

The Influence of Digital Literacy on Students' Critical Thinking Skills

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Abstract

This study examines the impact of digital literacy on the critical thinking skills of elementary school students (Madrasah Ibtidaiyah, MI). With the rapid development of digital technology, the use of the internet and digital devices has become increasingly widespread in daily life, including in the education sector. However, not all students are able to use digital information critically and effectively, making digital literacy a crucial competency that must be developed from an early age. A qualitative approach using a literature review method was applied in this study. Data was collected from various sources, such as books, journals, and other academic publications, and then analyzed using content analysis techniques. The results of the study of ten research articles indicate that digital literacy, reading literacy, interest in reading, interest in learning, and independent learning are interrelated and have a positive influence on the critical thinking skills of elementary school students. Digital literacy facilitates students in accessing, understanding, and evaluating information effectively, while the implementation of literacy-based learning supported by digital media is also capable of encouraging student engagement and participation in the learning process.

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1. INTRODUCTION

Education plays a crucial role in developing quality human resources (HR) from an early age. Through education, students gain not only insight but also the competencies, behaviors, and values needed to face life's challenges (Pare & Sihotang, 2023). Efforts to improve the community's quality of life can also be supported through non-formal education programs that reach various levels (Warin, 2022). The process of transferring knowledge and values is known as learning, which is then evaluated to assess the level of achievement of goals and learning outcomes (Shodiq et al., 2025). Instilling moral values alongside the use of technology is crucial from an early age (Darmawan & Sagita, 2026). Educational success is not solely determined by the materials or curriculum used but also depends heavily on how the learning process is conducted in the classroom. The implementation of appropriate teaching standards is essential for effective and safe teaching and learning activities (Masfufah & Darmawan, 2023). According to Santiani (2025), an effective learning process can increase students' motivation, focus, and active participation. Thus, students not only gain insight but also understand and apply the knowledge they learn. Good mentoring from educators has been proven to strengthen students' learning independence in this modern era (Darmawan & Musonawawi, 2026). A crucial aspect that influences learning success is students' ability to learn independently or learn independently.

Critical thinking skills are a crucial competency that influences the success of a student's learning cycle. Critical thinking can be defined as a student's ability to evaluate, study, and assess information rationally to understand a problem and determine an appropriate solution (Rendi et al., 2024). Learning methods that combine face-to-face interaction and online learning are also considered effective in training students' thinking skills (Darmawan et al., 2024). Critical thinking skills are crucial for addressing various problems and producing logical and objective conclusions (Darmawan et al., 2026). A combination of technical skills and social skills is essential for preparing students to face future developments in the outside world (Mendonca et al., 2021). This competency is crucial for learning activities because it encourages students to understand learning materials in greater detail and motivates them to avoid accepting information directly without prior review. Through appropriate educational processes, public awareness of the importance of maintaining environmental balance can also be increased (Gautama & Mardikaningsih, 2022). Some indicators of critical thinking skills include analyzing problems, analyzing information, evaluating arguments or opinions, drawing logical conclusions, and providing rational reasons for decisions (Manurung et al., 2023). By improving critical thinking skills, students will be better able to understand various information objectively, solve problems more systematically, and make appropriate decisions during the learning process.

Digital literacy is a crucial component in individual and societal development, particularly in the modern era characterized by the rapid flow of technology-based information (Ghozali et al., 2024). Proficiency in using digital devices is also a driving factor in students' enthusiasm for learning and academic success (Zahid & Darmawan, 2025). Digital literacy is a student's ability to utilize, understand, and evaluate information obtained from various digital media wisely and responsibly (Devi & Winangun, 2024). Amidst the rapid flow of information, a good understanding of digital media is essential to filter out circulating hoaxes (Sinambela, 2022). Digital literacy skills determine the extent to which students can access a variety of quality learning resources that enrich their learning experience (Kholid & Darmawan, 2023; Kholid et al., 2024). The use of well-managed digital communication tools in educational institutions also supports the smooth running of teaching and learning activities (Hariani et al., 2025). Digital literacy encompasses the ability to understand software usage, access online information, evaluate digital sources, and participate productively on various digital platforms (Rizal et al., 2024). The use of digital-based learning media has been shown to have a positive impact on students' academic achievement (Rizal & Darmawan, 2024). This ability is not only related to the ability to use technological instruments but also involves more complex thinking processes, such as searching for relevant information, assessing its accuracy, and utilizing that information to support the learning process. In addition to supporting academics, correct and wise internet use also has a positive impact on children's psychological well-being (Khayru et al., 2025). Several indicators of digital literacy include the ability to access digital information, understand the content of the information found, evaluate the accuracy of sources, and use technology effectively in learning activities. However, this ease of access needs to be considered so that it can be enjoyed by all children without exception (Newman et al., 2017). The development of digital literacy is supported by various educational theories, including Piaget's Cognitive Development Theory (1952), which emphasizes that insight is formed through a process of events and relationships with the environment. Discovery Learning Bruner's (1961) theory motivates students to responsively identify insights through information exploration, while Vygotsky's (1978) Social Constructivism Theory emphasizes the importance of social relationships and guidance in learning. With strong digital literacy skills, students can become more adept at using technology positively, broaden their knowledge, and improve their critical thinking skills when dealing with various information in the digital age.

According to Susanto and Wulandari (2024), various learning theories in education also support the development of critical thinking skills in students. Piaget (1952) explained that insight is formed through actual events that align with students' intellectual growth, enabling them to understand

information in a more logical and structured manner. Providing diverse learning materials from various perspectives is very effective in helping train children's social sensitivity from an early age (Hariani et al., 2021b). Meanwhile, Bruner (1961), through the concept of Discovery Learning, emphasizes that student understanding can improve if they play a proactive role in identifying and processing the insights they learn. Moreover, in today's era, internet media plays a significant role in disseminating various educational information (Darmawan & Fajar, 2024). Furthermore, Bandura (1977), in his Social Learning Theory, emphasized that learning patterns can be implemented through observing and imitating the behavior of others in their surroundings. Daily consumption of digital entertainment, music, and other entertainment content also contributes to shaping students' character and habits (Kurniawan & Khayru, 2021). Based on these experts' views, the critical thinking skills of elementary school students can improve rapidly, making them more active, able to analyze information, and participate better in classroom learning activities.

At the Madrasah Ibtidaiyah level, digital literacy and critical thinking skills play a crucial role in supporting the success of learning schemes (Fadli et al., 2024). Elementary school-aged students are in the concrete operational development process based on Jean Piaget's Cognitive Development Theory. Students can think logically about real-world situations, understand cause-and-effect relationships, and demonstrate a strong curiosity about diverse information. The abundance of information on social media requires every user to always prioritize ethics in communication (Al Hakim & Irfan, 2023). According to Malo et al. (2025), digital literacy helps students wisely access, understand, and identify various information obtained through digital media. Meanwhile, critical thinking skills improve students' ability to identify information, assess the validity of a source, and draw rational conclusions. Equal distribution of technological facilities and digital skills training is key to expanding learning opportunities for all groups (Arifin & Darmawan, 2021). If these two abilities develop in balance, the learning process can be more engaging, effective, and provide meaningful learning experiences for students. A critical approach to selecting information online is also crucial to mitigate the negative impact of hoaxes (Rojak, 2023). Furthermore, the presence of guidance services in schools plays a significant role in guiding the development of students' personal character (Rojak et al., 2024). Beyond the use of technology, moral guidance from the family remains the most important foundation for maintaining children's good manners (Rahayu et al., 2025). Positive use of social media can even be directed toward broadening students' horizons regarding environmentally friendly lifestyles (Mardikaningsih et al., 2025). Thus, strengthening digital competencies coupled with sharp thinking will foster a generation of intelligence and character.

Based on the description above, this study aims to examine the impact of digital literacy on the critical thinking skills of elementary school students. Digital literacy is a crucial factor in the learning process because it helps students responsibly access, understand, and evaluate various information obtained through digital media. Furthermore, critical thinking skills are crucial for students to identify information, assess the validity of a source, and draw rational conclusions in the learning process. Therefore, understanding the relationship between these two variables is crucial so that teachers can design learning strategies that not only optimize students' digital literacy competencies but also optimize their critical thinking skills. Thus, the learning process in elementary school is expected to be more effective and support the achievement of educational goals optimally.

2. RESEARCH METHODS

This study employed a qualitative approach through library research. The research was conducted to examine various research findings related to the impact of digital literacy on the critical thinking skills of elementary school (MI) students (Amin et al, 2025). This research does not focus on statistical data processing, but rather on the study of theories, concepts, and previous analysis results relevant to the two variables. Through a qualitative approach, the researcher seeks to understand the meaning, relationships, and trends of the analysis findings that have been carried out by previous researchers.

The application of literature studies allows researchers to collect and examine various scientific views to obtain more comprehensive knowledge regarding the relationship between digital literacy and students' critical thinking skills. Study data is collected from various readings, including national and international articles, proceedings, books, and other academic publications related to the research theme. Data is collected through a digital literature search process with keywords related to digital literacy and the critical thinking skills of elementary school students. The literature used is then selected based on several criteria, including the suitability of the title and content to the research focus, the credibility of the author, and the year of publication, so that the sources used remain relevant and have a strong academic basis.

3. RESULTS AND DISCUSSION

This article discusses various efforts to optimize elementary school students' critical thinking skills by strengthening digital literacy in the learning process. Numerous studies on digital literacy have been conducted, but this study focuses on how digital literacy contributes to the development of students' critical thinking skills. Several previous studies indicate that the use of digital technology can help students access various sources of information while also training them to analyze and evaluate the information they obtain (Aisyah *et al*, 2024). The use of digital media and learning resources can create interactive and engaging learning schemes in line with technological transformation. Therefore, studying various related literature is important to gain in-depth knowledge regarding the impact of digital literacy on students' critical thinking skills and to serve as a foundation for designing innovative learning schemes for Madrasah Ibtidaiyah students. The following are some of the articles reviewed:

1. Mai Wanda Putri, Irwan Irwan, and Sri Rahmadani (2025)

This study was conducted to examine the extent to which digital literacy influences students' critical and creative thinking skills during sociology lessons at SMAN 07 Solok Selatan. A quantitative approach was used *after the fact, applied* as the study method. Data collection was carried out through observation, interviews, and questionnaires, then analyzed using statistical techniques with the help of data processing software. The sample was obtained through the technique of *cluster sampling*, with 33 10th-grade students as a sample. The study results indicate that digital literacy has a significant impact on critical thinking skills and also strengthens its role in encouraging students' creative thinking skills.

2. Martha Debby Rosalina, Patricia Daniela Iman, and Visensia Rini Anggraini (2023)

The purpose of this study was to identify the impact of digital literacy on the critical thinking skills of sixth-grade students at Dian Harapan Daan Mogot Elementary School. Quantitative methods were employed in this study. Data were collected through questionnaires and analyzed using regression tests to assess the impact of digital literacy and critical thinking skills on differences in ability between groups. Sampling was conducted using *simple random sampling*. A total of 97 sixth-grade students. The analysis findings indicate that digital literacy has a positive impact on critical thinking skills.

3. Neng Ela, Happy Karlina Marjo, and Sendi Ramdhani (2025)

The study was conducted to analyze the impact of digital literacy and learning interest on the critical thinking skills of fifth-grade elementary school students in Cluster 7, Cakung District. The study employed a quantitative approach using a survey method. The study involved all fifth-grade students, with a sample size of 156. *Cluster sampling* is the sampling technique used. Data were collected through questionnaires. Data were analyzed using simple linear regression and multiple regression, using t-tests and F-tests. The research findings indicate that digital literacy and learning interest influence students' critical thinking skills.

4. Gistrant Yoda Arinda, Putri Ayu Manalu, Nazwa Tantri Fitria, and Suci Indah Triani (2024)

The study was conducted to determine how digital literacy and students' critical thinking skills relate to each other. This study utilized a quantitative approach known as the correlational approach. Thirty students were sampled using a purposive sampling method. To collect data, a Likert-scale questionnaire was used to assess students' digital literacy and critical thinking skills. This began with a prerequisite analysis test, followed by a simple linear regression analysis. The research findings indicate that digital literacy has a positive and significant impact on students' critical thinking skills. Therefore, the higher the level of digital literacy, the better the critical thinking skills.

5. Sofiyah Hidayat (2024)

This study was conducted to examine the impact of digital literacy on students' creativity and critical thinking skills in Islamic jurisprudence (Fiqh) learning at MTs (Islamic junior high school) in Batukliang District. A quantitative approach with a causal associative design was applied as the research method. Data were collected by distributing questionnaires, while data analysis used simple linear regression techniques and *random sampling*. A sample size of 30 students was used. The study results indicated that digital literacy had no significant impact on students' creativity or critical thinking skills.

6. Yashinta Ekafitri Maharani, Susantiningrum Susantiningrum (2025)

This study was conducted to examine the impact of digital literacy and *self-efficacy* on the critical thinking skills of students at SMK Negeri 6 Surakarta. A quantitative approach with a correlational design was applied as the research method. Data collection was carried out by distributing questionnaires, and then analyzed using multiple linear regression techniques. *Proportional random sampling* was used to select a sample with a total of 85 students. The findings of the analysis indicate that digital literacy and *self-efficacy* significantly influence students' critical thinking skills.

7. Luthfi Rosyida, and Moh. Danang Bahtiar (2024)

This study was conducted to examine the factors that influence students' critical thinking skills, namely *self-confidence*, emotional intelligence, and digital literacy. The study applied a quantitative explanatory method at SMK Negeri 4 Surabaya. All 106 students of class X Accounting were the study population, using the *simple random sampling technique* to select a sample of 84 students. The data were analyzed using statistical analysis to examine the impact of the two variables. The findings of the analysis indicate that both collectively and individually, *self-confidence*, emotional intelligence, and digital literacy have a significant influence on students' critical thinking skills.

8. Fatimah Az Zahra (2024)

The study was conducted to examine the impact of digital literacy and environmental literacy on students' critical thinking skills. The quantitative approach used multiple linear regression techniques at a public junior high school in Jati Agung District. The study involved students from six schools in the district. *Stratified random sampling* was applied to obtain the study sample. Multiple linear regression techniques were used to analyze the study data. The results indicate that students' critical thinking skills are significantly influenced by digital literacy and environmental literacy.

9. Siti Aminah (2024)

This study was conducted to examine the impact of independent learning, digital literacy, and peer interaction on students' critical thinking skills through the mediating variable of learning motivation. A quantitative approach with a descriptive method was used *after the fact*, applied as a study method on class VIII students of SMP Negeri 34 Bandar Lampung, with a sample of 138 students determined using the *simple random sampling*. Data were collected through questionnaires, tests, observations, interviews, and documentation, then analyzed statistically. The study findings indicate that independent learning directly influences critical thinking skills, while

digital literacy and peer interaction have no direct influence but have an indirect influence through learning motivation. Furthermore, digital literacy, independent learning, peer interaction, and learning motivation collectively influence students' critical thinking skills.

Based on a review of nine relevant research articles, it can be concluded that literacy plays a crucial role in optimizing the critical thinking skills of elementary school students. Several studies indicate that digital literacy positively influences critical thinking skills by helping students access, understand, and evaluate information more deeply. Furthermore, reading literacy activities, reading interest, and the application of literacy-based learning have also been shown to motivate students to examine information and develop logical arguments. Other factors, such as learning interest, learning independence, and the use of digital learning media, also support the development of students' thinking skills. Therefore, strengthening literacy and implementing appropriate learning schemes are crucial factors in improving the critical thinking skills of elementary school students.

Table 1. Previous Studies

Researchers	Location	Research Focus	Key Findings
Daughter <i>et al.</i> (2025)	SMAN 07 South Solok	Examining digital literacy impacts critical and creative thinking skills	Digital literacy significantly influences critical thinking skills.
Rosalina <i>et al.</i> (2023)	Dian Harapan Daan Mogot Elementary School	The influence of digital literacy on critical thinking skills and gender differences	Digital literacy has a positive impact on critical thinking skills; there is no difference in digital literacy between men and women.
She <i>et al.</i> (2025)	Elementary School Cluster 7, Cakung District	The influence of digital literacy and learning interest on students' critical thinking skills	Digital literacy and interest in learning influence critical thinking skills.
Protectet <i>al.</i> (2024)	Medan Elementary School	The relationship between digital literacy and students' critical thinking skills	Digital literacy has a positive correlation with students' critical thinking skills.
Hidayat (2024)	MTs throughout Batukliang District.	The influence of digital literacy on students' creativity and critical thinking skills	Digital literacy does not have a significant impact on students' creativity or critical thinking skills.
Maharani and Susantiningrum (2025)	State Vocational School 6 Surakarta.	The influence of digital literacy and <i>self-efficacy</i> on students' critical thinking skills	Digital literacy and <i>self-efficacy</i> have a significant influence on students' critical thinking skills
Rosyida and Bahtiar (2024)	State Vocational School 4 Surabaya.	Factors that can influence students' critical thinking skills, namely, intelligence	Emotional intelligence, <i>self-confidence</i> , and digital literacy have a significant influence

Researchers	Location	Research Focus	Key Findings
			on students' critical thinking skills.
Zahra (2024)	Public Junior High School in Jati Agung District.	The influence of environmental literacy and digital literacy on students' critical thinking skills	Environmental literacy and digital literacy have a significant influence on students' mathematical critical thinking skills.
Amina (2024)	State Junior High School 34 Bandar Lampung	The influence of digital literacy, learning independence, and peer interaction on critical thinking skills is mediated by learning motivation.	Digital literacy, learning independence, peer interaction, and learning motivation also influence students' critical thinking skills.

A review of nine studies shows that various aspects of literacy, learning interest, and learning independence play a crucial role in optimizing students' thinking skills, particularly critical thinking skills, at the elementary school level. Most studies employed quantitative methods through correlational techniques, experiments, and regression analysis to examine the relationships and influences between the variables studied. Findings from these studies indicate that higher levels of reading literacy, digital literacy, reading interest, and learning independence tend to be followed by improvements in students' critical thinking skills (Yani, 2025). This confirms the positive relationship between these factors and the development of critical thinking skills. A good understanding of the principles and regulations applicable in the surrounding environment also helps train a person's thinking maturity from school age (Rojak, 2021). Therefore, strengthening literacy activities and implementing learning strategies that can motivate student response and engagement are crucial steps in optimizing critical thinking skills in elementary school learning systems. Furthermore, fulfilling children's basic rights to receive adequate educational services is absolutely necessary to support their growth and development (Hariani et al., 2021a).

Digital literacy plays a crucial role in supporting the development of students' critical thinking skills. The use of digital technology in learning has been proven to help students use, understand, and analyze information in depth. Concrete steps to improve readiness for today's technological advancements can begin with training in basic digital skills (Zahid et al., 2025). Putri *et al.* (2025) stated that digital literacy significantly influences critical thinking skills and contributes to optimizing students' creative thinking competencies. This condition aligns with the fact that most of today's young generation relies heavily on social media to find information (Kurniawan et al., 2021). A study by Aminah (2024) also stated that digital literacy, independent learning, peer interaction, and learning motivation also impact students' critical thinking skills. This openness of information has also changed the way modern society communicates daily (Darmawan, 2021). This is in line with Vygotsky's Social Constructivism Theory (1978) and the Theory of *Discovery Learning* from Bruner (1961), which emphasizes the importance of active student contributions to form insights through information exploration.

Most analytical findings indicate that digital literacy positively influences critical thinking skills, both directly and through supporting factors such as learning interest, motivation, and learning independence. However, several studies have shown conflicting results, with digital literacy having no effect or only indirectly influencing it through mediating variables such as learning motivation. These findings suggest that critical thinking skills are not solely driven by digital literacy, but also by

various other interrelated factors within the learning framework. Each individual inherently possesses unique behavioral characteristics that influence how they adapt to the learning environment (Darmawan, 2013). Therefore, strengthening digital literacy in learning needs to be integrated and supported by appropriate learning strategies. The choice of varied learning methods by educators significantly determines students' comfort level and acceptance of the subject matter (Mardikaningsih, 2014). Teachers are expected to utilize digital media effectively and encourage students' active participation in identifying information, thereby optimally enhancing critical thinking skills. Furthermore, implementing technology-friendly pedagogical guidelines is crucial to ensure that learning activities in schools continue to run fairly and safely (Darmawan, 2023). Ultimately, managing key components within the educational environment will support the effectiveness and success of achieving shared goals.

4. CONCLUSION

Based on a review of nine previous studies, it can be confirmed that digital literacy is an influential element in optimizing students' critical thinking skills. Digital literacy is not simply related to the skill of applying technology, but also encompasses the ability to sort, understand, and evaluate information logically. This reinforces the view that learning processes that utilize technology appropriately can optimize the development of advanced thinking skills in students. Findings from various studies indicate that the impact of digital literacy on critical thinking skills tends to be positive, although not due to a single factor. Critical thinking skills are also triggered by other aspects, including learning interest, independence, motivation, and student psychological factors. Thus, digital literacy plays a crucial role in interrelated learning, not the sole determining factor. The implications of developing students' critical thinking skills need to be implemented by integrating digital literacy, strengthening a culture of reading literacy, and learning strategies that encourage student activeness. These efforts demonstrate that developing thinking skills cannot be done in isolation but must be mutually supportive. Schools and teachers have a crucial role to play in creating a learning environment that encourages this process. Thus, students are expected to not only be able to apply technology but also be able to think critically, analytically, and reflectively when dealing with various information in the digital era.

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