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Digital Literacy and the Development of Critical Thinking Competence among Indonesian Language Education Students in the Era of Digital Transformation

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Abstract. The rapid development of digital technology has significantly transformed the landscape of higher education, including the learning process in universities. However, there remains a gap between students' ability to utilize technology productively and the demands of the digital era, which emphasize information literacy and critical thinking skills. This study aims to analyze the role of digital literacy in shaping students' critical thinking competence in the Indonesian Language Education Study Program during the era of digital transformation. The research employed a descriptive qualitative approach, with participants comprising sixth-semester students and two lecturers teaching technology-based courses at a public university in Indonesia. Data collection instruments included in-depth interviews, participatory observation, and documentation of digital learning activities. The data were analyzed using thematic analysis, which involved data reduction, data display, and conclusion drawing. The findings reveal that digital literacy plays a crucial role in fostering students' critical thinking skills, particularly through activities involving information analysis, digital collaboration, and evaluation of online sources. Students with higher levels of digital literacy demonstrate stronger abilities to assess the credibility of information, construct logical arguments, and produce academic writing based on digital data. Furthermore, lecturers serve as facilitators who encourage reflective and ethical use of digital literacy within the learning process. This study contributes to strengthening the 21st-century learning paradigm in higher education, particularly in integrating digital literacy with the development of critical thinking. It is recommended that educational institutions provide ongoing digital literacy training for both lecturers and students to build an adaptive learning ecosystem aligned with technological advancement.

Keywords: critical thinking, digital literacy, digital transformation, higher education, Indonesian language education

INTRODUCTION

The era of digital transformation has brought significant changes to human life patterns, including in the field of education (Judijanto et al., 2024)In the context of higher education, students are exposed to an overwhelming flow of information that requires the ability to sort, evaluate, and process information critically (Mashuri et al., 2023). Consequently, digital literacy has become an essential competency that every student must possess to adapt to rapid changes and use technology wisely (Aksenta et al., 2023). Moreover, digital literacy encourages students to be more creative and reflective in the learning process(Imamudin & Syabaruddin, 2022). Through technologies such as e-learning platforms, academic social media, and other digital resources, students can explore new ideas, engage in interactive discussions, and produce scientific work that meets the demands of the digital era. These practices strengthen their critical thinking skills, as every digital activity requires a high level of cognitive engagement in processing data and making rational decisions(Pratama et al., 2022).

In the digital era, literacy is no longer limited to the conventional ability to read and write, but also encompasses the ability to understand, analyze, and create digital content responsibly (Fitri, 2025). Therefore, the development of critical thinking competence becomes an integral part of digital literacy that must be nurtured through education, especially for university students who are future educators (Bertola et al., 2023; Erstad & Siddiq, 2023; Fiqtianisa & Purwanti, 2025; Jayaram, 2015). Students in Indonesian Language Education programs play a strategic role in integrating digital literacy and critical thinking skills, as both serve as foundational competencies in responding to the paradigm shift of 21st-century learning (Zamista & Charona, 2023). With strong digital literacy, students are not only able to access and utilize information from various sources, but also to select, interpret, and evaluate the validity and credibility of information circulating in the digital sphere. This process directly trains critical thinking skills such as the ability to analyze arguments, detect logical fallacies, and draw rational conclusions (Kurniati et al., 2015; Lee et al., 2021; Wati et al., 2023).

Students of the Indonesian Language Education Study Program at a public university in Sumatra, Indonesia, as future language teachers, are expected to master not only linguistic and pedagogical skills but also the ability to think critically in responding to various forms of digital information. However, preliminary observations indicate that many students still use digital technology primarily for entertainment and social media rather than for intellectual development. This phenomenon indicates that students' digital literacy remains at a technical level and has not yet reached the reflective and evaluative dimensions that are central to critical thinking (Febriani et al., 2025). Such conditions may lead to low analytical ability, weak logical argumentation, and poor judgment in evaluating the truth of digital information encountered in daily life.

Several previous studies have investigated the dimensions of digital technology and learning competencies. A study by I Made Putrayasa, I Gede Suwindia, and I Made Ari Winangun (2024) emphasized that digital literacy is an integration of traditional reading literacy and technological literacy, shaping the competencies of the younger generation in the digital age. The study revealed the great potential of digital literacy in expanding access to information and learning, while also highlighting challenges such as misinformation, digital inequality, and declining deep reading skills due to the dominance of social media. Meanwhile, research by Aida Fiqtianisa and Purwanti (2025) found that students with higher levels of digital literacy tend to exhibit stronger critical thinking and problem-solving abilities. However, these existing studies have primarily focused on general youth populations or specific fields such as economics and business, leaving a clear empirical gap regarding how digital literacy shapes critical thinking in language teacher education. Therefore, a specific research gap remains regarding how digital literacy contributes to the development of critical thinking among Indonesian Language Education students in the era of digital transformation.

To address this gap, the present study aims to analyze the role of digital literacy in shaping students' critical thinking competence in the Indonesian Language Education Study Program at the masked public university. This research not only focuses on students' technical ability to use technology but also explores how well they can interpret, evaluate, and filter digital information using rational and logical reasoning. Through this analysis, the study seeks to identify the relationship between digital literacy levels and students' critical-thinking abilities and to propose learning strategies that more effectively integrate these competencies.

The researcher's motivation for conducting this study stems from the observed reality that students still struggle to think critically when confronted with the massive flow of digital information. As future Indonesian language teachers, they hold a moral and academic responsibility to instill critical thinking skills in their future students. Therefore, it is crucial for them first to possess a strong foundation in digital literacy. In addition, this study is motivated by a desire to expand academic discourse in language education, particularly regarding the relationship between digital literacy and critical thinking skills. This area remains underexplored in the university's specific local context.

The main objective of this research is to analyze the role of digital literacy in shaping students' critical thinking competence in the Indonesian Language Education Study Program during the era of digital transformation. The specific objectives of this study are as follows:

1. To analyze students' digital literacy practices in academic activities.
2. To identify students' patterns of critical thinking in the digital era.
3. To explore the challenges students face in developing digital literacy.

To describe the role of lecturers as facilitators in strengthening students' digital literacy and critical thinking abilities. This research is expected to provide significant contributions both theoretically and practically. Theoretically, the findings of this study expand the academic discourse regarding digital literacy and the development of critical thinking skills within the context of language education in the era of digital transformation. In practice, the results can serve as a reference for lecturers, students, and policymakers in higher education when designing learning strategies that simultaneously support digital literacy and critical thinking. Furthermore, this study is expected to provide direct benefits to students by improving their capacity to think critically, creatively, and responsibly when utilizing digital technology, thereby serving as a strategic step toward preparing an adaptive, reflective, and competitive generation of educators.

METHOD

Research Design

A descriptive qualitative design was employed in this study to explore the natural phenomenon of digital literacy practices and critical thinking competencies within the university environment. (Creswell, 2017). This approach allows the researcher to capture and interpret students' experiences, perceptions, and viewpoints deeply without manipulating the setting. According to John W. Creswell (2017), qualitative research is particularly suited for understanding a central phenomenon by exploring the subjective meanings that individuals assign to their social or educational experiences. Consequently, this design aims to provide a comprehensive, systematic, and detailed depiction of how digital literacy influences the ways language education students analyze and evaluate digital information in their daily academic activities (Heath, 2015; Moleong, 2018; S. E. Pritzker & Perrino, 2025).

Participants

This study was conducted in the Indonesian Language Education Study Program at the Faculty of Teacher Training and Education (FKIP) of a public university in Sumatra, Indonesia. The location was purposively selected because students in this program are actively engaged with various digital platforms for academic activities. However, empirical investigations into their critical cognitive responses to digital information remain limited. The participants of this study were selected using a purposive sampling technique, which involves choosing informants based on specific criteria that directly align with the research objectives (Creswell, 2017). To capture a comprehensive development trajectory, the selection process screened active students from different academic years who regularly integrate digital devices into their learning.

The criteria for selecting participants were as follows:

1. Active students enrolled in the Indonesian Language Education Study Program at the University of Jambi.
2. Students who regularly use digital devices and platforms in their learning activities.
3. Students who consented to participate voluntarily and were willing to share their experiences openly during interviews.

The final sample consisted of 10 students selected based on their digital engagement levels: 4 from the fourth semester, 3 from the sixth semester, and 3 from the eighth semester. To protect their privacy and fulfill research ethics, all participant names were masked using alphabetical pseudonyms (Student A to Student J). Additionally, two lecturers teaching technology-integrated courses (Lecturer X and Lecturer Y) were selected to provide triangulation from the educators' perspective.

Research Instrument

In this qualitative study, the researcher served as the primary instrument (human instrument) who collected, analyzed, and interpreted the data directly. To maintain consistency and validity, the researcher used a semi-structured interview guide focused on the technical, cognitive, and ethical dimensions of digital literacy, as well as critical-thinking indicator sheets. [Moved instrument before data collection..

Data Collection Techniques

The data collection was carried out through three interconnected qualitative methods: semi-structured interviews, non-formal participatory observations, and academic documentation. In-Depth Interviews: Semi-structured interviews were conducted either face-to-face or virtually via digital meeting platforms. The interview sessions lasted approximately 30–45 minutes and were guided by core questions regarding information verification and digital source evaluation. To ensure instrument clarity, a pilot interview was conducted with two students from outside the main sample before data collection. Observation: The researcher conducted informal observations of students' behavioral patterns in digital academic spaces, including interactions in online discussion forums and class text groups, which were recorded in detailed field notes (Barrick, 2020; Julmi, 2020).

Documentation: This technique was used to gather supporting contextual materials, including screenshots of learning management systems, curriculum profiles that support digital literacy, and relevant institutional digital learning policies (Ajagbe et al., 2015; Hamilton & Finley, 2019).

Data Analysis Technique

Data analysis followed the interactive model proposed by Miles, Huberman, and Saldaña (2014), consisting of data reduction, data display, and conclusion drawing. During data reduction, interview transcripts were systematically coded to extract relevant themes regarding literacy practices, constraints, and analytical responses. Data were presented through narrative descriptions and conceptual matrices, which were continuously verified through data triangulation (Creswell, 2017).

Research Procedure

The research procedure was executed in four consecutive stages. Preparation Stage: the researcher designed the research framework, determined the study's focus, developed interview and observation guidelines, and obtained formal permission from the faculty and the study program. The Data Collection Stage involved conducting interviews, observations, and documentation in accordance with the schedule agreed upon with the informants. Data Analysis Stage transcribed the collected data, performed data reduction, thematic coding, and data presentation following the model of Miles and Huberman. In the Conclusion Drawing Stage, the researcher interpreted the findings, verified them with the informants (member checking), and formulated the implications of the results for the development of digital literacy and students' critical thinking competence.

Ethical Considerations

Ethical clearance was maintained by securing written informed consent from all participants prior to data collection. Complete anonymity was guaranteed by utilizing pseudonyms, and all collected materials were strictly managed for academic purposes without disrupting the students' formal academic schedules.

FINDINGS

The findings related to each research question are based on four central themes generated during the thematic analysis: (1) academic digital literacy practices, (2) critical thinking cognitive patterns, (3) infrastructural and pedagogical challenges, and (4) the pedagogical role of lecturers as reflective facilitators (cf. Indrayadi, 2023).

Students' Digital Literacy Practices in Academic Activities

The findings reveal that students of the Indonesian Language Education Study Program at the University of Jambi actively utilize various digital platforms to support their academic activities. The most frequently mentioned platforms include Google Scholar, Grammarly, the University's e-learning system, YouTube, and several educational social media platforms such as Instagram and TikTok. The use of these platforms goes beyond simply searching for reading materials or lecture content; students also use them to enhance conceptual understanding, broaden their knowledge horizons, and improve the quality of their academic writing. Some participants reported using supporting applications such as Mendeley for automatic citation management and ChatGPT for idea generation or conceptual clarification, albeit with caution and awareness of potential limitations.

One participant, an upper-semester student, described her habit of cross-checking multiple sources before reaching a conclusion. This behavior reflects an early stage of critical information literacy, where digital users consciously evaluate the credibility of information:

"When I look for course materials, I go straight to Google Scholar. I usually compare several articles to determine which are more reliable"

This statement demonstrates that the student does not rely on a single source but rather conducts inter-source evaluation to ensure data reliability and accuracy. Such a practice signifies the initial development of critical evaluation skills in processing digital information. In contrast, earlier-semester students exhibited slightly different behaviors. They tended to rely more on audiovisual sources, particularly YouTube, as they found them easier to understand than academic articles. However, difficulties often arose when they encountered conflicting information across different channels. As one participant noted:

"I usually use YouTube to find theories, but sometimes the explanations differ, so I get confused about which one is correct"

This excerpt suggests that while students demonstrate motivation for independent learning, their ability to evaluate the credibility of digital sources still needs improvement critically. The abundance of differing perspectives in online media often leads to confusion, especially when students lack clear strategies or criteria for verifying the accuracy of information.

Furthermore, several participants reported that the use of digital media was often carried out without formal instruction or digital literacy training from lecturers. Most students learned autonomously through experience and peer support. One senior student explained that she frequently assisted her classmates in finding journal articles or using reference management tools:

"I usually help my friends find journals on Google Scholar or teach them how to use Mendeley, since I learned it on my own"

This finding indicates the presence of community-based digital literacy practices (peer learning), where students' digital competence develops through social interaction and knowledge sharing among peers. Such practices are crucial in higher education settings, as they show that digital literacy competence is influenced not only by individual factors but also by social and cultural support within the digital academic environment.

Overall, the interview data suggest that students have demonstrated basic digital literacy, particularly in information searching and use for academic purposes. However, the depth of critical thinking in evaluating and filtering information varies among participants. Some students already exhibit critical reading and analytical thinking skills, while others still consume information passively without reflective processing.

In conclusion, students' digital literacy practices are currently in a transitional phase—from passive to reflective users. Therefore, pedagogical support through digital literacy-oriented courses and assignments that emphasize evaluation, analysis, and source validation is needed to foster stronger critical-thinking competencies in the context of academic digital engagement.

Students' Critical Thinking Patterns in the Digital Era

Based on the results of in-depth interviews, the critical thinking abilities of students in the Indonesian Language Education Study Program at the University of Jambi show a wide range of cognitive maturity levels. These differences are particularly evident in how students interpret, analyze, and evaluate digital information in academic contexts.

Students who are accustomed to accessing scholarly databases such as Google Scholar, ResearchGate, or the national journal portal (Sinta) demonstrate more systematic and reflective thinking patterns. They tend not to accept online information at face value; instead, they examine the source's validity, the author's credibility, and the content's relevance to their research or coursework. One senior student explained the steps she usually takes when encountering differing perspectives among sources:

"If there are two sources with different opinions, I first check who the author is, when it was published, and whether that opinion also appears in other journals."

This statement illustrates that the student has internalized the principles of critical thinking within the context of digital literacy, particularly in the evaluative and reflective dimensions. She can assess the validity of data using academic criteria such as author reputation and temporal relevance. This process exemplifies critical appraisal, in which an individual rationally evaluates the strengths and weaknesses of an argument before reaching a conclusion.

However, the interviews also revealed that not all students have reached this reflective stage. Many early-semester students still tend to trust authoritative or popular figures without conducting a deeper evaluation. Their judgments often rely more on source authority than on the substance of the argument. A junior student admitted that she often trusted information shared by educational figures on social media without further verification:

"Sometimes I immediately believe it if the post comes from a lecturer or an education influencer. However, after taking a digital literacy course, I realized it is important to check the sources."

This statement indicates a shift in cognitive awareness following exposure to formal digital literacy instruction. Prior to attending such courses, the student tended to adopt a reproductive thinking pattern, accepting information as given. After learning about verification and source validation principles, she began to recognize the importance of analytical and skeptical thinking when dealing with digital information.

In addition to educational experience, the interviews show that the frequency of engagement with academic sources significantly affects students' critical thinking abilities. Students who regularly complete research-based assignments or write academic papers demonstrate more mature abilities in comparing and interpreting arguments. They are accustomed to using information triangulation techniques, comparing findings from multiple sources to ensure accuracy.

Conversely, students who primarily rely on social media platforms such as Instagram and TikTok, or on educational blogs, exhibit surface-level thinking patterns. They focus on practical, instant content and rarely engage in deeper reflection. One participant even admitted that she seldom reads full-length journal articles, feeling that short-form content is sufficient for understanding concepts:

"I prefer watching summarized theory videos on TikTok because they are easier to understand. Reading journals is boring, and the language is too complex."

This statement reflects fast content consumption, which may hinder the development of critical thinking, as the processes of analysis, evaluation, and reflection are not fully activated. Overall, the findings indicate that students' critical thinking abilities in the digital era develop gradually and at varying levels. Students with strong academic digital literacy show analytical, reflective, and evaluative thinking tendencies, while those who engage more with popular digital media demonstrate reactive and imitative thinking patterns.

Therefore, efforts to strengthen students' critical thinking in the digital age should focus on pedagogical strategies that encourage source evaluation, reflective discussion, and research-based assignments, enabling students to develop consistent habits of critical reasoning as they navigate the complexities of digital information.

Challenges in Developing Digital Literacy and Critical Thinking

The interview results reveal that students of the Indonesian Language Education Study Program at Jambi University face various challenges in developing digital literacy and critical thinking skills amid the ongoing technology-based transformation of education. These challenges emerge from three interrelated dimensions- technical, pedagogical, and psychological, which collectively influence the overall learning process.

Technical Challenges: Access and Digital Infrastructure

Limited internet access and digital devices remain the main barriers for some students, particularly those from regions with unstable network infrastructure. Several informants reported that poor signal quality and limited internet data often caused them to fall behind in online lectures or to have difficulty accessing academic resources. An early-semester student stated:

"At home, the signal is really bad, so sometimes I cannot join Zoom or open journals. I often end up missing assignments."

This condition demonstrates that the digital divide remains a significant issue among students. Unequal access to technology and the internet creates disparities in learning opportunities, resulting in varying levels of digital literacy development. Some students even admitted that they prefer to search for information on social media platforms, as these are easier to access than academic journal websites, which require stable connections.

Pedagogical Challenges: Integrating Digital Literacy and Critical Learning

From a pedagogical perspective, challenges arise because not all lecturers have effectively integrated digital literacy into their teaching practices. Based on interview data, many students perceive that the learning methods remain predominantly teacher-centered, focusing on content delivery rather than on exploring and analyzing digital information that fosters critical thinking skills. One lecturer reflected:

"Many students still think digital literacy only means being able to use a laptop or search for articles. In fact, it is about how they think critically about digital information."

This statement underscores that students' conceptual understanding of digital literacy remains limited to its technical dimension (technical literacy) and does not encompass critical and reflective aspects. Furthermore, the lack of training for lecturers in implementing interactive and reflective, digitally based learning strategies has hindered the development of students' critical thinking skills.

Some students also mentioned that lecturers tend to use digital platforms merely as tools for content delivery rather than as collaborative spaces that challenge students to think critically. Consequently, students become passive and consumptive of information rather than active learners who evaluate and construct new knowledge.

Psychological Challenges: Digital Fatigue and Decreased Motivation

In addition to technical and pedagogical factors, psychological challenges such as digital fatigue, online learning burnout, and low motivation to explore academic resources have also emerged. Continuous engagement with digital devices during online learning leaves students feeling exhausted, stressed, and unfocused. An intermediate student described:

"Sometimes I get tired of staring at the laptop all day. I end up opening entertainment apps instead of searching for journals."

This phenomenon highlights an imbalance between academic activities and the need for digital relaxation, leading to a decline in the quality of critical digital literacy. Many students turn to entertainment media such as TikTok or Instagram as an escape from academic fatigue, ultimately reducing their engagement in developing critical-thinking skills.

Moreover, some students admitted to lacking confidence in evaluating the credibility of academic information, especially when distinguishing between credible sources and opinion-based content. This indicates the need for intensive mentoring to enhance students' self-efficacy in critically and independently managing digital information.

Thematic Analysis

Overall, the three dimensions of challenges are closely interconnected. Technical barriers limit access to credible learning resources; pedagogical barriers restrict opportunities to practice critical thinking in class; and psychological barriers weaken students' motivation and concentration. The combination of these factors forms a digital constraint cycle that hampers the achievement of critical thinking competence in higher education settings.

Therefore, the development of digital literacy and critical thinking among students cannot rely solely on the availability of technological facilities. It also requires reflective pedagogical strategies, supportive institutional policies, and continuous psychological assistance. This aligns with the concept of holistic digital literacy, which emphasizes a balance among technical, cognitive, and affective competencies for navigating the complexity of information in the era of digital transformation.

The Role of Lecturers as Facilitators of Digital Literacy and Critical Thinking

The findings of this study indicate that lecturers' roles are a key factor in shaping a digital literacy ecosystem that supports the development of students' critical thinking skills. Based on interviews with lecturers who teach technology-based courses in the Indonesian Language Education Study Program at Jambi University, the role of educators in the digital era has shifted from traditional knowledge transmitters to facilitators, mentors, and guides in reflective thinking.

One lecturer explained that he had begun to modify his teaching approach by integrating activities centered on critical digital literacy, such as reading and discussing journal articles from multiple perspectives. Through these activities, students are encouraged to practice analytical, argumentative, and reflective thinking toward the data and theories they encounter online:

"We are getting students used to reading international journals and discussing them from different perspectives. From there, they learn to think critically and build arguments based on data."

This statement illustrates that lecturers play an active role in building a collaborative and reflective learning environment that encourages students not only to comprehend the content of digital texts but also to evaluate their validity and relevance. Such an approach aligns with the concept of digital critical pedagogy (Luke & Freebody, 2018), in which educators guide learners to interpret, critique, and construct meaning from various digital texts independently and responsibly.

Furthermore, several innovative pedagogical practices implemented by lecturers—such as digital discussion forums, critical reflection tasks, and online peer reviews—have proven effective in enhancing students' engagement in higher-order thinking processes. Through digital forums, students have space to express opinions, respond to peers' arguments, and reassess the validity of the information they use. The lecturer then acts as a moderator, ensuring that the discussion proceeds academically and ethically.

Another lecturer emphasized that beyond cultivating critical thinking, she also highlights the importance of academic ethics in the use of digital resources. During classroom activities, students are reminded to respect intellectual property, cite sources properly, and avoid digital plagiarism—ensuring that their digital literacy practices encompass not only cognitive but also moral dimensions:

"We also stress the importance of digital ethics. It is not enough to know how to use technology; they must also understand academic boundaries and respect others' work"

This finding demonstrates that lecturers not only function as developers of students' digital skills but also as agents in the formation of academic character and digital integrity. Thus, digital literacy extends beyond the ability to use technology; it encompasses critical thinking, ethical responsibility, and social awareness within academic contexts.

Keen data analysis reveals a transformation in the lecturer's role in the digital era—from a singular authority figure to a co-learner who learns alongside students. In digital discussions and collaborative projects, lecturers are no longer the sole source of knowledge but rather facilitators who create learning situations that stimulate curiosity, challenge assumptions, and foster independent thinking.

Data analysis suggests that learning approaches oriented toward dialogue, reflection, and digital collaboration significantly contribute to students' critical thinking development. Lecturers who consistently implement this facilitative model help students internalize evidence-based reasoning and develop metacognitive awareness in using technology for academic purposes.

In conclusion, the lecturer's role as a facilitator of digital literacy is not merely instrumental but also transformative. Lecturers play a key role in cultivating a generation of digitally literate, critical, ethical, and adaptive students who can thrive amid the rapid evolution of educational technology in the era of digital transformation.

DISCUSSION

Based on the research findings, students in the Indonesian Language Education Study Program at this regional public university have demonstrated a relatively strong level of digital literacy in their academic activities. They actively use various digital platforms, including Google Scholar, Grammarly, the university's e-learning platform, YouTube, and educational social media such as Instagram and TikTok, to search for, understand, and disseminate academic information. This use indicates that students can manage digital information effectively and use technology as a tool for learning and self-development.

These findings align with the perspective of Paul Gilster (as cited in Mashuri et al., 2022), who defines digital literacy as the ability to understand and use information from diverse sources accessible through digital devices. Bawden (as cited in Mashuri et al., 2022) adds that digital literacy is not only about information-seeking skills but also involves technical and cognitive competencies in using technology and managing information effectively and efficiently. This view corresponds with the findings of Ririen and Daryanes (2022), who found that students not only access digital sources but also process and apply information in academic contexts such as writing scientific papers, preparing presentations, and engaging in online scholarly discussions.

According to Sutisna (2020) Digital literacy is the competence to comprehend and use information from various types of sources displayed through digital devices. The results of this study reveal that students can select relevant and valid information from diverse online sources to support their academic assignments. This indicates that students' digital literacy encompasses both the technical and conceptual skills required to interact effectively within the digital academic environment.

Mashuri et al. (2022) emphasize that the key objectives of digital literacy include fostering a culture of responsible technology use, cultivating curiosity, enhancing knowledge acquisition, and developing critical thinking in evaluating digital information. These objectives are evident in students' selective behavior when choosing sources, their caution toward misinformation, and their productive use of digital technology for learning (Riswanti Rini et al., 2022). Hence, students of this educational program have developed a form of digital literacy that is not only technical but also reflective and critical.

In terms of the four pillars of digital literacy, as described by Mudji & Hum (2023), namely Digital Skills, Digital Ethics, Digital Safety, and Digital Culture, the study's findings reflect mastery in all four aspects. In terms of Digital Skills, students demonstrate proficiency with digital devices and academic applications. Regarding Digital Ethics, they demonstrate awareness of academic

responsibility by avoiding plagiarism and properly acknowledging sources. Within Digital Safety, students show an understanding of data security and safe internet practices. Finally, under Digital Culture, they use digital media for collaboration and interaction within academic contexts.

The findings also reinforce those of I Made Putrayasa, I Gede Suwindia, and I Made Ari Winangun (2024) In their study "Transformation of Literacy in the Digital Era: Challenges and Opportunities for the Young Generation." Their research highlighted that digital literacy results from the integration of traditional reading literacy and digital literacy, shaping young people's competence in the technological era. The study identified digital literacy as a double-edged phenomenon offering opportunities to expand access to information and learning while also presenting challenges related to misinformation and digital inequality. However, that study focused on the broader context of youth and did not specifically explore how digital literacy contributes to critical thinking development in higher education (Carolus et al., 2023; Imamudin & Syabaruddin, 2022). Thus, the present research contributes new insights by emphasizing the application of digital literacy within the context of pre-service language teachers at this regional institution.

Similarly, Aida Fiqtianisaa and Purwanti (Fiqtianisa & Purwanti, 2025) In their study, "The Importance of Digital Literacy in Enhancing Critical Thinking and Problem-Solving Skills among University Students in the Digital Era," the authors found that students with higher levels of digital literacy demonstrate better critical thinking and problem-solving skills. However, their research focused on economics and business students, whereas the present study examines Indonesian language education students. Therefore, this research expands the scope of digital literacy studies by emphasizing its relevance to language education and digital text literacy, which have distinct characteristics and challenges.

This study contributes significantly to the development of knowledge in the field of language education and digital literacy. First, it enriches the discourse on digital literacy by situating it within the context of language education, particularly among pre-service Indonesian language teachers. This demonstrates that digital literacy functions not merely as a technical skill for accessing information but also as a pedagogical competence that supports critical, creative, and reflective thinking. Second, it provides empirical evidence on how students in higher education settings adapt and internalize digital ethics within their learning processes. Third, the findings offer valuable insights for lecturers and educational policymakers in designing learning strategies that integrate digital literacy competencies, enabling students to become intelligent and responsible users of technology.

Despite offering an in-depth overview of students' digital literacy practices, this study has several limitations. First, the research was conducted with a limited number of participants from a single study program, which limits the generalizability of the results to all university students. Second, the data relied primarily on qualitative findings from interviews and observations without extensive quantitative measurement of students' digital literacy levels. Third, the study did not explore in detail how digital literacy influences measurable learning outcomes and critical thinking abilities. Future research is therefore recommended to adopt a mixed-methods approach with a broader sample and to incorporate comprehensive assessment instruments for digital literacy to yield deeper and more generalizable insights.

CONCLUSION

This study concludes that digital literacy plays a crucial role in shaping students' critical thinking competence in the Indonesian Language Education Study Program at this leading public university in Sumatra during the era of digital transformation. Students have used various digital platforms, including Google Scholar, the university e-learning system, Grammarly, and educational YouTube channels, to support their academic activities. These digital literacy practices indicate that

students are not merely oriented toward the technical use of technology but are also beginning to develop cognitive skills in evaluating, selecting, and critically assessing information. However, the level of critical thinking skills still varies among individuals, influenced by factors such as technological exposure, learning habits, and academic environment support. The findings also reveal that challenges in digital literacy development are not only related to access and infrastructure limitations but also to the lack of integration of digital literacy into learning processes and to the emergence of digital fatigue, which affects students' motivation to learn. Moreover, the role of lecturers as facilitators is essential to fostering a culture of critical thinking through digitally based, reflective, and collaborative learning.

Therefore, digital literacy should be systematically integrated into higher education curricula, especially in teacher education programs, so that future educators can adapt to technological developments while internalizing critical thinking and digital ethics in their teaching practices. From a theoretical perspective, this research contributes to the development of educational science by enriching the understanding of the relationship between digital literacy and critical thinking in higher education contexts. In practice, the results can serve as a reference for educators and institutions when designing learning models oriented toward digital literacy and the reinforcement of critical thinking. Future studies are recommended to explore project-based or digital reflection learning strategies that are more effective at enhancing students' critical literacy, and to expand the scope to other disciplines to provide broader cross-disciplinary insights into digital literacy in the era of technological transformation.

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