

Implementation Of Digital Libraries In Digital Literacy Learning For Elementary School Students

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Abstract. The development of digital literacy in primary schools has not progressed in line with the increasing availability of digital devices. This study analyzes the implementation of digital libraries in supporting digital literacy learning in a public primary school in Purwakarta Regency. Using a descriptive qualitative method, the study involved 25 participants consisting of one principal (4%), four teachers (16%), and 20 students from grades four and five (80%). Data were obtained through observation, semi-structured interviews, and documentation, then analyzed using Miles and Huberman's model of data reduction, data display, and conclusion drawing. The findings show that digital libraries expand students' access to information and enhance independence in searching for digital content, where 70% of students demonstrate high information-seeking autonomy. Teachers' utilization of digital libraries is categorized as moderate (50%), while access to digital devices remains uneven, with only 35% of students in the high-access category. The use of digital libraries also strengthens students' critical and reflective skills, although implementation is constrained by limited facilities, low teacher proficiency in managing digital shelves, and restrictive school policies particularly the ban on mobile phone use. Overall, digital libraries function as collaborative learning spaces that support the development of 21st-century competencies when supported by adequate infrastructure and flexible school regulations.

Keywords: digital library, digital literacy, 21st-century learning, elementary school.

INTRODUCTION

In this era of rapid digital transformation, digital literacy has become a fundamental competency that determines students' readiness to face the complex demands of 21st-century life (Dewi et al., 2021). Digital literacy is no longer limited to the ability to operate devices or access information, but rather encompasses a set of critical, analytical, creative, and communicative thinking skills in managing technology-based information. Responding to this need, the Ministry of Education and Culture of the Republic of Indonesia launched the National Literacy Movement (GLN) in 2016 as a systematic effort to foster a culture of literacy across all levels of education. In line with this, international institutions such as UNESCO and the OECD have positioned digital literacy as a global priority that must be integrated into national education systems and school curricula in various countries (Uswatun & Silitonga, 2020).

The urgency of mastering digital literacy continues to grow alongside the increasing ease of access to information, which is not always accompanied by the ability to filter, interpret, and use it ethically (Terttiaavini & Saputra, 2022). The abundance of information can lead to information overload when students lack the critical capacity to assess its validity, relevance, and potential impacts on their thinking and behavior. At the elementary school level, this challenge becomes particularly important because this stage functions as the foundational

period for the formation of essential competencies. Trianto & Heryani, (2021) emphasize that literacy is no longer merely the ability to read and write, but a complex and dynamic set of thinking and language skills that must continuously adapt to technological developments and the needs of a global, networked society.

Recent research indicates that one strategic medium for strengthening digital literacy in elementary schools is the digital library. Hasan et al., (2022) show that structured and relevant learning resources can support students' digital literacy development when they are easily accessible and integrated into the learning process. Digital libraries emerge as an educational innovation that supports 21st-century skills because they provide fast, flexible, and broad access to various sources of knowledge in digital formats (Pane, 2023). Ridlwan, (2025) explains that digital libraries not only provide content, but also train students to search for, evaluate, and use information independently. In practice, digital libraries can bridge students' need for varied learning resources while simultaneously facilitating teachers in integrating digital literacy into classroom activities in line with the Merdeka Curriculum.

A growing number of studies reinforce the positive impact of digital libraries on students' literacy and learning motivation. Subekti & Pratama, (2024) state that technology-based information systems in digital libraries enable teachers and students to access diverse learning resources more easily and in an organized manner. Isnaini et al., (2024) demonstrate that library digitization can increase students' interest in reading and improve their narrative text comprehension skills. Fitria et al., (2024) show that e-libraries can encourage more active interaction between students, teachers, and learning resources, creating a richer and more participatory learning experience.

Sulistiani et al., (2022) add that the digitization of school libraries supported by appropriate technical training can overcome the inefficiencies of manual systems and improve both librarian performance and students' access to information. In the context of social studies learning, Puspitasari & Resmalasari, (2023) emphasize the importance of integrating local wisdom into website-based digital literacy content to reinforce students' cultural identity while simultaneously sharpening their digital skills. Based on several studies, Mubarak, (2021) also underlines the strategic function of digital libraries in supporting distance learning, especially during the pandemic, which highlights the urgency of transforming library services from physical to digital formats.

Although this body of literature indicates the potential of digital libraries, the implementation of digital library services in elementary schools has not yet been fully optimized. Aiman, (2019)

found that the utilization rate of digital libraries in many schools remains low due to limited guidance and training for both teachers and students. Data from the Purwakarta Regency Archives and Library Office (2022) shows that the average number of library visitors only reaches around 2% of the total 199,410 students, which indicates low participation in library-based literacy activities, including digital literacy initiatives. . Ridlwan et al., (2025) also confirm that most students use digital devices more for entertainment purposes than for reading or learning activities. This condition reflects a gap between the potential of digital libraries and the reality of their pedagogical implementation in schools.

The research gap becomes more apparent when examining how previous studies have approached the role of digital libraries. Many studies have focused on technical aspects such as system management, digitization processes, or the improvement of reading interest, but relatively few have examined how digital libraries are pedagogically integrated into digital literacy learning in elementary school classrooms. The learning dimension that links the function of digital libraries with the development of students' digital literacy competencies such as critical evaluation of information, ethical use of digital content, and active engagement with digital texts has not been comprehensively explored. Moreover, there is still a limited number of studies that capture the experiences and perspectives of both teachers and students in using digital libraries as learning media, especially in the context of the Merdeka Curriculum which explicitly mandates the strengthening of digital literacy through authentic, student-centered learning.

The present study positions digital libraries not merely as technological add-ons, but as pedagogical instruments that actively shape digital literacy learning experiences in elementary schools. Previous research has shown that digital libraries can broaden access to diverse learning resources, increase reading motivation, and support inquiry-based learning, yet their role is still predominantly framed in terms of access and infrastructure rather than instructional design. Sari et al., (2025) demonstrate that digital libraries significantly enrich resource availability, but their integration into classroom pedagogy remains uneven and highly dependent on teacher initiative. Halomoan. et al., (2025) show that web-based digital libraries are valid, practical, and effective, although their implementation is often restricted to schools with adequate infrastructure. Subject-specific initiatives such as the Science Digital Library developed by Prastiti and Adi (2024) prove effective in enhancing science literacy, and studies by Jefa et al., (2024), Baan et al., (2024) and Zami, (2025) indicate that digital library platforms can foster digital engagement and reading interest. However, these studies collectively reveal a recurrent gap: digital libraries are rarely examined as structured learning environments

where digital literacy competencies such as searching, evaluating, and ethically using information are intentionally and systematically cultivated within everyday classroom practice.

This research seeks to deepen understanding of the pedagogical role of digital libraries in fostering digital literacy in early education. The study reframes digital libraries from passive resources to active learning spaces, providing practical guidance for teachers to integrate them effectively into the Merdeka Curriculum and 21st-century skills. The study also offers recommendations for policymakers to develop sustainable digital literacy programs that position digital libraries as key components of the elementary school learning ecosystem. These findings align with research showing that digital libraries enhance access to learning resources and support educational transformation through digital technology integration (Astuti et al., 2023; Suwarno et al., 2022)

Based on the above explanation, this study aims to analyze the implementation of digital libraries in teaching digital literacy to elementary school students by examining their implementation patterns, the perceived benefits for teachers and students, and the challenges that arise in the process. By understanding these dimensions, the study is expected to contribute to the development of more effective strategies for strengthening digital literacy at the elementary education level and to support the optimization of digital libraries as a strategic medium in creating an active, reflective, and future-oriented digital learning ecosystem.

METHODOLOGY

This study employs a qualitative approach with a descriptive method designed to present an in-depth portrayal of the implementation of digital libraries within the context of digital literacy learning in elementary schools. A qualitative approach was selected because it enables the researcher to understand meaning, patterns of behavior, and the social realities experienced by participants in their natural setting without manipulating variables (Creswell, 2014). The descriptive design supports the effort to construct a factual, systematic, and accurate representation of how digital literacy practices unfold within the school ecosystem (Prasanti, 2018). This research was conducted during the odd semester of the 2024/2025 academic year at a public elementary school in Purwakarta Regency that has implemented a digital library program since 2022/2023. This research was conducted during the odd semester of the 2024/2025 academic year at a public elementary school in Purwakarta Regency that has implemented a digital library program since 2022/2023. The participants were determined

using purposive sampling based on their direct involvement and relevance to the digital library program (Miles & Huberman in Santosa et al., 2022).

The academic year at public elementary schools in Purwakarta Regency that have implemented a digital library program since the 2022/2023 academic year. Research participants were selected using purposive sampling based on their direct involvement and relevance to the digital library program (Miles & Huberman in Santosa et al., 2019). The final sample consisted of one principal as the policy-level decision maker; four teachers two from grade 4 and two from grade 5 who actively integrated digital library media into their teaching; and 20 students (10 from grade 4 and 10 from grade 5) who regularly accessed and used the school's digital library. These students were selected based on criteria of regular digital library use, teacher recommendations, and representation of high and low levels of digital engagement to capture a diverse range of user experiences.

The sampling procedure followed three purposive considerations. First, the participants had to be directly involved in the planning, implementation, or use of the digital library in order to ensure relevance to the research questions. Second, variation in roles was intentionally included policy actors (principal), pedagogical implementers (teachers), and users (students) to allow triangulation across different perspectives within the school ecosystem. Third, for student participants, criteria included minimum one semester of digital library use and teacher verification of their participation in digital literacy activities. Data were collected using an interactive and iterative procedure following Miles and Huberman's (in Santosa et al., 2019) model, which includes data collection, data reduction, data display, and conclusion drawing. Observation was conducted to document classroom practices and students' interactions with the digital library platform. Semi-structured interviews were used to explore the perceptions, experiences, and challenges encountered by principals, teachers, and students. Documentation including school reports, photos of activities, digital library usage statistics, and program guidelines served as supplementary data to strengthen contextual understanding.

To maintain the credibility and dependability of the findings, methodological and source triangulation were employed by comparing observations, interview narratives, and documentation, while member checking was conducted with key informants to ensure accuracy of interpretations (Sugiyono, 2013). Throughout the research, the researcher acted as the primary instrument (human instrument), supported by observation sheets and interview guides developed from indicators of digital literacy implementation in elementary schools.

Data analysis was carried out continuously and interactively, moving back and forth between data condensation, data presentation, and verification, until stable themes were identified and meaningful conclusions were derived regarding the implementation of digital libraries in supporting digital literacy learning among elementary school students.

RESULTS AND DISCUSSION

This study aims to describe the implementation of digital libraries in digital literacy learning for elementary school students. Data were collected through observation, interviews, and documentation involving the school principal, teachers, and fourth- and fifth-grade students in a public elementary school in Purwakarta Regency. Based on data analysis, five major aspects were identified as indicators of implementation, namely: (1) student access to digital devices, (2) teacher utilization of digital libraries, (3) student independence in searching for information, (4) policy restrictions related to cell phone use at school, and (5) challenges in managing digital bookshelves.

Aspect	Category (High/Medium/Low)	Supporting Evidence (Interview/Observation Excerpt)
Student Access to Digital Devices	Low–Medium	<i>“Saya bisa baca di rumah pakai HP mama, tapi di sekolah nggak ada laptop yang cukup untuk semua.” (Student)</i>
Teacher Use of Digital Library	Medium	<i>“Saya pakai perpustakaan digital kalau materinya pas, tapi kadang ribet masuk ke rak digital yang harus pakai akun lain.” (Teacher Grade 4)</i>
Student Information-Seeking Independence	High	<i>“Anak-anak sudah bisa cari buku sendiri. Mereka malah suka eksplor koleksi lain di luar tugas.” (Teacher Grade 5)</i>
Policy Restrictions (HP Ban)	Strong Barrier	<i>“Aturannya memang tidak boleh bawa HP. Ini jadi dilema, karena akses digital jadinya terbatas.” (Headmaster)</i>

Management of Digital Bookshelves	Low	<i>“Kelola rak digital masih sulit. Upload buku itu kadang gagal, dan ada fitur yang belum familiar.” (Teacher).</i>
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Result

The findings show that student access to digital devices remains uneven. Although some students can access the digital library through their parents’ devices at home, school facilities are not yet able to accommodate access for all students. This condition is reflected in student narratives, such as: *“Kalau mau baca, saya tunggu giliran komputer di lab, soalnya sering penuh.”* (Student). Teachers also confirm this limitation, noting that device scarcity creates unequal access among students.

Teachers’ use of the digital library is categorized as moderate. Those who frequently use the platform generally have undergone technological training or self-learning initiatives. One teacher explained: *“Saya pakai bahan dari perpustakaan digital untuk tugas literasi, tapi tidak setiap hari karena kelola raknya cukup rumit.”* (Teacher Grade 4). This aligns with observation results showing that some teachers encountered technical difficulties in organizing digital shelves and uploading materials.

Student independence in searching for information shows the strongest outcome. Many students are able to navigate the digital library autonomously and choose materials according to their interests. During observation, a fifth-grade student stated: *“Aku biasanya cari buku tentang hewan. Kadang aku buka video juga kalau ada link-nya.”* This demonstrates that the digital library fosters exploratory learning and encourages students to develop self-directed information-seeking behaviors.

However, policy barriers significantly limit digital literacy integration. A strict ban on cell phone use in school results in limited access to digital reading materials during class activities. The principal acknowledged this constraint: *“Kami khawatir soal keamanan digital dan distraksi, tapi di sisi lain kami tahu aturan ini menghambat literasi digital.”* This inconsistency between policy and pedagogical needs is a structural challenge that directly affects implementation.

In addition, the management of digital bookshelves remains a major obstacle for teachers. Several teachers reported difficulty navigating the application’s layered account system. As one teacher noted: *“Harus masuk akun berbeda untuk setiap rak itu merepotkan. Kalau*

sistemnya lebih sederhana, pasti saya lebih sering pakai.” This practical challenge affects both the frequency of use and the quality of digital content curation.

Discussion

The discussion of this study provides a deeper interpretation of how digital libraries are implemented, utilized, and constrained within digital literacy learning in a public elementary school in Purwakarta Regency. The analysis is grounded in observational data and strengthened by interview excerpts from principals, teachers, and students, allowing each theme to be connected to existing theories and previous research. Rather than merely describing the phenomenon, this discussion aims to contextualize the findings within broader discourses on digital literacy and the transformation of learning in the digital era.

The first finding reveals that the implementation of the digital library is integrated into school-based literacy activities such as the “7 Poe Atikan” program themed *Mapag Buana*, where students explore digital reading sources. This integration illustrates the early shift from conventional print-based literacy toward digital literacy, emphasizing online information access and comprehension. A teacher explained, “*Setiap pekan kami arahkan anak-anak membaca dari perpustakaan digital, tapi tetap harus disesuaikan dengan aturan sekolah*” (interview). This aligns with Fitria et al., (2024), who highlight the role of digital content in encouraging active engagement, yet differs in the degree of system integration. Unlike Fitria’s findings which emphasize a fully institutionalized system this study shows that implementation in elementary schools remains adaptive and highly dependent on school policies. Consequently, the contribution of this study lies in demonstrating that digital literacy development in basic education is influenced not only by the availability of digital infrastructure but also by the regulatory environment and institutional culture that govern technology use.

The second key finding confirms that digital libraries substantially improve students’ independence and motivation in learning. Students demonstrated strong competence in navigating search features, selecting reading materials, and evaluating content relevance. During observation, one student stated, “*Aku bisa cari bukunya sendiri, Bu. Tinggal ketik saja di kotak pencarian*” (interview). This indicates a shift from teacher-centered to exploration-based learning. These findings intersect with Isnaini et al., (2024) who note that digital content stimulates imagination, creativity, and curiosity. However, this study extends the literature by showing the pivotal role of teachers as facilitators who guide students through the process of digital information retrieval and reflection. A teacher noted, “*Anak-anak itu cepat paham, tapi tetap harus diarahkan supaya tahu mana sumber yang tepat*” (Teacher Grade 4).

Theoretically, these results reinforce the argument that digital literacy involves not only technical proficiency but also metacognitive abilities related to information management. This study thus contributes empirically to understanding how digital libraries can accelerate pedagogical transitions toward student-centered approaches in elementary education.

The third finding highlights structural constraints that impede the optimal use of digital libraries, particularly unequal access to devices and restrictive school policies. Students rely heavily on their parents' devices at home, while at school, access to digital tools remains limited. One student admitted, *"Kalau di sekolah susah, Bu, rebutan komputer. Jadi seringnya baca di rumah pakai HP mama"*. The principal acknowledged this gap, stating, *"Aturan larangan membawa HP itu ada untuk keamanan, tapi memang jadi hambatan bagi kegiatan literasi digital"*. These constraints are more structural than motivational, contrasting with Kurnia & Wijayanto, (2020) argument that digital literacy challenges arise primarily from low learning motivation. Instead, this study shows that infrastructural disparity and rigid policies create unequal opportunities for digital engagement. This positions the study's contribution within the policy dimension, providing evidence that equitable digital literacy development requires flexible device policies, continuous teacher training, and fair distribution of digital infrastructure.

From a theoretical perspective, the findings reinforce several of the ten dimensions of digital literacy proposed Kurnia & Wijayanto, (2020) particularly access, participation, collaboration, and ethical information use. The interviews demonstrate that digital libraries shape not only students' access to information but also their reflective and critical skills. A teacher shared, *"Saya sekarang mulai ajarkan anak-anak membedakan sumber yang kredibel, karena di internet banyak sekali informasi yang harus disaring"* (interview). This study extends the application of digital literacy theory by showing that elementary schools serve as a foundational ecosystem where ethical, responsible, and collaborative digital behavior is cultivated early through guided participation in digital platforms. The digital library, therefore, is not just a technological tool but a structured environment that trains students to navigate digital spaces responsibly.

Overall, the findings of this study demonstrate that while digital libraries possess great potential to strengthen digital literacy learning, their effectiveness depends heavily on the readiness of the surrounding educational ecosystem. The success of digital literacy integration is shaped by the interplay between technology availability, school regulations, pedagogical readiness, and teacher competence. This study confirms that digital literacy transformation in

elementary schools is not solely a technological matter; rather, it requires a coherent alignment of learning culture, institutional policies, and supportive infrastructure. Consequently, these findings provide both conceptual and empirical foundations for developing inclusive, adaptive, and sustainable digital literacy policies at the national level.

CONCLUSION

This study concludes that the implementation of digital libraries in elementary schools has the potential to significantly strengthen students' digital literacy when it is integrated into structured school programs, facilitated by teachers, and supported by a conducive policy environment. The findings show that digital libraries encourage a shift from print-based literacy to digital, foster students' independence in seeking and processing information, and provide teachers with more varied and contextual learning resources. At the same time, the study reveals that structural constraints such as limited device availability, strict bans on the use of mobile phones, and technical difficulties in managing digital shelves create inequalities in access and hinder optimal utilization. Conceptually, the research reinforces digital literacy theory by showing how access, participation, and ethical information use can be cultivated from the elementary level through guided engagement with digital libraries, positioning these platforms not merely as repositories, but as pedagogical spaces where critical and reflective digital practices are formed.

Based on these conclusions, several recommendations can be proposed for practice and policy. Schools are advised to gradually revise device-related policies by designing controlled and supervised models of digital device use, so that concerns about distraction and safety can be addressed without sacrificing students' opportunities to develop digital literacy. Education offices and school leaders should invest in improving infrastructure and provide continuous professional development for teachers, particularly in managing digital content, curating age-appropriate materials, and facilitating critical use of digital resources. Developers or managers of school digital libraries are encouraged to simplify system interfaces to make bookshelf management more intuitive for teachers. Future research could expand this study by involving multiple schools with different contextual characteristics, or by focusing more deeply on students' digital literacy trajectories over time, so that a more comprehensive model of digital library-based literacy education in Indonesian elementary schools can be developed.

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