

Implementation of Digital Literacy to Form National Insight in the Era of the Industrial Revolution

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Abstract: In the current era, digital literacy helps students filter out hoaxes, assess the credibility of information, understand the values of Pancasila, appreciate diversity, and cultivate a sense of patriotism within the digital space. However, its implementation faces various challenges, including limited access to devices and the internet, students' limited ability to verify information, exposure to negative content, weak digital ethics, and disparities in teacher competence regarding the use of educational technology. The objectives of this study are to: (1) describe the implementation of digital literacy to foster national insight in the Industrial Revolution era, and (2) describe the challenges associated with implementing digital literacy to foster national insight. This study employs a qualitative approach using a case study method. Data collection was conducted through observation, interviews, and documentation, while data analysis techniques included data collection, data reduction, data presentation, and conclusion drawing and verification. The study's findings are as follows: (1) The implementation of digital literacy to foster national insight in the Industrial Revolution era proceeds through three main stages: First, the process begins in the classroom with the use of Smart TV as interactive learning media to present national-themed material visually and to hone students' critical thinking skills. Second, the process continues with the reinforcement of digital ethics through collaborative guidance aimed at habituating students to filter out hoaxes. Third, the process culminates in concrete action, where the school facilitates students in producing content related to national insight for the school's social media channels and guides them in the wise use of artificial intelligence (AI). (2) The challenges that must be addressed regarding the implementation of digital literacy to foster national insight include limited access to devices and the internet, students' low capacity for information verification, exposure to negative content, a lack of understanding regarding digital ethics, and disparities in teacher competence in utilizing educational technology. This integration requires support through a relevant curriculum, contextual teaching materials, teacher guidance, and the cultivation of habits among students to use digital media wisely. Schools, teachers, families, and the community need to collaborate to ensure that technology serves not merely as a medium for information, but also as a means of fostering a national character that is critical, responsible, and adaptable to the demands of 21st-century education.

Keywords: Digital Literacy, National Insight, Pancasila Education, Civic Education, Industrial Revolution, Digital Ethics, Artificial Intelligence

INTRODUCTION

Rapid technological advancements have ushered global society including Indonesia into the era of the Industrial Revolution 4.0. This transformation has significantly impacted various aspects of life, including the education sector. The use of Information and Communication Technology (ICT) in learning offers convenience, accessibility, and innovative, creative teaching methods. Data from the Indonesian Internet Service Providers Association (APJII) for 2024 shows an internet penetration rate of 79.5% in Indonesia, indicating that approximately 221.56 million people are digitally connected, with Generation Z constituting one of the largest user groups.

Twenty-first-century education is characterized by rapid digital technological advancements and an increasing need for higher-order thinking skills such as digital literacy, problem-solving, and collaboration. Although internet access in Indonesia reached 79.5% in 2024, many higher education institutions remain heavily reliant on conventional teaching methods. These conventional approaches often result in passive learning with minimal interaction, making it difficult for students to develop an understanding of fundamental concepts and analytical reasoning skills. This issue is particularly evident in foundational courses like *Pancasila* Education, which require the direct application of moral values to civic issues. Addressing these challenges calls for instructional innovations that combine structured digital exploration with real-world problem-solving. Integrating WebQuest with Problem-Based Learning (WebQuest-PBL) especially when supported by high student motivation has proven significantly more

effective than conventional approaches in enhancing conceptual understanding and problem-solving skills (Asmaroini et al., 2026).

However, the use of this technology is not without real-world challenges. Without strong digital literacy and adequate parental supervision, students often fail to grasp the boundaries of mobile phone usage; they tend to prioritize playing games and watching YouTube over their studies. This behavior contributes to a lack of interest in reading among students, which in turn negatively impacts their comprehension. To address this issue, teachers and school administrators must take proactive steps to foster a love of reading, such as by implementing school-wide literacy initiatives (Rokmana Rokmana et al., 2023).

According to Sembiring (2021), the challenges facing Pancasila education in the Industry 4.0 era include the ability to implement a technology-based Pancasila education system and to foster digital literacy and ethics. If these capabilities are achieved, the researcher is optimistic that the existence of Pancasila education will be sustained in the Industry 4.0 era.

Several previous studies have examined the issues of digital literacy and national consciousness, yet a research gap remains that warrants further investigation. Research by Mellinda Fatimah et al (2020) highlights the enhancement of national consciousness through conventional Civic Education instruction, whereas a study by Sianipar (2024) focuses primarily on analyzing the technical barriers students face regarding digital literacy. The majority of prior studies have centered on theoretical approaches or addressed technological infrastructure constraints in isolation. There is a lack of in-depth research examining concrete, institution-based implementation models that directly integrate modern digital tools such as smart TV, social media, and artificial intelligence (AI) as proactive instruments for fostering national consciousness.

Therefore, this study aims to address this gap by focusing on the junior high school level, specifically at SMP Negeri 4 Ponorogo, an institution responsive to the integration of technology into its instructional practices. The study's novelty lies in its contextual approach, which examines advanced elements of digital literacy, ranging from media ethics, digital security, and the creation of positive, nation-oriented content to the prudent use of artificial intelligence. The findings are expected to serve as a strategic reference for educators and policymakers in developing learning innovations that keep pace with the times, thereby fostering a generation of citizens who are intelligent, adaptable, critical, and imbued with a spirit of nationalism amidst the challenges of globalization.

Based on the explanation above, this article aims to describe the implementation of digital literacy in shaping national insight in the Industrial Revolution era at SMP Negeri 4 Ponorogo. This article also aims to identify the challenges that arise in implementing digital literacy to shape national insight. The research problems examined in this article are: first, how is digital literacy implemented to shape national insight in the Industrial Revolution era at SMP Negeri 4 Ponorogo? Second, what are the challenges in implementing digital literacy to shape national insight in the Industrial Revolution era?

METHODS

This study employs a qualitative approach using a case study method to gain an in-depth understanding of the phenomenon of digital literacy implementation in fostering national consciousness at SMP Negeri 4 Ponorogo. The research site was selected purposively, given the school's commitment and active programs regarding digital-based learning integrated with the cultivation of national character.

Data collection was conducted using three primary techniques: observation, in-depth interviews, and document analysis. Limited participatory observation was carried out regarding classroom learning processes and digital literacy habituation activities at the school. In-depth interviews were conducted with key informants, including the Literacy Coordinator, subject teachers, and representatives of Grade VIII students. Meanwhile, document analysis was employed to examine supporting documents such as the School Operational Curriculum (KOSP), teaching modules, lesson plans, as well as photographs and reports on school literacy activities.

The data analysis technique comprises three continuous stages: (1) data condensation, involving the selection, focusing, and simplification of field data; (2) data display, organized in the form of narrative text and categorization matrices; and (3) conclusion drawing and verification. Data validity testing was

conducted through technique triangulation (combining interviews, observation, and documentation) and source triangulation (comparing information from the principal, teachers, and students) to ensure the validity and reliability of the research findings.

RESULTS AND DISCUSSION

Implementation of Digital Literacy to Shape National Insight in the Industrial Revolution Era

Based on the research findings, the implementation of digital literacy at SMPN 4 Ponorogo is carried out through three main stages: the use of Smart TV in the classroom, the reinforcement of digital ethics, and concrete actions involving the creation of content promoting national values on social media and the utilization of AI.

Based on field findings, the initial stage of implementing digital literacy at SMPN 4 Ponorogo takes place directly in the classroom through the optimized use of Smart TV facilities. During lessons, teachers utilize these devices as interactive media to present content fostering a sense of national identity ranging from videos depicting the nation's struggle for independence and documentaries on Indonesia's cultural diversity to infographics illustrating the application of Pancasila values. This visual and audiovisual presentation is designed not only to capture students' interest and attention but also to stimulate active engagement. By displaying such digital content, teachers purposefully guide students in healthy discussions and debates; consequently, students do not merely act as passive recipients of information but instead continuously hone their critical reasoning skills while analyzing various emerging national issues.

The findings regarding the optimization of Smart TV as an interactive medium for presenting content on national identity align with research conducted by Mellinda Fatimah et al. (2020). That study demonstrated that integrating digital literacy into the learning process is highly effective for enhancing students' understanding of national perspectives. Furthermore, the use of visual content such as historical videos and documentaries on diversity closely relates to findings by Fathulaila (2024), whose study highlighted the effectiveness of digital resources in boosting student interest in history and strengthening national identity. Additionally, the teacher's practice of guiding students through discussions to foster critical reasoning when analyzing national issues aligns well with the study by Ishmah Rahadatul Aisy et al (2023). That research emphasized that digital literacy encompasses not only technical skills but also the ability to think critically and communicate effectively when utilizing technology. This interactive classroom approach is also consistent with research by Sutrisno (2023), which showed that implementing 21st-century-adaptive learning is highly effective in training students to think critically and solve complex problems.

In the second stage, activities focus on strengthening digital ethics through a collaborative mentoring approach designed to cultivate students' habits of filtering out misinformation (hoaxes). This stage integrates the roles of educators and mentors to provide intensive guidance on the wise use of digital media technology. Through this structured mentoring, students gain an understanding of internet ethics (netiquette) principles, the importance of critical awareness regarding unverified information, and practical steps for verifying the accuracy of news before sharing it. The habit of filtering hoaxes is instilled through information evaluation and content analysis exercises, enabling students not only to avoid the dangers of disinformation but also to transform into responsible, wise, and principled digital citizens.

These research findings align with and reinforce the study by Puji Asmaroini & Sutrisno (2024), which asserts that strengthening digital citizenship ethics can be effectively achieved through collaborative strategies involving both schools and families specifically by fostering positive behavioral habits and character development. The need for collaborative guidance in filtering out hoaxes is supported by Sianipar (2024) findings, which identify a lack of familiarity with information verification and difficulty evaluating digital content as major obstacles to students' digital literacy. This also resonates with the findings of Yani et al (2024), indicating that negative content and news pose the greatest challenges in digital media usage, thereby necessitating concrete guidance from teachers and schools. Furthermore, this digital ethics guidance supports the perspective of Ishmah Rahadatul Aisy et al (2023) that digital literacy should not merely focus on mastering technical skills but must also cultivate critical thinking and a sense of responsibility in technology use. Thus, the implemented collaborative guidance successfully

addresses real-world challenges while sustainably strengthening a culture of ethical digital behavior among students.

In the third stage, the process of student learning and character building culminates in tangible action. Here, the school plays an active role in facilitating students to create various forms of content centered on national identity, which are subsequently published via the school's official social media channels. Beyond merely providing a creative outlet, the school guides and supports students in utilizing artificial intelligence (AI) technology wisely, ethically, and responsibly. Through this concrete initiative, students not only gain technical proficiency in the digital realm but also develop the ability to internalize values of nationalism and share them positively with the public.

These findings regarding students' tangible actions in producing content related to national identity using AI and social media align closely with several previous studies. The use of AI technology to foster a spirit of nationalism is consistent with the findings of Devi Aryani Saputri et al (2024), who noted that AI facilitates rapid access to information on history, culture, and noble national values, thereby strengthening national solidarity. School guidance encouraging students to use AI wisely also supports the research of Puji Asmaroini & Sutrisno (2024), which emphasizes the need to strengthen digital citizenship ethics within the school environment through the integration of digital literacy and character building. Furthermore, the practice of creating content focused on national insight for social media platforms aligns with research by Yani et al (2024) and Ishmah Rahadatul Aisy et al (2023); these studies demonstrate that social media usage when balanced with digital literacy that encompasses critical, creative, and responsible attitudes is highly effective in enhancing students' understanding of national identity while shielding them from exposure to negative content in the digital space.

Compared to the study by Sianipar (2024) which focused solely on analyzing basic digital literacy levels and student challenges in Civics (PKn) classes and the study by Fathulaila (2024) which limited its scope to history education this research offers a more holistic perspective. The novelty of this study lies in its case study setting at SMP Negeri 4 Ponorogo, where the implementation of digital literacy is examined specifically within the context of the Industrial Revolution 4.0 transformation. This research goes beyond social media to integrate the adoption of automation technologies, artificial intelligence (AI), and the Internet of Things (IoT) as tools for the direct internalization of Pancasila values.

The findings of this study hold fundamental theoretical and practical implications for developing a nationalism-based digital literacy education model in secondary schools. Conceptually, the findings indicate that strengthening digital literacy must go beyond mere mastery of technical facilities (such as Smart TV) or passive information consumption. Instead, digital literacy initiatives should be designed in a structured, phased manner starting with stimulating critical thinking and fostering ethical digital character resilient to hoaxes, and culminating in tangible action through the creation of AI-driven creative content. Practically, the findings demonstrate that combining interactive technological facilities with ethical guidance from educators can transform students from passive consumers into active creators specifically, creators of positive content who actively internalize and mainstream nationalist values within the digital public sphere.

As a concrete step following these implications, it is recommended that the school institutionalize this three-stage learning model within its operational curriculum on a sustainable basis, accompanied by periodic training for educators on cybersecurity and the use of AI technology. Concurrently, the Education Office and relevant policymakers are encouraged to adopt the implementation at SMPN 4 Ponorogo as a reference or "best practice" for digital literacy education models grounded in national values, while also supporting the equitable distribution of interactive technology infrastructure across other schools. Furthermore, future researchers are advised to evaluate the model's effectiveness using quantitative approaches or longitudinal studies to measure the long-term impact of producing content centered on national values on strengthening students' civic engagement in the digital era.

Challenges in Implementing Digital Literacy to Shape National Insight

Research findings indicate that the implementation of digital literacy at SMPN 4 Ponorogo faces challenges, including limited access to devices and the internet, students' limited ability to verify information, exposure to negative content and the "filter bubble" phenomenon, inadequate application of digital ethics, and disparities in teachers' competence regarding the use of educational technology.

Research findings indicate that the implementation of digital literacy aimed at fostering a sense of national identity faces several challenges, primarily limited access to devices and internet networks. Uneven distribution of technology devices and infrastructure constraints mean that the use of digital media as a tool for learning and instilling national values has yet to reach all students effectively.

This situation aligns with and is reinforced by findings from relevant research, such as the study conducted by Sianipar (2024) regarding students' digital literacy within the context of Pancasila and Civic Education (PPKn) instruction. The study highlights that key obstacles include limited access and facilities, a lack of basic technological skills, and students' difficulties in evaluating information factors that ultimately hinder efforts to optimize digital literacy development for the purpose of strengthening national character.

A second challenge lies in the students' limited ability to verify or evaluate information. The difficulty students face in filtering and assessing the veracity of information acts as a barrier, preventing the use of digital media from functioning optimally in fostering a sense of national identity.

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A third challenge associated with the use of digital media is the prevalence of negative content exposure among students; this arises from digital platform algorithms that personalize content, causing students to receive only information aligned with their preferences or past interaction history. This situation has the potential to narrow their intellectual horizons, limit access to objective perspectives, and hinder the cultivation of inclusive national values.

This situation aligns with findings by Sianipar (2024), which indicate that students' digital literacy requires improvement; many students are not accustomed to using technological media correctly, fail to verify information, and struggle to evaluate the information they encounter. These issues are closely linked to exposure to negative content and limited access to objective perspectives. Furthermore, Sutrisno (2023) demonstrated that integrating digital literacy with a global citizenship-based learning model is effective in fostering an understanding of national identity and shielding students from the limitations associated with a lack of objective information.

The fourth challenge lies in the weak application of digital ethics among students. This phenomenon is evident in the lack of awareness regarding courtesy during virtual interactions, the prevalence of disregard for others' privacy, and online behavior that frequently ignores social norms. This limited understanding of internet ethics often turns the digital space into a medium for the spread of negative behaviors that run counter to the nation's character values.

This situation aligns with the findings of Puji Asmaroini & Sutrisno (2024), who emphasize the urgent need to strengthen digital citizenship ethics to curb negative online behavior a factor that significantly impacts students' character. It is also consistent with findings by Sianipar (2024), which highlight that limited access to facilities and students' inability to verify the accuracy of information serve as major obstacles to learning.

The fifth challenge concerns the disparity in teacher competence regarding the use of instructional technology. Not all educators possess uniform digital literacy or the adequate technical skills to creatively integrate digital media and tools into the learning process. Consequently, the use of technology in the classroom is inconsistent often limited to basic functions and falls short of fully supporting the creation of an interactive and innovative learning ecosystem.

This situation aligns with findings by Ishmah Rahadatul Aisy et al (2023), which highlight the importance of transforming the education system to strengthen digital literacy among educators and learners encompassing not only basic technical skills but also critical, creative, and responsible thinking. Findings from Fathulaila (2024) emphasize the importance of digital literacy in enabling educators to create engaging, interactive, and meaningful learning experiences through the use of diverse digital resources. Furthermore, findings from Puji Asmaroini & Sutrisno (2024) underscore the need to

strengthen digital ethics and literacy in an integrated manner across various environments including schools to address challenges regarding educator readiness and to shape a holistic curriculum.

Unlike the study by Sutrisno (2023) which focused on developing the "Global Citizen Project" model to train students in addressing global issues in a general sense this study conducts an in-depth analysis of the root causes of local issues. The study's novelty lies in its focus on the complex, overlapping challenges of the digital era: ranging from disparities in access and basic competencies, the massive spread of hoaxes, and eroding digital ethics, to the lack of reinforcement of national values all of which clash directly with the extreme socio-cultural shifts driven by digitalization. This research links technical challenges to their sociological impact on the erosion of national identity.

Findings regarding the various challenges in implementing digital literacy ranging from infrastructure limitations, poor information verification skills, exposure to negative content and "filter bubbles," and weak digital ethics to disparities in teacher competence carry a crucial implication: the use of technology in schools has not yet been fully effective in fostering national consciousness and shaping students' character. These challenges demonstrate that the mere availability of digital devices does not automatically guarantee improved learning quality unless accompanied by the necessary cognitive skills, ethical literacy, and pedagogical readiness of educators. If left unaddressed, this situation risks producing a digital generation that is vulnerable to disinformation, trapped in narrow, polarized viewpoints, and prone to disregarding moral and national values in the virtual realm.

Based on these implications, it is recommended that educational institutions, the government, and relevant stakeholders promptly formulate comprehensive strategic measures such as conducting intensive training to enhance teachers' technical and pedagogical competencies in the creative integration of technology. Furthermore, schools need to strengthen digital literacy curricula that focus on critical thinking, information verification skills, and the cultivation of online ethics to shield students from the adverse effects of negative content and the "filter bubble" phenomenon. Ensuring equitable access to technological infrastructure must also be a shared priority, guaranteeing that all students have equal opportunities to access high-quality digital learning that fosters a national perspective.

CONCLUSION

Based on the research findings and discussion regarding the implementation of digital literacy to foster a sense of national identity and the associated challenges during the Industrial Revolution era at SMP Negeri 4 Ponorogo, the following conclusions can be drawn:

1. The process of implementing digital literacy to form national insight at SMPN 4 Ponorogo is integrated through three main stages: First, using Smart TV as an interactive medium in the classroom to train critical reasoning; Second, strengthening digital ethics through assistance in filtering hoaxes; and Third, real action by facilitating students to produce national insight content on social media and utilizing artificial intelligence (AI) wisely. Thus, this three-stage model is recommended to be institutionalized into the school curriculum and supported by regular training for teachers, and can be adopted as best practice by the Education Department for equitable distribution of infrastructure, while further researchers are advised to study its long-term impact on civic participation (civic engagement).
2. The challenges associated with this implementation involve several key obstacles: limited access to devices and internet connectivity; students' limited ability to verify the accuracy of information; student vulnerability to negative content; weak adherence to digital ethics; and disparities in teachers' competence regarding the use of educational technology. Therefore, to address these challenges, it is recommended that relevant stakeholders urgently organize competency training for teachers, strengthen the digital literacy curriculum to enhance students' verification skills and ethical awareness, and prioritize the equitable distribution of technology infrastructure across schools.

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