Digital Literacy in Elementary School: A Systematic Literature Review

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**Abstract**

Digital literacy has become an essential competency for elementary school students in the digital era, enabling them to navigate and critically evaluate information in a safe and informed manner. This study employs a systematic literature review, guided by the PRISMA framework, to explore how digital literacy is taught in elementary schools, the learning resources and tools utilized, and the challenges and opportunities in integrating digital literacy into the curriculum. A total of 17 articles were reviewed, highlighting strategies such as interactive media, motion comics, and digital storytelling to enhance student engagement and comprehension. The findings emphasize the role of teacher preparedness, parental support, and adequate infrastructure in overcoming challenges such as limited resources and cybersecurity concerns. Opportunities for integrating digital literacy include fostering ethical awareness, promoting critical thinking, and using diverse digital tools. This research contributes valuable insights for educators and policymakers to design effective digital literacy programs tailored to the needs of young learners.

Keywords: Digital literacy, Learning Media, Curriculum, Elementary School

**INTRODUCTION**

In everyday life, children are very close to digital-based information through various platforms, especially through social media such as YouTube, TikTok, and Instagram (Cairns & McClatchey, 2013; Nussey et al., 2014; Singh & Kaur, 2015). Children can easily access various types of positive (beneficial) and negative (harmful) information (Ozturk & Ohi, 2018; Yu, 2011). If children access information incorrectly, it can negatively influence their attitudes (Sudrajad et al., 2019). Exposure to positive and educational content on digital platforms can benefit children's attitudes and behaviors (Jeong & Park, 2020; Xu et al., 2022; Yu et al., 2012). Conversely, negative or inappropriate content can exposure lead to undesirable attitudes and behaviors (Hammond et al., 2011; Rakap et al., 2016).

Digital literacy is a required skill that is continuously evolving, especially for elementary schools that are growing up in a highly digitized environment with access to a wide range of digital devices, platforms, and applications (Cairns & McClatchey, 2013; Nussey et al., 2014; Singh & Kaur, 2015). Digital literacy skills can positively impact academic performance, enabling children to effectively access, evaluate, and utilize digital information for learning (Clay & Barrett, 2011; Gavic et al., 2022; Park & Chitiyo, 2010).

The importance of digital literacy for elementary school children lies in its ability to provide them with the skills to obtain the latest and more expansive knowledge using technology, thus enhancing their learning experience (Dwiyasa et al., 2022).

Besides, Digital literacy skills allow children to navigate online spaces safely, engage in meaningful digital interactions, and develop essential digital citizenship skills (Doğan et al., 2020; Lee et al., 2022; Tsai et al., 2018). Developing these skills in elementary school lays the foundation for children to thrive in a digital-centric future (Blancher & Goodwyn, 2016; Merga, 2017; Yu et al., 2012). Digital literacy education equips children with the knowledge and skills to navigate challenges and make informed decisions about their digital activities (Hammond et al., 2011; Jeong & Park, 2020; Xu et al., 2022).

Through the Independent Curriculum, the Government of the Republic of Indonesia emphasizes the importance of literacy skills, including digital literacy for elementary school students. Therefore, learning in elementary schools needs to equip students with digital literacy skills, including using learning media. This study contributes to how digital literacy is taught to elementary school students so that it can provide basic information on the need for learning media to teach digital literacy following the characteristics of the current curriculum in Indonesia.

**METHOD**

This systematic literature review employed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework outlined by Page et al. (2021). The data for this review were retrieved from the Scopus database, resulting in an initial dataset of 740 articles. The search query was constructed as follows: ( TITLE-ABS-KEY ( "Digital literacy" ) OR TITLE-ABS-KEY ( "information literacy" ) OR TITLE-ABS-KEY ( "media literacy" ) ) AND PUBYEAR > 2013 AND PUBYEAR < 2025 AND ( LIMIT-TO ( SRCTYPE , "j" ) OR LIMIT-TO ( SRCTYPE , "p" ) ) AND ( LIMIT-TO ( LANGUAGE , "English" ) ) AND ( LIMIT-TO ( AFFILCOUNTRY , "Indonesia" ) ).

The screening process was conducted systematically using predefined inclusion and exclusion criteria. The inclusion criteria required articles to be open access, written in English, focused on relevant research subjects, and published in peer-reviewed journals or conference proceedings. Exclusion criteria eliminated duplicates, closed-access publications, articles in languages other than English, and studies focusing on teachers. After applying these criteria, the selected articles were reviewed in full text to address the study's research questions.

The research questions guiding this study are:

1. How is digital literacy taught to elementary school students?

2. What digital literacy learning resources and tools are used in elementary school?

3. What challenges and opportunities are digital literacy integrated into the elementary school curriculum?
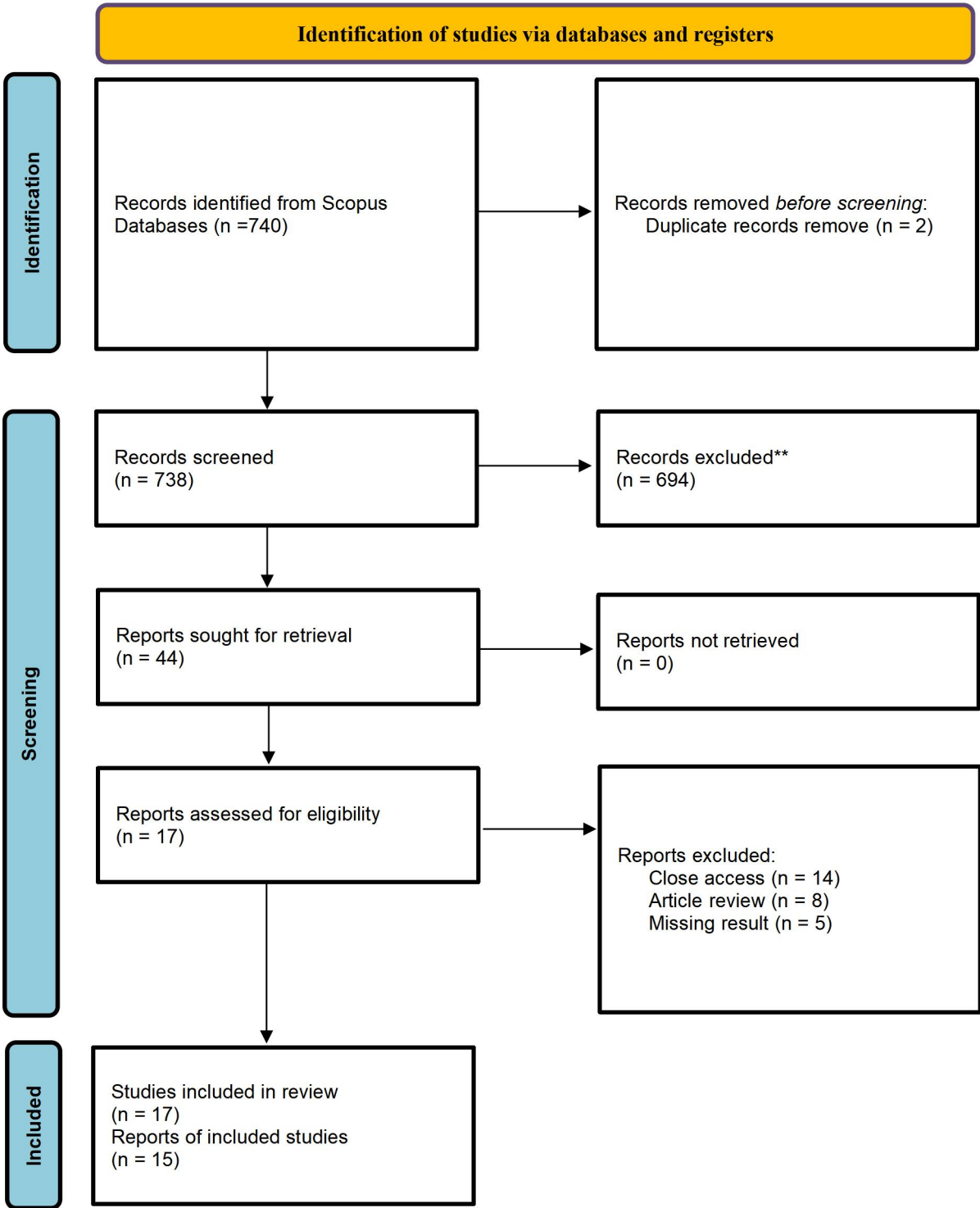


Figure 1. The systematic literature review process

**RESULTS AND DISCUSSION**

Based on the analysis of the selected 17 articles, the research focus can be categorized into two primary areas: teacher-centered studies and student-centered studies, as summarized in Table 1.

Table 1. Findings Research-based teachers and students

| Focus research | Findings |
| --- | --- |
| Teachers | Digital literacy has a significant positive relationship with teacher performance (Tongli et al., 2024); Teachers' digital literacy skills can be improved through training (Atmojo et al., 2021; Suwarto et al., 2022); Teachers need ICT infrastructure support to support digital literacy practices for students in learning (Suwarto et al., 2022); |
| Students | Teaching about digital literacy can begin with a discussion with students, including ethical and moral obligations in the digital world, the truth of news and hoaxes, filtering pornography and pornoaction (Rina et al., 2020); The integrative approach helps students develop better reading skills and digital literacy (Asdar et al., 2024); Students with higher digital literacy levels show better performance in critical thinking tasks (Fadli et al., 2024; Haryanto et al., 2022); The virtual field trip model significantly enhances students' digital literacy skills (Wardi et al., 2024); The media literacy programs and ICT are effective in improving both media and digital literacy among young children (Hasibuan et al., 2024; Rina et al., 2020; Yuliana et al., 2021); Digital literacy positively influences students' self-control, helping them manage online activities responsibly and avoid cyberbullying, exposure to harmful content, and internet addiction (Purnama et al., 2021); Motion comics are a promising tool for improving digital literacy (Karlimah et al., 2021); digital media tools integrated into the educational framework (curriculum) needed for young students (Muharam et al., 2021); Digital stories can improve digital literacy of students (Wangid et al., 2021); Computational thinking learning media is effective in enhancing digital literacy (Yuliana et al., 2020); Digital literacy effectively improves writing and storytelling skills (Suwarni et al., 2019); The formation of digital literacy skills requires habituation in the learning process in elementary schools (Novitasari et al., 2020). |

**How is digital literacy taught to elementary school students?**

Digital literacy can be taught to students by teachers (Asdar et al., 2024; Atmojo et al., 2021; Ika Sari et al., 2024; Muharam et al., 2021) and parents (Muharam et al., 2021; Purnama et al., 2021; Zainil et al., 2024). The main access point for digital literacy shows the dominant role of educators, Class teachers play a crucial role in promoting digital literacy (Suwarto et al., 2022), because they directly influence students' learning experiences and their professional growth. Teachers' beliefs about digital literacy greatly affect their willingness to incorporate these practices into their teaching, with attitudes and self-confidence being key factors for successful technology integration (Deiniatur et al., 2024; Sadaf, 2019).

Additionally, teachers' proficiency in digital literacy significantly shapes their teaching methods, helping them manage classroom interactions effectively and engage students in meaningful learning activities (Atmojo et al., 2022; Muntu et al., 2023).

Teacher's competence in using ICT facilities influences the development of digital literacy among elementary school students (Suwarto et al., 2022). Additionally, teachers' training in digital literacy can facilitate the improvement of students' digital literacy skills (Atmojo et al., 2021; Suwarto et al., 2022). Teachers can employ various methods to enhance students' digital literacy abilities.

Teachers have been integrating a structured digital literacy curriculum into the classroom, which is essential. This curriculum should encompass the use of technology for learning purposes, such as effectively utilizing educational software and online resources (Hutagalung & Purbani, 2021; Kailani et al., 2021). Additionally, fostering a culture of digital literacy through thematic learning can create an engaging environment where students actively participate in digital activities, supported by adequate resources like computers and internet access (Saleh & Solihin, 2023; Sari et al., 2022).

When introducing digital literacy, teachers should emphasize the importance of digital ethics. This foundational step helps students understand responsible behavior in online environments, including respecting others, protecting personal information, and navigating digital spaces safely (Ribble, 2011). This foundational understanding helps students navigate the digital world responsibly, minimizing risks such as cyberbullying, misinformation, and privacy breaches (Livingstone, 2011; Ribble, 2011; Rina et al., 2020). Research highlights that integrating digital ethics into early digital literacy instruction fosters critical thinking and encourages students to make informed decisions while engaging with technology (Livingstone & Helsper, 2007). Moreover, ethical awareness in digital spaces contributes to creating a positive and respectful online community (Gleason & Gillern, 2018).

**What digital literacy learning resources and tools are used in elementary school?**

Based on Table 1, Media literacy programs and ICT-based interventions have proven effective in enhancing both media and digital literacy among young learners (Hasibuan et al., 2024; Rina et al., 2020; Yuliana et al., 2021). Among these tools, motion comics stand out as an engaging and innovative medium for improving digital literacy by combining visual storytelling with interactive elements to captivate students' attention (Karlimah et al., 2021). Similarly, digital storytelling has emerged as a valuable educational strategy, enabling students to develop critical digital skills while fostering creativity, narrative skills, and a deeper understanding of digital tools (Wangid et al., 2021). These approaches highlight the

importance of integrating diverse, interactive media to effectively support digital literacy development in educational settings.

In Indonesia, various learning media have been implemented to enhance digital literacy among elementary school students. The integration of Information and Communication Technology (ICT) into the curriculum has been emphasized, with educators utilizing digital platforms to facilitate learning and improve student engagement (Kailani et al., 2021; Pardede & Dewanti, 2022; Suwarto et al., 2022). For instance, interactive tools such as online videos (Zainil et al., 2024), multimedia, animations (Ibda et al., 2023), module, flipbook (Qumillaila et al., 2022) and digital libraries have been employed to provide diverse learning resources, making educational content more accessible (Suwarjo et al., 2022; Suwarto et al., 2022).

The development and selection of learning media for elementary students must consider their unique characteristics to maximize learning outcomes effectively. Aligning educational resources with students' cognitive abilities, interests, and levels of digital literacy is critical for fostering engagement and enhancing comprehension (Reyna et al., 2018; Suryani et al., 2023). Studies demonstrate that learning media tailored to the specific needs of students not only improve understanding but also promote critical thinking and active participation, essential components of a meaningful educational experience (Hasanah et al., 2022; Kailani et al., 2021).

Additionally, incorporating a variety of digital tools and platforms can address diverse learning styles, ensuring inclusivity and accessibility in the classroom(Evans & Midford, 2021). This strategy is pivotal in preparing students for a digitalized future, equipping them to critically evaluate and navigate information from multiple sources (Yelken & ÇOcuk, 2018). By thoughtfully selecting and developing learning media grounded in an understanding of student characteristics, educators can effectively build foundational digital literacy skills. This approach supports broader educational objectives while addressing the dynamic demands of modern education (Delita et al., 2022; Shihomeka, 2023).

**What challenges and opportunities are digital literacy integrated into the elementary school curriculum?**

Strengthening digital literacy in elementary school students requires involvement from various parties (teachers, parents, and government), especially to integrate it into the curriculum so that it can be delivered in a structured and sustainable manner. But of course it has challenges to implement, various challenges faced include:

**Limited Infrastructure**

Many schools, particularly in rural or underfunded areas, face inadequate access to technology, such as computers, internet connectivity, and modern learning devices. This lack

of infrastructure creates a digital divide that hinders equitable implementation of digital literacy programs (United Nations Educational Scientific and Cultural Organization, 2022). so that infrastructure support is needed from both schools and the government.

**Teacher Preparedness**

Not all educators are proficient in digital tools or confident in teaching digital literacy. Therefore, teachers, both independently and in a structured manner from schools and the government, must continue to improve their ICT mastery skills through various training (Saa, 2024).

**Curriculum Alignment**

Incorporating digital literacy into the already dense elementary curriculum can be challenging. Schools often struggle to balance traditional subjects with new competencies, such as digital literacy, without overburdening students and teachers (Ribble, 2012).

**Parental Support**

Parents play a significant role in supporting their children's digital literacy outside of school. However, parents with limited digital skills or access to technology may find it difficult to provide adequate guidance, potentially widening the gap between students from different socioeconomic backgrounds (Livingstone & Haddon, 2012).

**Cybersecurity and Ethics Concerns**

Introducing digital literacy at an early age requires addressing online safety, privacy, and ethical use of technology (Livingstone & Helsper, 2007; Rina et al., 2020). Ensuring students understand these aspects can be complex and resource-intensive. In addition to the challenges, there are also opportunities to integrate digital literacy into the elementary school curriculum, including:

**A. Interactive Learning**

Interactive learning is supported by various approaches and learning models that support 21st-century skills, such as Problem-based learning (Sinaga et al., 2023), PjBL (Swandi et al., 2023), and integrative approaches (Asdar et al., 2024). Interactive learning can also be supported by various learning media such as video, PPT, animation, and gamification (Hamidah et al., 2023; Qumillaila et al., 2022; Suwarto et al., 2022).

**B. Parental Involvement**

Digital literacy programs create opportunities for schools to engage parents through workshops and collaborative activities, empowering them to support their children's learning and develop their digital skills (Gleason & Gillern, 2018; Theopilus et al., 2024). So parents

can monitor their children's digital activities and help make decisions when their children need help.

**CONCLUSION**

This systematic literature review underscores the critical role of digital literacy in equipping elementary school students with essential skills for academic and personal success in a digitalized world. The findings reveal that while challenges such as limited infrastructure, teacher readiness, and parental engagement persist, significant opportunities exist to enhance digital literacy through interactive and innovative learning media. Collaboration among educators, parents, and policymakers is pivotal to developing a robust framework integrating digital literacy into the elementary curriculum. By addressing these challenges and leveraging opportunities, schools can foster a generation of digitally literate, responsible, and ethically aware learners, prepared for future challenges in a rapidly evolving technological landscape.

**ACKNOWLEDGEMENT**

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