



# The Role of Digital Literacy and Indonesian Language Proficiency Among University Students in Using Social Media

Yulian Dinihari<sup>1</sup>, Musringudin<sup>2</sup>

<sup>1</sup>Universitas Indraprasta PGRI, Jakarta, Indonesia

<sup>2</sup>Universitas Muhammadiyah Prof. Dr. HAMKA, Jakarta, Indonesia



DOI : <https://doi.org/10.46245/ijorer.v7i1.1185>

## Sections Info

### Article history:

Submitted: October 31, 2025

Final Revised: Nov. 13, 2025

Accepted: November 21, 2025

Published: January 30, 2026

### Keywords:

Digital Literacy; Language Proficiency; Social Media Use; Digital Ethics; Higher Education.



## ABSTRACT

**Objective:** This study examines how digital literacy and Indonesian language proficiency shape university students' patterns of social media use. Digital literacy is conceptualized not merely as technical ability, but as a reflective and ethical capacity to access, evaluate, and produce information responsibly. Indonesian language proficiency is similarly positioned as a key indicator of students' logical reasoning, clarity of expression, and politeness in digital communication. Using a mixed-methods approach with 75 Communication Science students, this study collected quantitative data through Likert-scale questionnaires measuring digital literacy, language proficiency, and ethical awareness, while qualitative insights were obtained from open-ended responses describing students' verification practices, communicative strategies, and perceptions of responsible online behavior. The results show that 84% of students routinely verify information sources before sharing, 78% maintain polite and audience-appropriate language when interacting online, and 92% express pride in using proper Indonesian in digital spaces. These findings indicate that higher digital literacy is associated with stronger discernment, self-regulation, and ethical awareness in social media use, while greater Indonesian language proficiency supports clarity, civility, and context-sensitive communication. The integration of these competencies fosters responsible and reflective participation in online environments. The novelty of this study lies in demonstrating how language proficiency complements digital literacy in fostering responsible digital behavior and strengthening students' communicative ethics. Importantly, these insights have practical implications for curriculum development and character education in higher education, by promoting an integrated approach that combines digital literacy and language ethics to prepare students for responsible digital citizenship.

## INTRODUCTION

In the era of social media, interaction, knowledge production, and public opinion formation unfold at high speed. Within higher education, social media has shifted from a tool for entertainment to a space that supports student learning, collaboration, and academic engagement. Studies show that its use on university campuses can strengthen learning participation, self-reflection, and creativity, particularly through microlearning formats such as short-form video (Yang et al., 2025). At the same time, the integration of social media into academic settings raises concerns related to ethics, information credibility, and the stewardship of academic content. These concerns are increasingly relevant given the rapid spread of biased or unverified information across platforms, as documented in research on media ecology, digital-behavior patterns, and misinformation dynamics (Bogdanova et al., 2017; Ciriello et al., 2025; Gabonada Gatcho et al., 2024; Li et al., 2025; Lumbin et al., 2023; Yuan & Li, 2025). Together, these studies highlight the growing urgency of strengthening digital literacy and ethical awareness among university students.

In this context, digital literacy is understood not only as a technical proficiency in using digital devices, but also as a reflective capacity to access, evaluate, and produce



information responsibly (Nurhayati et al., 2020; Pool, 1997; Thomas et al., 2022). A growing body of research indicates that digital literacy correlates positively with the development of students' core competencies such as critical thinking, collaboration, and creativity. In addition, digital literacy demonstrably supports academic adjustment within digital learning ecosystems and strengthens students' ability to appraise information ethically and rationally (Zakir et al., 2025; Zhou et al., 2025).

Recent studies seek to identify the enabling conditions under which digital literacy and digital wisdom can effectively flourish in higher education. Improvements in students' digital literacy contribute directly to reflective thinking and ethical decision-making in online activities (Yuan & Li, 2025). At the same time, literacy practices on social media play a critical role in shaping digital competence and responsible communicative behavior (Gu et al., 2023).

Beyond the academic sphere, digital literacy influences the quality of students' social engagement online. Users with higher levels of digital literacy tend to demonstrate greater empathy, self-control, and social responsibility in their interactions on social media (Ciriello et al., 2024). This evidence suggests that digital literacy is not only about technological capability, but also about cultivating values and the character of digital wisdom rooted in the ethics of communication (Weber et al., 2025).

A range of studies highlights that effective digital literacy development must be systematically embedded in higher education policy. Strong institutional support, curricula aligned with digital competency frameworks, and committed academic leadership are essential in shaping ethical and inclusive learning ecosystems (Calderón et al., 2015; Mejías-Acosta et al., 2024). Within this context, higher education institutions play a strategic role in fostering students' social responsibility through guided, reflective, and sustainability-oriented media-literacy practices (Albardía et al., 2025).

Strengthening digital literacy is most effective when paired with innovative learning designs and collaborative activities (Dinihari et al., 2025). Interactive, digitally mediated training encourages significant gains in educators' technological competencies and in their capacity to create learning media that are both creative and responsive to student needs. The use of digital platforms based on content management systems likewise contributes to improving teachers' and learners' ability to curate, assess, and present digital portfolios in reflective and professional ways (Dinihari et al., 2024).

Moreover, integration of microlearning strategies with digital-literacy approaches has been shown to increase learner engagement, self-efficacy, and reflective capacity in online environments (Dinihari et al., 2025). Elements of gamification further enhance learning motivation and responsibility for self-directed learning, creating more meaningful and enjoyable experiences (Dinihari, 2025). Critical literacy practices in digital discourse are vital for cultivating students' language awareness particularly in recognizing and rejecting misinformation and hoaxes (Dinihari et al., 2024; Dinihari et al., 2025). These practices, developed through empathetic and humanistic approaches, also reduce bullying behaviors and reinforce students' social character and ethical communication in online spaces (Dinihari et al., 2025).

Digital wisdom in social media is closely linked to linguistic ability. Mastery of language underpins critical thinking, logical reasoning, and the capacity to communicate with civility and meaning. Communicating politely and clearly on social media strengthens students' academic relationships and professional identities (Li et al., 2025). In the Indonesian context, Indonesian Language (Bahasa Indonesia) serves as both a



medium of academic communication and a vehicle for internalizing values of politeness and national identity (Sonni et al., 2025).

Thus, digital literacy, critical literacy, and linguistic competence form a mutually reinforcing foundation for digital wisdom. Digital literacy equips students with evaluative skills, critical literacy frames ethical interpretation, and linguistic competence ensures clarity and politeness in expression. This triad explains why focusing on technical skills alone is insufficient; without ethical orientation and linguistic proficiency, students remain vulnerable to misinformation and harmful online behavior.

Research shows that strong language competence promotes ethical communicative behavior in digital spaces. The ability to choose appropriate diction and construct clear sentence structures helps prevent misunderstandings and conflicts in online communication (Ribino, 2023). Furthermore, linguistic proficiency bolsters students' logical reasoning and digital empathy (Hidayat, 2024). Digital literacy and language competence complement each other in fostering awareness and prudent conduct in digital environments.

New challenges have emerged with the growth of misinformation and hate speech. Despite unprecedented access to information, many students still struggle to distinguish between credible and manipulative content. Weak fact-verification skills contribute to the spread of hoaxes among young users (Kops et al., 2025). Media literacy training and critical pedagogy interventions have been shown to enhance the accuracy of information evaluation (Altay et al., 2024).

In Indonesian higher education, a notable gap exists between digital capabilities and language competence. Many students are proficient with technology, but lack sufficient linguistic awareness and ethical communication practices (Maisuroh et al., 2024). Therefore, instruction in Bahasa Indonesia should address not only linguistic aspects but also ethics and social reflection in digital communication.

This study responds to that need by examining how digital literacy and Indonesian language competence contribute to the formation of students' digital wisdom in social media use. This research is significant because it offers an interdisciplinary perspective, bridging digital literacy, language studies, and character education areas often explored in isolation. Using a mixed-methods approach, the study aims to identify meaningful patterns between these two competencies, providing a conceptual foundation for developing curricula that integrate digital literacy and language ethics in higher education.

## RESEARCH METHOD

This study adopts a mixed-methods explanatory sequential design, in which quantitative findings inform and guide the qualitative phase. The design was chosen because responsible digital citizenship involves measurable behavioral tendencies as well as deeper cognitive and ethical processes that cannot be fully captured through numerical data alone. The sample consisted of 75 Communication Studies students recruited through convenience sampling. This population was intentionally selected because students in Communication Studies frequently engage in media production, audience interaction, and online discourse, making them an information-rich group for examining the intersection of digital literacy, language use, and social-media behavior. However, it is important to note that this sample is not representative of the broader university population, limiting the generalizability of the findings to other faculties. The



disciplinary familiarity of the participants with digital communication increases the transferability of the findings to similar programs in Indonesian higher education.

In the quantitative phase, data were collected through a self-administered online questionnaire using Likert 1–5 scales to measure four constructs: digital literacy, Indonesian language competence, ethical awareness, and responsible digital citizenship, along with several background variables such as daily social-media duration. Instrument development followed expert validation procedures and internal-consistency checks using Cronbach’s alpha. Quantitative analysis involved descriptive statistics, correlation analysis, and predictive structural modeling using PLS-SEM to estimate both direct and mediated effects between constructs. The PLS-SEM outputs served as the analytical anchor of the design, identifying significant pathways such as the mediating role of ethical awareness and the relationship between digital literacy and Indonesian language competence – that prompted the qualitative phase. Specifically, the pathway showing a strong correlation between digital literacy and ethical awareness, as well as between Indonesian language competence and responsible digital behavior, led to a deeper qualitative exploration of students’ fact-checking habits, politeness strategies in online communication, and reflections on ethical conduct.

The qualitative phase expanded and clarified the quantitative results through thematic analysis of students’ open-ended responses. All 75 participants submitted written responses, ensuring full alignment between the quantitative and qualitative datasets and enhancing interpretive validity. The qualitative analysis explored key themes related to students’ fact-checking practices, their use of polite language in online communication, and their ethical decision-making when engaging with social media. These themes were interpreted in relation to the significant PLS-SEM pathways, allowing the qualitative evidence to explain, validate, or elaborate on the quantitative model – particularly regarding how students exercised discernment, linguistic clarity, and ethical judgment in fast-paced digital environments.

Integration of the two phases was carried out through joint displays that visually linked statistically significant relationships with representative qualitative excerpts. This approach strengthened the sequential logic of the design by demonstrating how quantitative model predictions corresponded with students’ lived experiences and articulated reasoning. Ethical procedures adhered to established research standards, including informed consent, confidentiality, and secure data management. Nonetheless, the study acknowledges limitations related to its single-program context, cross-sectional design, and reliance on self-report measures, which may influence the depth and generalizability of the findings.

## RESULTS AND DISCUSSION

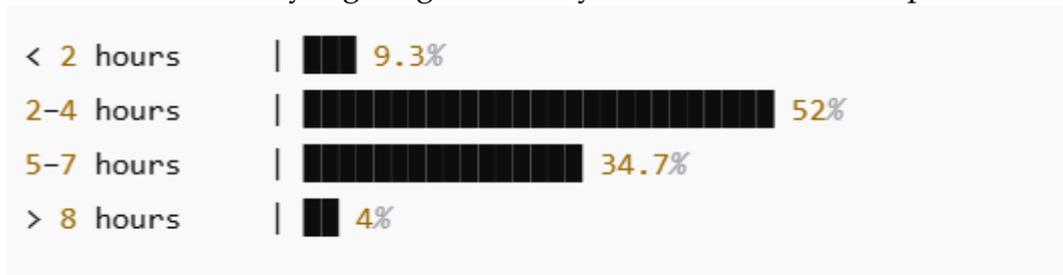
### *Results*

This section presents the descriptive findings of students’ digital-literacy awareness and patterns of social-media engagement. The analysis begins by outlining platform preferences, daily usage duration, and students’ perceived importance of digital literacy. These descriptive results serve as the baseline for interpreting subsequent findings related to information-verification practices, ethical judgment, and Indonesian language competence. Data were obtained from a cross-sectional online questionnaire

administered to 75 university students using four-point Likert items for attitudes and single or multiple-response items for usage patterns.

**a. Students' Digital Literacy Awareness**

The majority of students (52%) report using social media for 2–4 hours per day, while 34.7% spend 5–7 hours daily. The most frequently used platforms are Instagram (82%) and TikTok (78%), indicating that students’ digital environments are dominated by visual and audio-visual formats. Most respondents (90%) report understanding the importance of digital literacy, and 89% state they can distinguish valid information from hoaxes, an initial indication of relatively high digital-literacy awareness in the sample.



**Figure 1.** Duration of Social Media Use per Day

Figure 1 presents the distribution of students’ daily social-media use. A total of 52% of respondents reported using social media for 2–4 hours per day, making this the most common usage category. Another 34.7% used social media for 5–7 hours per day, while 9.3% spent less than 2 hours online each day. Only 4% reported using social media for more than 8 hours daily. These findings indicate that the majority of students fall within a moderate-to-high range of daily usage.

**Table 1.** Understanding of Digital Literacy Importance

Skor Likert	1	2	3	4
Frequency	0	0	4	32

The table shows that a large majority of students recognize the importance of digital literacy, with 32 respondents selecting “4” and four respondents selecting “3” on the Likert scale. These responses indicate that students generally view digital literacy as a relevant competence in their daily social-media use. No respondents selected “1” or “2,” suggesting uniformly positive perceptions across the sample.

**b. Ethical and Responsible Online Behavior**

This subsection profiles students’ ethical conduct in digital spaces as a behavioral complement to their digital-literacy awareness. The data show that students display a high level of responsibility in their online interactions. A total of 84% of respondents reported that they consistently verify news sources before sharing information. Additionally, 78% indicated that they maintain politeness when posting or responding to comments, reflecting adherence to linguistic and social norms in digital exchanges. Furthermore, 84% acknowledged that their online posts represent both their personal image and, to some extent, the image of their academic institution.

These behaviors align with the PLS-SEM analysis, which revealed a strong correlation between digital literacy and ethical awareness, suggesting that students with higher digital literacy scores are more likely to engage in source verification, demonstrate politeness in communication, and be mindful of their online image. The high percentage

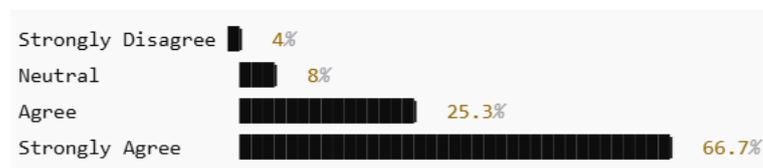
of students engaging in these self-regulated behaviors indicates that their ethical orientation extends beyond theoretical knowledge of digital norms, translating into practical, everyday actions in their digital lives. Further, the correlation between digital literacy and ethical behaviors, such as verifying information before sharing, supports the notion that digital literacy is not just about technical proficiency but also about critical thinking and ethical decision-making. Students with stronger digital literacy skills are better equipped to discern credible information, engage in polite discourse, and practice reflective self-presentation. This pattern emphasizes the role of digital literacy in fostering responsible digital citizenship, reinforcing the findings from the PLS-SEM analysis, which identified ethical awareness as a key outcome of digital literacy. These self-reported behaviors reflect a commitment to ethical norms in digital spaces, aligning with the broader concept of digital wisdom, where critical thinking, ethical judgment, and civility converge to guide responsible online conduct.

**Table 2.** Indicators of Ethical Digital Behavior

Statement	Score Percentage 4-5	Category
Check sources before sharing	84%	High ethical awareness
Use polite language	78%	Polite communication
Be aware of personal image	84%	Reflective self-presentation

**c. Pride and Identity through Indonesian Language Use**

Figure 2 presents students' attitudes toward using proper Indonesian language on social media. The results show that 66.7% of respondents strongly agree, and 25.3% agree that they feel proud when using proper Indonesian online, producing a combined total of 92% expressing positive attitudes. Only 8% reported a neutral stance, and 4% indicated strong disagreement. These proportions highlight a strong sense of pride and responsibility associated with using proper Indonesian in digital communication, underlining the importance students place on maintaining linguistic standards in online spaces.



**Figure 2.** Students' Attitudes toward Using Proper Indonesian Language on Social Media

The bar chart shows the distribution of students' responses, with 66.7% selecting "Strongly Agree," 25.3% selecting "Agree," 8% selecting "Neutral," and 4% selecting "Strongly Disagree".

This pride in using proper Indonesian aligns closely with the broader themes of digital literacy and ethical communication. Indonesian language competence, as demonstrated by students' positive attitudes toward using correct grammar and polite language online, plays a key role in fostering reflective and responsible communication. This is consistent with the findings that students with stronger digital literacy skills are not only more likely to engage in ethical online behavior (such as verifying sources and maintaining politeness) but also to value linguistic clarity and correctness in their digital interactions. The ability to communicate effectively and courteously in Indonesian reinforces the responsible behavior model in digital spaces, where students use their

linguistic competence to engage thoughtfully with others, ensuring that their communication aligns with social norms, academic integrity, and ethical standards.

In this context, proper Indonesian usage is not just a matter of grammar but also a reflection of digital wisdom the integration of ethical judgment, critical thinking, and linguistic precision. Students who take pride in using correct language are demonstrating a commitment to respectful and meaningful engagement in the digital public sphere. This behavior is a key aspect of digital citizenship, where ethical communication and reflective self-presentation in online spaces contribute to a healthier, more responsible digital ecosystem.

#### **d. Understanding of Digital Literacy Concepts**

To better understand students' digital practices, this subsection analyzes 75 open-ended responses on the meaning of digital literacy, revealing four key themes: Critical & Ethical, Evaluative & Reflective, Technological & Adaptive, and Creative & Productive. These themes illustrate students' multifaceted conceptualization of digital literacy, highlighting both technical proficiency and the ethical dimensions of online engagement.

The Critical & Ethical theme emerged most frequently, with 38.6% of responses indicating that students associate digital literacy with the ability to think critically and act responsibly in the digital world. This theme underscores the importance of ethical judgment in digital spaces, aligning with the quantitative findings that 84% of students report regularly verifying sources before sharing information. The strong correlation between digital literacy and ethical behavior, as identified in the PLS-SEM analysis, reinforces the idea that students who are more digitally literate are better equipped to engage in critical thinking and make responsible decisions online.

The Evaluative & Reflective theme, present in 28% of responses, emphasizes students' ability to assess and interpret digital messages consciously. This reflects a key component of digital literacy: the capacity to evaluate information for credibility and relevance, which also ties to students' self-reported practices of distinguishing valid information from hoaxes. The evaluative skills outlined in this theme are closely linked to the quantitative results showing that a significant proportion of students engage in reflective practices when interacting with digital content, thus supporting ethical communication in online spaces.

The Technological & Adaptive theme, cited in 20% of responses, describes digital literacy as the ability to use technology effectively and safely. This aligns with the high levels of technological proficiency reported in the quantitative data, where students demonstrated competence in using digital tools for learning and communication. While this theme focuses more on technical skills, it complements the other themes by reinforcing the foundational ability to navigate digital environments securely and adaptively.

Finally, the Creative & Productive theme, noted in 13.4% of responses, highlights students' view of digital literacy as the capacity to create meaningful and beneficial content. This theme reflects the broader purpose of digital literacy in fostering productive digital engagement, where students use their digital tools not only for consumption but for creating positive, educational, and socially responsible content. This aligns with the notion of digital wisdom, where students' creative output is coupled with ethical considerations, ensuring that the content they produce contributes to the greater good.

In summary, the four themes Critical & Ethical, Evaluative & Reflective, Technological & Adaptive, and Creative & Productive represent a multidimensional understanding of digital literacy. These findings resonate with the broader framework of digital literacy, where students' skills in critical thinking, ethical behavior, technological adaptation, and creative production are interwoven to guide responsible participation in digital spaces. These conceptual categories reinforce the link between digital literacy and ethical behavior, showing that students view digital literacy as a holistic competence that extends beyond technical ability to include ethical, reflective, and creative dimensions.

**Table 3.** Thematic Coding of “Meaning of Digital Literacy”

Main Theme	Freq	%	Example Narrative
Critical & Ethical	29	38,6%	“The ability to think critically and act responsibly in the digital world.”
Evaluative & Reflective	21	28%	“The ability to assess and interpret digital messages consciously.”
Technological & Adaptive	15	20%	“The ability to use technology effectively and safely.”
Creative & Productive	10	13,4%	“The ability to create meaningful and beneficial content.”

#### **e. Critical Thinking and Fact Verification Practices**

More than 85% of students report concrete, real-world experience verifying facts before sharing information, with the most frequently cited cases involving political news, vaccine claims, and spotting fraudulent job postings. This suggests that students are actively applying evaluative skills in everyday contexts where misinformation is prevalent. The process of critical thinking, which involves recognizing problematic claims, consulting external sources, and withholding the amplification of unverified information, has become a routine part of students' digital literacy practices. These fact-verification habits align with the broader concept of digital literacy, where critical thinking and ethical decision-making play crucial roles in how students interact with and evaluate digital content.

The digital literacy skills students demonstrate are directly related to their ability to critically assess and verify the credibility of information. The ability to verify news sources, as seen in the data where 45 students reported checking information through official government or reputable news websites, is a prime example of how digital literacy underpins ethical decision-making. Students with stronger digital literacy skills are more likely to engage in ethical verification practices, ensuring that they only share credible information, thus preventing the spread of misinformation.

Related experimental evidence supports this, showing that simple “accuracy prompts” can measurably reduce the sharing of misinformation. This reinforces the plausibility of the self-reported practices among students, highlighting how digital literacy is not just about technical proficiency but also about engaging in ethical decision-making that prioritizes the responsible use of information. The act of ethical decision-making is a core element of digital wisdom, where critical thinking and ethical judgment combine to guide responsible behavior in digital spaces.

**Table 4. Critical Thinking in Digital Context**

Aspect	Freq	Example Practice
News source verification	45	Checking information through official government or news websites.
Message content analysis	18	Evaluating the use of provocative or clickbait language.
Ethical decision-making	12	Choosing not to share viral content without verification

**f. Common Violations and Corrective Language Awareness**

Students demonstrate a clear recognition of prevalent digital literacy violations, with the most commonly reported being hoaxes/misinformation (42%), followed by hate speech (25%), privacy oversharing (18%), and provocative content (15%). In addition to identifying these issues, students report the ability to rewrite negative or harmful messages into educational, polite, and still engaging posts. This combination of problem recognition and corrective response not only indicates rule awareness but also showcases students' application of language-based repair strategies that align with civility and counterspeech practices in online discourse. These practices reflect a deeper understanding of digital wisdom, where students use their digital literacy and linguistic skills to counter harmful content while maintaining ethical standards in communication.

The ability to reframe negative messages into civil, constructive language is a key aspect of ethical awareness and linguistic competence. Students are not just identifying violations but also actively participating in reforming the discourse to ensure that their online communication promotes respect, clarity, and responsibility. For example, the recognition of hoaxes and misinformation is paired with efforts to correct these claims, highlighting the students' commitment to truthful communication and ethical digital practices. By engaging in these corrective behaviors, students demonstrate how digital literacy and linguistic competence work together to foster a healthy online environment where respectful, informed, and responsible discourse is prioritized.

This focus on corrective language supports the idea of digital wisdom, where students not only master the technical aspects of digital communication but also embody ethical decision-making, reflection, and social responsibility. In doing so, they align with broader counterspeech strategies that de-escalate conflict and promote constructive engagement, ensuring that their online presence contributes positively to the digital public sphere.

**Table 5. Common Digital Violations Reported by Students**

Type of Violation	%	Example Narrative
Hoax / Misinformation	42%	"The government always lies! Don't trust the news on TV."
Hate Speech	25%	"Ugly people aren't allowed to comment."
Privacy Oversharing	18%	"Posting someone's personal photos without permission."
Provocative Content	15%	"The country has failed to overthrow the government."

The profile above is consistent with research showing that misinformation, toxic language, and privacy violations are among the most common threats to healthy online ecosystems; importantly, language matters for remediation. These strands substantiate the pedagogical value of teaching *corrective language* – not merely “what not to do,” but how to rewrite in ways that inform, de-escalate, and preserve dignity.

Illustrative corrective rewrites (from typical student cases).

*"The government always lies! Don't trust the news on TV."* (Interview, October 20, 2025).

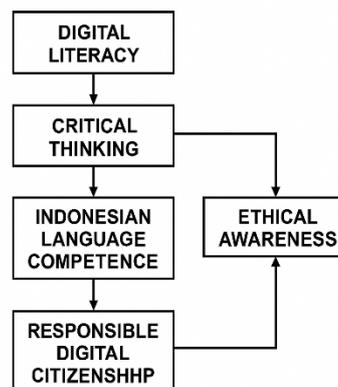
*"Ugly people aren't allowed to comment."* (Interview, October 20, 2025).

*“Posting someone’s personal photos without permission.”* (Interview, October 20, 2025).  
*“The country has failed to overthrow the government.”* (Interview, October 20, 2025).

Taken together, these findings suggest that cultivating corrective language as a routine practice can operate as a practical safeguard for healthy discourse and a teachable pathway to “digital wisdom,” where technical skill, ethical judgment, and social responsibility converge. Embedding counterspeech micro-moves (source-citing, de-escalation, consent reminders) in authentic assignments, assessing them with audience-aware and civility rubrics, and reinforcing norms through community guidelines and reflective debriefs can translate awareness into durable behavior change. While self-reports signal promising uptake, future iterations should pair performance-based tasks (e.g., lateral-reading trails, rewrite portfolios) with outcome analytics (reduced propagation of flagged claims, improved tone metrics) to verify impact and inform iterative curriculum and policy refinement.

### g. Integrated Role of Digital Literacy and Language Competence

This subsection explains how students’ digital literacy and Indonesian language competence work together to shape ethically grounded participation online, positioning critical thinking and ethical awareness as the key bridges between individual skills and responsible digital citizenship. Students’ ability to evaluate digital content critically and express their thoughts effectively in Indonesian enables them to engage in digital spaces responsibly and ethically.



**Figure 3.** Conceptual Relationship Between Literacy and Language

The diagram illustrates a pathway where digital literacy → critical thinking → Indonesian language competence → responsible digital citizenship are interconnected, with ethical awareness being influenced by critical thinking and, in turn, reinforcing responsible conduct. In practical terms, digital literacy enables students to assess digital information, distinguishing credible sources from unreliable ones. Critical thinking organizes this evaluation into reasoned, informed judgment. Indonesian language competence allows students to articulate this judgment clearly, courteously, and in a manner appropriate for their audience, thereby ensuring responsible communication. Finally, ethical awareness helps students align their choices with social responsibility, ensuring that their digital interactions are not only informed but also respectful and constructive.

Together, digital literacy and Indonesian language competence form a foundation for responsible digital citizenship, where students use their language skills to engage

thoughtfully and ethically in online environments. This integrated approach reflects a holistic view of digital wisdom, where technical ability, critical reasoning, and linguistic clarity combine with ethical responsibility to guide students in making informed and ethical decisions in digital spaces.

#### **h. Summary of Findings**

The findings indicate that students demonstrate a high level of digital literacy awareness, particularly in the areas of ethics and responsibility in social media use. A large majority of respondents report consistently verifying information prior to sharing, recognizing the importance of source credibility, and maintaining polite language in online interactions. These patterns suggest that students' digital literacy extends beyond just technical skills, encompassing reflective and ethical dimensions of thinking and acting in digital spaces.

Additionally, Indonesian language competence plays a crucial role in strengthening ethical online communication. Students with higher linguistic awareness tend to use courteous, clear, and empathetic language, which fosters constructive discourse on social media. This aligns with the broader concept of responsible digital behavior, where students not only act ethically but also communicate in ways that reflect cultural and academic norms.

Qualitative evidence further supports this, showing that students conceptualize digital literacy as the ability to think critically, evaluate information, and engage responsibly in the digital public sphere. These insights align with the notion that digital literacy is not just about navigating technology, but about using it for ethical decision-making and responsible engagement.

Taken together, the interdependence between digital literacy and Indonesian language competence provides a solid foundation for the emergence of digital wisdom a form of prudent engagement that integrates technological skill, linguistic clarity, and moral discernment. Students with stronger digital literacy profiles are generally more likely to demonstrate ethical and reflective language use, positioning them as potential agents of positive change in the online environment. Accordingly, digital literacy and linguistic competence function not only as academic enablers but also as powerful tools for character formation and social awareness within the university digital ecosystem.

#### **Discussion**

The results of this study provide strong evidence that digital literacy functions not only as a technical capacity but as an ethical-reflective practice that interacts with Indonesian language competence to support responsible social-media behavior. Students' consistent verification before sharing information, production of educational content, and use of polite, grammatically sound Indonesian language illustrate how evaluative judgment and linguistic prudence underpin everyday digital participation. These practices reflect a form of "digital wisdom," where technical proficiency converges with ethical judgment and audience-aware communication (Adzka et al., 2025; Afandi et al., 2025; Ng, 2012; Vuorikari et al., 2022). This interpretation is consistent with evidence that digital literacy significantly predicts critical-thinking ability and enhances resilience to misinformation by strengthening analytical acuity and source evaluation (Coldwell-Neilson & Cooper, 2019) (Prasastiningtyas et al., 2024) (L. Zhang et al., 2024).

The qualitative findings deepen this interpretation, showing that students primarily associate digital literacy with Critical & Ethical (38.6%) and Evaluative & Reflective (28%) dimensions. These themes indicate that students view literacy as a disposition toward scrutiny, responsibility, and civility rather than merely functional mastery. Such meanings align with longstanding digital-literacy frameworks that center credibility appraisal, metacognitive monitoring, safe tool use, and constructive authorship as core competencies in networked contexts (Eshet-Alkalai, 2004; Hobbs, 2010; Free, 2022; N. Law et al., 2018). The presence of Technological & Adaptive (20%) and Creative & Productive (13.4%) themes complements this profile, resonating with competence maps like DigComp and UNESCO media-literacy agendas that integrate operational fluency with security, problem-solving, and civic-oriented content creation (UNESCO, 2018). Together, these themes show that students conceptualize digital literacy as the integration of (i) critical-ethical judgment, (ii) evaluative-reflective understanding, (iii) technological fluency, and (iv) purposeful production confirming conceptual validity for the measured constructs (N. Law et al., 2018; Vuorikari et al., 2022).

Students' strong emphasis on source verification is consistent with evidence from misinformation research demonstrating that brief accuracy prompts and prebunking/inoculation interventions reliably improve truth discernment across contexts (Lorenz-Spreen et al., 2023; Pennycook & Rand, 2021; Roozenbeek & van der Linden, 2019; Wineburg & McGrew, 2019). These findings support a plausible pathway: awareness → verification behavior → improved judgment accuracy, providing a strong basis for instructional design. Effective course interventions may include: (a) quick accuracy-attention cues at the point of decision, (b) prebunking micro-activities exposing students to weakened misinformation techniques, and (c) evidence-based debunking strategies using clear labels, causal alternatives, and warnings about rhetorical manipulation (Pennycook et al., 2021). These elements can be translated into authentic assessments such as claim reviews, lateral-reading logs, and audience-aware explanation tasks.

A central result of this study is the prominence of linguistic competence, particularly in polite and grammatically correct Indonesian language use. This reflects a distinctly Indonesian communicative logic. As discussed in the Introduction, Indonesian functions as both a scientific medium and a symbol of civic identity. This dual role explains why clarity, politeness, and grammatical correctness are perceived not merely as stylistic preferences but as moral, identity-affirming behaviors (Sonni et al., 2025). Prior research shows that linguistic competence – including diction, sentence structure, and politeness supports critical reasoning and helps prevent misunderstandings in fast-paced digital spaces (Ribino, 2023; Hidayat, 2024). A key finding of this study is the direct link between students' linguistic competence and their ability to rewrite harmful posts into civil, evidence based messages. This corrective language function exemplifies how linguistic competence acts as a tool for ethical decision-making, where politeness strategies, audience design, and clarity translate ethical intent into communicative action capable of reframing or de-escalating discourse. As Ribino (2023) and Hidayat (2024) note, linguistic competence especially in politeness strategies helps prevent misunderstandings, ensuring that students' digital communication aligns with social norms and promotes ethical engagement.

Consistent with studies on counterspeech and community governance, civil and evidence-forward responses can reduce the prevalence or salience of harmful content,

while norm-setting around respectful language supports sustained participation quality (Benesch, 2020; Nathan Matias, 2019; Schieb & Preuss, 2016; P. Zhang et al., 2019). Work on networked privacy further emphasizes audience awareness and consent-oriented framing as essential in youth and student populations (Boyd & Marwick, 2011; Mathew et al., 2019).

Two deviations from previous findings warrant reflection. First, the high self-reported verification rate among students exceeds some cross-platform observational baselines. This discrepancy may be explained by sampling Communication Studies students are more accustomed to media evaluation and by possible social desirability effects. Future research should triangulate survey responses with behavioral trace data (e.g., click-through patterns or recorded lateral-reading sequences) to distinguish stated intentions from actual practices (Wineburg & McGrew, 2017; Pennycook & Rand, 2021). This recommendation should be emphasized as a limitation in the Conclusion section. Second, the strong prominence of politeness and grammatical correctness may be particularly pronounced in Indonesian-language settings due to the cultural and civic role of Indonesian as both a unifying national language and a medium of academic legitimacy. Comparative mixed-methods studies across Indonesian and English discourse communities, controlling for topic and network composition, are needed to determine whether this linguistic ethical association generalizes to multilingual contexts (Brown & Levinson, 1987; Leech, 2014; Fairclough, 2014).

Collectively, these findings offer several methodological and pedagogical implications. Methodologically, longitudinal designs could test whether the “Digital wisdom” composite digital literacy × linguistic competence predicts sustained behavioral improvements or healthier network dynamics. Experimental designs may compare accuracy prompts, prebunking micro videos, and structured counterspeech rewrites, evaluated through blinded ratings of civility and informativeness. NLP based audits of student outputs may operationalize linguistic competence via stance, hedging, evidence citation, and politeness markers to explore mediation pathways (Pennycook & Rand, 2021; Roozenbeek & van der Linden, 2021; Fairclough, 2014). Pedagogically, pairing digital-literacy routines with language workshops and assessing student performance through authentic public artifacts such as explainer threads or counterspeech rewrites can reinforce accuracy, civility, and clarity as unified competencies (Jones & Mitchell, 2016; Livingstone & Haddon, 2009; Prensky, 2009).

## CONCLUSION

Based on the findings of this research, it can be concluded that digital literacy and Indonesian language competence play an integral role in shaping university students’ ethical and reflective engagement on social media. Digital literacy enables students to critically evaluate, verify, and produce information responsibly, while linguistic competence guides them in communicating with clarity, empathy, and respect. Together, these competencies foster digital wisdom, a synthesis of technical proficiency, moral awareness, and cultural identity that strengthens students’ digital citizenship.

The study implies that higher education should integrate digital and linguistic literacies into the curriculum through reflective media practices, fact-checking activities, and ethical communication training. This could involve embedding both technical skills (e.g., digital tool proficiency) and ethical dimensions (e.g., critical thinking, reflective

decision-making) in coursework to ensure students are well-prepared for responsible engagement in digital spaces.

Although this study was limited to communication students and based on self-reported data, the results provide valuable insight into the interdependence between digital literacy and linguistic competence in the digital era. The study highlights that linguistic competence (such as using polite and grammatically correct Indonesian) serves as a key component in ethical communication and responsible digital behavior, underlining the role of language in digital wisdom.

Future research should include more diverse disciplines and longitudinal designs to explore how these competencies evolve over time and across contexts, particularly in non-communication disciplines. Exploring how digital and linguistic literacies contribute to ethical decision-making in different academic and professional settings could further refine approaches to digital literacy education. Additionally, triangulating self-reports with behavioral trace data (such as click-through patterns or actual fact-checking behaviors) would offer a more robust understanding of how these competencies translate into real-world online engagement.

Ultimately, this research emphasizes that cultivating digital and linguistic literacies is not only an academic necessity but also a moral responsibility to build a generation of socially conscious and ethically minded digital citizens. By integrating these competencies into educational curricula, universities can contribute to the development of digital wisdom, empowering students to navigate digital spaces with responsibility, integrity, and respect.

## REFERENCES

- Adzкия, K. P., Kurniati, E., Justicia, R., Jayadinata, A. K., & Putri, D. S. (2025). Early Childhood Teacher's Perspectives on Children Digital Literacy Skills Through Home Safety Heroes Media. *International Journal of Recent Educational Research*, 6(5), 6(5), 1359-1373.
- Afandi, 'A. N. H., Pristiani, R., Slamet, S., & Kusumaningrum, S. R. (2025). The effectiveness of interactive multimedia "HEROKIDS" on digital and cultural literacy: Reviewed from students' cultural interests and frequency of smartphone use. *IJORER: International Journal of Recent Educational Research*, 6(5), 1398-1417. <https://doi.org/10.46245/ijorer.v6i5.941>
- Albardía, M. S., Peña-Fernández, S., & Agirreazkuenaga, I. (2025). Technology, education and critical media literacy: Potential, challenges, and opportunities. *Frontiers in Human Dynamics*, 7, 1-12. <https://doi.org/10.3389/fhumd.2025.1608911>
- Altay, S., De Angelis, A., & Hoes, E. (2024). Media Literacy Tips Promoting Reliable News Improve Discernment and Enhance Trust in Traditional Media. *Communications Psychology*, 2(1), 1-9. <https://doi.org/10.1038/s44271-024-00121-5>
- Antieau, L. (2009). Language and the Internet, 2nd ed. by David Crystal. *Critical Inquiry in Language Studies*, 6(4), 350-353. <https://doi.org/10.1080/15427580903121519>
- Benesch, S. (2020). Countering Dangerous Speech: New Ideas for Genocide Prevention. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3686876>
- Blutner, R. (1989). Politeness: Some Universals in Language Usage. *STUF - Language Typology and Universals*, 42(1), 135-135. <https://doi.org/10.1515/stuf-1989-0124>
- Bogdanova, R., Šiliņa, M., & Renigere, R. (2017). Ecology Approach in Education and Health Care. *Discourse and Communication for Sustainable Education*, 8(1), 64.



<https://doi.org/10.1515/dcse-2017-0005>

- B Boyd, D., & Marwick, A. E. (2011, September). Social Privacy in Networked Publics: Teens' Attitudes, Practices, and Strategies. In *A Decade in Internet Time: Symposium on the Dynamics of the Internet and Society*.
- Calderón, M., Slavin, R. E., Sánchez, M., Calderón, M., Slaviti, R., Sánchez, M., Iurea, C., Neac, I., Georgiana, C., Suditu, M., Can, Y., Compare, J., Countries, D., Myth, R., Doesn, C. S., Myth, M. R., Schools, L., Better, A., Ones, S., ... Özönder, Ö. (2015). Learner-Based Teaching Systems for English for Specific Purposes. *Teaching and Teacher Education*, 63(2).
- Ciriello, R., Gal, U., Hannon, O., & Thatcher, J. (2025). Responsible Social Media Use: How user Characteristics Shape the Actualisation of Ambiguous Affordances. *European Journal of Information Systems*, 34(5), 799–821. <https://doi.org/10.1080/0960085X.2024.2444249>
- Coldwell-Neilson, J., & Cooper, T. (2019). Digital Literacy Meets Industry 4.0. In *Education for Employability (Volume 2)*, 37-50. [https://doi.org/10.1163/9789004418707\\_004](https://doi.org/10.1163/9789004418707_004)
- Dinihari, Y., Rafli, Z., & Boeriswati, E. (2024). Dissecting Hoaxes as an Important Strategy in Maintaining Information Literacy. *SALEE: Study of Applied Linguistics and English Education*, 5(1), 328-343. <https://ejournal.stainkepri.ac.id/index.php/salee/article/view/1222>
- Dinihari, Yulian, Rafli, Z., & Boeriswati, E. (2025). *Inovasi Bahan Ajar Literasi: Pendekatan Gamifikasi dan Pedagogi Modern*. EDUPEDIA Publisher.
- Dinihari, Y., Santosa, I., & Ayuwardini, M. (2025, July). Trends in microlearning and literacy integration in digital learning. In *International Seminar on Humanity, Education, and Language* (pp. 681-688).
- Dinihari, Yulian, Wiyanti, E., Nazelliana, D., Karyati, Z., Lutfi, L., & Handayani, W. (2025). Discourse Analysis of Digital Hoaxes as a Critical Literacy Strategy in Indonesian Language Education. *KEMBARA Journal of Scientific Language Literature and Teaching*, 11(1), 185–198. <https://doi.org/10.22219/kembara.v11i1.40485>
- Dinihari, Yulian, Wiyanti, E., Solihatun, & Nazelliana, D. (2025). Development of an Empathy-Based Literacy Module into Islamic Boarding School Education to Reduce Bullying Behavior. *Ijlecr - International Journal of Language Education and Culture Review*, 11(1), 1–13. <https://doi.org/10.21009/ijlecr.v11i1.54561>
- Ennis, R. H. (2018). Critical Thinking Across the Curriculum: A Vision. *Topoi*, 37(1), 165–184. <https://doi.org/10.1007/s11245-016-9401-4>
- Eshet-Alkalai, Y. (2004). Digital Literacy: A Conceptual Framework for Survival Skills in the Digital era. In *Journal of Educational Multimedia and Hypermedia*. 13(1), 93-106.
- Free, D. (2022). Companion Document to the ACRL Framework for Information Literacy for Higher Education: The Framework for Visual Literacy in Higher Education. *ACRL Insider*.
- Gabonada Gatcho, A. R., Mao, X. G., & Ting, F. (2024). *Early Literacy in the Digital Age*. 02(July), 123–148. <https://doi.org/10.4018/979-8-3693-1777-8.ch005>
- Gu, M. M., Huang, C. F., & Lee, C. K. J. (2023). Investigating University Students' Digital Citizenship Development Through the Lens of Digital Literacy Practice: A Translingual and Transsemiotizing Perspective. *Linguistics and Education*, 77, 101226. <https://doi.org/10.1016/j.linged.2023.101226>
- Guess, A. M., Lerner, M., Lyons, B., Montgomery, J. M., Nyhan, B., Reifler, J., & Sircar, N. (2020). A Digital Media Literacy Intervention Increases Discernment Between

- Mainstream and False News in the United States and India. *Proceedings of the National Academy of Sciences of the United States of America*, 117(27), 15536-15545. <https://doi.org/10.1073/pnas.1920498117>
- Herring, S. C. (2007). A Faceted Classification Scheme for Computer - Mediated Discourse. *Discourse*, 2007(1).
- Hidayat, H. (2024). Determining the Influence of Digital Literacy on Learning Personal. *Jurnal Penelitian Pendidikan Eropa*, 13(4), 1775–1789.
- Hobbs, R. (2010). Digital and Media Literacy: A Plan of Action. *A White Paper on the Digital and Media Literacy Recommendations of the Knight Commission on the Information Needs of Communities in a Democracy*.
- ISTE. (2007). ISTE Standards: Students. *International Society for Technology in Education*.
- Jones, L. M., & Mitchell, K. J. (2016). Defining and Measuring Youth Digital Citizenship. *New Media and Society*, 18(9), 2063-2079. <https://doi.org/10.1177/1461444815577797>
- Kops, M., Schittenhelm, C., & Wachs, S. (2025). Young People and False Information: A Scoping Review of Responses, Influential Factors, Consequences, and Prevention Programs. *Computers in Human Behavior*, 169, 108650. <https://doi.org/10.1016/j.chb.2025.108650>
- Leech, G. (2014). *The Pragmatics of Politeness*. Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780195341386.001.0001>
- Li, J., Chen, P., & Man, L. (2025). Understanding the Influence of Social Media on University Students' Communication Skills in Digital Information Environment. *Profesional de La Informacion*, 33(6), 1–14. <https://doi.org/10.3145/epi.2024.ene.0603>
- Livingstone, S., & Haddon, L. (2009). *EU Kids Online: Final report*. EU Kids Online.
- Lorenz-Spreen, P., Oswald, L., Lewandowsky, S., & Hertwig, R. (2023). A Systematic Review of Worldwide Causal and Correlational Evidence on Digital Media and Democracy. *Nature Human Behaviour*, 7(1), 74-101. <https://doi.org/10.1038/s41562-022-01460-1>
- Lumbin, N. F., Puspa Ardini, P., & Suryana Jamin, N. (2023). The Effect of Digital Card Media Towards Children's Ability to Recognize Letters. *JPUD – Jurnal Pendidikan Usia Dini*, 17(1), 44-54. <https://doi.org/10.21009/jpud.171.04>
- Maisuroh, S., Jamil, M., & Manshur, U. (2024). The Role of Social Media in Enhancing Digital Literacy Among Generation Z: A Social and Psychological Perspective. *Journal of Social Studies and Education*, 1(2), 113–125. <https://doi.org/10.61987/jsse.v1i2.457>
- Mathew, B., Saha, P., Tharad, H., Rajgaria, S., Singhanian, P., Maity, S. K., ... & Mukherjee, A. (2019, July). Thou shalt not hate: Countering online hate speech. In *Proceedings of the 13th International Conference on Web and Social Media (ICWSM 2019)*. (Vol 13, 369-380). <https://doi.org/10.1609/icwsm.v13i01.3237>
- Matias, J. N. (2019). Preventing Harassment and increasing Group Participation Through Social Norms in 2,190 Online Science Discussions. *Proceedings of the National Academy of Sciences*, 116(20), 9785-9789. <https://doi.org/10.1073/pnas.1813486116>
- Mejías-Acosta, A., D'Armas Regnault, M., Vargas-Cano, E., Cárdenas-Cobo, J., & Vidal-Silva, C. (2024). Assessment of Digital Competencies in Higher Education Students: Development and Validation of a Measurement Scale. *Frontiers in Education*, 9, 1497376. <https://doi.org/10.3389/feduc.2024.1497376>
- N. Law, Woo, D. J., & Wong, G. (2018). A Global Framework of Reference on Digital Literacy Skills for Indicator 4.4.2. *UNESCO Institute for Statistics*, 51.
- Nathan Matias, J. (2019). Preventing Harassment and Increasing Group Participation



- Through Social Norms in 2,190 Online Science Discussions. *Proceedings of the National Academy of Sciences of the United States of America*, 116(20). <https://doi.org/10.1073/pnas.1813486116>
- Ng, W. (2012). Can We Teach Digital Natives Digital Literacy? *Computers and Education*, 59(3), 1065-1078. <https://doi.org/10.1016/j.compedu.2012.04.016>
- Nurhayati, S., Fasa, M. I., Panjaitan, R., & ... (2020). Digital Marketing Literacy for Marginalized Society to Improve Society's Economic Empowerment. *Prosiding ICoISSE*, 1(1), 505-516. <http://conference.loupiasconference.org/index.php/ICoISSE/article/view/74>
- Paul, R., & Elder, L. & F. for C. T. (2012). The Miniature Guide to Critical Thinking: Concepts and Tools. *27th International Conference on Critical Thinking*.
- Pennycook, G., Epstein, Z., Mosleh, M., Arechar, A. A., Eckles, D., & Rand, D. G. (2021). Shifting Attention to Accuracy Can Reduce Misinformation Online. *Nature*, 592(7855), 590-595. <https://doi.org/10.1038/s41586-021-03344-2>
- Pennycook, G., & Rand, D. G. (2021). The Psychology of Fake News. In *Trends in Cognitive Sciences*, 25(5), 388-402. <https://doi.org/10.1016/j.tics.2021.02.007>
- Pool, C. R. (1997). A New Digital Literacy A Conversation with Paul Gilster. *Educational Leadership*, 55(3), 6-11.
- Prasastiningtyas, W., Ubaidillah, A. Z., Aprianti, I., & Nurfadilah, L. (2024). *Improving Literacy in the Digital Age: Unleashing Critical Thinking Potential*. *TOPLAMA (Jurnal Komunikasi dan Pengabdian Masyarakat)*, 2(1), 18-27. <https://altinriset.com/journal/index.php/>
- Prensky, M. (2009). H. Sapiens Digital: From digital Immigrants and Digital Natives to Digital Wisdom. *Innovate: Journal of Online Education*, 5(3).
- Ribino, P. (2023). The Role of Politeness in Human-Machine Interactions: A Systematic Literature Review and Future Perspectives. *Artificial Intelligence Review*, 56. 445-482. <https://doi.org/10.1007/s10462-023-10540-1>
- Roozenbeek, J., & van der Linden, S. (2019). The Fake News Game: Actively Inoculating Against the Risk of Misinformation. *Journal of Risk Research*, 22(5), 570-580. <https://doi.org/10.1080/13669877.2018.1443491>
- Schieb, C., & Preuss, M. (2016). Governing Hate Speech by Means of Counterspeech on Facebook. In *66th ICA Annual Conference, at Fukuoka, Japan (pp. 1-23)*.
- Sonni, A. F., Mau, M., Akbar, M., & Putri, V. C. C. (2025). AI and Digital Literacy: Impact on Information Resilience in Indonesian Society. *Journalism and Media*, 6(3), 100. <https://doi.org/10.3390/journalmedia6030100>
- Thomas, P. B., Hogan-Taylor, C., Yankoski, M., & Weninger, T. (2022). Pilot Study Suggests Online Media Literacy Programming Reduces Belief in False News in Indonesia. *First Monday*, 27(1). <https://doi.org/10.5210/fm.v27i1.11683>
- Vuorikari, R., Kluzer, S., & Punie, Y. (2022). DigComp 2.2. The Digital Competence Framework For Citizens. With New Examples of Knowledge, Skills and Attitudes. Publications Office of the European Union. <https://doi.org/10.2760/115376>
- Weber, P. M., Kammerl, R., & Schiefner-Rohs, M. (2025). What Does Digital Well-Being Mean for School Development? A Theoretical Review with Perspectives on Digital Inequality. *Education Sciences*, 15(8), 1-23. <https://doi.org/10.3390/educsci15080948>
- Wineburg, S., & McGrew, S. (2019). Lateral Reading and the Nature of Expertise: Reading Less and Learning More When Evaluating Digital Information. *Teachers College Record*, 121(11), 1-40. <https://doi.org/10.1177/016146811912101102>



- Yang, Y., Zhang, C., Zhang, S., & Shen, J. (2025). Tiktok In Higher Education: A Systematic Review of Disciplinary Applications, Learning Outcomes, and Implementation Factors. *Interactive Learning Environments*, 4820, 1–21. <https://doi.org/10.1080/10494820.2025.2564736>
- Yuan, J., & Li, X. (2025). How Digital Literacy and ICT Self-Efficacy Shape Student Perceived Post-Editing Competence. *Acta Psychologica*, 259(August), 105409. <https://doi.org/10.1016/j.actpsy.2025.105409>
- Zakir, S., Hoque, M. E., Susanto, P., Nisaa, V., Alam, M. K., Khatimah, H., & Mulyani, E. (2025). Digital Literacy And Academic Performance: The Mediating Roles of Digital Informal Learning, Self-Efficacy, and Students' Digital Competence. *Frontiers in Education*, 10, 1–13. <https://doi.org/10.3389/educ.2025.1590274>
- Zhang, L., Ryskulova, B. A., Cheng, X., Ren, S., & Apaeva, S. K. (2024). Critical Thinking Development of Foreign Language Teachers Through Digital Literacy Training. *Journal of Educational Technology Development and Exchange*, 17(1), 222–236. <https://doi.org/10.18785/jetde.1701.13>
- Zhang, P., Shi, X., Khan, S. U., Ferreira, B., Portela, B., Oliveira, T., Borges, G., Domingos, H., Leitão, J., Mohottige, I. P., Gharakheili, H. H., Moors, T., Sivaraman, V., Najari, N., Berlemont, S., Lefebvre, G., Duffner, S., Garcia, C., Parmentier, A., ... Shan, H. (2019). IEEE Draft Standard for Spectrum Characterization and Occupancy Sensing. *IEEE Access*, 9(2), 1-6.
- Zhou, X., Sun, K., Zhu, K., Feng, L., Sun, Q., & Zhong, D. (2025). The Impact of Digital Literacy on University Students' Innovation Capability: Evidence from Ningbo, China. *Frontiers in Psychology*, 16, 1548817. <https://doi.org/10.3389/fpsyg.2025.1548817>

---

**\*Yulian Dinihari (Corresponding Author)**

Department of Biology Education,  
Indraprasta PGRI University Jakarta,  
Jl. Nangka Raya No. 58 C, Jakarta Selatan, DKI Jakarta, 12530, Indonesia  
Email: [yulian.dinihari@unindra.ac.id](mailto:yulian.dinihari@unindra.ac.id)

**Musringudin**

Department of Educational Administration,  
Muhammadiyah Prof. Dr. HAMKA University Jakarta,  
Jl. Warung Jati Barat, Blok Darul Muslimin No.17, Jakarta Selatan, DKI Jakarta, 12740, Indonesia  
Email: [musringudin@uhamka.ac.id](mailto:musringudin@uhamka.ac.id)

---