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ORIGINAL ARTICLE

Pictogram use on literacy development in 4- and 5-year-old children at Isidoro Barriga Public Educational Unit, Ecuador

Uso de pictogramas en el desarrollo de la lectoescritura en niños de 4 y 5 años en la Unidad Educativa Fiscal Isidoro Barriga, Ecuador

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Abstract Pictograms are visual tools that facilitate the learning of reading and writing, especially at an early age. Their implementation promotes text comprehension, idea expression, and the development of communicative skills. This research aimed to identify the level of literacy learning through pictograms in 4 and 5-year-old children at the Isidoro Barriga Public Educational Unit. The research, descriptive with a mixed approach, allowed for determining the initial state of literacy development through theoretical methods such as analysis-synthesis, induction-deduction, and empirical methods based on the application of surveys to teachers. It was identified that 4-5-year-old children were at an intermediate stage of literacy development, indicating the need to strengthen their skills. Difficulties in communicating their ideas and understanding pictograms in class were observed.

Keywords literacy, pictograms, teaching-learning.

Resumen Los pictogramas son herramientas visuales que facilitan el aprendizaje de la lectoescritura, especialmente en edades tempranas. Su implementación fomenta la comprensión de textos, la expresión de ideas y el desarrollo de habilidades comunicativas. En la investigación, se estableció como objetivo identificar el nivel de aprendizaje de lectoescritura a través del uso de pictogramas en niños de 4 y 5 años en la Unidad Educativa Isidoro Barriga. La investigación, de tipo descriptivo y con un enfoque mixto, permitió determinar el estado inicial del desarrollo de la lectoescritura a través de métodos teóricos como el análisis-síntesis, inducción-deducción, y métodos empíricos basados en la aplicación de encuestas a docentes. Se identificó que los niños de 4-5 años se encontraban en una etapa media de desarrollo en lectoescritura, lo que indicó la necesidad de fortalecer sus destrezas y habilidades. Se observó dificultad en la comunicación de sus ideas y comprensión de los pictogramas en clase.

Palabras clave lectoescritura, pictogramas, enseñanza-aprendizaje.

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PUBLIS EDITORIAL

Introduction

Early Childhood Education, during the first five years of life, impacts the development of competencies and skills that influence children throughout their lives. This stage lays the foundation for academic and personal development. In this process, preschool educators' preparation is essential; they must possess the necessary knowledge to effectively address the development of reading and writing (Lema et al., 2019).

Psychomotor development in early childhood facilitates the acquisition of basic skills and competencies for reading and writing while promoting the personality's integral development in various dimensions, such as cognitive, emotional, social, and affective. According to Gutiérrez et al. (2021), reading and writing are fundamental skills for children and teachers, and the strategies implemented in the classroom and at home determine young children's learning.

In this context, reading and writing refer to the learning process of reading and writing skills, and it is considered essential to begin at an early age since knowledge and abilities develop more effectively during this period. Mastery of reading and writing is fundamental to future academic and professional success. Starting this process in Early Childhood Education allows children to strengthen their learning style and better understand their environment (Daza et al., 2020).

Pictograms have proven to be an effective tool in developing reading comprehension, as they also stimulate children's creativity, imagination, and attention. As a form of visual communication, pictograms help children better understand texts and improve their pronunciation and writing (Chulli, 2019). Although initially used as an alternative communication system, pictograms have been successfully integrated into teaching reading and writing, especially for children with special educational needs. This research aimed to identify the level of literacy learning through pictograms in 4—to 5-year-old children at the Isidoro Barriga Public Educational Unit.

Methodology

The research design was descriptive, which allowed for the independent and joint measurement of information regarding the concepts and variables related to the development of reading and writing through pictograms. The study followed a mixed approach, combining qualitative and quantitative data collection processes. The mixed approach enables a qualitative description of the study's elements and variables, using the observation technique to interpret reality.

The research was conducted at the Isidoro Barriga Public Educational Unit in the Puerto López canton, Manabí province, Ecuador. The study population consisted of 43 children and 16 Early Childhood Education teachers. A purposive sample of 29 children aged 4 to 5 years and 10 teachers from Level II of Early Childhood Education, working in the morning shift, was selected.

The research employed theoretical and empirical methods, allowing for a direct understanding and detailing of events. Data were collected through a questionnaire. Ethical principles were upheld throughout all phases of the research. Participants were informed about the study's objectives, and informed consent was obtained from the children's parents and/or guardians and teachers. The confidentiality and anonymity of the collected data were strictly respected, ensuring that the results were used solely for academic and research purposes. Quantitative data were analyzed using measures of central tendency and dispersion.

Results and discussion

The Isidoro Barriga Public Educational Unit offers education from Early Education to high school on morning and afternoon shifts. The center has 34 teachers and 1,111 students.

Among the deficiencies perceived by teachers in literacy development, it was noted that pictograms were not used in all important didactic activities. On the positive side, many teachers considered pictograms effective as they facilitated children's learning. They also used various didactic resources to enhance children's reading and writing development.

The children were evaluated and found to be able to express their feelings and emotions, allowing them to develop communication skills. However, they lacked interest in activities with pictograms and still found it challenging to communicate, interpret, and create short sentences using this teaching method.

Table 1 shows the teachers' views on the use and impact of pictograms in literacy development. Of the 10 teachers, 70% agreed that pictograms help children understand information. Meanwhile, the remaining 30% strongly agreed, considering pictograms to be very helpful in improving comprehension of the content being taught.

Seventy percent of the teachers strongly agreed that pictograms are an exceptional didactic tool for the development of literacy. The remaining 30% agreed that pictograms are important educational resources for this learning purpose. Teachers' most commonly used educational resources to develop literacy were figure silhouettes (40%), stories, puzzles, and picture sheets, each accounting for 20%.

Table 1. Use and impact of pictograms in the development of literacy

Indicator	Frequency	Percentage
Question 1.- Do pictograms facilitate the understanding of messages or information?		
Strongly agree	3	30
Agree	7	70
Disagree	0	0
Question 2.- Is the pictogram a didactic resource that facilitates children's literacy learning?		
Strongly agree	7	70
Agree	3	30
Disagree	0	0
Question 3.- What didactic resources do you use most frequently to develop literacy through pictograms?		
Story	2	20
Puzzle	2	20
Figures silhouette	4	40
Sheets	2	20
Question 4.- What teaching resource do you use for the development of writing through pictograms?		
Letter tracing	3	30
Drawing sheets	4	40
Tracing practice	3	30
Pregunta 5.- Do you consider that the pictogram provides an appropriate and playful environment for the child's expression?		
Strongly agree	7	70
Agree	3	30
Disagree	0	0
Pregunta 6.- Which activities are the most important to strengthen literacy learning through pictograms in children aged 4 to 5 years?		
Pictographic stories	5	50
Descriptive cards	3	30
Reading sentences	1	10
Riddles	0	0
Expression of ideas and emotions	1	10
Question 7: Will the design of a system of didactic activities through pictograms strengthen teachers' efforts to develop children's literacy?		
Strongly agree	5	50
Agree	5	50
Disagree	0	0

Regarding writing, 40% of teachers used drawing sheets, 30% employed letter tracing, and the remaining 30% used the didactic action of tracing over letters. Seventy percent of teachers expressed that the educational materials provide an appropriate environment for children to express themselves. An additional 30% agreed, noting that the resources create a playful and supportive environment.

Fifty percent of teachers mentioned that using pictorial stories was the most important activity to strengthen literacy through pictograms, while 30% highlighted descriptive cards. Sentences with pictograms and expressions of ideas and emotions through pictograms were essential for 10% each.

About designing a system of activities with pictograms, 50% of teachers strongly agreed that this approach benefits both the teacher and the child in their professional and learning development, while another 50% agreed.

These results align with previous research that emphasizes the effectiveness of pictograms in literacy learning in early childhood education. According to Morocho & Cabrera (2022), pictograms are valuable didactic resources to promote reading comprehension and written expression in children, helping to associate abstract concepts with concrete images, which enhances information retention. Similarly, Mendoza & Delgado (2022) concluded that pictograms contribute to children's emotional and cognitive development, creating a playful and participatory learning environment. These findings highlight the importance of pictograms not only as tools for literacy but also as key elements in children's motivation and expression in the classroom.

Table 2 shows the skills and abilities of children to communicate using pictograms. It was found that 45% of children had acquired the ability to communicate and graphically represent their ideas and emotions. However, 34% were in progress, and 21% were beginning to express themselves clearly due to the lack of teaching tools and lack of attention from the child.

The majority (55%) of the children were still in the process of voluntarily and enthusiastically solving activities with pictograms. 24% had already acquired this skill and participated voluntarily, while 21% were still developing this ability, as they had delays in their language and difficulties relating images. 55% of the children were in the process of communicating easily with pictograms, while 38% faced difficulties and were at the initiation level. Only 7% communicated easily using pictograms.

It was determined that 55% of the children were correctly interpreting the pictograms according to the activity plan-

ned by the teacher. 28% (8 children) correctly interpreted the pictograms, while 17% had difficulty doing so. It was also observed that 79% of the children were learning, while 10% were starting to develop communication skills, and the other 10% had already acquired these skills through pictograms.

Table 2. Skills and abilities of the children

Alternative	Frequency	Percentage
Question 1.- Does the child clearly communicate and draw their ideas and emotions?		
Initiated	6	21
In process	10	34
Acquired	13	45
Question 2.- Does the child willingly and enthusiastically complete activities that involve the use of pictograms?		
Initiated	6	21
In process	16	55
Acquired	7	24
Question 3.- Does the child communicate easily using pictograms?		
Initiated	11	38
In process	16	55
Acquired	2	7
Question 4.- Does the child interpret and arrange the pictograms according to the planned activity?		
Initiated	5	17
In process	16	55
Acquired	8	28
Question 5.- Does the use of pictograms develop literacy skills in children?		
Initiated	3	10
In process	23	79
Acquired	3	10
Question 6.- Does the child create short sentences and write the vowels represented using pictograms?		
Initiated	9	31
In process	10	34
Acquired	10	34
Question 7.- Does the child recognize, name, and write the vowels represented in the pictogram?		
Initiated	2	7
In process	24	83
Acquired	3	10
Question 8.- Understand stories, riddles, and pictographic cards, increasing their literacy level		
Initiated	7	24
In process	22	76
Acquired	0	0

Regarding the ability to create short sentences using pictograms, it was noted that 34% of the children could already do this, and another 34% were in the process of achieving it. However, 31% were still in the initiation phase of this learning process. Regarding pictogram recognition, 83% of the observed children had few complications recognizing the pictograms in their environment. 10% of the children recognized them adequately inside and outside their environment, while 7% barely recognized them. No child had fully understood the pictograms, and it was observed that 76% of the children were in the process of understanding them, while 24% were starting in this stage.

These results align with previous studies that highlight the effectiveness of pictograms in developing literacy in early childhood education. Sánchez et al. (2023) concluded that pictograms are educational resources that support the teaching-learning process of children, contributing to literacy development. Likewise, Arellano (2021) emphasized that the application of pictograms is necessary for children to develop language skills, distinguish concepts, and improve reading comprehension.

The results of this research on the use of pictograms in children's literacy are consistent with prior studies that highlight the effectiveness of this tool in developing communication and writing skills in children aged 4 to 5 years. These findings support the importance of incorporating pictograms into educational strategies to strengthen literacy in early education.

Conclusions

Learning literacy at early ages is based on the zone of proximal development and the use of schemas for each type of activity. This complex process allows children to approach and understand the text step by step, integrating reading and writing as a communication system. The research revealed a deficit in the literacy learning level of 4—to 5-year-old children at the Isidoro Barriga Public Educational Unit. A deficit in idea communication was observed, making it difficult for them to recognize pictograms and affecting their skills and abilities.

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Conflicts of interest

The authors declare that they have no conflicts of interest.

Author contributions

Katty K. Oviedo: Conceptualization, data curation, research, methodology, visualization, writing the original draft, writing, review and editing.

Data availability statement

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Statement on the use of AI

The authors acknowledge the use of generative AI and AI-assisted technologies to improve the readability and clarity of the article.

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