

The Influence of Digital Learning Media in Stimulating Literacy Skills of Children Aged 5-6 Years

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Abstract

Literacy development in children aged 5–6 is crucial for fostering cognitive growth, school readiness, and social competence. However, implementing effective literacy teaching strategies remains challenging in diverse educational settings. This study employs a Systematic Literature Review (SLR) to examine the impact of digital learning media on early childhood literacy, focusing on the competencies developed and factors influencing effectiveness. Analysis of 34 selected studies reveals that digital media significantly enhances literacy skills, particularly in language, communication, and cognitive domains. Interactive tools such as digital storybooks, educational applications, and learning games promote engagement, vocabulary expansion, narrative comprehension, and critical thinking. The active involvement of parents and educators is essential in guiding children and selecting developmentally appropriate digital content. Although the direct effects on reading and writing acquisition remain underexplored, findings suggest that integrating digital media in literacy instruction can make learning more enjoyable and effective. The study concludes that digital media serves as a promising pedagogical tool to strengthen early literacy when supported by active adult participation, thoughtful content design, and conducive learning environments.

Keywords: Digital Learning Media; Literacy Skills; Children Aged 5-6 Years

History

Received 2025-06-26, Revised 2025-08-23, Accepted 2025-10-08, Online First 2025-11-04

INTRODUCTION

In today's digital age, literacy skills have become incredibly important for every individual. Literacy is not just about reading and writing, but also about how one comprehends, analyzes, and utilizes information from various sources, including books, newspapers, as well as digital platforms such as the internet and social media (Kusuma Dewi et al., 2024). With strong literacy skills, an individual can be wiser in sifting through information, making decisions, and adapting to the ever-evolving technological advancements (Stolpe & Hallström, 2024). As information continues to grow and becomes more easily accessible, having good literacy skills is no longer just an additional skill but has become a primary necessity. With robust literacy skills, an individual can more easily adapt, understand various concepts, and actively participate in the increasingly complex life. These skills aid in filtering information, making informed decisions, and facing challenges in the modern era with more confidence (Kit Ng et al., 2021).

Literacy is an individual's ability to obtain, comprehend, and utilize information in various forms, whether from books, newspapers, television, or the internet. With these skills, an individual can more easily integrate into daily life, engage in social activities, work more effectively, and grasp the culture surrounding them. Literacy is not just about reading and writing; it is also about how one uses information to think critically, make decisions, and interact with the world (UNESCO, 2017). Literacy is not just about being able to read and write, but also about how one understands, evaluates, and uses information from various sources, including digital media. With good literacy skills, one can discern accurate and useful information, think critically, and make more informed decisions in their daily lives. In the current technological era, these skills are increasingly vital for an individual to adapt and actively participate in society (Su et al., 2023).

Literacy encompasses various aspects that play a role in the cognitive, social, and emotional development of young children (Martin, 2021; Ninsiana et al., 2024; Rozaimie et al., 2025), including:

- 1) Literacy Skills for Reading and Writing: Introduced through picture books, songs, and interactive games that help children understand letters, words, and stories. Activities like reading stories aloud, writing letters with pictures, and expressive speaking enhance their communication skills (Shvartsman & Shaul, 2024),
- 2) Numeracy Literacy: Involves introducing basic math concepts such as counting, recognizing shapes, and comparing sizes through educational toys like number blocks or simple games. Grouping objects based on color or shape also aids in developing logic and problem-solving skills (Chang, 2023),
- 3) Digital Literacy: Plays a role in introducing children to technology through educational apps, interactive videos, and technology-based games. The use of tablets or computers in education helps them understand how to access information and use technology wisely (Kusuma Dewi et al., 2024),
- 4) Financial Literacy: Taught through simple concepts such as saving, recognizing money, and choosing items based on price through role-playing games, which introduce children to money management in daily life (Permatasari & Ifitah, 2023),
- 5) Scientific Literacy: Encourages children to understand basic scientific concepts through simple experiments like observing plant growth, playing with water and sand, and exploration that strengthen their curiosity and critical thinking skills. In terms of social and cultural aspects,
- 6) Social and cultural literacy: Children are supported in developing an understanding of diversity, social norms, and moral values through exposure to folklore, regional songs, and engagement in community activities. Furthermore, engaging in role-playing activities that simulate various professions helps facilitate their comprehension of the surrounding world (Sakina et al., 2025),
- 7) Visual literacy: Enables children to comprehend and interpret information through images, symbols, and visual expressions they encounter in art, films, or creative games (Eliza et al., 2024). Activities such as drawing, creating collages, and recognizing symbols in storybooks play a crucial role in developing their imaginative capabilities. With a fun and interactive approach, all these literacy types are interconnected and contribute to the comprehensive development of early childhood skills (Stolpe & Hallström, 2024).

Based on the definition of literacy above, it can be concluded that literacy in early childhood education is not just about learning to read and write, but also encompasses many other aspects that aid in their development. At this stage, children begin to learn language, understand and use words, and develop listening and speaking skills. Additionally, they also start to recognize numbers and various symbols around them, which form the basis for critical thinking and understanding the world in the future. Strong literacy from an early age helps children be more prepared for further learning processes (Ika Sari et al., 2024). In childhood, children are highly sensitive to what they see, hear, and feel. They also have an exceptional ability to absorb information from their surrounding environment. Therefore, it is important to provide appropriate literacy stimulation for them to thrive, not only in language, thinking skills, but also in social and emotional skills. With the right approach, they can learn faster, communicate better, and understand the world around them more deeply (Yulia & Eliza, 2021; Forsling, 2023).

The primary aim of this research is to attain a comprehensive understanding of the impact of digital learning media on children's literacy. This systematic literature review is guided by three research questions: (1) What is the impact of digital learning media on the literacy skills of 5-6-year-old children? (2) What are the literacy skill aspects of children from the use of digital learning media? (3) What factors influence the effectiveness of digital learning media in enhancing the literacy skills of 5-6-year-old children?. The research objectives are as follows: 1) The impact of digital learning media on early childhood literacy abilities; 2) Literacy skill aspects influenced by digital media; 3) Factors determining the success of using digital media to enhance children's literacy.

Early literacy is not just about preparing children for school, but also aiding them in developing critical and creative thinking. For example, when children read with parents or teachers, they not only recognize letters but also understand stories and learn to express their thoughts (Setty, 2024). Telling stories with varied intonations also captivates children and helps them understand emotions and meanings in a story (Solichah et al., 2025). Additionally, games involving letters and numbers in digital form can be a fun way to learn, enabling children to more quickly grasp language and mathematics concepts. All of these help them build a strong foundation for their future (Asmayawati et al., 2024). According to Su & Yang (2023), literacy skills in early childhood are not just about learning to read and write, but also serve as the foundation for other important skills such as problem-solving, communication, and collaboration (Wahidah et al., 2025). From a young age, children are encouraged to develop basic skills like pattern recognition, understanding abstract concepts, and structured thinking through play (Istyadji & Sauqina, 2023). Early learning is typically based on play and sensory exploration activities, as this approach is more aligned with how they learn through direct experiences and interaction with their surrounding environment (Fan et al., 2024). With appropriate stimulation, their fine and gross motor skills as well as language skills develop rapidly through natural social interactions (Roy et al., 2025). All of these help them be better prepared to face learning challenges in

the next stage (O'Connor et al., 2021).

Digital learning media, such as educational apps and online platforms, are increasingly employed to aid children in learning. This technology offers interactive and engaging experiences, especially for young children in their exploratory development stage (Weldemariam et al., 2023). In developed countries, it is integrated into early childhood curricula to enhance reading and comprehension skills. Such media helps children develop literacy through engaging methods, making learning effective and relevant (Linde-Valenzuela et al., 2022). For 5-6-year-olds, these tools foster reading, language comprehension, and critical thinking. Research indicates that a stimulating literacy environment at home, combined with digital media, significantly supports children's cognitive development and literacy progress (Slattery 2025; Taylor et al., 2022).

The effectiveness of digital learning media in early childhood education is debated. Some studies, like those by Orji (2022), show benefits in enhancing children's learning interest and literacy skills. Conversely, others highlight negative impacts of excessive technology use on development, emphasizing the need for careful implementation by schools and parents. Proper use of digital media can significantly benefit children, but excessive exposure may lead to addiction and developmental issues. Balancing digital and traditional learning methods, such as reading and interactive play, is critical. Additionally, children's access to technology should be supervised to ensure content safety and promote healthy communication (Herwegen, 2024).

Apart from that, several other studies, such as the one conducted by Zulfiani (2023), have identified challenges faced by educators in effectively integrating digital media into existing curricula. Many educators feel they lack sufficient training and support in utilizing technology, which can lead to suboptimal implementation. There are also concerns about uneven access to technology among children, which can create disparities in literacy skills within various communities (Marini, 2023). This situation indicates the need for further research on how exactly digital learning media can be utilized to enhance children's literacy. More comprehensive research should not only address the benefits of using digital media but also explore strategies to tackle these issues, including the role of teachers, the available technological resources in each educational institution, and the importance of parental involvement in this matter (Nurwita, 2023).

Based on theoretical perspectives, there is a need to develop a conceptual framework connecting the use of digital media with literacy skills. Cognitive theory, for instance, emphasizes the importance of mental processes in learning, including how children store and process information (File et al., 2023). In the context of digital media, it is important to understand how digital tools can influence children's cognitive processes, enabling them to interact with text and multimedia content dynamically. Research indicates that the use of digital media involving interactive elements, such as videos and educational games, can enhance comprehension and retention of information (Yuliana, 2020). On the

other hand, behaviorist theory focuses on reinforcement and responses to specific stimuli. Within this framework, the use of digital learning media that provide direct feedback to children can facilitate the learning of literacy skills more rapidly and effectively. However, there is a growing concern regarding the risk of technology addiction that may disrupt children's learning processes and decrease their concentration (Gupta et al., 2025).

Further, Lev Vygotsky's Zone of Proximal Development (ZPD) theory focuses on the significance of social interaction in children's learning and development. ZPD represents the gap between what a child can do independently and what they can achieve with assistance from adults or more competent peers. In the context of digital media usage, ZPD can be understood by observing how digital media can serve as a tool that facilitates social interaction, provides additional support, and fosters cognitive development and literacy in children aged 5-6 years (Siswanto, 2022). The ZPD concept provides guidance to parents on how to support their children at home in utilizing digital learning media. For example, when a child uses an educational app on a tablet, they can learn new concepts with the assistance of an adult. Thus, digital media not only offers interactive learning experiences but also facilitates discussions and reflections that enrich a child's understanding (Janet Fellowes, 2024).

Research focusing on the use of digital media in the context of ZPD emphasizes the importance of the role of adults in accompanying children as they interact with technology. For instance, a study by (Noviani & Arjaya, 2024), asserts that parental and teacher guidance significantly influences maximizing the benefits of digital media for children's language development and cognitive skills. Another study, as conducted by Suardipa(2020), indicates that when teachers actively engage in using digital tools, children demonstrate improvements in conceptual understanding and literacy skills. However, it is important to remember that without proper guidance, the use of digital media can be counterproductive. When children access content without adequate social interaction, they may not receive the necessary support to reach their full potential according to the ZPD concept. Therefore, interventions focusing on collaboration and support are key points in leveraging digital media for sustainable development (Janet Fellowes, 2024).

The study titled "The Influence of Digital Learning Media in Stimulating Literacy Skills of Children Aged 5-6 Years" reveals various gaps, including phenomenon, research, and theoretical gaps. The phenomenon gap refers to unaddressed differences in practice, such as diverse experiences with digital learning applications among children from various socio-economic backgrounds, differing parental education levels, and variable access to technology. While some studies indicate that children benefit from these applications (Marini et al., 2023), others suggest otherwise, highlighting inconsistencies in learning experiences. Additionally, research gaps exist regarding the effectiveness of mobile learning models and overlooked issues like potential addiction and negative impacts of

prolonged screen time (Linde-Valenzuela et al., 2022).

METHODS

This study employs the Systematic Literature Review (SLR) approach to explore the impact of digital learning media on the development of literacy skills in children aged 5–6 years. The study focuses on the types of literacy skills stimulated through digital media and the factors influencing its effectiveness in the context of early childhood education. Initially, a total of 35 articles were identified as relevant through searches across various academic databases. Following a screening process based on inclusion and exclusion criteria (such as topic relevance, subject age, and methodological quality), 34 articles were selected for in depth analysis. The methodology employed in this research follows a transparent and rigorous framework for SLR, as outlined by (McFadden et al., 2012) According to (Macdonald, 2003), systematic reviews provide a structured approach to synthesizing research findings, yielding valuable insights to meet specific research needs. The methodology outlined in this study aims to provide a comprehensive overview of the impact of digital learning media on stimulating literacy skills in the context of early childhood education.

Search Strategy

Literature search was conducted using a systematic technique aimed at identifying relevant studies on the impact of digital learning media in stimulating literacy skills. Three main databases were explored: Scopus Search, Crossref Search, and Mendeley Search. This search process took place over three weeks, from March 5th to March 25th, 2025. The search utilized keywords and search strings developed based on core concepts such as "Digital Learning Media," "Digital Literacy," and "Early Childhood Education." Each keyword was tailored to match the specific search requirements of each database, ensuring comprehensive coverage of all relevant aspects related to the research topic. Table 1 details the search strings used in each database, along with additional keywords applied during the search in Harzing's Publish or Perish. To further enhance the search and ensure no relevant studies are missed, the systematic review technique applied by (McFadden et al., 2012) across all databases provides a consistent framework for identifying high-quality and relevant literature.

Table 1

Data-Based Search

No	Directory Search	Search Keywords
1	Scopus Search	Digital Learning Media", "Digital Literacy", "Early Childhood Education
2	Crossref Search	"Digital Learning Media", "Early Childhood Literacy", "Educational Technology"
3	Mendeley Search	"E-learning for Early Literacy", "Digital Storytelling", "Interactive Learning for Preschool"

Inclusion and Exclusion Criteria

Strict inclusion and exclusion criteria are implemented to ensure the quality and relevance of the selected studies, taking into consideration the following aspects:

Table 2

Inclusion and Exclusion Criteria

Aspect	Inclusion	Exclusion
Publication Date	Articles published from 2020 onwards to ensure the use of recent data and findings.	Articles published before 2020.
Language	Articles published in English to ensure accessibility and relevance.	Articles published in languages other than English.
Study Type	Peer-reviewed journal articles, including quantitative, qualitative, mixed-method research, meta-analyses, or review articles focused on the impact of digital learning media in stimulating early childhood literacy.	Books, dissertations, theses, or conference proceedings not included in peer-reviewed journals.
Methodological Quality	Articles with clear research design, strong data analysis, and adequate sample size.	Studies with unclear research design, limited data analysis, or inadequate sample size.
Field of Study	Studies from psychology and education to ensure alignment with the review's focus.	Studies from other fields not related to psychology or education.
Study Focus	Articles discussing digital learning media and digital literacy.	Articles discussing topics unrelated to digital learning media or digital literacy.
Key Variables	Studies addressing at least one key variable: digital learning media, early childhood literacy skills.	Studies that do not address any of the key variables.
Population	Studies involving teachers, parents, and early childhood children aged 5–6 years.	Studies that do not focus on children aged 5–6 years or exclude teachers and parents.
Geographical Scope	Global studies relevant to digital learning media practices, including e-books, e-learning, picture books, and YouTube across various cultural contexts.	Studies irrelevant to digital learning media or outside the scope of age-appropriate digital materials for children aged 5–6 years.

Matrix and literature

The following is a matrix and relevant literature related to the literature review of the research conducted:

Table 3

Matrix and literature

References & Titles	Research Purposes	Study Design	Age Group & Target	Research Methodology	Research Variables	Research Results
Aeni, S. Q., & Setiasih, O. (2024)	Facilitating critical thinking skills in early childhood through teacher communication strategies	Qualitative study	Early childhood students	Observational and interview-based analysis	Teacher communication strategies, critical thinking development	Effective teacher communication enhances critical thinking skills
File, N., Mueller, J. J., Wisneski, D. B., & Stremmel, A. J. (2023)	Understanding research methodologies in early childhood education	Literature review	Educators and researchers	Content analysis of existing research frameworks	Various research methodologies	Provides comprehensive guidelines for research in early childhood education
Herwegen, J. Van (2024)	Investigating the impact of digital technology on cognitive processes and learning outcomes in early childhood	Experimental study	Early childhood students	Neuroscience-based analysis, experimental cognitive tests	Digital technology usage, cognitive process development	Digital tools influence cognitive function and learning effectiveness
Ika Sari, G., et al. (2024)	Strengthening digital literacy in Indonesia through collaboration, innovation, and sustainability education	Mixed-methods study	Various education stakeholders	Surveys and policy analysis	Digital literacy initiatives, collaboration and sustainability education	Effective collaboration enhances digital literacy in Indonesia
Isnain, W. N., et al. (2024)	Developing educational videos to introduce ethical vocabulary to early childhood learners	Developmental study	Early childhood students	Video-based instructional intervention	Ethical vocabulary introduction, video learning effectiveness	Educational videos improve vocabulary acquisition

The Article Selection Process

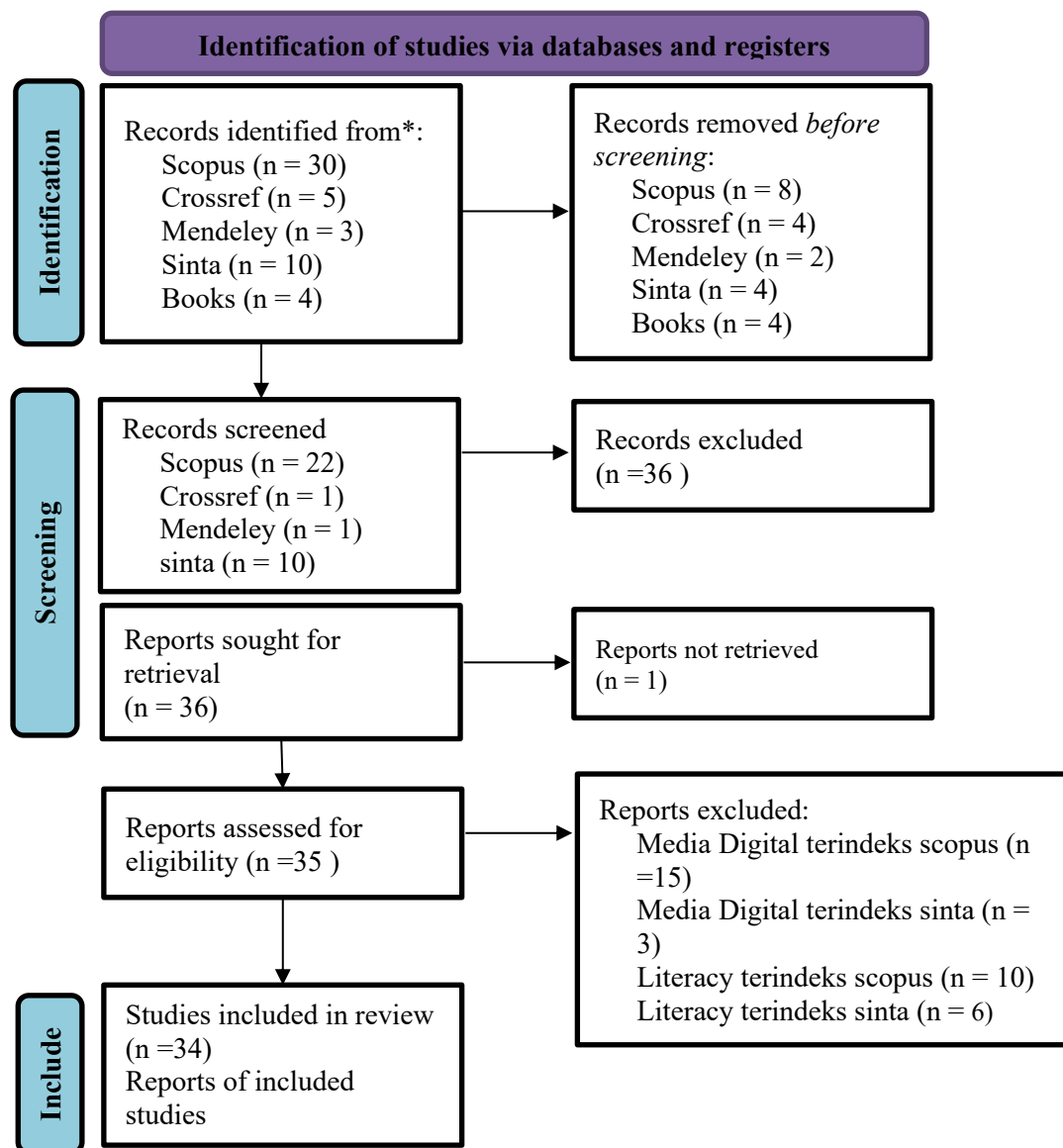


Figure 1. Prism Screening Process

RESULTS AND DISCUSSION

Research Question 1: What is the impact of digital learning media on the literacy skills of 5-6-year-old children?

Table 4

The Impact of Digital Learning Media on Early Childhood Literacy Abilities

Study	Focus	Key Findings	Context	Research Gaps
File et al. (2023)	Understanding research methodology in early childhood education	Emphasizes the importance of contextual and reflective approaches in literacy research	Global, theoretical approach	Does not specifically address digital media and its impact on early

Study	Focus	Key Findings	Context	Research Gaps
Isnain et al. (2024)	Development of educational videos to introduce ethical vocabulary	Video media effectively enhances vocabulary comprehension and ethical values in early childhood	Indonesia, local early childhood education	childhood literacy Does not directly measure the impact on literacy aspects such as reading and writing
Khalisha & Gustiana (2024)	Group play services and children's social-emotional development	Play-based interaction supports children's social and communication development	Indonesia, community-based early childhood services	Not focused on digital media or academic literacy skills
Linde-Valenzuela et al. (2022)	Digital literacy of teachers, families, and students for virtual participation	Digital literacy is essential for effective engagement in virtual education	Spain and Latin America	Focuses on adult actors, not directly on early childhood learners
Noviani & Arjaya (2024)	Game-based learning model for cognitive development in early childhood	Educational games support cognitive development and symbol recognition	Indonesia, Islamic-based early childhood education	Does not examine digital media as the primary literacy learning tool
Siswanto (2022)	Digital learning integrated with local wisdom	Digital media improves digital literacy and problem-solving skills in students	Indonesia, secondary education level	Not directly relevant to early childhood or foundational literacy
Weldemariam & Sandvik (2023)	Literacy and language education practices in early childhood in Ethiopia	Culturally-based literacy practices effectively support children's language development	Ethiopia, indigenous approach	Does not discuss digital technology as a learning medium

Literature review on the influence of digital learning media on early childhood literacy abilities indicates that despite various relevant studies, not all directly examine the impact of digital media on the basic literacy skills of 5–6-year-old children. File et al. (2023) highlight the importance of a reflective approach in early childhood education research, yet do not specifically address the use of digital media. Isnain et al. (2024) demonstrate that instructional videos are effective in enhancing children's vocabulary comprehension, supporting language aspects but not comprehensively addressing reading and writing skills. Khalisha & Gustiana (2024) focus on socio-emotional development through collaborative play services, relevant to children's communication but not directly assessing academic literacy. Linde-Valenzuela et al. (2022) emphasize the importance of digital literacy for teachers and families in virtual learning, but their focus is more on adults than on young children. Meanwhile, Noviani & Arjaya (2024) investigate game-based learning models that support cognitive development

and symbol recognition, yet do not integrate digital media as a primary tool. (Siswanto, 2022) shows that digitally integrated learning with local wisdom can enhance digital literacy and problem-solving skills, but its focus on secondary education levels makes it less relevant for early childhood. Weldemariam et al. (2023) discuss culturally based literacy practices in Ethiopia, enriching children's literacy perspectives but excluding digital technology. Based on these studies, it can be concluded that digital media holds great potential in supporting the development of early childhood literacy, especially in language and communication aspects. However, there are still research gaps that need to be bridged through more systematic and focused studies on the effectiveness of digital media in improving the basic literacy skills of 5–6-year-old children.

Parents play a crucial role in supporting the digital literacy of 5-6-year-old children. One key step that can be taken is providing age-appropriate digital media, such as applications, videos, and educational games specifically designed to enhance language development and basic literacy skills. Active supervision when children are using digital media is essential to ensure they understand the content correctly and are shielded from inappropriate information. Parents are also encouraged to promote two-way interaction with their children, for example, through discussions about the digital content they access, so that children's critical thinking and communication skills can develop. Digital activities should be integrated with traditional literacy activities, such as writing or redrawing stories from educational videos, to maintain and enhance reading and writing skills. Consistent with the findings of Linde-Valenzuela et al. (2022), parents also need to improve their own digital literacy to effectively facilitate their children's learning process.

On the other hand, teachers in schools also bear a significant responsibility in optimizing the use of digital media to enhance early childhood literacy. They can design lessons that incorporate interactive digital media, such as educational videos and literacy apps that provide immediate feedback, to enhance children's reading and writing skills (Isnain et al., 2024). Furthermore, teachers need to train children in using symbols and language meaningfully through game-based digital activities that support symbol recognition and language comprehension (Noviani & Arjaya, 2024). The development of literacy activities based on social and emotional factors is also crucial, for instance, by integrating digital media in collaborative play activities to strengthen children's communication and social skills (Khalisha & Gustiana, 2024). Teachers should also engage in reflective evaluation of the use of digital media in teaching, as suggested by File et al. (2023), to ensure that the media used aligns precisely with children's needs. Lastly, teachers serve as mediators of digital literacy in the school environment by ensuring that technology is used appropriately and supports children's holistic development.

Research Question 2: What are the literacy skill aspects of children from the use of digital learning media?

Table 5

Literacy Skill Aspects Influenced by Digital Media

Study	Focus	Key Findings	Context	Research Gaps
File et al. (2023)	Research methodology in early childhood education	Emphasizes the importance of reflective and contextual approaches in early childhood research	Global, theoretical approach	Does not specifically address digital literacy or the use of digital media in children's learning
Ika Sari et al. (2024)	Strengthening digital literacy in Indonesia through collaboration and innovation	Digital literacy can be enhanced through synergy between education, technology, and sustainability	Indonesia, cross-level education	Does not focus on early childhood or basic literacy skills such as reading and writing
Kelli Erwin (2022)	Digital literacy instruction and skill improvement	Structured instruction improves learners' digital literacy proficiency	United States, general education	Does not specifically examine early childhood or the context of preschool learning
Maureen (2021)	Designing storytelling activities to enhance digital literacy in early childhood	Storytelling is effective in building literacy and digital skills in young children	Global, early childhood education	Does not quantitatively measure impact on core literacy skills
Rahiem (2021)	Digital storytelling in early childhood education	Digital storytelling strengthens language and literacy development in children	Indonesia, preschool education	Needs further exploration of technology integration in early childhood curriculum
Saleha et al. (2022)	Implementing digital literacy to support social-emotional development	Digital literacy contributes to children's social and emotional growth	Indonesia, early childhood education	Does not examine academic literacy skills such as reading and writing
Yilmaz & Sigirtmaç (2023)	Using digital storytelling in preschool science education	Digital storytelling improves concept understanding and communication skills in children	Turkey, preschool education	Focuses on science; does not comprehensively address basic literacy development

Literature review indicates that digital media holds great potential in strengthening various aspects of early childhood literacy skills, although not all studies directly measure its impact on fundamental literacy skills such as reading and writing. Some studies highlight the contribution of digital media to young children's language development, communication, and symbolic understanding. For instance, Maureen (2021) and Rahiem (2021) demonstrate that digital storytelling activities are

effective in enhancing literacy and language skills in young children. Digital storytelling not only enriches children's vocabulary but also trains their abilities in understanding storylines, narrative thinking, and communicating effectively.

Other studies like Yilmaz & Sığirtmaç (2023) extend the use of digital storytelling to science learning, which also supports children's understanding of concepts and communication skills. Saleha et al. (2022) add that digital literacy also plays a role in the socio-emotional development of children, which is an essential part of social literacy skills. Meanwhile, Ika Sari et al. (2024) and Kelli Erwin (2022) emphasize the importance of instruction and collaboration in enhancing digital literacy overall, although not specifically targeting early childhood. File et al. (2023) provide important methodological foundations in early childhood education research but do not directly discuss the use of digital media. Overall, the literacy aspects most influenced by digital media in these studies include language, communication, symbolic understanding, and social skills, while reading and writing as core academic skills are still underexplored in the digital context. This indicates the need for further focused and quantitative research to measure the effectiveness of digital media on early childhood basic literacy skills.

Parents' role in supporting early childhood literacy skills through digital media links to Piaget's cognitive development theory and Vygotsky's Zone of Proximal Development (ZPD) concept. According to Piaget, children who are 5-6 years old are thinking preoperational, which means that they learn through symbols, images and imagination. Therefore, parents should provide digital media matching the child's stage of development-for example educational apps or interactive stories are equally suitable. Then there are other forms: games involving vision that can stimulate one's sense of realism as well as language ability. In the framework of ZPD, Vygotsky stresses the importance of adults as a guide in children's learning. Parents need to use digital media and explain their content-gradually supporting children in using it by means like scaffolding; facilitating questions; promoting critical thinking. This ensures that children optimally learn in their developmental zone. Once again, the encouragement of active engaging in exploration and discussion is recommended for parents, but from a slightly different source now. In order to improve communication and critical-thinking skills all round, children are urged to actively engage in dialogues about the stories or videos they watch. Meanwhile, schools' teachers also play a strategic role in using digital media to enhance early childhood literacy skills to best advantage. Teachers must design digital learning that corresponds with children's cognitive stages, running activities involving symbols, picture books and word games to promote vocabulary expansion and forms of language. In ZPD, teachers function as facilitators to children, providing gradual support when they are unable to do a task independently yet. Support measures might include clear instructions, repeating the information and providing examples for-pointing out practical uses of digital media in reading and writing. Moreover, teachers need to integrate digital media into social and collaborative activities, such as making digital stories together, examining video content or

enacting role-plays from what was seen in stories. A Piaget-ZPD perspective on digital media views it not just as entertainment but also an effective learning tool for all areas of children's literacy: language training and literature, critical thinking exercises with intellectual consequences on society, general communication skills teaching.

Research Question 3: What factors influence the effectiveness of digital learning media in enhancing the literacy skills of 5-6-year-old children?

Table 5

Factors Determining the Success of Using Digital Media to Enhance Children's Literacy

Study	Focus	Key Findings	Context	Research Gaps
Aeni & Setiasih (2024)	Teacher communication strategies to foster critical thinking in early childhood	Effective communication strategies by teachers support children's cognitive and literacy development	Indonesia, early childhood education	Does not directly assess digital media use or its integration in literacy instruction
Herwegen (2024)	Impact of digital technology on cognitive processes and learning outcomes	Neuroscience evidence shows digital tools can enhance attention, memory, and learning in young children	Global, neuroscience-based approach	Needs application in classroom settings and connection to literacy-specific outcomes
Linde-Valenzuela et al. (2022)	Digital literacy of teachers, families, and students for virtual participation	High digital literacy among adults improves children's access and engagement in digital learning	Spain and Latin America, comparative study	Focuses on adult competencies; lacks direct evaluation of child literacy development
Marini et al. (2023)	Effect of digital comics on reading literacy in language learning	Digital comics significantly improve reading comprehension and motivation in students	Indonesia, language learning	Focuses on older students; limited insight into early childhood literacy impact
Noviani & Arjaya (2024)	Game-based learning model for cognitive development in early childhood	Educational games support symbol recognition and cognitive growth in young children	Indonesia, Islamic early childhood education	Does not explicitly link game-based media to literacy outcomes like reading and writing
Slattery (2025)	Benefits of digital game-based learning using Minecraft	Game-based learning enhances engagement, creativity, and problem-solving across age groups	Global, systematic review	Broad age range; lacks targeted analysis of literacy development in early childhood

Study	Focus	Key Findings	Context	Research Gaps
Zulfiani et al. (2023)	Digital pedagogy in Android-based science learning media	Android media improves understanding and digital interaction in science education	Indonesia, science education	Focuses on science content; does not address literacy skill development directly

According to literature, digital media used to enhance literacy in young children is greatly influenced by different factors, three of which are as follows: those from the child and adults around her, the family environment, and technology design itself. One of the critical factors is teacher communication strategy taught in the incurs study. As projected by Aeni & Setiasih (2024), teacher communication style can help children develop really entry-level literacy skills, which are crucial for growth. Support from neuroscience is another important determinant. This was found by Herwegen (2024), when examined through brain scanning techniques. It is well established that digital technology can enhance cognitive processes such as attention and memory, directly contributing to children's learning, including literacy. Another big factor is the digital literacy levels of surrounding adults where the child is located: her teachers or guardians and parents. Linde-Valenzuela et al. (2022) stress that high digital literacy in adults can significantly increase children's participation in digital learning. The kind of digital media utilized is also a factor In terms of content. Marini et al. (2023) state that digital comics can help improve readers' literal comprehension and motivation for studying on their own, although this study is more applicable to elementary aged children. Game-based learning models, which Noviani & Arjaya (2024) discovered and Slattery (2025) explains vividly, have shown to be effective at increasing children's engagement and creative thinking ability, and in so doing indirectly improving their grasp of reading. Finally, pedagogical design in digital media, for example as Zulfiani et al. (2023) of Moody Institute demonstrate, affects interaction and understanding of concepts--except that so far their work has focused exclusively on science content. In short, successful use of digital media in early literacy education depends on how interactively children and adults engage, the alignment of content with children's developmental stages, and what kind of technological design will facilitate exploration and communication.

Based on the literature review, to make the determinants of successful digital use in early childhood literacy more effective, parents and teachers need to take university courses in active media use that align with the developmental needs and technological characteristics of children. Parents should develop their own digital literacy to help their children make use of digital media in an effective way. Study on the level of digital literacy among parents and children Linde-Valenzuela et al. (2022) also points out that in parents who ranked higher, there was little of children's interaction with digital learning media inside their home. They should make their homes literacy-friendly environments, provide age-appropriate access to digital media and encourage children to discuss the content that they

consume. Through active guidance and unobstructed communication, children may develop critical thinking skills and language comprehension simultaneously from a young age.

However, in schools, teachers must implement effective communication strategies as outlined by Aeni & Setiasih (2024) to support the development of children's basic literacy skills. Educators should also be able to select and create digital media that is age-appropriate and aligned with children's cognitive development stages; for example, educational games or comics (such as digital picture books) can significantly enhance children's enthusiasm and reading ability (Marini et al., 2023; Noviani & Arjaya, 2024). Neuroscience findings in support of digital technology from Herwegen (2024) show that digital technology has the potential to augment cognitive functions such as attention and memory -thus teachers should use interactive features inherent in digital media for studying purposes. In addition, the design of digital media complements one another as a field to give rise to interaction, exploration, and communication of so called "active play" (Zulfiani et al., 2023). Through their combined efforts and careful selection of media, parents and teachers can make early childhood literacy learning more effective, engaging, and capable of producing long-term impacts.

Building upon the importance of teachers' communication and media selection, collaboration between teachers and parents is a key factor in ensuring the effectiveness of digital-based literacy learning. Through open communication and the selection of appropriate media, this cooperation enables children to have consistent learning experiences both at home and at school. These synergistic efforts help children build intrinsic motivation, develop curiosity, and continuously improve their early literacy skills. Thus, literacy learning in early childhood can be more effective, enjoyable, and have a long-term positive impact on children's language, cognitive, and social development.

Overall, this study makes a significant contribution to the study of early childhood literacy, particularly in the context of utilizing digital media as an interactive and contextual learning tool. Theoretically, this study reinforces the social constructivist perspective that emphasizes the importance of social interaction and adult guidance in children's learning processes. Practically, the results imply the need for training early childhood teachers to integrate digital literacy into the curriculum through interactive media such as educational games and digital stories. In addition, this study opens opportunities for further research on the long-term effects of digital media use on children's reading, writing, and cognitive development in an era of ever-evolving technology.

CONCLUSION

Based on a systematic review of 34 publications, including 7 articles on the impact of digital learning media on children's early literacy skills, 7 articles on the influence of digital media in general, and 7 articles discussing factors that influence children's literacy, it can be concluded that digital media plays a significant role in supporting the literacy development of children aged 5–6 years, especially in the areas of language, communication, cognition, and social-emotional skills. The successful

implementation of digital media is greatly influenced by the active role of teachers and parents in selecting content and assisting children during the learning process. Therefore, it is recommended that future research focus on quantitatively measuring the impact of digital media on reading and writing skills, as well as conducting longitudinal and cross-cultural studies to assess long-term effects and contextual differences. In addition, the development of artificial intelligence-based digital media with adaptive pedagogical designs needs to be optimized in order to strengthen a fun, interactive, and sustainable literacy learning process for early childhood.

ACKNOWLEDGMENTS

The author expresses gratitude to the educators at TK Negeri 3 Pembina Gunungsitoli for providing the opportunity to conduct research, as well as to the previous authors whose works facilitated a deeper understanding of digital literacy for early childhood. This collaborative support underscores the importance of community in advancing educational research and highlights the collective effort required to enhance the learning experiences of young children in the digital age.

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