativo hacia la construcción de una base sólida para el viaje hacia la alfabetización.

Descriptores: enseñanza de la lectura; programa de lectura; promoción de la lectura. (Fuente: Tesoro UNESCO).

Received: 09/16/2023. Revised: 03/10/2023. Approved: 09/11/2023. Published: 01/01/2024.

Research articles section



INTRODUCTION

In the constant search for effective educational strategies that foster the integral development of children in the preschool stage, this article dives into the exploration of an innovative and promising tool: the use of pictograms as facilitators of pre-reading in high school children. This study is situated at the intersection of developmental psychology and pedagogy, with the primary goal of understanding how the early introduction of pictograms can positively influence the process of acquiring pre-reading skills (Puetate-Manitio & Esteves-Fajardo, 2023).

Considering the critical importance of the preschool phase in the cognitive and linguistic formation of children, this paper aims to rigorously examine the impact of pictograms in stimulating phonological awareness, graphic-linguistic association, and other aspects fundamental to the development of emergent reading skills. As technology and cognitive science converge, the use of pictograms offers a novel and visually engaging approach that could prove critical in optimizing the transition to mainstream reading (Ripalda, et al. 2020).

Through the critical review of previous research, as well as a meticulous empirical design, this article seeks to contribute to the existing body of knowledge by exploring the possibilities that pictograms present as a pedagogical tool. An in-depth understanding of the underlying mechanisms and the evaluation of the results obtained in specific educational contexts will not only provide a theoretical foundation for their implementation, but also offer practical guidelines for educators and child development professionals.

In this journey towards understanding how pictograms can transform pre-reading in high school children, it is hoped to shed light on a new perspective that will contribute to the continuous advancement of pedagogical practices, enriching the training of future generations (Bonilla-Jarquín & Ruiz-Almendárez, 2020). The pre-reading phase is an essential process that involves the development of fundamental skills for effective reading competence, an indispensable requirement in the integral formation of any individual (Huarca-Flores, 2022). This process demands special attention from the early stages of life, focusing on activities that enhance visual and auditory perception, decoding, as well as laterality. In this context, a strategy based on the use of pictograms, understood as icons, signs or images designed to convey a message, has been implemented in order to facilitate the execution of the aforementioned activities by children.

In the specific area of the city of Loja, the research conducted at the Bernardo Valdivieso Millennium Educational Unit reveals that most of the children present difficulties in figure recognition, laterality problems, perceptual and visual discrimination, as well as a lack of imagination and a shortage of vocabulary, factors that affect the beginning of the pre-reading phase. These observations highlight the urgent need to address these challenges in order to ensure adequate development in reading readiness and, therefore, in the academic formation of children in this educational institution.

This article provides essential information on pre-reading, highlighting its crucial character in individual formation (Bauch, et al. 2021). In addition, it presents a series of attractive and dynamic activities centered on the use of pictograms. These activities involve the stimulation of visual perception, the creation and narration of stories with visual support, the following of sequences of illustrations and the use of songs designed to work with children. The purpose is that children, through these practices, can develop skills such as decoding images, recognizing directions (right and left) and improving visual and auditory perception. This approach seeks to prepare children to face future challenges in the reading process. It is important to highlight that the main beneficiaries of these activities are the 5 to 6 year old children of the mentioned institution, who actively participated in each of the proposals designed to enhance the pre-reading process through the effective use of pictograms.



Based on the above, the objective is to determine the effectiveness of the use of pictograms for pre-reading in high school children at the Bernardo Valdivieso Millennium Educational Unit in the city of Loja, Ecuador.

METHOD

The research adopted a descriptive approach to obtain detailed information on the variables and their qualities, highlighting essential characteristics that contributed to the construction of the theoretical framework. It focused on the interpretation, presentation and description of the effects generated by the instrument applied. The methodological design was oriented towards a quantitative approach, allowing the collection of statistical data through the application of instruments that made possible the weighting of the results.

A quasi-experimental design was chosen, manipulating the independent variable to observe and analyze its effects on the dependent variable, that is, on the research problem. A pre-test was implemented to identify initial difficulties in pre-reading and a post-test to evaluate changes after the intervention. The study population consisted of 60 high school children from the Bernardo Valdivieso Millennium Educational Unit. A sample of 29 children from parallel "A" was selected by non-probabilistic sampling, considering a previously established group.

The instrument used was the Reversal Test, a nonverbal graphic test applicable to pre-school and high school children (Torío-López & Mesonero-Valhondo, 2019). Performed in small groups, the test lasts 15 minutes and focuses qualitatively on the evaluation of perceptual discrimination ability, right-left symmetries, and discernment of identical and non-identical figures. Quantitatively, errors were evaluated, classified into crossed-out and uncrossed-out identical figures, with a maximum score of 84 points. Errors were subtracted to obtain the direct score. This instrument was used as a pre-test to obtain initial data and as a post-test to identify improvements in relation to the research problem.

After data collection, a statistical comparison was made by means of percentages at the pre- and post-test moment, complemented with a proportions test to determine the exact percentage of change in the population, using the SPSS V25 statistical program.

RESULTS

In accordance with the objective of the research, the research hypothesis is presented:

H1: There is effectiveness of the use of pictograms for pre-reading in high school children in the Bernardo Valdivieso Millennium Educational Unit in the city of Loja, Ecuador.

H0: There is no effectiveness of the use of pictograms for pre-reading in high school children at the Bernardo Valdivieso Millennium Educational Unit in the city of Loja, Ecuador.



Table 1. Comparative table of the application of the Reversal Test of Edfeldet, Ake to high school children.

Pre test			Post test		
Niveles	f	%	Niveles	f	%
Apto para la lectura	2	7	Apto para la lectura	20	69
Madurez media suficiente	4	14	Madurez media suficiente	3	10
Caso límite	3	10	Caso límite	2	7
No apto aún para aprender a leer	2		No apto aún para aprender a leer	4	14
	0	69			
	2				
Total	9	100%	Total	29	100%

Source: Own elaboration.

The various results presented in Table 1, both in the Pre-test and Post-test, indicate the following: in the level considered apt for reading, the children experienced a notable increase, going from 7% to 69%, thus showing an evolution of 62% in the pre-reading process. On the other hand, in the medium sufficient maturity level, a decrease was observed from 14% to 10%, representing a 4% reduction. In the borderline case, the proportion decreased from 10% to 7%, implying a decrease of 3%. Finally, at the level not yet ready to learn to read, there was a significant improvement from 69% to 14%, reflecting a 55% increase in the number of children ready to begin this phase. These advances materialized after the implementation of the activity guide "the magic village of images", confirming that the activities implemented have a significant impact on the development of pre-reading in high school children.

Proportion test

"Able to read" level:

Before intervention: 7%.

After the intervention: 69%.

Change: $69\% - 7\% = 62\%$.

Source: Own elaboration.

The results reveal a significant transformation in the level "Able to read" before and after the intervention. Initially, only 7% of the children were considered reading literate. However, after implementation of the intervention, this proportion increased dramatically to 69%, representing a substantial change from 62%. This marked increase suggests that the intervention, at this particular level, has had a positive and noticeable impact on the development of pre-reading skills.

DISCUSSION

In relation to the results obtained, it is suggested that the effective development of pre-reading involves the implementation of various activities that act as stimuli for children, facilitating the formulation of sentences and the expression of their thoughts and emotions (Benischek, 2020). Among these activities, the use of pictograms in various forms (Dowse, 2021), along with a wide variety of materials, stands out as an initiation strategy.

In conjunction with pictograms, support materials are developed that contribute to the interpretation of books. The approach to learning pre-reading should start from the simplest, gradually progressing to more complex levels. A valuable technique is to start with a detailed observation of the available pictures, followed by a playful game to guess their meaning. This



approach allows the child to become effectively familiar with this initial phase of pre-reading, making this easy-to-understand code a fundamental model for adults to assist children beginning the pre-reading process. This didactic resource has become increasingly common in this crucial phase of pre-reading development, and with the help of pictograms, the acquisition of skills and competencies is favored, stimulating interest and improving attention (Kisaalita & Sempira, 2022).

In parallel, when conceiving the animation and taste for reading, a series of strategies seeks motivational methods to bring the reader closer and ensure that he/she enjoys this knowledge-generating activity (Sánchez-Sánchez, et al. 2023). As stated by (López, 2017), the teacher must avoid imposing this reading activity, seeking that it be perceived as a free and recreational act that supports the integral development of the individual. The goal is for it to be adopted as a life practice that allows access to distant worlds within and outside the universe, discovering values such as peace, friendship, companionship, cooperation, justice and solidarity.

Focusing on the development of unique skills that guarantee the comprehension, recreation and interpretation of any text in its various forms, the educator's mission is to form individuals who discover the pleasure of interpretive reading. Children progressively discover that reading is a voluntary activity that requires intellectual effort, and therefore, this approach to pre-reading seeks to integrate affective and cognitive dimensions.

The importance, influence and contribution of pictographic resources in educational environments to develop skills and abilities in the initial phase of pre-reading is highlighted. These resources guide children towards optimal learning, improving their vocabulary, pronunciation and acquisition of new words. In addition, they function as complementary elements that facilitate learning in various areas, being the gateway to knowledge. The correct execution of the skills adopted for quality comprehensive pre-reading culminates in capable individuals, endowed with analytical, critical and reflective thinking, able to communicate their emotions and feelings with the world effectively.

In accordance with the above; it is important to keep in mind that the introduction and application of pictograms in the initial phase of pre-reading for high school children stands as an essential pillar in the educational process, acting as a catalyst for the comprehensive development of cognitive and emotional skills. By exploring this initiation strategy, a bridge between visual perception and the world of words is revealed, providing children with a solid foundation for their literacy journey.

In the web of activities designed to stimulate thinking and expression, pictograms stand out as key elements. Not only do they serve as visual tools that awaken curiosity, but they also become the first symbolic language that children learn to decipher. The diversity of shapes and the combination with a diverse range of materials bring richness to this initial experience, nurturing children's ability to formulate sentences and express their thoughts in a more articulate way.

The creation of support materials that complement the interpretation of books further reinforces the importance of this strategy. Starting from the simplest, through close observation of images, followed by playful games to guess at meanings, is an approach that not only engages children, but also effectively familiarizes them with the essence of pre-reading. This form of visual learning has the power to convey information in a manner equivalent to a thousand words, thus becoming a comprehensible and accessible code for young readers-in-training (Boerma, et al. 2016).

The transition from pre-reading to a deeper appreciation of interpretive reading is supported by the integration of motivational strategies (Verwimp, et al. 2020). The conception of reading as a free and recreational act, instead of an imposition, opens the doors to the exploration of fascinating worlds. This approach, supported by the statement of (López, 2017), seeks to cultivate a taste for reading as a life practice that transcends the limits of the classroom, revealing fundamental values that enrich personal development.



In this context, pictograms act as essential facilitators for access to these distant worlds (Medina-Cardozo & Veliz-Campos, 2013). Its influence extends beyond the acquisition of linguistic skills, improving vocabulary and pronunciation (Guevara, *et al.* 2020). They function as complementary elements that unlock knowledge in various areas, opening the doors to exploration and discovery. The correct execution of pre-reading skills not only creates individuals competent in textual interpretation, but also nurtures analytical, critical and reflective minds, capable of expressing their emotions and thoughts clearly and effectively in the world around them.

CONCLUSIONS

The results obtained after the implementation of the intervention based on the introduction and application of pictograms in the initial phase of pre-reading reveal a significant change in the level of reading aptitude in high school children. The drastic increase of 62%, going from an initial 7% to an impressive 69% of children considered capable of reading, conclusively indicates the positive and notable effectiveness of this strategy in the development of skills related to pre-reading, accepting the affirmative hypothesis and rejecting the null one.

Pictograms are positioned as key elements in this educational process, acting as a crucial bridge between visual perception and the world of words. Their role as visual tools that spark curiosity and as the first symbolic language that children learn to decipher is evident in the marked progress observed. The diversity of shapes and the combination with a variety of materials not only enriches the initial experience, but also contributes to children's ability to express their thoughts more articulately.

The creation of supporting material that complements the interpretation of books further reinforces the effectiveness of the strategy. The approach of starting from the simplest, with a detailed observation of the images followed by playful games, has proven to be effective in engaging children and effectively familiarizing them with the essence of pre-reading. As Vásquez highlights, visual learning through pictograms is positioned as an understandable and accessible code, equivalent to transmitting information with a thousand words, thus facilitating the process of developing reading skills.

In summary, the results support the idea that the introduction and application of pictograms in pre-reading for high school children is not only effective, but also constitutes an essential component in the comprehensive development of cognitive and emotional skills. This innovative approach represents a significant step towards building a solid foundation for the literacy journey, positively impacting children's access and enjoyment of reading on their path to comprehensive and enriching learning.

AUTHORSHIP CONTRIBUTION

Ana Lucía Andrade-Carrión was mainly responsible for the initial conception of the research project, identifying the problem, outlining the objectives and generating the first outline of the experimental protocol. Michellé Ivanova Aldeán-Riofrío played a crucial role in the implementation of the quasi-experimental study, coordinating data collection, supervising the intervention and ensuring the integrity of the experimental process. Gabriela Estefanía Román-Celi contributed significantly through exhaustive research of the relevant bibliography, providing a solid theoretical foundation to the study. Additionally, she played an essential role in the statistical analysis of the collected data. **María Luisa Díaz-López** carried out a detailed and rigorous statistical analysis of the data obtained, providing a critical and analytical perspective to the study. Likewise, she actively participated in the writing and structuring of the research article. All authors collaborated cooperatively to consolidate the working paper into a coherent and complete research article. The editorial review process was carried out jointly, incorporating comments, suggestions and improvements to guarantee the quality and relevance of the final article. This contribution reflects the collective effort of the authors, who actively participated in different stages of the project, contributing comprehensively to the development and success of the research.



FINANCING

Non-monetary

CONFLICT OF INTEREST

There is no conflict of interest with persons or institutions related to the research.

ACKNOWLEDGMENTS

To the high school children at the Bernardo Valdivieso Millennium Educational Unit in the city of Loja, Ecuador.

REFERENCES

- Bauch, Anne, Friedrich, Claudia, & Schild, Ulrike. (2021). Phonemic Training Modulates Early Speech Processing in Pre-reading Children. *Frontiers in psychology*, 12, 643147. <https://doi.org/10.3389/fpsyg.2021.643147>
- Benischek, Alina, Long, Xiangyu, Rohr, Christiane, Bray, Signe, Dewey, Deborah, & Lebel, Catherine. (2020). Pre-reading language abilities and the brain's functional reading network in young children. *NeuroImage*, 217, 116903. <https://doi.org/10.1016/j.neuroimage.2020.116903>
- Boerma, Inouk, Mol, Suzanne, & Jolles, Jelle. (2016). Reading Pictures for Story Comprehension Requires Mental Imagery Skills. *Frontiers in psychology*, 7, 1630. <https://doi.org/10.3389/fpsyg.2016.01630>
- Bonilla-Jarquín, A. M., & Ruiz-Almendárez, S. E. (2020). La comprensión narrativa en preescolares de zonas periféricas de Nicaragua [Narrative comprehension in preschoolers in peripheral areas of Nicaragua]. *RECIE. Revista Caribeña De Investigación Educativa*, 4(2), 62–77. <https://doi.org/10.32541/recie.2020.v4i2.pp62-77>
- Dowse, Ros. (2021). Pharmacists, are words enough? The case for pictograms as a valuable communication tool. *Research in social & administrative pharmacy : RSAP*, 17(8), 1518–1522. <https://doi.org/10.1016/j.sapharm.2020.10.013>
- Guevara, James, Erkoboni, D., Gerdes, M., Winston, S., Sands, D., Rogers, K., Haecker, T., Jimenez, M. E., & Mendelsohn, A. L. (2020). Effects of Early Literacy Promotion on Child Language Development and Home Reading Environment: A Randomized Controlled Trial. *The journal of pediatrics*: X, 2, 100020. <https://doi.org/10.1016/j.ympdx.2020.100020>
- Huarca-Flores, Paola. (2022). La lectura en la educación superior y el rol del docente en su desarrollo [The Reading In The Higher Education and Teacher'S Rol in His Development]. *Revista Cubana de Educación Superior*, 41(1), 10.
- Kisaalita, W. S., & Sempíra, E. J. (2022). Development of Pictograms to Communicate Technological Solution Instructions (Labeling) Among Low-Literacy Users. *Ergonomics in Design*, 30(2), 17-29. <https://doi.org/10.1177/1064804620959145>
- López, C. (2017). Fomento de la Lectura [Reading Promotion]. *PublicacionesDidacticas*, 81, 325-335. Recuperado de <https://core.ac.uk/download/pdf/235856602.pdf>
- Medina-Cardozo, I. I., & Veliz-Campos, J. (2013). Pictogramas para mejorar la comprensión lectora de textos narrativos en educación primaria [Pictograms to improve reading



comprehension of narrative texts in primary education]. *UCV-HACER. Revista de Investigación y Cultura*, 2(2), 84-90.

- Puetate-Manitio, Gloria, & Esteves-Fajardo, Zila. (2023). Importancia de los pictogramas para el inicio de la prelectura [Importance of pictograms for the beginning of pre-reading]. *CIENCIAMATRIA*, 9(1), 617-627. <https://doi.org/10.35381/cm.v9i1.1089>
- Ripalda, V, Macías, J, & Sánchez-Mata, M. (2020). Rincón de lectura, estrategia en el desarrollo del lenguaje [Reading corner, language development strategy]. *Horizontes Revista de Investigación en Ciencias de la Educación*, 4(14), 127-138.
- Sánchez-Sánchez, Deysi, Bonilla-Roldán, María, Herrera-Lara, Marcela, & Tamami-Pachala, Jorge. (2023). Los pictogramas y su incidencia en el desarrollo de la lectoescritura de estudiantes de educación inicial bilingüe [Pictograms and their impact on the literacy development of bilingual early childhood education students]. *Magazine De Las Ciencias: Revista De Investigación E Innovación*, 8(1), 38-49. <https://doi.org/10.33262/rmc.v8i1.2855>
- Torío-López, Susana, & Mesonero-Valhondo, Antonio. (2019). El reversal test y la ficha de observación de G. Yoakam en la determinación de la madurez para la lectura [The reversal test and G. Yoakam's observation sheet in the determination of reading maturity]. *Magister*, 12, 279-295. <https://doi.org/10.17811/msg.12.0.1994.%p>
- Verwimp, Cara, Vanden Bempt, F., Kellens, S., Economou, M., Vandermosten, M., Wouters, J., Ghesquière, P., & Vanderauwera, J. (2020). Pre-literacy heterogeneity in Dutch-speaking kindergartners: latent profile analysis. *Annals of dyslexia*, 70(3), 275-294. <https://doi.org/10.1007/s11881-020-00207-9>

Copyright: 2024 By the authors. This article is open access and distributed under the terms and conditions of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) license.

<https://creativecommons.org/licenses/by-nc-sa/4.0/>