Article

Reinforcing Digital Citizenship Literacy through Exploration and Reflection in Civic Education

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A B S T R A C T

The rapid growth of digital technology is reshaping how young people learn, communicate, and participate in civic life. Guided by Ribble's digital citizenship framework and Choi's multidimensional model, this study examines the level of digital citizenship literacy among Indonesian high school students. It proposes a practical reinforcement model for civic education, using a quantitative, descriptive design and a cross-sectional survey. Data were collected from 40 eleventh-grade students using a validated 19-item questionnaire covering four dimensions: digital awareness, digital ethics, digital social responsibility, and digital civic participation. Results show a high overall literacy level (86.94%), with students demonstrating strong social responsibility and civic participation but lower critical awareness of digital information. Significant correlations among dimensions indicate that ethical awareness helps shape responsible civic engagement. Based on these findings, a Two-Phase Reinforcement Model was developed, emphasizing value exploration and critical reflection. This model offers a relevant approach for strengthening civic education in Indonesia's transition toward a human-centered digital.
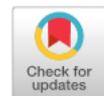
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INTRODUCTION

The accelerating wave of digital transformation has redefined the nature of human interaction across social, political, and educational domains. In the twenty-first century, young generations are expected not only to master technological skills but also to demonstrate civic competence that aligns with ethical, responsible, and participatory behaviors in the digital environment (Zhong & Zheng, 2023). This global shift underscores the urgency of preparing students to become active and responsible digital citizens who can critically navigate information, communicate ethically, and engage meaningfully in online communities.

The concept of digital citizenship literacy, as proposed by Ribble (2015), emphasizes four key dimensions: digital awareness, digital ethics, digital social responsibility, and digital civic participation as the foundation for building critical and ethical citizens in the digital age (Ribble & Bailey, 2015). These competencies extend beyond technical proficiency; they integrate moral reasoning, social empathy, and civic engagement as essential elements of holistic digital citizenship. In the educational context, this framework provides a lens through which civic education can be reimagined to address the realities of life in the information society.

However, despite having broad access to digital technology, many high school students remain unaware of the civic implications of their online behavior. Previous studies indicate that adolescents tend to use digital media primarily for entertainment and social interaction, while aspects such as digital ethics, online empathy, and civic participation receive limited attention (Adolescents et al., 2025). In the Indonesian context, where social media

penetration among youth exceeds 90%, this phenomenon presents a challenge to the cultivation of civic literacy and national character through digital means.

Integrating digital media into *Pendidikan Pancasila dan Kewarganegaraan* (Civic and Character Education) offers a promising pedagogical strategy to bridge this gap (Kusumawati & Mardianti, 2025). Through carefully designed activities that combine digital exploration and reflective learning, students can be guided to recognize the values of citizenship, critically assess online information, and engage in socially responsible digital practices. Such integration aligns with the vision of 21st-century education, which promotes critical thinking, creativity, collaboration, and digital ethics as core competencies (Ninawati et al., 2025).

While numerous studies have examined digital literacy and online learning, few have specifically addressed how digital platforms can strengthen civic literacy through a structured pedagogical model (Schmitt et al., 2024; Wineburg et al., 2017). The novelty of this study lies in the development of a two-phase Digital Citizenship Literacy Reinforcement Model that combines (1) the exploration of civic values through educational digital content and (2) critical reflection on social and moral issues in digital spaces. This approach not only measures students' levels of digital citizenship literacy but also proposes a transformative learning model for civic education in the digital era.

Therefore, this study aims to analyze the level of digital citizenship literacy among students at SMA Negeri 11 and to develop a model that reinforces civic and ethical awareness through digital-based instruction. The study's contribution lies in its contextual adaptation of global digital citizenship frameworks to the Indonesian educational landscape, offering both theoretical and practical insights for educators and policymakers.

Strengthening digital citizenship literacy among high school students is urgent in shaping a generation that is intelligent, ethical, and socially responsible in navigating the complexities of the Society 5.0 era. By empowering students to become reflective digital citizens, civic education can play a pivotal role in cultivating integrity, empathy, and active participation within the rapidly evolving digital ecosystem.

The concept of digital citizenship has evolved from the broader framework of civic literacy to accommodate the challenges and opportunities presented by the digital era. Ribble (2015) defines digital citizenship as "the norms of appropriate, responsible behavior about technology use." This framework encompasses nine essential elements: digital access, communication, literacy, etiquette, law, rights, responsibility, health, and security that together shape ethical participation in digital environments (Ribble & Bailey, 2015).

Building upon Ribble's framework, scholars such as Choi (2016) argue that digital citizenship literacy goes beyond mere digital skills; it reflects an integration of moral reasoning, critical awareness, and civic engagement in online contexts (Choi, 2016). It is not only about knowing how to use technology but also about understanding the ethical, social, and civic consequences of one's digital actions.

In educational settings, digital citizenship literacy represents a transformative approach to civic education that prepares students to act responsibly in a globalized and interconnected society. It bridges the gap between technological competence and civic awareness, allowing students to engage with real-world issues such as online ethics, misinformation, digital empathy, and participation in virtual communities. This form of literacy promotes reflective citizenship, encouraging learners to evaluate their digital presence and its impact on others and society.

Civic education has traditionally been centered on developing knowledge, attitudes, and behaviors that support active citizenship in democratic societies (Hajunilato, 2022). In Indonesia, *Pendidikan Pancasila dan Kewarganegaraan (PPKn)* serves as a foundational subject for cultivating national identity, democratic values, and moral integrity among students. However, in the context of rapid digitalization, the traditional classroom-based approach often falls short in addressing the dynamics of online civic participation.

Research by Bennett, Wells, and Freelon (2011) highlights that young citizens increasingly participate in civic life through digital platforms, from online petitions and social movements to digital discussions and campaigns. This shift requires civic education to be

reoriented from knowledge transmission to value-based engagement that integrates digital experiences into learning (Bennett et al., 2011).

Integrating digital tools and media into civic education allows students to explore real civic issues while developing critical thinking and empathy. According to Westheimer and Kahne (2004), effective civic education should promote justice-oriented citizenship, encouraging learners to question, reflect, and act upon social issues that affect their communities. In digital contexts, this means empowering students to participate in virtual civic dialogues, create positive digital content, and advocate for ethical use of technology (Kahne, 2014).

The emergence of Society 5.0, a concept initiated by Japan and widely adopted across Asia, envisions a human-centered society that balances technological advancement with social well-being. In this paradigm, digital competence is not only a technical necessity but also a moral and civic imperative. As Fukuyama states in Harayama, Society 5.0 emphasizes collaboration between humans and technology to create solutions that enhance the quality of life, social harmony, and sustainability. Within this framework, digital citizenship literacy plays a critical role in ensuring that individuals do not become passive consumers of technology but active contributors to digital ecosystems (Harayama, 2016). For students, this means understanding their responsibilities as digital citizens, respecting others, combating misinformation, upholding integrity, and participating in community development through digital means (Afrilihadi & Sumadi, 2025).

In Indonesia, where social media engagement among youth is among the highest in the world, strengthening digital citizenship literacy becomes a national priority. A previous study, Putri et al (2025), shows that while Indonesian students are digitally active, their understanding of digital ethics and civic participation remains limited (Putri et al., 2025). This gap underscores the need for a structured pedagogical model that integrates digital exploration and moral reflection within the curriculum.

The theoretical foundation of this study is derived from Ribble's (2015) Digital Citizenship Framework and Westheimer and Kahne's (2004) Civic Education Typology. The study adopts four core indicators: digital awareness, digital ethics, digital social responsibility, and digital civic participation to assess students' literacy levels and develop an integrative reinforcement model.

Previous studies have primarily focused on assessing digital literacy from a technical or cognitive perspective (Ng, 2012) whereas fewer have explored its moral and civic dimensions. This study addresses that gap by proposing a two-phase Digital Citizenship Literacy Reinforcement Model consisting of: exploration of civic values through digital educational content, and critical reflection on social and moral issues in digital spaces.

The novelty of this study lies in contextualizing global digital citizenship theories within the Indonesian civic education system. By combining empirical evidence from students' digital behaviors with a pedagogical model grounded in moral reflection, the study contributes both theoretically and practically to the discourse on civic education in the digital era.

METHOD

This study adopted a quantitative, descriptive design using a cross-sectional survey. The purpose of this design was to obtain a systematic understanding of students' levels of *digital citizenship literacy* at a specific point in time. A quantitative approach was selected to measure relationships among variables objectively and to identify patterns of digital awareness, ethics, social responsibility, and civic participation among high school students. This design aligns with the study's objective of developing an empirically grounded model to reinforce civic literacy in digital contexts.

Respondents

The study was conducted at SMA Negeri 11, a senior high school in Indonesia recognized for its active use of digital platforms in the learning process. The participants were 40 Grade XI students, selected through purposive sampling based on their engagement in digital learning and access to digital media. This group was considered representative of adolescents who engage in digital interactions in both academic and social contexts. The sample size was determined based on principles of class representation and data saturation commonly used in educational research.

Instruments

The research instrument used in this study was a closed-ended questionnaire designed to measure students' digital citizenship literacy across four dimensions: digital awareness, digital ethics, digital social responsibility, and digital civic participation. The instrument consisted of 19 items developed from Ribble's (2015) Digital Citizenship Model and adapted to the context of Indonesian civic education (*Pendidikan Pancasila dan Kewarganegaraan*).

Each item was rated on a five-point Likert scale, ranging from *1 (Strongly Disagree)* to *5 (Strongly Agree)*, allowing for quantitative measurement of students' perceptions, attitudes, and self-reported behaviors in digital spaces. Examples of items include: "*I verify information from several sources before sharing it online*" (digital ethics) and "*I participate in positive digital campaigns such as anti-hoax or environmental initiatives*" (digital civic participation).

Before distribution, the instrument underwent expert validation by three specialists in civic education and digital literacy to ensure content validity, relevance, and clarity. The questionnaire was then pilot tested with a group of students to assess language comprehensibility and item consistency. The Cronbach's Alpha reliability coefficient obtained was 0.87, indicating high internal consistency.

The final version of the instrument was administered online via Google Forms to 40 eleventh-grade students of SMA Negeri 11. The structured format enabled efficient data collection while ensuring anonymity and ethical compliance.

Procedures

The research was conducted through several sequential stages to ensure methodological rigor and data validity. The procedure consisted of four main phases: instrument preparation, validation, data collection, and data analysis.

Instrument Preparation

Based on the theoretical framework of digital citizenship literacy (Ribble, 2015; Choi, 2016), a 19-item questionnaire was constructed to measure four dimensions: digital awareness, digital ethics, digital social responsibility, and digital civic participation. Each item was designed using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Scenario-based items reflecting moral and civic situations in digital spaces were also included to assess students' value-based decision-making.

Instrument Validation

The initial questionnaire draft was reviewed by three experts in civic education and digital literacy to ensure content validity, linguistic clarity, and contextual appropriateness. A pilot test was conducted among 10 students outside the research sample to confirm reliability and comprehensibility. The final version demonstrated a high reliability coefficient (Cronbach's Alpha = 0.87), indicating internal consistency across items.

Data Collection

The validated questionnaire was administered online via Google Forms to 40 eleventh-grade students of SMA Negeri 11. Participation was voluntary, and informed consent was obtained at the beginning of the form. Students' responses were automatically recorded in spreadsheet format to maintain data accuracy and confidentiality. Ethical clearance was secured from the institution, ensuring anonymity and protection of participants' privacy.

Data Analysis

Responses were coded numerically (1–5) according to the Likert scale, with scenario-based items rated using a civic-valence rubric. The data were analyzed using descriptive and inferential statistics. Descriptive analysis involved calculating mean scores and percentages

for each dimension, while inferential analysis employed Cronbach's Alpha to test reliability and Pearson correlation to examine inter-dimensional relationships. Results were interpreted based on standardized literacy categories: Low (<60%), Moderate (60–79%), and High (≥80%).

Data Analysis

The data collected from 40 respondents were analyzed quantitatively using descriptive and inferential statistical techniques. Each of the 19 questionnaire items was scored on a five-point Likert scale ranging from *1 (Strongly Disagree / Never)* to *5 (Strongly Agree / Always)*. Scenario-based responses were additionally coded based on civic valence, where prosocial and ethical actions received higher scores, and non-reflective or unethical responses received lower scores.

The analytical procedure followed five key stages. First, the raw responses were cleaned and converted into numerical values. Second, the data were grouped according to four main dimensions of *digital citizenship literacy*: Digital Awareness (DA), Digital Ethics (DE), Digital Social Responsibility (DSR), and Digital Civic Participation (DCP). Mean scores and percentages were calculated for each dimension to categorize literacy levels as *Low (<60%)*, *Moderate (60–79%)*, or *High (≥80%)*.

Third, reliability testing was conducted using Cronbach's Alpha to evaluate internal consistency across the 19 items. Fourth, Pearson correlation analysis was performed to examine the relationships among the four dimensions and to identify the mediating role of digital ethics in fostering civic engagement. Finally, the analyzed data were interpreted in relation to the theoretical framework and were used to design the Two-Phase Digital Citizenship Literacy Reinforcement Model.

Figure 1. Data Analysis Flow

All statistical calculations were processed using Microsoft Excel and verified through SPSS (Statistical Package for the Social Sciences) for reliability and correlation analyses. Descriptive data visualization (bar charts and conceptual models) was developed to illustrate trends and the interconnection between the four literacy dimensions.

FINDINGS AND DISCUSSIONS

Findings

Descriptive statistical analysis revealed that the overall level of *digital citizenship literacy* among the 40 eleventh-grade students of SMA Negeri 11 is high, with a mean score of 4.35 (86.94%). This result indicates that the majority of students demonstrate strong ethical awareness, social responsibility, and civic engagement in digital environments. The dimension-based distribution of literacy levels is presented in Table 4

Table 4. Digital Citizenship Literacy Levels by Dimension

Dimension	Mean (1–5)	Percentage (%)	Category
Digital Awareness (DA)	3.70	74.0	Moderate
Digital Ethics (DE)	4.10	82.0	High
Digital Social Responsibility (DSR)	4.63	92.5	Very High
Digital Civic Participation (DCP)	4.96	99.25	Very High
Overall Literacy	4.35	86.94	High

The highest scores were recorded for Digital Civic Participation and Digital Social Responsibility, illustrating that students actively engage in prosocial digital behavior such as promoting online harmony, participating in community-oriented campaigns, and reporting unethical conduct. Meanwhile, Digital Awareness received the lowest score (74.0%), indicating a relative gap in students' ability to critically evaluate online information and discern credible sources.

Discussions

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Reliability and Internal Consistency

The internal consistency of the questionnaire was measured using Cronbach's Alpha, yielding coefficients ranging from 0.81 to 0.89 across dimensions, with an overall reliability of 0.87. These values confirm that the 19-item instrument possesses strong reliability for assessing digital citizenship literacy among senior high school students. The 19 items made by the researchers depend on the need.

Table 5. Reliability Coefficients (Cronbach's Alpha)

Dimension	Number of Items	Cronbach's Alpha (α)	Interpretation
Digital Awareness	7	0.81	Reliable
Digital Ethics	3	0.84	Reliable
Digital Social Responsibility	5	0.89	Highly Reliable
Digital Civic Participation	2	0.83	Reliable
Overall Instrument	19	0.87	Highly Reliable

Correlation among Dimensions

Pearson's correlation analysis revealed positive, significant relationships among all four dimensions ($p < 0.05$). The strongest correlation was found between Digital Ethics and Civic Participation ($r = 0.72$), suggesting that ethical awareness enhances students' engagement in digital civic actions. Moderate correlations were found between Digital Awareness and Social Responsibility ($r = 0.58$) and between Digital Awareness and Ethics ($r = 0.61$), indicating that information literacy supports ethical reasoning and responsible conduct online.

Table 6. Pearson Correlation Matrix

Dimensions	DA	DE	DSR	DCP
Digital Awareness (DA)	1	0.61*	0.58*	0.46*
Digital Ethics (DE)	0.61*	1	0.65*	0.72*
Digital Social Responsibility (DSR)	0.58*	0.65*	1	0.69*
Digital Civic Participation (DCP)	0.46*	0.72*	0.69*	1

Note: All correlations are significant at $p < 0.05$ (two-tailed).

These relationships demonstrate that digital ethics serves as a bridge between informational literacy and civic engagement, reinforcing the theoretical assumption that ethical reflection mediates responsible participation in the digital public sphere.
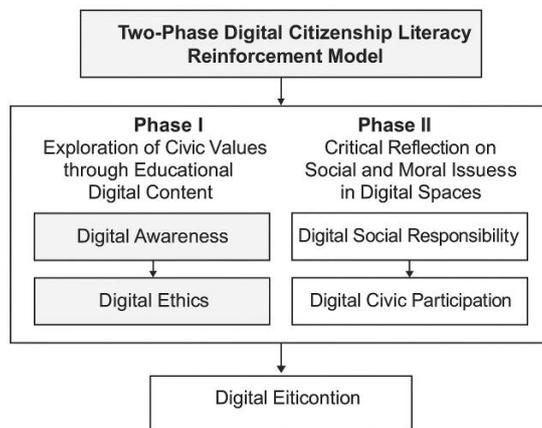
Conceptual Diagram

Figure 2. Two-Phase Digital Citizenship Literacy Reinforcement Model

Figure 2 presents the Two-Phase Digital Citizenship Literacy Reinforcement Model, which serves as the pedagogical framework proposed in this study. The model integrates the four dimensions of digital citizenship literacy, digital awareness, digital ethics, digital social responsibility, and digital civic participation into two interconnected instructional phases designed to strengthen students' civic competencies in the digital era.

In Phase I Exploration of Civic Values through Educational Digital Content, learners are exposed to value-based digital materials that highlight moral reasoning, empathy, discipline, and respect for diversity. This phase focuses on fostering digital awareness and digital ethics, enabling students to recognize credible information sources, reflect on online behavior, and understand the moral implications of their digital interactions.

Phase II Critical Reflection on Social and Moral Issues in Digital Spaces emphasizes analytical engagement and civic participation. In this stage, students are guided to discuss

real-world online issues such as cyberbullying, misinformation, and social inclusion while exercising empathy and ethical judgment. This reflective process reinforces digital social responsibility and encourages civic participation through meaningful, prosocial actions in digital communities.

The model's design illustrates a cyclical learning continuum, where awareness and ethics acquired in Phase I evolve into responsibility and participation in Phase II, ultimately leading to sustained civic engagement. By linking cognitive literacy with moral reflection, the model aligns with the vision of Society 5.0, which advocates for human-centered technological advancement that integrates ethics, empathy, and innovation.
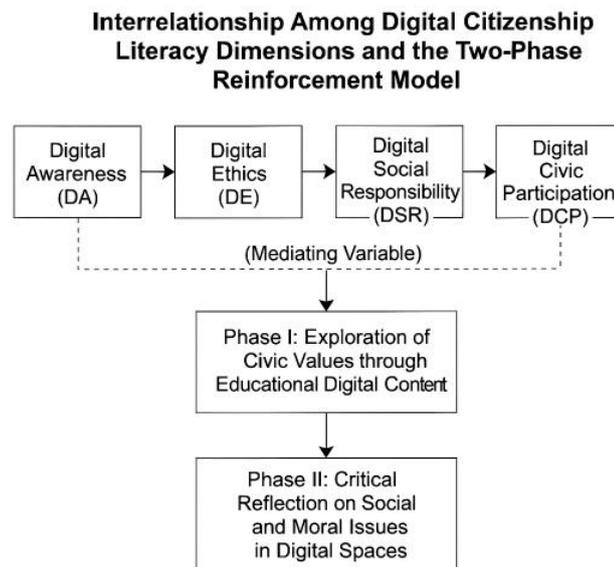

Figure 3. Interrelationship Among Digital Citizenship Literacy Dimensions and the Two-Phase Reinforcement Model

The diagram illustrates the conceptual relationship between four dimensions of *digital citizenship literacy*—Digital Awareness (DA), Digital Ethics (DE), Digital Social Responsibility (DSR), and Digital Civic Participation (DCP)—and their integration within the Two-Phase Reinforcement Model. The directional flow (DA → DE → DSR → DCP) represents the progressive development of civic competence, where awareness of digital information evolves into ethical reflection, social responsibility, and active civic engagement. The model comprises two instructional phases: Exploration of civic values through educational digital content, and Critical reflection on social and moral issues in digital spaces. Together, these stages construct a holistic framework for nurturing ethical, informed, and participatory digital citizens aligned with the Society 5.0 paradigm.

CONCLUSIONS

This study concludes that the overall level of *digital citizenship literacy* among eleventh-grade students at SMA Negeri 11 is high (M = 4.35/5; 86.94%), demonstrating that young learners possess both ethical and participatory awareness in digital spaces. Among the four dimensions, Digital Civic Participation and Digital Social Responsibility showed the highest mean scores, indicating that students actively engage in prosocial online behaviors and value-driven participation. Meanwhile, Digital Awareness scored lowest, suggesting that although students are digitally active, their ability to evaluate information sources critically needs further improvement. These findings support the implementation of a Two-Phase Digital Citizenship Literacy Reinforcement Model, consisting of the exploration of civic values through educational digital content and Critical reflection on social and moral issues in digital spaces. This model serves as a pedagogical framework to strengthen civic consciousness, digital ethics, and participatory behavior aligned with the vision of Society 5.0, in which technological advances are harmonized with human values. This study acknowledges several

limitations that may influence the interpretation and generalizability of the findings. First, the research was conducted in a single public high school, which may not fully represent the diversity of students' digital competencies across different regions or school types in Indonesia. Second, the data were collected through self-reported questionnaires, which may be affected by social desirability bias or students' subjective judgments. Third, the cross-sectional design limits the ability to observe changes in digital citizenship literacy over time, and the instrument primarily measured perceived competencies rather than directly observed digital behaviors. Future research is encouraged to involve broader and more diverse samples across multiple schools and geographic areas to enhance generalizability. Employing mixed-method or longitudinal designs would allow researchers to capture developmental trends and examine how digital citizenship competencies evolve. Experimental or quasi-experimental studies could also be implemented to evaluate the effectiveness of the proposed Two-Phase Reinforcement Model in real classroom settings. In addition, incorporating qualitative approaches, such as interviews, focus groups, classroom observations, or analysis of students' digital artifacts, may provide deeper insights into ethical reasoning and civic engagement in digital environments. Further examination of contextual factors, including digital access, family support, and school policies, is recommended to inform future curriculum development and policymaking.

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