

# Charting the Path of Reading Development: A Study on the Importance and Effective Strategies for Reading in Early Ages Based on Technology

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**Abstract.** This scientific article explores the transcendental dimension of reading development in early childhood, highlighting its impact on the educational and cognitive training of children. Through a rigorous study, we investigated the importance of reading early in life and evaluated effective strategies to foster a strong reading foundation. From a solid theoretical framework to a carefully designed methodology, our findings shed light on key practices to enhance the love of reading from an early age. This study not only addresses academic relevance but also highlights the connection between early reading and children's holistic development. We conclude by offering valuable practical implications for educators and policymakers, thereby contributing to the understanding and promotion of reading development in early childhood. This work represents a significant contribution to advance knowledge and effective strategies to cultivate competent readers from their first years of life.

**Keywords:** Reading Development · Effective Strategies · Early Childhood · Technology

## 1 Introduction

In this context, our study seeks to trace the complex network of factors that influence reading development at an early age. From the analysis of pedagogical theories to the evaluation of teaching strategies, our meticulous methodological approach aims to unravel the secrets of effective teaching and learning in the field of children's reading. Through this scientific inquiry, we aim not only to enrich academic understanding, but also to provide tangible and insightful tools for educators, parents, and professionals involved in shaping young minds. With this work, we aspire to shed light on the path of reading development at an early age, thus contributing to the construction of a solid foundation for the educational future of future generations.

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The existing literature on the importance of reading at an early age is presented as a vast landscape of research and reflections that converge in the unanimous conclusion that reading development in the first years of life establishes the fundamental pillars for educational success and well-being, cognitive and emotional throughout life. Numerous studies have shown that early exposure to reading not only promotes the acquisition of linguistic and cognitive skills, but also acts as an essential catalyst for socio-emotional development. Early interaction with books and storytelling are intrinsically linked to strengthening the emotional bond between parents and children, creating fertile ground for the development of crucial social and emotional skills.

In the academic field, the literature reviewed consistently highlights the positive correlation between reading competence at an early age and future academic performance. Early literacy not only facilitates the assimilation of knowledge in various disciplines, but also nurtures critical thinking and problem solving from an early age. As research advances, the connection between reading at an early age and the development of creative thinking has also been highlighted. Exposure to rich and varied narratives stimulates imagination and creativity, cultivating young minds capable of approaching challenges with insight and originality. In summary, the literature review unequivocally confirms that early reading is not simply a milestone in the educational journey, but rather the seed that germinates in the fertile garden of continuous learning. This analysis sets the stage for the detailed exploration of effective strategies in promoting early childhood reading in our scientific study.

## 2 Methodology

Research on early reading development has generated various theories and approaches that shed light on the importance of this crucial stage. Next, a theoretical framework with four steps is presented, supporting the scientific study on reading development in young children: document search; research questions; Article selection; and extraction of relevant data.

### 2.1 Document Search

**Theory of Information Processing**

Information Processing Theory, supported by studies such as that of Anderson and Clark [1], offers an essential perspective to understand reading development at an early age. This theory postulates that reading is built through a gradual process of information processing, encompassing letter identification, word decoding, and understanding meaning. The process begins with the identification of individual letters. Perfetti *et al.,* [2] has explored how children, in their early stages of learning, develop the ability to recognize and distinguish between different letters.

Word decoding is a crucial milestone. Studies such as Ehri's [3] have examined how children acquire decoding skills, connecting letters with their corresponding sounds and forming the necessary foundations for fluent reading.

Understanding meaning is the ultimate goal. According National Reading Panel [4] research has highlighted the importance of lexical and semantic understanding in the reading process, highlighting how children, from an early age, work towards deep understanding of words and text.

At early ages, there is a focus on the development of basic skills. Studies such as Share [5] have examined the progression of word recognition skills, identifying developmental patterns in children's ability to recognize common words. This scientific analysis supports the Information Processing Theory by showing how the different stages of identification, decoding and comprehension are interconnected in the process of reading development at an early age.

**Theory of Constructivism in Reading Development**

The Theory of Constructivism, supported by research such as that of Chen [6], offers a valuable perspective on how children actively build their reading comprehension from an early age. From this perspective, reading is conceived as an interactive and social process, where children participate in the active construction of meaning through interaction with texts, experiences and their environment.

The basis of constructivism is the idea that children are not passive recipients of information, but active constructors of their own knowledge [7]. Research by Vygotsky [8] supports how the reading process benefits when children actively participate in the construction of meaning.

The interaction with texts is central to this process. Studies such as Pressley [9] have explored how interaction strategies, such as asking questions during reading, facilitate meaning construction and improve reading comprehension in children.

Participation in Conversations: Conversations about the text are essential. Nystrand's [10] research has highlighted the importance of group discussions and structured conversations about read content to strengthen understanding and meaning construction.

From an early age, children participate in an interactive and social process of meaning construction. Palincsar and Brown's [11] research has highlighted how social interactions, such as peer tutoring, contribute significantly to reading development. This scientific approach supports the Theory of Constructivism by highlighting how active participation, interaction with texts and conversations about content promote the effective construction of meaning in the children's reading process.

Bronfenbrenner Ecological Model considers reading as a phenomenon that develops within an ecological context. Factors such as family, school, and community have a significant impact on reading development. At early ages, the model highlights the importance of an enriching environment that provides literary experiences and emotional support to encourage reading [12].

Dual Processing Model suggests that there are two processing systems involved in reading: one for word recognition and another for understanding meaning. At early ages, it is examined how children develop decoding skills (surface processing) and comprehension (deep processing) simultaneously [13].

Socio-Cultural Reading Theory highlights the influence of culture and social environment on reading development. At early ages, it focuses on how cultural practices and social interaction impact the way children acquire reading skills. It includes aspects such

as storytelling, exposure to different types of texts, and participation in literary practices within the community [14].

Phonic Processing Theory focuses on how children develop phonological awareness, the ability to recognize and manipulate speech sounds. At early ages, how phonological awareness is related to learning to read and the ability to connect letters and sounds is explored [15].

Evidence-Based Reading Theory focuses on the application of evidence-based practices for teaching reading. At early ages, it involves using research-backed teaching methods to develop reading skills, such as systematically teaching phonics and comprehension strategies [16].

These theories, models and concepts provide a comprehensive theoretical framework to understand reading development at an early age, opening the door to the exploration of effective strategies in our scientific research.

The accumulated research in the field of reading at early ages has provided a solid basis for understanding the various aspects of this crucial process. The review of previous studies reveals findings and trends that enrich our understanding and guide the direction of the present research highlighting: the importance of shared; influence of family literacy; evidence-based teaching approaches; impact of oral storytelling; role of phonological awareness; effectiveness of phonics teaching; and role of the literary game.

The relevance and positive impact of shared reading between parents and children have been analyzed in significant research. Notable studies, such as the one carried out by Bus, van Ijzendoorn and Pellegrini [17], highlight the direct connection between shared reading and reading development in childhood. Research indicates that the quality of interaction during shared reading emerges as a key predictor of reading progress in young children. The findings of this study suggest that active parental involvement during reading contributes not only to the enrichment of vocabulary and comprehension, but also to the stimulation of a lasting interest in reading in children. Shared reading is thus presented as a valuable tool to foster a love of reading from the early stages of development [17].

Sénéchal and LeFevre's [18] research has provided valuable exploration of the positive influence of family literacy on children's reading development. This detailed study examined how early exposure to books and reading activities at home is significantly associated with an increase in children's reading skills. Family literacy emerges as a crucial factor that goes beyond the classroom, demonstrating that shared reading experiences and the presence of printed materials in the home environment have a measurable impact on reading progress. The findings support the idea that fostering a literate home environment positively contributes to the early development of reading skills in children [18].

Critical evaluation of research by the National Academy of Sciences, as reviewed by the National Reading Panel in 2000 [4], has shed light on the effectiveness of evidence-based approaches for teaching reading to young children. Explicit instruction in comprehension strategies and guided practice have been highlighted as critical elements in improving reading skills at this crucial stage of development. This review provides solid

scientific support for the implementation of research-backed teaching methods, emphasizing the importance of directly addressing comprehension strategies and providing structured guidance during the process of teaching early reading [4].

Impact of Oral Storytelling:

Significant research, such as the study conducted by Dickinson and Smith [19], has delved into the positive impact of oral storytelling on vocabulary development and reading comprehension in young children. This study examined how exposure to complex, vocabulary-rich narratives significantly contributes to children's cognitive development. Oral storytelling is identified as a key factor in expanding vocabulary and understanding narrative structures, essential elements for reading success. Research by Dickinson and Smith [19] supports the idea that the practice of active, nurturing storytelling can have lasting positive effects on young children's language and reading development.

The crucial role of phonological awareness in learning to read has been the subject of extensive research, supported by significant studies in the field. Wagner and Torgesen [20] conducted extensive research highlighting the close relationship between phonological awareness and the process of learning to read. Their work provides substantial evidence that the ability to manipulate and understand speech sounds is an essential precursor to early reading success. In a similar vein, Bradley and Bryant [21] contribute to this perspective by addressing how phonological awareness directly impacts children's ability to decode words and understand the structure of written language. Both studies underscore the critical importance of developing phonological awareness as an integral part of early instruction to ensure solid progress in learning to read [20, 21].

The effectiveness of phonics teaching has been the subject of numerous studies that support its positive impact on the development of reading skills at early ages. Adams [1], in his influential work, highlights the importance of systematic phonics instruction by demonstrating how the relationship between letters and sounds lays the crucial foundation for initial reading acquisition. This finding has been corroborated in more recent research, such as that carried out by Johnston and Watson [22], who reaffirm the effectiveness of phonics teaching by focusing on the precise connection between letters and their corresponding sounds. These studies highlight the relevance of structured and systematic instruction in phonics as a key strategy for the effective development of reading skills in the initial stages of learning [1, 22].

Research by Wasik and Bond [23] and Neuman [24] has examined how literary play activities, such as story dramatizations, can improve reading comprehension and interest in young children. This review confirms the diversity of factors that influence reading development at early ages and highlights the importance of a holistic approach that integrates various aspects of the educational and family environment. These previous studies provide a solid foundation for our current research, which seeks to expand and contextualize this knowledge in the current educational landscape. In the educational field, teaching reading has become an exciting and dynamic challenge. The implementation of game-based pedagogical strategies has emerged as an innovative approach to stimulate students' interest and active participation. This review thoroughly explores the impact of the game-based approach on the development of reading skills, providing a comprehensive view of its effectiveness and benefits.

In respect to the importance of Reading and the Role of Playful Strategies, reading skills are essential for the academic and personal development of students. As technology advances, it is imperative to adapt our teaching strategies to keep students engaged. Game-based strategies not only offer a refreshing change to the traditional approach, but also address the diverse learning styles present in the classroom.

Game-Based Approach present some benefits: promotion motivation; the development of cognitive skills; and the adaptability to different reading levels (Table 1).

**Table 1.** Game-Based approach benefits.

| Benefits | Description |
|---|---|
| Promoting Motivation | "The game, being intrinsically motivating, creates an environment conducive to learning, stimulating students' desire to actively participate in reading" [25] |
| Development of Cognitive Skills | The incorporation of games in the teaching of reading has been shown to strengthen cognitive skills such as attention, memory, and problem solving" [26] |
| Adaptability to Different Reading Levels | The games allow the difficulty to be adapted according to the reading level of each student, providing a personalized approach and favoring individual progress" [27] |

Despite successful strategies in practice is possible highlight the educational crossword games, and the reading roles in simulation games.

Educational Crossword Games is "The creation of crossword puzzles with terms related to the reading content consolidates comprehension and facilitates the retention of information" [28].

In the case of Reading Roles in Simulation Games, "through reading roles, students immerse themselves in contextualized situations, improving their reading comprehension by relating it to practical experiences" [29].

The game-based approach in teaching reading emerges as an effective and engaging strategy. Educators can leverage this methodology to transform students' learning experience, cultivating not only strong reading skills but also a lasting love of reading.

### 2.2 Research Questions

The design of this study is framed in a descriptive and cross-sectional research. The descriptive nature focuses on providing a detailed analysis of the current situation of early reading instruction, while the transversal nature involves the collection of data at a single point in time.

The target population consists of kindergarten teachers from public schools in the city of Machala, Ecuador. The sample is selected in a representative manner, and the electronic survey is sent to all available preschool teachers in the city.

A questionnaire designed and administered through Google Forms is used. This questionnaire consists of 10 questions specifically formulated to obtain relevant information about teaching reading practices at an early age. The questions cover topics such as teaching methods used, resources available, challenges faced, and perceptions about the effectiveness of the strategies implemented.

The survey is sent electronically to preschool teachers identified in the public schools of Machala. A link accessible via email or electronic messaging is provided.

Teachers have the option to participate voluntarily and provide informed consent to participate in the study before completing the survey.

Data is collected as teachers complete the online survey. Using Google Forms allows for efficient and organized collection of responses.

The data collected is analyzed using statistical tools and descriptive techniques. Tables and graphs are used to present the results in a clear and understandable way.

A detailed interpretation of the results is carried out, highlighting patterns, trends and key findings. Special attention is paid to responses that offer insights into the effectiveness of current reading instruction strategies.

This methodological approach allows us to obtain a comprehensive vision of the teaching practices of reading at an early age in the specific context of the public schools of Ecuador. The use of electronic tools facilitates efficiency in data collection and analysis, guaranteeing the quality and representativeness of the information obtained.

### 2.3 Article Selection

During the article selection process, filtering criteria were applied with the objective of choosing documents from research databases. These criteria considered aspects such as the relevance of the content, the inclusion of reviews and its relationship with topics such as education, early reading, methodology, technology and related areas. Furthermore, in the searches carried out in the bibliographic databases, an additional filter was incorporated that covered the classification by disciplines such as education, early reading and technology.

### 2.4 Extraction of Relevant Data

**Technology and Reading**

In the digital age, the integration of technology into education has significantly transformed the way students interact with reading. This scientific article critically examines the role of educational applications in promoting reading skills, highlighting relevant research and evaluating their impact on reading development.

**The Paradigm Shift in Reading**

Access to mobile devices and tablets has redefined the way students approach the reading process. Recent research suggests that educational apps can play a critical role in improving reading comprehension and promoting digital literacy [30].

Benefits Identified in Previous Studies: Interactivity and Engagement: “The interactivity of educational applications captures students’ attention, promoting active engagement with the reading material” [6].

Adaptability and Personalization: "Applications that adapt the level of difficulty according to individual abilities improve the learning experience and promote gradual progression in reading competence" [12].

Immediate Feedback: "The immediate feedback provided by the applications allows students to correct errors and improve their understanding efficiently" [13].

Challenges and Ethical Considerations: Despite the obvious benefits, it is crucial to address the challenges associated with the use of technology in education. Student privacy, equity in device access, and quality of digital content are areas that require continued attention [14].

Recommendations for Effective Implementation: Continuous Evaluation: "Educators should regularly evaluate the effectiveness of educational applications, ensuring that they are aligned with pedagogical objectives and student needs" [15].

Teacher Training: "Teacher training in the effective integration of educational applications is essential to maximize the benefits and address the challenges associated with technology in the classroom" [16].

This article highlights the need for continued exploration and critical evaluation of educational applications as tools to improve reading literacy. By thoughtfully embracing technology, the educational community can transform the way students interact with the act of reading.

## 3 Analysis and Results

In this research, a qualitative approach is used through the collection of data from articles in scientific journals and the survey conducted with 150 preschool teachers, that is, initial education teachers from public schools in Machala Ecuador. The analysis of these data suggests a diversity in the methods and approaches used to teach early reading. Here is a breakdown of each result:

Game-Based Approach (43.4%): The predominance of this approach indicates a significant interest in the integration of playful and participatory elements in the reading teaching process. This method could involve using educational games, interactive activities, and immersive narratives to make learning to read more engaging and effective.

Phonic Method (37%): Like the Phonetic-Syllabic Method, this approach involves teaching the relationship between letters and sounds. This result suggests a preference for methods that focus on phonics as a basis for the acquisition of reading skills. Phonetic-Syllabic Method (36.1%): This method focuses on teaching children to recognize and associate letters or groups of letters with corresponding sounds. The inclusion of this method highlights the importance attributed to decoding and phonics as essential components of learning to read. The significant presence of multiple approaches reveals the understanding that children may have diverse learning styles, and combining strategies may be key to addressing their individual needs. This analysis provides a balanced view of the methodologies applied in teaching reading at an early age, this can be seen in Fig. 1.

The analysis of these data reveals that the most used strategies to promote reading comprehension in children in their early stages of learning are Open Questions, with 51.6%. They are followed by Role Games, with 50.2%, and the Use of Manipulable

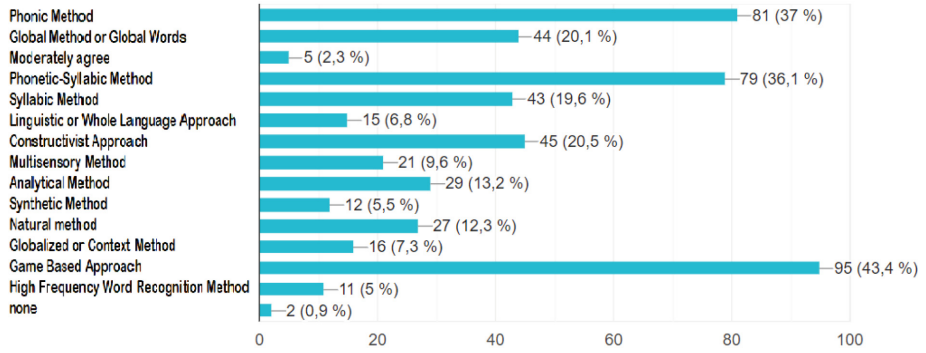


**Fig. 1.** Reading Teaching Strategies What main method or approach do you use to teach early reading?

Materials, with 41.6%. These results indicate that there is a significant emphasis on the practical and experiential approach to promoting reading comprehension in children. The use of Role Plays suggests the incorporation of playful and participatory activities that actively involve children in situations related to reading. Open Questions indicate a deeper analysis approach, encouraging reflection and verbal expression. Furthermore, the Use of Manipulative Material suggests the integration of tangible resources to improve comprehension through the physical manipulation of objects related to the reading content. This diverse set of strategies reflects the importance of approaching reading comprehension from multiple perspectives, adapting to the unique nature of each child and providing a rich and varied learning environment, this can be seen in Fig. 2.

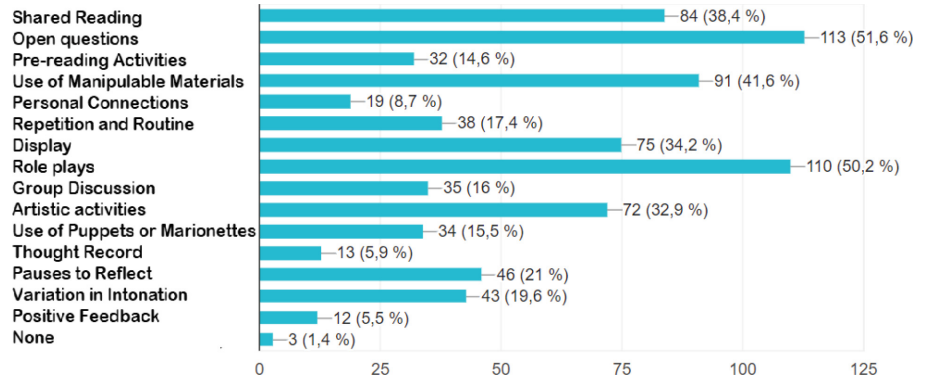


**Fig. 2.** Promotion of Reading Comprehension. What strategies do you use to promote reading comprehension in children in their early stages of learning?

The analysis of this data in relation to the use of technology in teaching reading reveals a trend towards the incorporation of digital tools. Here is a breakdown of each

result: Educational Applications (41.6%): The prevalence of this category suggests substantial interest in the integration of educational applications to support the reading teaching process. These apps could range from those designed to improve phonics to those that promote reading comprehension through interactive activities. Phonetics and pronunciation tools (28.8%): The inclusion of these tools highlights the recognition of the importance of pronunciation in reading development. Phonetics and pronunciation tools could involve creating digital stories, interactive audiobooks, or other forms of narrative content in digital format. Interactive Multimedia Resources (26%): The significant presence of interactive multimedia resources indicates an adoption of digital tools that go beyond specific applications. This could include interactive presentations, online educational games, and other resources that combine visual and auditory elements to enhance the learning experience. The preference for these technological tools suggests an adaptation to contemporary trends in education, recognizing the potential of technology to make learning to read more attractive and effective. This analysis provides valuable information to understand how technology is integrated into the context of early reading instruction. This can be seen in Fig. 3.

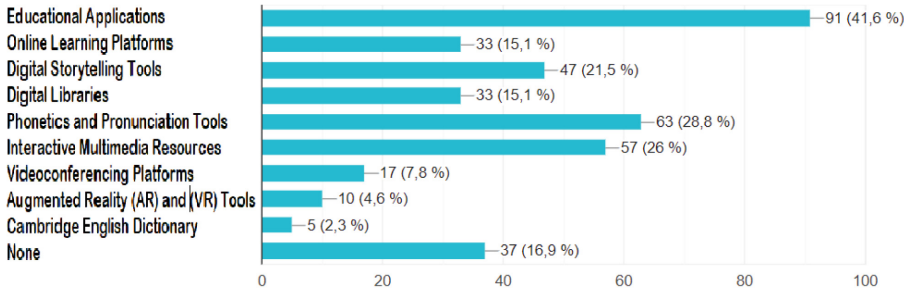


**Fig. 3.** Technology and Reading Do you use technological tools or multimedia resources as support for teaching reading? If so, which ones?

Analysis of data on challenges and obstacles in teaching reading at early ages reveals the following trends: Lack of Family Participation (61.6%): This result highlights the perception that the lack of family participation is the main challenge when teaching reading to children in their early years. The lack of support or involvement from families can negatively impact reading development since active parental participation is essential to strengthen reading skills at home. Variety in Skill Levels (35.2%): Recognizing the variability in skill levels among children presents a significant challenge. This diversity in students' abilities can make teaching more complex, as educators must adapt their approaches to address each child's individual needs. Developmental Differences (32.9%): Identifying developmental differences among children as a challenge underscores the importance of understanding and addressing individual disparities in the pace of reading skill acquisition. Adapting pedagogical strategies to address these differences becomes crucial. These results suggest that, from the perspective of educational professionals, family participation is essential for success in teaching reading at an early age. Additionally, variability in abilities and differences in development are challenges that

require flexible and personalized pedagogical strategies. This analysis provides valuable insight into perceived barriers, which may be useful in developing effective approaches and addressing existing challenges in teaching early reading. This can be seen in Fig. 4.

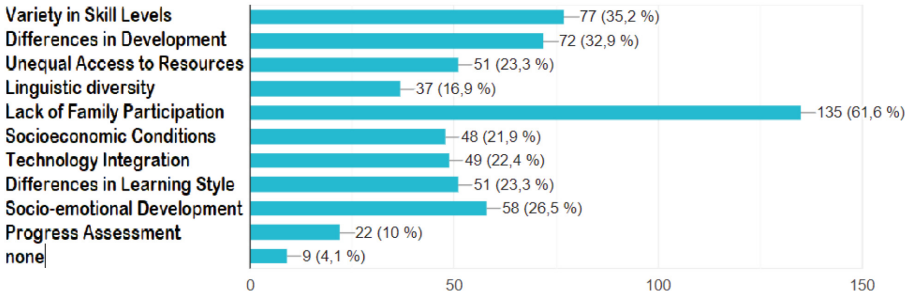


**Fig. 4.** Challenges and Obstacles: What do you consider to be the biggest challenges or obstacles when teaching reading at an early age?

## 4 Discussion

The integration of technology in education has sparked widespread discussion due to its potential to enhance teaching and learning. However, it also brings forth ethical concerns, particularly regarding student privacy and equitable access to resources. The use of digital devices and online platforms in classrooms raises questions about data privacy and exacerbates existing inequalities in access to education. Addressing these challenges requires collaborative efforts among educators, policymakers, and stakeholders to ensure ethical use of technology while promoting equity in education. Furthermore, exploring various strategies, practices, and policies can improve early reading instruction and lay solid foundations for children's academic development. Analysis of different teaching methods underscores the diverse approaches employed in early literacy education, highlighting the need for comprehensive solutions to address these issues effectively.. This discussion topic focuses on exploring the implications and benefits of each identified approach:

Game-Based Approach: How can the game-based approach improve children's participation and interest in the reading learning process?, How can this method be effectively integrated into a broader approach?, How can the phonic approach be adapted to address the individual needs of students?, Educational Applications: How can educational apps be selected and adapted to address specific aspects of learning to read, such as phonics or comprehension?

Is there evidence to support the effectiveness of certain educational applications in reading development?

Interactive Multimedia Resources: What are the key aspects of interactive multimedia resources that are most beneficial for learning to read?

Digital Storytelling Tools: To what extent do digital storytelling tools positively impact the development of reading and comprehension skills?

## 5 Conclusions

The study on the teaching of reading at early ages provides a comprehensive vision of the challenges, strategies, and integration of technology in this crucial process. The main findings reveal: Challenges and obstacles: Lack of family participation emerges as the most prominent challenge, highlighting the need to actively involve parents in their children's educational process. Additionally, variation in skill levels and differences in development are identified as key factors, underscoring the importance of adaptive and personalized strategies to address diverse student needs. Technology and reading: There is growing interest in the integration of technological tools in the teaching of reading, with educational applications leading the way, closely followed by interactive multimedia resources and digital storytelling tools. This reflects adaptation to contemporary trends and recognizes the potential of technology to enrich the learning experience. Reading Teaching Strategies: Diversity in methods and approaches highlights the undefrstanding that children have diverse learning styles. The game-based approach is positioned as a leader, suggesting a playful and participatory approach to teaching. The significant presence of phonetic methods reinforces the importance attributed to decoding and phonics in the development of reading. Promoting reading comprehension: Strategies to promote reading comprehension include the use of roles, open-ended questions, and manipulatives. This indicates the relevance of practical and interactive approaches to strengthen understanding and connection to content. These findings outline an integrative path where technology merges with diverse strategies, addressing challenges and promoting a holistic approach to early reading development. However, it is important to recognize the limitations of the study and additional research is recommended to evaluate the long-term effectiveness of the identified strategies and their impact in different educational contexts and student populations. Furthermore, it is suggested to explore how these strategies can be adapted and applied in non-formal and domestic environments.

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