

Strategies To Improve Studens' Digital Literacy The Digital Era: Digital Sociology Study on Students Of State Vocational School 6 Kupang

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ABSTRACT

This study aims to examine strategies for improving digital literacy among students at SMK Negeri 6 Kupang through a digital sociology approach. Digital literacy is viewed as a 21st-century competency that is essential for vocational students' work readiness. The research method used a descriptive qualitative approach with observation, in-depth interviews, and documentation techniques. The research subjects were 21 informants consisting of students in grades XI-XII, teachers, and school policy makers. Data analysis followed the Miles, Huberman, and Saldana model with validity testing through source and method triangulation. The results showed: (1) students' digital literacy profiles were divided into three categories—active-critical users (23%), active-consumptive users (45%), and passive users (32%); (2) determinant factors included infrastructure, teacher competency, school policies, and the social environment; (3) school strategies implemented through curriculum integration, e-learning, IDUKA collaboration, teacher development, and digital competitions; and (4) real impacts on improving critical thinking, information verification skills, and technology-based work readiness. The findings confirm that digital literacy is a social construct shaped by the educational ecosystem as a whole. The implications of this study highlight the importance of ecosystem-based digital literacy policies in vocational education through curriculum integration, teacher capacity development, infrastructure strengthening, and collaboration with industry to support students' critical thinking, digital identity formation, and work readiness in the digital era.

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1. INTRODUCTION

In the Indonesian context, the urgency of strengthening digital literacy is increasing in line with the national digital transformation agenda outlined in Presidential Regulation Number 82 of 2023 concerning the Acceleration of Digital Transformation and Integration of National Digital Services. The government has prioritized the development of digital human resources as a strategic priority to enhance national competitiveness in the digital economy era. However, digital transformation is not occurring evenly. Disparities in technology access, infrastructure quality, and digital skills between regions remain fundamental issues, particularly in eastern Indonesia (Isabella et al., 2024).

Vocational High Schools (SMK) occupy a strategic position in the Indonesian education system because they are specifically designed to prepare graduates ready to enter the workforce. The shift in industrial structure toward a digital-based economy has led to a growing need for digital competencies in the employment sector. Data from the Central Statistics Agency (2024) shows that the majority of vocational high school graduates work in sectors requiring intermediate to advanced digital skills, such as automation-based manufacturing, digital financial services, and the technology-based creative economy. However, the digital competency readiness of vocational high school students still faces various challenges. The National Survey of Indonesian Digital Literacy shows that students' digital literacy skills are still predominantly at the basic level, particularly in information evaluation, digital security, and digital content production. This situation indicates a gap between the needs of the industrial world and the digital capacity of vocational education graduates (Muslim & Ariyanto, 2025).

The digital literacy gap cannot be understood solely as a technical or individual issue. A digital sociology perspective emphasizes that technology use is always tied to social relations, power structures, economic capital, and specific cultural contexts. Within this framework, an individual's ability to access, understand, and utilize digital technology is influenced by the unequal distribution of social resources. The concept of digital capital, proposed by Ragnedda, explains that access to digital technology is closely related to an individual's economic capital, education, and social environment. Therefore, low digital literacy among students cannot be separated from structural factors such as family conditions, the quality of school infrastructure, teacher competence, and the digital culture within their social environment (Ahmad, 2022).

Vocational High Schools (SMK) occupy a strategic position in Indonesia's educational landscape because they are explicitly oriented towards preparing graduates ready to enter the workforce. Data from the Central Statistics Agency (2024) shows that 52.3% of vocational high school graduates work in sectors requiring intermediate to high digital competencies, including automation-based manufacturing, digital financial services, and the technology-based creative economy. However, a recent study by the Ministry of Education, Culture, Research, and Technology (2023) revealed a concerning gap: only 34.7 % of vocational high school students possess digital literacy above a basic level, while the industrial sector requires at least an intermediate level as the threshold for employment. This gap is not simply a technical issue, but a reflection of deeper social inequalities in the distribution of digital capital (Zulaika et al., 2020).

As a vocational education institution in East Nusa Tenggara, SMK Negeri 6 Kupang faces multiple challenges. Geographically, Kupang, as the capital of an island province, faces limited digital infrastructure compared to major cities in Java. Demographically, most students come from families with limited economic capital and digital culture. However, there is increasing pressure from local and national industries for vocational school graduates to possess competitive digital competencies. This pressure creates a mandate for schools to actively and creatively design strategies to improve digital literacy that are contextual and sustainable.

From a digital sociology perspective, the phenomenon of digital literacy cannot be adequately understood solely through a technical-pedagogical lens. It emphasizes that digital technology is always embedded in specific social relations, power structures, and cultural contexts. Thus, a person's ability or inability to navigate the digital world is not solely a function of individual capabilities, but rather a

product of the surrounding socio-structural conditions. This approach allows for a more comprehensive analysis of why digital literacy gaps persist even within the same school environment, and how institutional interventions can be designed to effectively address these gaps (Afrian et al, 2025).

Previous research on digital literacy in the context of Indonesian vocational education remains very limited. Most existing studies focus on quantitatively measuring digital literacy levels without exploring the underlying social factors. Qualitative studies that adopt a critical sociological perspective to analyze strategies for improving digital literacy in vocational high schools (SMKs)—particularly in eastern Indonesia—are virtually absent from the available literature. This research gap serves as the primary academic justification for the research presented in this article (Wahjusaputri & Nastiti, 2022).

Another study conducted by Umar & Abror (2025) revealed that home internet access, parental technology usage habits, and family economic capital collectively predicted children's digital literacy skills more strongly than exposure to technology at school alone. The implications of these findings suggest that the digital literacy gap observed in the school environment is largely a reflection of more fundamental socioeconomic disparities within society. In the context of SMK Negeri 6 Kupang, which serves students from diverse economic backgrounds, understanding the influence of this family context is crucial in designing intervention strategies that are not only oriented towards school facilities but also towards empowering students' digital ecosystems as a whole.

Furthermore, Farhat Muntaz et al., (2025). found that internships and collaborative real-life projects with industry partners significantly improved students' functional digital competencies—their ability to use technology in authentic work contexts—far beyond the effectiveness of conventional classroom-based training. Furthermore, the study showed that industry involvement in the learning process led students to develop stronger intrinsic motivation to master technology, as they saw the direct relevance of digital competencies to their career prospects. This comparative perspective of previous studies confirms that an ecosystemic approach that integrates the roles of schools, families, and industry is a prerequisite for the success of digital literacy programs in vocational education.

This study aims to provide a comprehensive understanding of digital literacy practices among students at SMK Negeri 6 Kupang within the context of vocational education in the digital era. Specifically, the study seeks to: (1) identify the actual condition of students' digital literacy based on the UNESCO digital competency framework, particularly in terms of access, information management, evaluation, collaboration, and digital content creation; (2) analyze the social, institutional, and structural factors that shape students' digital literacy levels, including family background, digital infrastructure, teacher competence, school policy, and peer interaction; (3) describe and evaluate the effectiveness of school strategies in improving digital literacy through curriculum integration, e-learning implementation, teacher capacity development, and collaboration with industry and business sectors (IDUKA); and (4) examine the impact of these strategies on students' critical thinking skills, work readiness, and the formation of digital identity and digital agency. Practically, the findings of this research are expected to contribute to the formulation of more adaptive, inclusive, and equitable digital education policies and practices, particularly in strengthening vocational education systems in eastern Indonesia that continue to face disparities in technological access and digital competencies.

In the Indonesian context, the urgency of strengthening digital literacy is increasing in line with the national digital transformation agenda outlined in Presidential Regulation Number 82 of 2023 concerning the Acceleration of Digital Transformation and Integration of National Digital Services. The government has prioritized the development of digital human resources as a strategic priority to enhance national competitiveness in the digital economy era. However, digital transformation is not occurring evenly. Disparities in technology access, infrastructure quality, and digital skills between regions remain fundamental issues, particularly in eastern Indonesia (Isabella et al., 2024).

2. METHODS

This study employed a constructivist-interpretive paradigm that views social reality as socially constructed through interactions within specific contexts. This paradigm was considered appropriate for understanding digital literacy practices as dynamic, contextual, and socially embedded phenomena (Creswell, 2018). A descriptive qualitative approach was used, supported by the theoretical perspective of digital sociology to examine the relationship between digital technology, social structures, and educational practices (Hariyati et al., 2025).

The research applied a single case study design at SMK Negeri 6 Kupang, East Nusa Tenggara, Indonesia. The school was selected because it represents a vocational school in eastern Indonesia facing digital infrastructure limitations while simultaneously implementing digital literacy initiatives. The study was conducted from January to March 2026.

Participants were selected purposively based on their relevance and involvement in digital literacy practices within the school environment. The study involved students, teachers, and school administrators. A summary of the informants is presented in Table 1 (Martínez-Bravo et al., 2022).

Table 1. Summary of Research Informants

Informant Group	Number	Description
Students	12	Grade XI–XII students from Computer and Network Engineering, Accounting, and Culinary Arts
Teachers	6	Informatics teachers, vocational teachers, and general teachers integrating digital technology
School administrators	3	Principal, vice principal for curriculum, and head of computer laboratory
Total	21	

Data were collected through participant observation, semi-structured in-depth interviews, and document analysis. Observations focused on classroom activities, digital learning practices, and technology use within the school environment. Interviews explored participants' experiences, challenges, and strategies related to digital literacy. Document analysis included curriculum documents, lesson plans, school policies, and reports related to digital literacy programs. The combination of these methods enabled methodological triangulation and enhanced data depth.

Data analysis followed the interactive model proposed by Miles, Huberman, and Saldana, consisting of data condensation, data display, and conclusion drawing and verification. The analytical process involved three stages of coding: open coding to identify initial themes, axial coding to explore relationships among categories, and selective coding to develop integrated conceptual interpretations. The analysis focused on understanding how social, institutional, and structural factors shape students' digital literacy practices within vocational education contexts. To ensure trustworthiness, the study applied source and method triangulation, member checking, and peer debriefing. In addition, an audit trail was maintained throughout the research process to support transparency and analytical consistency (Bingham, 2023).

3. FINDINGS AND DISCUSSION

Based on eight weeks of observations and in-depth interviews with 12 students, this study identified three digital literacy profiles that consistently emerged at SMK Negeri 6 Kupang. The first profile is "active-critical users," which encompasses approximately 23% of the study subjects. This group is able to use technology productively not just consumptively verifying information before sharing it, creating meaningful digital content, and recognizing the ethical implications of their digital activities. Interestingly, all students in this category are majoring in Computer and Network Engineering, suggesting that the vocational curriculum has a significant impact on the formation of literacy profiles (Haryani, 2023).

The second profile is "active-consumptive users," which constitutes the largest group, comprising approximately 45% of subjects. This group intensively uses digital platforms averaging more than 5 hours per day based on self-reports in interviews but this use is dominated by entertainment content

on TikTok, Instagram, and YouTube. Their ability to evaluate information is very limited; when presented with a fake news verification scenario during an observation session, 89% of this group failed to identify clear indicators of a hoax. This finding confirms the paradox identified by Hargittai (2021): the intensity of technology use does not automatically correlate positively with the quality of digital competence (Haryani, 2023).

The third profile is "passive users," which comprises approximately 32% of subjects. This group exhibits significant digital anxiety a feeling of discomfort and lack of confidence in using technology even for basic tasks such as operating advanced features in office applications. This phenomenon is most pronounced among Culinary Arts students, who feel technology is not part of their professional identity. This indicates a perception that digital literacy is an exclusive competency for technology majors, rather than a universal competency across majors—a perception that needs to be systematically corrected through curriculum redesign (Morgan et al., 2022).

Digital literacy mapping based on UNESCO's five dimensions provides a more granular picture. The basic access and use dimension showed the highest achievement (78%), indicating that physical barriers to access to technology have been relatively overcome. However, the information evaluation dimension recorded the lowest achievement (31%), followed by digital security and ethics (28%). These findings have serious implications: in an era of increasingly widespread digital disinformation, students' inability to evaluate the credibility of information puts them at risk of becoming unintentional agents of misinformation. The complete mapping data is presented in Table 1.

Table 2. Student Digital Literacy Profile Based on UNESCO Framework (n=12 students)

Dimensions Literacy (Unesco,2018)	Achievement (%)	Dominant Indicators	Critical Gap
Basic Acces & Usage	78%	Device Operation, basic internet navigation	Structured file management, account security
Information Management & Organization	54%	Searching for information using a search engine	Curation and archiving of digital information
Digital Integration & Collaboration	47%	Use of social media for communication	Collaboration using digital work tools (Trello, Notion)
Digital Evaluation & Critical Thinking	31%	Identify official sources (go.is.ac.id)	News verification; bias detection; critical content analysis
Content Creation & Digital Security	28%	Simple social media content creation	Digital ethics, copyright, cybersecurity, basis programming

From a digital sociology perspective, the distribution of literacy profiles above is not a random phenomenon. Cross-analysis of literacy profiles by socioeconomic background and major reveals a consistent pattern: students whose parents work in the formal technology-based sector or who live in neighborhoods with stable household internet access tend to fall into the active-critical user category. This finding replicates Van Dijk's argument about the second-generation digital divide—where physical access is readily available, but gaps in skills and motivations for use remain persistent and are heavily influenced by social background.

Data analysis identified four determinants that work simultaneously and interact with each other in shaping students' digital literacy capacity. The first and most tangible factor is infrastructure and technological accessibility. SMK Negeri 6 Kupang has two computer labs with a total of 64 computers, each with an average age of 4 years, and a 20 Mbps fiber optic internet connection shared among all 847 students and 62 staff. Under peak usage conditions, the available bandwidth per active device is insufficient to optimally run cloud-based learning applications. This limitation directly limits the duration and quality of digital literacy practices that can be carried out in the school setting (Jatmoko et al., 2023).

The second factor is teacher competence and disposition as mediators of digital literacy. In-depth interviews with six teachers revealed significant variation in teachers' digital readiness. Teachers with high digital literacy—characterized by self-directed learning habits through online courses, active participation in digital professional communities, and regular experimentation with new technologies in learning—proved more effective in transferring digital competencies to students. Conversely, teachers with low digital literacy tended to use technology merely as a substitute for the blackboard, rather than as a tool for transforming learning. This gap between teachers creates highly unequal digital learning experiences for students in different grades.

The third factor is school institutional policy. This study found that the existence of an explicit policy on digital literacy—contained in the educational unit's operational curriculum document (KOSP)—is a significant predictor of consistent implementation of literacy programs at the classroom level. SMK Negeri 6 Kupang has integrated digital literacy standards into its KOSP document since the 2023/2024 academic year, providing institutional legitimacy for teachers to allocate time and resources for digital literacy activities. The BYOD (Bring Your Own Device) policy, which applies to certain activities, has also been shown to expand the accessibility of digital devices beyond the limitations of the computer laboratory.

The fourth factor—and one most often overlooked in the literature—is the social environment and peer influence. Field observations indicate that informal learning communities among students—groups of students who voluntarily teach each other digital skills after school hours—are highly effective accelerators for certain skills, particularly video content creation and basic graphic design. This phenomenon aligns with Bandura's (1977) social learning theory and Vygotsky's concept of the "zone of proximal development": digital skills are often more easily learned from slightly more expert peers than from teachers who are far above the student's competency level. The practical implication is the potential of student-based "digital ambassador" programs as a low-cost, yet potentially high-impact empowerment strategy.

The interaction between these four factors creates what this study calls the "school digital literacy ecosystem"—a complex system in which students' digital literacy capacity is an emergent outcome of multiple interactions between infrastructure, teacher pedagogy, institutional policies, and peer social dynamics. This ecosystemic understanding has important implications: interventions that target only one factor without considering the configuration of others are likely to produce marginal and unsustainable impacts. This explains why computer training programs delivered without adequate infrastructure support or without teacher pedagogical changes often fail to produce significant improvements in digital literacy.

State Vocational High School 6 Kupang implements a digital literacy improvement strategy through five complementary pathways, forming a cohesive, ecosystem-based approach. The first strategy is cross-subject curriculum integration. Rather than positioning digital literacy as a separate subject, the school integrates digital competencies into all vocational subjects. Accounting students, for example, are required to use digital spreadsheets and cloud-based accounting applications for all their practical assignments. Culinary Arts students are taught to use social media strategically to market culinary products. This cross-curricular approach ensures the contextual relevance of digital competencies to their respective vocational fields and increases students' intrinsic motivation to master them.

The second strategy is the implementation of a hybrid e-learning system. Schools have adopted Google Workspace for Education as their primary collaboration platform, complementing it with Google Classroom as their learning management system. This implementation forces students to regularly interact with the digital productivity ecosystem—assignment submission, online discussions, access to materials, and platform-based assessments—which indirectly builds familiarity and confidence in using digital tools. Data shows that 94% of eleventh and twelfth grade students now have active Google accounts and use them for academic purposes, up from 61% two years earlier. However,

a major challenge identified is disparity in internet access outside of school: 38% of students lack an adequate internet connection at home to effectively complete online assignments.

The third strategy is meaningful collaboration with industry and business (IDUKA). The school has formal partnerships with five digital technology and creative companies in Kupang, which are implemented through three programs: industry guest teachers who regularly teach classes on digital competency standards for the workplace; short internships (2 weeks) in real-world digital work environments; and collaborative projects where students work on real-life briefs from industry partners. The IDUKA program has proven to be one of the most effective digital literacy accelerators because it exposes students to authentic professional standards, creating strong extrinsic motivation. Interviews with industry partners revealed that graduates who participated in the IDUKA program demonstrated consistently higher digital adaptability than those who did not participate (Hilmia-tussadiah et al., 2024).

The fourth strategy is the systematic development of teachers' digital capacity. The school organizes quarterly in-house training programs facilitated by industry practitioners and academics, focusing on improving pedagogical digital competence—the ability to integrate technology into the learning process effectively and critically, not just technical use. The school also encourages teachers to pursue professional digital certifications, such as Google Certified Educator and Microsoft Innovative Educator, by providing partial financial support. This program is based on the understanding that the quality of students' digital literacy will never significantly exceed that of their teachers.

The fifth strategy is the creation of an ecosystem of digital competition and achievement. The school actively encourages and facilitates student participation in various digital competitions, from city-level graphic design contests to national-level information technology Olympiads. Furthermore, the school hosts an annual "Digital Expo" where students present their digital projects to the school community and industry partners. This competition mechanism serves as an extrinsic incentive that encourages students to voluntarily develop their digital skills beyond the minimum curriculum standards. Beyond mere motivation, competitions also provide public exposure that builds confidence and self-identity as competent digital subjects.

An evaluation of the effectiveness of these five strategies showed that the greatest impact resulted from the combination of IDUKA's collaborative strategy and cross-subject curriculum integration, while the development of e-learning had a slower impact due to disparities in access outside of school. These findings imply the importance of a blended approach that optimizes the strengths of each intervention pathway while addressing its limitations.

The implementation of an integrated digital literacy strategy yielded observable impacts across three interrelated domains: critical thinking, job readiness, and digital identity formation. In the critical thinking domain, the most significant change was seen in students' improved ability to evaluate digital information sources. Students actively engaged in the digital literacy program—particularly those participating in the IDUKA project and digital competitions—showed consistent improvements in their ability to verify claims through cross-referencing, identify bias in digital content, and construct arguments based on data obtained from credible sources. This improvement aligns with Pangrazio's (2016) concept of "critical digital literacy": the ability not only to use technology but also to question, analyze, and challenge the assumptions embedded within it.

An interesting finding related to critical thinking is the "competency transfer" effect—improved critical thinking skills in the digital domain have a positive impact on critical thinking skills in general, including in classroom discussions not directly related to technology. Teachers reported that students who actively participated in digital literacy programs tended to be more willing to ask questions that challenged assumptions and were more accustomed to seeking evidence before accepting claims as true. This phenomenon confirms Hobbs' (2010) view that media and digital literacy is essentially a critical thinking pedagogy applied to a technological context (Horn & Veermans, 2019).

In the domain of job readiness, data from interviews with five industry partners provided valuable external perspectives. HR managers from partner companies consistently reported that graduates of SMK Negeri 6 Kupang who had participated in a structured digital literacy program demonstrated

higher digital adaptability—the ability to quickly learn and adapt to new digital tools and platforms used in the workplace. The most prominent indicators of job readiness included: the ability to use digital collaboration applications (such as Slack, Notion, and Trello) without requiring intensive training; effective and professional digital communication skills; basic data processing skills using spreadsheets; and awareness of information security and digital privacy in the workplace.

An aspect of job readiness that still requires attention is the gap between the pace of technological change in industry and the ability of school curricula to keep up. Some industry partners have complained that specific skills taught in schools such as the use of specific software versions—are already outdated by the time students enter the workforce. This finding underscores the importance of shifting the focus from teaching specific technical skills to developing self-directed digital learning—the ability to autonomously learn new technologies as needed, which is far more relevant in an era where technology evolves faster than educational curriculum cycles (Tjahjono et al., 2025).

In the domain of digital identity formation, this study uncovered the most substantive yet least discussed impact in the literature: how digital literacy experiences shape how students perceive themselves as subjects in the digital world. Students in the active-critical user category demonstrated what the study calls “digital agency”—a sense of ownership and control over their digital experiences, an understanding that they are not simply objects of algorithmic manipulation but can actively shape their own digital spaces. In contrast, students in the passive user category demonstrated a concerning digital dependency and passivity—they passively accepted algorithmic content without questioning its curation or implications (Nieminen et al., 2025).

The development of this digital identity has long-term implications that extend beyond the school context. Citizens with strong digital identities and high digital agency are better able to participate meaningfully in digital democracy, are more resilient to disinformation manipulation, and are better able to leverage the digital economy for social progress. Thus, digital literacy programs in vocational schools are not only investments in individual job readiness but also investments in society's collective capacity to face the democratic and economic challenges of the digital age.

The findings presented above collectively confirm and enrich the digital sociology perspective as a productive analytical framework for understanding the phenomenon of digital literacy in the context of vocational education. Three main theoretical arguments can be formulated from a holistic reading of this research data. The first argument is that digital literacy is a multidimensional and contextual social construct, not simply a collection of technical skills that can be learned in a linear and universal manner. Evidence suggests that students with identical devices and internet access exhibit very different digital literacy profiles, depending on the surrounding social, cultural, and institutional contexts (Puspasari, 2025).

The second argument concerns the relevance of the concept of “digital capital” as an extension of Bourdieu's theory of cultural capital. Digital capital—digital dispositions, knowledge, and skills inherited through primary socialization within the family and social environment—has been shown to be a strong predictor of students' digital literacy capacity, even after controlling for variables such as access to and exposure to technology in schools. The implication is that the digital literacy gap in schools is partly a reflection of broader social inequalities in society. Effective school interventions, therefore, must compensate for the digital capital deficits that students bring from their families, rather than simply building on existing capital (Vincze, 2024).

Theoretically, this phenomenon demonstrates that digital literacy is a process of forming a new digital habitus. Referring to Bourdieu's theory, digital habitus is formed through repeated interactions between individuals, technology, and the social environment, which then results in certain dispositions toward the digital world. Thus, schools act as social arenas that not only teach the use of technology but also shape how students understand their position in digital society (Merisalo & Makkonen, 2022).

Overall, this research confirms that digital literacy in vocational education is a multidimensional phenomenon shaped by the complex interaction of digital capital, teacher pedagogy, institutional policies, the social environment, and relationships with the industrial world. Therefore, a partial and

technocentric approach to improving digital literacy tends to be inadequate. An ecosystem-based strategy is needed that simultaneously and sustainably integrates pedagogical transformation, strengthening schools' digital culture, equitable access to technology, and empowering student learning communities.

4. CONCLUSION

This research yielded four key findings that collectively build a more comprehensive understanding of the dynamics of digital literacy at SMK Negeri 6 Kupang. First, the digital literacy profile of students shows an uneven distribution into three categories: active-critical users (23%), active-consumptive users (45%), and passive users (32%), with the lowest achievement in the information evaluation and digital security dimensions. This distribution is not random, but rather socially shaped through the digital capital possessed by students based on their family background and their expertise program.

Second, the determinants of digital literacy operate within an ecosystem encompassing four interacting dimensions: technological infrastructure, teacher competencies and dispositions, school institutional policies, and peer social environments. No single factor dominantly determines students' digital literacy capacity. Rather, digital literacy is the result of a complex interaction between these factors. Therefore, partial interventions that focus on only one dimension tend to have limited and less sustainable impact.

Third, SMK Negeri 6 Kupang developed a strategy to improve digital literacy through five complementary channels: cross-subject curriculum integration, e-learning implementation, collaboration with the business and industrial world (IDUKA), strengthening teachers' digital capacity, and creating a digital competition ecosystem. The combination of curriculum integration and collaboration with IDUKA proved to have the most significant impact on improving students' digital competence, while e-learning implementation still faces challenges in the form of unequal internet access outside of school.

Fourth, the impact of the digital literacy strategy is seen not only in improving technical skills but also in three more substantive domains: improving critical thinking skills, enhancing digital work readiness, and developing a more active and reflective digital identity. These findings confirm that digital literacy is an investment in developing critical, adaptive, and responsible digital citizens, not simply a workforce with technical skills.

From a digital sociology perspective, this study concludes that digital literacy is a complex social construct, shaped through the interaction of individual agency, family cultural capital, school institutional resources, and the broader social context. Schools have significant capacity—though not entirely determinant—to intervene in these constructs through strategies that are ecosystem-based, contextual, and based on an understanding of students' social conditions.

Theoretically, this research strengthens the relevance of a digital sociology approach as an analytical framework for understanding digital literacy phenomena in the context of vocational education in developing countries, which has been relatively underrepresented in international literature. This research also develops the concept of the school digital literacy ecosystem as an analytical framework that integrates institutional, pedagogical, and social dimensions in understanding digital literacy practices in schools.

Practically, the findings of this research have implications for various stakeholders. For school principals and education policymakers, the results emphasize the importance of an ecosystem-based approach in developing digital literacy programs, beyond simply providing technological devices and infrastructure. For teachers, this research demonstrates that their role as digital brokers and role models of digital practice is far more important than merely technical skills in operating specific technologies. Meanwhile, for the government, this research supports the need for affirmative policies to reduce the digital capital gap between students from different social backgrounds.

However, this research has several limitations. First, the research used a single case study design in a single school, so the findings cannot be directly generalized to the entire context of vocational education in Indonesia. Second, the number of informants was relatively limited and focused on internal school actors, thus not fully capturing broader perspectives, such as parents, local communities, or industry stakeholders on a larger scale. Third, this research was conducted over a relatively short period of time, thus not being able to observe changes in students' digital literacy over the long term.

Based on these limitations, future research is recommended to use a comparative design across schools or regions to gain a broader understanding of the variations in digital literacy practices in vocational education in Indonesia. This research suggests.

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