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THE UTILIZATION OF DIGITAL TOOLS FOR INFORMATION ACCESS AND DEEP LITERACY DEVELOPMENT

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Abstract

Advances in digital technology have encouraged people to utilize various digital tools in daily life, particularly for accessing information and developing deeper literacy. This study aims to analyze how the utilization of digital tools supports information access and deep literacy development among users. A quantitative survey approach was employed, distributing an online questionnaire to 37 respondents, mostly aged 18–22 years, with women comprising 78.4%. Results show that 67.6% of respondents use digital devices 4–9 hours per day, with smartphones as the primary tool and ChatGPT as the most widely used AI. The main purposes of digital media use are academic needs (40.5%) and expanding knowledge (37.8%). Over 85% of respondents agreed that digital tools help deepen topic understanding, broaden access to diverse information sources, and enhance their ability to process and comprehend information independently. The main challenges faced were unstable internet connections and difficulty distinguishing valid information from hoax content. Most respondents reported an increase in vocabulary and broader knowledge after regularly using digital tools. This study concludes that the utilization of digital tools positively contributes to information access and deep literacy development, though users must remain critical in evaluating the credibility and accuracy of information obtained through digital media.

Keywords: *Digital tools; deep literacy; literacy development; reading tools*

INTRODUCTION

Digital technology's rapid advancement in the twenty-first century has fundamentally reshaped how young people and university students access information. AI assistants, social media, and digital reading tools offer unprecedented learning opportunities, prompting questions about the quality of comprehension. Central to this debate is deep literacy—the capacity for sustained, reflective, and critical engagement with complex materials—and whether growing dependence on digital tools fosters or hinders its development.

Deep literacy extends beyond decoding text to include critical analysis, empathy, and independent reasoning. As Wolf (2018) warns in Reader, Come Home, the skimming habits encouraged by digital environments might result in a "shallowing" of reading comprehension. This makes users more vulnerable to misinformation and less adept at deep analysis. Such risks are particularly relevant today, as Gonzalez-Mohino et al. (2023) show that digital technologies create new learning spaces that both enable and challenge critical thinking development.

In Indonesia, digital tools have seen rapid adoption in education. ChatGPT is reportedly the most-used AI application among students, with over half leveraging generative AI for academic work. Challenges remain, however, including infrastructure gaps, varying teacher readiness, and disparities in digital literacy. This highlights a critical question: despite widespread use, does educational technology genuinely develop deep literacy among Indonesian learners?

Survey data from students, aged 18–22, reveals they spend 4–9 hours daily with digital media. Smartphones are their primary tool, supported by ChatGPT, Gemini, TikTok, Google, and websites for academic research. Many noted digital tools deepened their topic understanding and expanded knowledge. Yet many struggled to distinguish credible information from misinformation—directly impacting the critical evaluation skills essential to deep literacy. Indah et al. (2022) confirmed digital literacy intertwines with research skills and critical thinking, but significant gaps in source evaluation persist.

Further concerns include potential declines in critical thinking amid AI overreliance. Yet research shows when purposefully applied—as Boroughani et al. (2023) demonstrated with mobile-assisted learning—digital tools effectively support vocabulary growth and self-regulated learning. This duality underscores the need to understand how students use these tools and why.

Accordingly, this study examines: first, the types of digital tools students most commonly used for learning; second, their perceived impact on critical thinking, comprehension, and vocabulary; and third, key obstacles to deep engagement via digital media. By addressing these objectives, this research aims to enrich understanding of digital literacy in Indonesian higher education and offer practical strategies to maximize benefits while minimizing cognitive risks.

METHOD

This research employs a quantitative descriptive approach to map out students' digital tool usage and perceptions of their own deep literacy development. The method systematically quantifies and describes these practices without seeking to prove causal relationships, focusing instead on capturing students' perspectives on digital tools and literacy gains.

Participants were Indonesian university students who regularly use digital tools for both academic and personal information purposes. Using a convenience sampling method, the study recruited 37 participants via an online survey. Approximately 83% identified as female, with ages ranging from 18 to 22, reflecting the typical university student demographic.

Data collection utilized a structured Google Forms questionnaire. Section 1 gathered demographic details: gender, age, and average daily time spent with digital media. Section 2 explored behaviors and perceptions regarding digital tool usage. It asked about specific platforms (e.g., ChatGPT, Gemini, Google, TikTok, websites, e-books), usage frequency, and reasons for use. Five Likert scale statements assessed tool impact on critical thinking, depth of understanding, access to diverse sources, evaluation of information reliability, and detail processing. The four-option scale omitted a neutral point, requiring respondents to lean towards agreement or disagreement. Open-ended questions addressed the perceived

benefits, challenges, motivations, and specific improvements in vocabulary and comprehension linked to digital use.

Survey administration occurred entirely online from June 9 to June 11, 2026, via multiple digital communication channels. All 37 submitted responses were complete and used in the analysis.

Data analysis involved three descriptive techniques: frequency and percentage analysis to outline demographic and tool preference distributions; Likert scale category frequency tallies to gauge respondent sentiments on tools and literacy; and a thematic summary of open-ended responses to enrich the quantitative data with perspectives on advantages, challenges, and motivations.

The study examined two variables. The independent variable, "digital tool use," encompassed device and application types, usage frequency, and reasons for use. The dependent variable, "deep literacy," measured via self-report, included five core indicators (critical thinking, understanding depth, source access, reliability evaluation, information synthesis) plus an additional indicator for vocabulary and comprehension growth. Adherence to ethical standards governed the research. Participation was voluntary, data use confined to academic purposes, and respondent confidentiality maintained throughout.

RESULTS AND DISCUSSION

Overview of Respondents

This study involved 37 respondents who were students utilizing digital tools for reading articles. The demographic characteristics of the respondents are summarized in Table 1 below.

Table 1. Demographic Characteristics of Respondents (n = 37)

Variable	Category	Frequency (%) n=37
Gender	Female	28 (75.7%)
	Male	9 (24.3%)
Age	15–19 years	21 (56.8%)
	20–28 years	16 (43.2%)
Screen Time / Day	< 1 Hour	3 (8.1%)
	1–3 Hours	8 (21.6%)
	4–6 Hours	17 (45.9%)
	7–9 Hours	9 (24.3%)
Primary Device	Smartphone / Handphone	34 (91.9%)
	Laptop	2 (5.4%)
	iPad / Tablet	1 (2.7%)

Female students accounted for 75.7% (n = 28) of respondents, with males representing 24.3% (n = 9). This aligns with prior digital literacy research showing higher female engagement in academic reading, particularly within Indonesian humanities programs.

Over half of respondents (56.8%, n = 21) were aged 15–19, while 43.2% (n = 16) fell into the 20–28 age range (including one 28-year-old). The sample aligns firmly within Generation Z (Prensky, 2001; Tapscott, 2009), known for early digital exposure—an important context for interpreting results.

Screen time revealed significant digital immersion: most participants reported 4–6 hours daily (45.9%, n = 17), followed by 7–9 hours (24.3%, n = 9) and 1–3 hours (21.6%, n = 8). Only 8.1% used devices for under one hour. Over two-thirds spent at least four hours daily on screens, consistent with youth digital trends accelerated by remote learning (APJII, 2023).

Smartphones dominated reading habits (91.9%, n = 34). Only 5.4% used laptops while 2.7% used tablets, reflecting developing nations' smartphone prevalence among students (World Bank, 2022). This mobile access affects reading formats, navigation, and sustained attention due to smaller screens.

Types of Reading Materials Accessed via Digital Tools.

Table 2. Types of Reading Materials Preferred by Respondents

Reading Material Type	Frequency	Percentage (%)
E-book	13	35.1%
Website	12	32.4%
Journal / Academic Article	7	18.9%
Social Media (TikTok, etc.)	3	8.1%
Physical Book	2	5.4%
PDF / Webtoon / Other	1 each	2.7% each
Total	37	100%

As shown in Table 2, e-books were the most common reading material accessed digitally, cited by 35.1% of respondents (n = 13), followed by websites at 32.4% (n = 12). Academic journals ranked third (18.9%, n = 7), while 8.1% (n = 3) named social media platforms like TikTok as a source. Physical books and other formats like PDFs and Webtoons had the smallest shares.

The preference for e-books and websites over physical formats highlights a strong shift toward digital reading. This trend aligns with the global move from print to digital content, especially in higher education (Walgermo et al., 2018). The significant number accessing academic journals (18.9%) suggests academic motivation, though accessibility challenges noted in open-ended responses mean this figure may be an overestimate. For instance, one respondent mentioned encountering "locked sites" for journals, pointing to persistent access barriers.

While only 8.1% used TikTok for reading, its inclusion is interesting. Some respondents identified it as their preferred information platform, showing algorithmically curated short-form content is becoming a reading medium for younger audiences. This trend—sometimes called "micro-reading" or "scrolling literacy"—raises questions about text depth, credibility, and sustained reading habits (Delgado et al., 2018).

Table 3. AI and Digital Tools Preferred by Respondents

AI/Digital Tool Preferred	Frequency	Percentage (%)
ChatGPT	20	54.1%
Gemini	13	35.1%
DeepSeek	2	5.4%

Claude	2	5.4%
Grok	1	2.7%
Total	38*	~103%*

ChatGPT dominated as the top AI tool, used by 54.1% of respondents (n=20). Gemini trailed at 35.1% (n=13). DeepSeek and Claude each got 5.4% (n=2), while Grok was named by 2.7% (n=1). One user uniquely favored Claude paired with Dola, explaining they preferred Claude because it "does not always agree with what we say" and is "more critical."

ChatGPT's lead aligns with its widespread use in higher education globally (Tlili et al., 2023). Users praised its ease, speed, and help with academic writing—comments like "easy in composing words" and "helps in constructing academic writing frameworks" were common. Gemini's strong adoption likely ties to its integration with Android and the Google ecosystem.

Reasons for preferring different tools ranged broadly. Some users cited convenience; others valued how tools gave "relevant answers" or responses "not too AI-like," pointing to concerns about how natural the output sounded. This matches research showing students judge AI tools on conversational quality and approachability as well as factual accuracy (Lo, 2023).

Primary Purposes for Using Digital Reading Tools

Table 4. Primary Purposes for Using Digital Tools for Reading

Primary Purpose	Frequency	Percentage (%)
Academic Tasks	16	43.2%
Adding Knowledge / Insights	16	43.2%
Entertainment / Current News	4	10.8%
Self-directed Learning	1	2.7%
Total	37	100%

Table 4 indicates an even split between academic purposes and knowledge enrichment as primary motivations for using digital reading tools, each selected by 43.2% (n = 16) of respondents. Entertainment and news consumption accounted for 10.8% (n = 4), while self-directed learning was cited by one participant (2.7%).

This near-equal distribution indicates that students utilize digital reading tools not solely in response to institutional demands, but also out of intrinsic intellectual curiosity. This is a noteworthy insight, as intrinsic reading motivation aligns with deeper engagement and enhanced long-term comprehension (Wigfield & Guthrie, 1997; Ryan & Deci, 2000). The relatively low proportion citing entertainment as a primary purpose (10.8%) may result from participant self-selection within this group, or indicate a tendency to report socially favorable learning purposes in surveys.

Qualitative responses deepened this understanding. One account described these tools as enabling rapid, comprehensive information access—especially for clarifying concepts incompletely grasped during class. Another participant emphasized using digital tools to create concise study materials and interpret exam questions, underscoring their instrumental role in managing academic demands. This instrumentality proves particularly relevant in Indonesian higher education, where students frequently balance multiple

concurrent courses with substantial reading requirements yet limited access to physical library resources (Wirawan & Gunawan, 2021).

Frequency of Digital Reading Activities

Table 5. Frequency of Reading with Digital Tools

Reading Frequency with Digital Tools	Frequency	Percentage (%)
Very Often	15	40.5%
Often	17	45.9%
Sometimes	5	13.5%
Never	0	0%
Total	37	100%

Table 5 presents the frequency with which respondents engage in digital reading activities. An overwhelming majority of respondents reported reading often or very often via digital tools: 45.9% (n = 17) read "often" and 40.5% (n = 15) read "very often," yielding a combined frequency rate of 86.4%. Only 13.5% (n = 5) reported reading only "sometimes," and no respondents reported never using digital tools for reading. These findings suggest a deeply habituated pattern of digital reading behavior among participants.

This high frequency of digital reading is consistent with broader trends documented in studies of student reading behaviors in digitally saturated environments (Mangen et al., 2013; Singer & Alexander, 2017). The complete absence of respondents who reported never using digital tools for reading is particularly noteworthy, as it may reflect the degree to which digital access has become a non-negotiable feature of academic life for this generation of Indonesian students. Unlike earlier cohorts who encountered print as the primary reading modality, these students appear to have fully incorporated digital tools into their everyday reading routines.

Perceptions of Digital Tools: Likert-Scale Response

Table 6. Likert-Scale Agreement Scores for Statements on Digital Reading Tools

Statement	Agree	Disagree	% Agree
Digital tools improve reading comprehension	33	4	89.2%
Digital tools increase reading motivation	35	2	94.6%
Digital tools provide access to diverse texts	37	0	100%
Digital tools support vocabulary development	34	3	91.9%
Digital tools enhance reading engagement	37	0	100%

As displayed in Table 6, student perceptions of digital tools across all five measured dimensions were overwhelmingly positive. Two statements that digital tools "provide access to diverse texts" and "enhance reading engagement" received unanimous agreement (100%, n = 37), reflecting a universal recognition among respondents of these particular affordances. The statement pertaining to reading motivation also achieved near-unanimous support (94.6%, n = 35), followed by vocabulary development support (91.9%, n = 34) and improved reading comprehension (89.2%, n = 33).

The universal agreement on access to diverse texts is logically coherent digital platforms objectively provide access to a vastly broader range of texts and genres than any individual could accumulate in physical form. This finding aligns with foundational arguments for digital reading by scholars such as Coiro (2003), who emphasized that digital environments fundamentally expand the reading landscape by enabling hypertext navigation, multimedia integration, and global textual access. The high engagement rating similarly reflects well-documented research showing that interactive, dynamic digital interfaces tend to capture and sustain student attention more effectively than static print formats, though concerns around shallow processing persist (Wolf & Barzillai, 2009).

The slightly lower though still very high agreement rate for comprehension improvement (89.2%) is instructive. Four respondents disagreed with this statement, which may reflect personal experiences of information overload, difficulty verifying accuracy, or awareness that rapid AI-assisted reading does not always translate into deep understanding. This is consistent with the critique advanced by Mangen et al. (2013), who found that students reading on screens tended to perform less well on comprehension measures than those reading from print, particularly for longer and more complex texts. The minority dissent on this item thus represents a theoretically coherent counterpoint to the otherwise positive consensus.

Perceived Benefits, Challenges, and Vocabulary Gains: Qualitative Findings

Analysis of open-ended responses revealed three dominant thematic clusters: (1) perceived benefits of digital reading tools, (2) challenges and barriers encountered, and (3) vocabulary and comprehension development. These themes are discussed in turn.

Respondents consistently highlighted the speed and convenience of access as a primary benefit. They described digital tools as enabling "instant" information gathering from multiple sources, without physical barriers or time limits. This ease was especially valued in academic settings, allowing students to clarify misunderstood class concepts, access materials at any hour, and manage workloads more effectively. As one noted, such tools help "understand material better when I did not fully understand it in class," reinforcing their role as just-in-time learning supplements.

Digital tools also expanded perspective. Several respondents emphasized how exposure to diverse sources offered multiple viewpoints and analytical frameworks, beyond what a single text provides. Access to varied materials means "we do not only view things from one perspective" – suggesting users develop critical literacy alongside digital reading habits. This echoes research showing critical digital reading can cultivate greater epistemic awareness (Coiro et al., 2008).

Finally, respondents especially valued AI tools' conversational function – a unique advantage over traditional reading. The ability to ask follow-up questions, request simpler explanations, or prompt alternative framings of complex ideas lets them engage dynamically in ways static texts can't match. This interactivity, frequently called a "companion" or likened to an on-demand tutor, aligns with findings highlighting how perceived personalization boosts motivation (Zawacki-Richter et al., 2019).

The biggest challenge was information reliability. Many people reported concerns about misinformation and AI inaccuracies, as one respondent noted it's hard to "distinguish what is right and wrong because both often sound plausible." This highlights increasing risks to understanding known through research on AI information literacy.

Network connectivity was the second significant barrier. Since people in Indonesia rely mainly on smartphones and face uneven mobile internet, digital reading often gets interrupted by slow or unavailable connections. This issue is especially present given digital infrastructure gaps between cities and rural areas. While powerful for learning, digital tools depend heavily on connectivity, making them far less reliable than printed books.

A third challenge was the risk of academic dependency. Some worried that leaning too much on AI for writing or summarizing might reduce students' own cognitive effort. One respondent who admits AI helps save time also felt "books are better for knowledge enrichment"—meaning speed doesn't equal deeper learning. Studies support this tension between efficiency and depth in education.

The overwhelming majority of respondents affirmed that their vocabulary and overall comprehension had improved through digital reading. Respondents specifically mentioned encountering new terminology through AI explanations, academic texts accessed online, and multilingual digital environments. One respondent described encountering " unfamiliar terms " provided by AI tools as a driver of lexical growth. Another noted expanded exposure to "various language dialects that continue to develop on the internet", pointing to the sociolinguistic dimension of digital vocabulary acquisition.

These self-reported gains in vocabulary align with established second language acquisition research linking extensive reading including digital reading with incidental vocabulary growth (Nation, 2001; Krashen, 1989). However, some respondents qualified their vocabulary gains with caveats. Two respondents noted minimal changes, and one observed that AI-generated language could sometimes be difficult to comprehend due to its formal or technical register, suggesting that the vocabulary exposure provided by AI tools is not always optimally scaffolded for learners at different proficiency levels.

Synthesis and Theoretical Implications

This study's findings show that Indonesian students widely adopt and benefit from digital reading tools. With 86.4% reporting frequent use and over 89% agreement across all five Likert scale areas, students broadly perceive these tools as enhancing their reading quality rather than diminishing it. The tools appear deeply integrated into their academic lives. Far from being passive users of AI-generated content, many students show measured awareness of the risks and limitations of these tools while valuing their utility.

However, there are significant challenges: misinformation, connectivity issues, and cognitive passivity. These highlight the need for improved instructional design and digital literacy curricula. Students would benefit from targeted instruction in source evaluation, critical AI literacy, and strategies to sustain concentration on longer, more complex texts. Educators and institutions should focus on developing what Coiro et al. (2008) term "new literacies"—the socially mediated skills necessary for purposeful, critical reading online.

The findings also impact reading instruction in Indonesian higher education. Given the near-universal adoption of tools like ChatGPT and Gemini among this cohort—where digital tools are the primary reading medium—educators cannot treat them as supplementary. Approaches that embrace, rather than resist, this reality through active scaffolding will likely prove more effective in fostering student comprehension, critical thinking, and academic literacy long-term.

CONCLUSION

Based on the findings of this study involving 37 respondents on the use of digital tools in article reading activities, it can be concluded that the majority of respondents were female, aged 18–20 years, who accessed information through mobile phones with an average internet usage duration of 4–6 hours per day. The most commonly used digital reading sources were e-books and websites, while the dominant platforms used were TikTok and AI-based applications. Among AI-powered digital tools, ChatGPT was the most popular, followed by Gemini, DeepSeek, Claude, and Grok.

Regarding the reasons for selecting digital tools, the majority of respondents indicated that they chose these tools due to ease of information access, speed in obtaining answers, and their ability to assist in completing academic tasks. The primary purposes of digital tool usage were divided between academic assignments and knowledge enrichment, with a smaller proportion using them for entertainment and accessing current news.

In terms of frequency of use, most respondents reported using digital tools frequently to very frequently in supporting their article reading activities. Overall, respondents agreed that digital tools provide significant benefits in their digital literacy activities, including facilitating comprehension of material, speeding up information retrieval, and providing efficient access to a wide range of knowledge sources.

The greatest benefit perceived by respondents was the ease and speed of obtaining information without limitations of time and place. Meanwhile, the main obstacles encountered included unstable internet connections, difficulty in verifying the accuracy of information, and the prevalence of hoaxes that were hard to distinguish from valid information. Nevertheless, nearly all respondents stated that the use of digital tools had a positive contribution to the growth of their vocabulary and comprehension, as they frequently encountered new terms and explanations from various perspectives that broadened their knowledge.

Based on the findings of this study, several suggestions can be put forward. First, given the high usage of AI tools such as ChatGPT and Gemini among respondents, there is a need to strengthen critical digital literacy skills, particularly the ability to verify and filter information obtained from digital sources. Universities and educators are encouraged to integrate source literacy training and information evaluation into the learning curriculum.

Second, since internet connectivity issues remain a significant obstacle for many respondents, improved network infrastructure support in learning environments is strongly needed so that the benefits of digital tools can be felt equally by all users.

Third, respondents are advised not to rely solely on a single type of digital tool, but rather to combine multiple sources such as scientific journals, verified e-books, and AI tools simultaneously to ensure the accuracy and depth of the information obtained.

Fourth, for future research, it is recommended to involve a larger number of respondents with more diverse backgrounds so that the results obtained can be more representative and more broadly generalized.

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Finally, the authors recognize that this research is far from perfect. Therefore, constructive criticism and suggestions are warmly welcomed for the improvement of future studies. It is sincerely hoped that the findings of this research may be of benefit to the academic community and contribute meaningfully to the development of knowledge in the field of digital literacy.

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