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Building Civic Resilience Against AI-Generated Misinformation: A Pancasila-Based Digital Citizenship Education Framework

Cahyo Aulia Andi Putra[1], R. Yahdi Ramadani[2], Ni Nyoman Yuliantini[3]

Correspondence:
cahyoandi@pnb.ac.id

Affiliation:
Department of Electrical Engineering, Politeknik Negeri Bali, Indonesia[1]
cahyoandi@pnb.ac.id [1]

Department of Electrical Engineering, Politeknik Negeri Bali, Indonesia[2]
r.yahdiramadani@pnb.ac.id [2]

Department of Electrical Engineering, Politeknik Negeri Bali, Indonesia[3]
nyomanyuliantini@pnb.ac.id [3]

Abstract
Generative artificial intelligence (AI) has reshaped digital education while making the production and spread of misinformation increasingly difficult to address. This situation presents a challenge for digital citizenship, particularly in developing citizens' capacity to respond to AI-generated information critically, ethically, and responsibly. Previous research has focused on AI literacy, digital literacy, media literacy, and critical thinking, yet their connection to civic resilience remains less explored. Existing digital citizenship frameworks have also given limited attention to local philosophical values. This study proposes a Pancasila-Based Digital Citizenship Education Framework to strengthen civic resilience against AI-generated misinformation. A qualitative descriptive approach was employed through a Systematic Literature Review guided by PRISMA 2020. Literature published between 2020 and 2026 was retrieved from Scopus, ERIC, and Garuda and analyzed through thematic synthesis and conceptual mapping. The review identified five core competencies: AI literacy, critical information evaluation, digital ethical reasoning, democratic digital participation, and collective civic responsibility. These competencies were connected to Pancasila values in developing the proposed framework. The framework offers a culturally grounded approach to connecting AI literacy, digital citizenship, and civic resilience. Its relevance is also evident in Islamic Education through *aql* as reasoning, *tabayyun* as information verification, and *akhlak* as moral responsibility in the use of knowledge. These principles offer complementary ethical and epistemological perspectives without equating Pancasila and Islamic values. As a conceptual framework, it requires empirical validation for further curriculum and pedagogical development.

Keywords:
AI-generated misinformation; AI literacy; civic resilience; digital citizenship education; Pancasila.

A. INTRODUCTION

Generative Artificial Intelligence (Generative AI) has rapidly transformed the digital information ecosystem by enabling the production of text, images, audio, and video that increasingly resemble human-generated content. In education, technologies such as ChatGPT and Google Gemini offer opportunities for personalized learning, adaptive pedagogy, and knowledge creation (Alfarwan, 2025; Bencsik *et al*., 2026; Yu, 2024). However, these capabilities have also increased the production and dissemination of AI-generated misinformation, including deepfakes, synthetic media, AI hallucinations, and AI-assisted disinformation, which are becoming increasingly

difficult to distinguish from authentic information (Jaidka *et al*., 2025). Chen and Shu (2024) demonstrate that the linguistic characteristics of AI-generated content can make misinformation more persuasive and difficult to detect. This suggests that AI-generated misinformation is more than an issue of information accuracy; it also raises broader epistemic, ethical, and social challenges in digital environments.

Its impacts extend to public trust, social cohesion, democratic deliberation, and civic participation (Boulianne & Humprecht, 2024; Lewandowsky *et al*., 2024; Zaun *et al*., 2024). Therefore, addressing AI-based misinformation requires more than the ability to identify false information; it requires citizens who are capable of critically evaluating information, considering ethical consequences, and participating responsibly in digital spaces (Pawelec, 2022). In the Indonesian context, this need has become increasingly important given the widespread use of social media and the growing presence of digital content that can influence public opinion and social cohesion. Although media and digital literacy have contributed to people's ability to identify misinformation (Bilo-thomas *et al*., 2021), the development of Generative AI has created new challenges through the increasingly easy, rapid, and convincing production of synthetic content (Sarjito, 2024).

Existing educational responses have primarily emphasized AI literacy, digital literacy, media literacy, and critical thinking. Although these approaches are important, they tend to conceptualize resilience primarily as an individual cognitive capacity, giving less attention to collective dimensions such as social responsibility, cohesion, and democratic participation. In addition, emerging Digital Citizenship frameworks remain largely rooted in Western contexts and have relatively limited integration of local philosophical values as normative foundations for digital citizenship in non-Western societies (Ardiansyah *et al*., 2026). In the Indonesian context, Pancasila provides a philosophical foundation that connects digital competencies with ethical reasoning, humanity, unity, deliberation, and social justice. However, the integration of these values into digital citizenship education to build civic resilience against AI-generated misinformation remains underexplored (Damanik *et al*., 2026).

The relevance of a Pancasila-based framework can also be strengthened within the context of Islamic Education. Islamic Education is oriented not only toward the acquisition of knowledge but also toward the development of character (*akhlak*), moral responsibility, and the responsible use of knowledge (Mahmud *et al*., 2026). The principle of *'aql* emphasizes the use of reasoning in understanding knowledge, while *tabayyun* emphasizes the importance of verification before accepting or disseminating information (Hakim & Susilo, 2026; Mukaromah *et al*., 2026). These principles are directly relevant to the needs of AI literacy and digital citizenship, particularly in evaluating the credibility of information, considering ethical consequences, and taking responsibility for digital communication. At the level of values, there are also points of convergence between Pancasila and Islamic values in aspects of divinity, humanity, unity, deliberation, and justice. Thus, Islamic Education can serve as a pedagogical context that strengthens the ethical and epistemological dimensions of a Pancasila-based digital citizenship framework without equating the two systems of values.

To address these gaps, this study proposes a Pancasila-Based Digital Citizenship Education Framework through a Systematic Literature Review (SLR) following the PRISMA 2020 guidelines. The framework integrates Pancasila values with digital citizenship competencies, AI literacy, critical information evaluation, ethical reasoning, democratic participation, and collective responsibility, while also considering ethical and epistemological principles relevant to Islamic Education. The framework broadens the concept of civic resilience beyond the ability to detect misinformation to include the capacity to assess, respond to, and participate responsibly in digital spaces. Accordingly, this study offers a contextual approach that connects Pancasila, Islamic Education, and

digital citizenship in addressing the epistemic challenges arising from the development of Generative AI.

B. METHODS

This study adopted a qualitative descriptive approach through a Systematic Literature Review (SLR) guided by the PRISMA 2020 framework to ensure a transparent, rigorous, and replicable review process (Page *et al*., 2021). Relevant literature on AI-generated misinformation, AI literacy, digital citizenship education, civic resilience, and Pancasila-based citizenship education was retrieved from Scopus and ERIC for international publications and complemented by Garuda, Indonesia's national research portal indexing SINTA-accredited journals, to capture contextually relevant national studies. The search focused on peer-reviewed articles published between 2020 and 2026 using Boolean search strategies developed from combinations of keywords aligned with the research objectives.

Eligible studies were analyzed using thematic synthesis following Thomas and Harden (2008), comprising line-by-line coding, the development of descriptive themes, and the generation of analytical themes to identify recurring concepts, competencies, and educational strategies. The resulting analytical themes were subsequently examined through conceptual mapping to integrate Pancasila values with the dimensions of AI literacy and digital citizenship, thereby informing the development of the Pancasila-Based Digital Citizenship Education Framework for strengthening civic resilience against AI-generated misinformation.

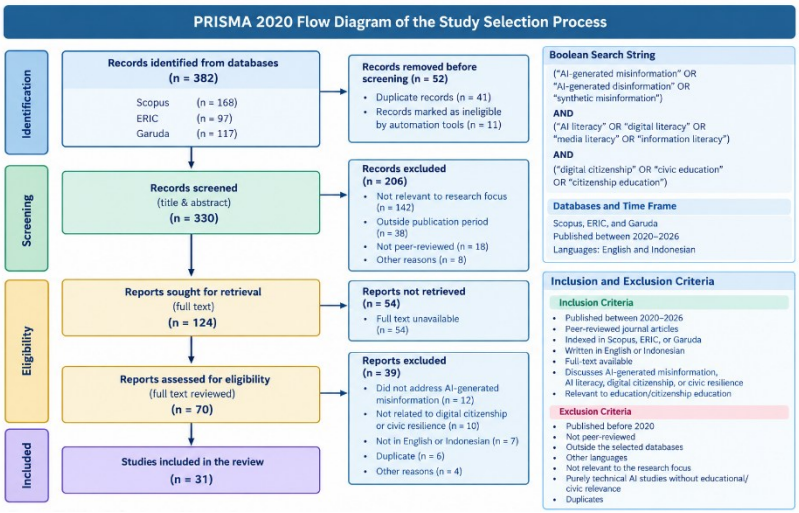


Figure 1. PRISMA 2020 Flowchart & Boolean Search String

C. RESULT & DISCUSSION

Civic Challenges and Educational Responses

The thematic synthesis shows that the rapid development of Generative Artificial Intelligence (Generative AI) has changed the digital information ecosystem. It has affected how information is produced, distributed, and consumed. Technologies such as large language models (LLMs), text and image generation, and synthetic media now make it possible to produce content on a large scale that increasingly resembles human-created content (Storey *et al*., 2025). At the same time, these technologies can also support the spread of AI-generated misinformation. This includes deepfakes, synthetic media, and other forms of manipulated content that are becoming more realistic and difficult to verify (Chu-ke & Dong, 2024; Mutmainnah *et al*., 2024; Zhou & Parker, 2023).

The problem is also related to AI hallucinations, which can produce information that appears reasonable but is actually inaccurate. In addition, algorithmic recommendation systems may contribute to the spread of misinformation through

personalization, filter bubbles, and echo chambers (Cinelli *et al*., 2021; Ji *et al*., 2023). These conditions show that AI-generated misinformation is not only a technological or information-quality issue. It has also become a broader challenge for the digital information ecosystem. The effects of this problem go beyond information accuracy and can influence civic life. When people find it difficult to distinguish authentic content from manipulated content, public trust in institutions, professional media, and credible sources of information may be weakened (Lewandowsky & Smillie, 2020). Digital environments that rely heavily on algorithms may also increase polarization and reduce people's exposure to different perspectives. These conditions can affect democratic deliberation and civic participation (Boulianne, 2020; Cinelli *et al*., 2021; Lorenz-spreen *et al*., 2023). Based on the synthesis, this study identifies five main civic challenges: declining civic trust, increasing social polarization, information uncertainty, public opinion manipulation, and democratic vulnerability.

Table 1. Civic Challenges Related to AI-Generated Misinformation

Emerging Civic Challenges	Description
Declining Civic Trust	The proliferation of synthetic content & manipulated information may undermine public confidence in democratic institutions, professional media, & credible sources of knowledge.
Increasing Social Polarization	Algorithmic personalization and echo chambers reinforce selective exposure to similar viewpoints, limiting engagement with diverse perspectives.
Information Uncertainty	The difficulty in distinguishing authentic information from AI-generated content challenges individuals' ability to critically evaluate & verify digital information.
Public Opinion Manipulation	Generative AI enables the large-scale production of persuasive narratives, increasing the potential for targeted manipulation of public perceptions and attitudes.
Democratic Vulnerability	The spread of misinformation may weaken public deliberation, informed decision-making, and social cohesion within democratic societies.

These five challenges show that AI-generated misinformation has cognitive, social, ethical, and democratic dimensions. For this reason, addressing the problem requires more than technologies that can detect synthetic content. It also requires stronger civic capacities. These capacities include AI literacy, critical evaluation of information, digital ethical reasoning, and civic responsibility. In this context, civic resilience is important because it can support citizens in dealing with the complexity of AI-based information environments. At the same time, it can contribute to maintaining social trust, social cohesion, and democratic values. The synthesis of educational responses shows that AI literacy, digital literacy, media literacy, and critical thinking are among the approaches most commonly discussed in the literature (Long & Magerko, 2020; Otero *et al*., 2023; Valverde-berrocoso *et al*., 2022). These competencies can help individuals understand AI technologies, assess the credibility of information, and make appropriate decisions when interacting with digital content. However, current approaches still tend to focus on individual cognitive skills, especially the detection and verification of misinformation. Civic dimensions such as trust, democratic participation, collective responsibility, and civic resilience receive relatively less attention.

A similar pattern can be found in the Indonesian context. Digital citizenship education has mainly emphasized digital literacy and digital ethics, while the integration of local values and civic capacities for dealing with AI-based misinformation remains limited (Purwantiningsih *et al*., 2022). This gap provides a basis for developing an approach that connects digital competencies with civic values and responsibilities in

the Indonesian context. The values of Pancasila; belief in God, humanity, unity, deliberation, and social justice, can serve as a normative foundation for connecting AI literacy and information evaluation with ethical reasoning, social responsibility, and democratic participation. In the context of Islamic Education, the principles of *aql* and *tabayyun* are also relevant. They emphasize the use of reasoning and the need to verify information before accepting or sharing it. There are points of connection between Pancasila and Islamic values in areas such as belief in God, humanity, unity, deliberation, and justice. However, these two value systems should not be treated as identical. Their relationship can instead provide a relevant context for developing digital citizenship education that goes beyond technical skills. It can also encourage moral and social responsibility in the use of digital information.

Based on this overall synthesis, this study integrates digital and civic competencies with Pancasila values and relevant ethical and epistemological principles from Islamic Education into the Pancasila-Based Digital Citizenship Education Framework. The framework aims to broaden the concept of civic resilience. Rather than focusing only on the ability to detect and evaluate misinformation, it also emphasizes the ability to assess information, respond appropriately, and participate responsibly in AI-based digital environments.

Synthesizing Core Competencies for Civic Resilience

The thematic synthesis of the reviewed literature identified five core competencies that consistently emerged as the foundation for strengthening civic resilience against AI-generated misinformation. Although previous studies employed different terminologies and research emphases, the processes of line-by-line coding, the development of descriptive themes, and the generation of analytical themes revealed recurring conceptual patterns across the literature. These recurring concepts were consolidated into five core competencies: AI literacy, critical information evaluation, digital ethical reasoning, democratic digital participation, and collective civic responsibility. These findings suggest that resilience to AI-generated misinformation cannot be achieved solely through technical competencies or information evaluation skills but requires the integration of cognitive, ethical, participatory, and civic capacities. This finding is consistent with the evolving discourse on AI literacy and digital citizenship, which emphasizes the integration of technological competence, ethical reasoning, and civic engagement as essential components for navigating the increasingly complex digital information ecosystem.

Table 2. Core Competencies Identified Through Thematic Synthesis

Core Competency	Representative Concept	Contribution to Civic Resilience
AI Literacy	AI awareness, AI competency, understanding AI capabilities and limitations	Ensures equitable access to AI literacy, enabling citizens to recognize AI-generated content and understand AI-related risks.
Critical Information Evaluation	Fact-checking, source verification, evidence-based reasoning	Strengthens the ability to evaluate information credibility and resist misinformation.
Digital Ethical Reasoning	Digital ethics, responsible AI use, ethical awareness	Encourages responsible digital behaviour and ethical information sharing.
Democratic Digital Participation	Civic engagement, democratic dialogue, online participation	Promotes constructive participation and democratic resilience in digital spaces.

Collecticve Civic Responbility	Social responsibility, collaborative action, civic responsibility	Reinforces collective efforts to maintain a trustworthy digital information ecosystem.

The identified competencies indicate that civic resilience is developed through the integration of cognitive, ethical, and participatory capacities rather than a single capability. AI literacy and critical information evaluation establish the cognitive foundation for understanding AI technologies and assessing the credibility of digital information, while digital ethical reasoning, democratic digital participation, and collective civic responsibility foster responsible digital behaviour, active civic engagement, and a shared commitment to maintaining the integrity of the digital information ecosystem (UNESCO, 2024; OECD, 2024). Collectively, these findings suggest that resilience against AI-generated misinformation depends on the balanced integration of technological understanding, critical information evaluation, ethical reasoning, democratic participation, and collective civic responsibility. Accordingly, civic resilience should be understood as a multidimensional civic capacity that enables individuals and communities to sustain a trustworthy, ethical, and democratic digital environment.

Unlike previous studies that have examined these competencies independently, this study integrates them into a coherent conceptual foundation for the Pancasila-Based Digital Citizenship Education Framework. Although these competencies are widely recognized in the international literature, their implementation requires contextualization within Indonesia's socio-cultural and democratic context. Therefore, this study positions the philosophical values of Pancasila as the normative foundation for contextualizing the five core competencies into a culturally grounded digital citizenship education framework. The following section presents the mapping between the five competencies and the values of Pancasila as the basis for strengthening civic resilience against AI-generated misinformation.

Pancasila-Based Digital Citizenship Education Framework

Based on the thematic synthesis, this study proposes a Pancasila-Based Digital Citizenship Education Framework to strengthen civic resilience against AI-generated misinformation. While existing digital citizenship frameworks primarily emphasize universal digital competencies, the proposed framework reconceptualizes these competencies through the philosophical values of Pancasila. Rather than treating Pancasila as complementary content, it serves as the normative foundation that guides ethical reasoning, democratic participation, and collective civic responsibility, resulting in a culturally grounded framework for the Indonesian context.

This normative gap is not merely a critical observation of the literature, but a methodological point of departure for the framework's formulation. As discussed in the preceding section, the five competencies derived from the synthesis largely specify what digital citizens need to master, yet rarely articulate the normative basis that should guide how these competencies are practiced. The following section details how each of the five principles of Pancasila provides this orientation to its corresponding competency.

Table 3. Core Competencies Identified Through Thematic Synthesis

Principle (Sila)	Core normative value	Directed competency	Conceptual rationale
Belief in the One and Only God (*Ketuhanan Yang Maha Esa*)	Moral conscience and transcendent accountability for one's actions	Digital ethical reasoning	Awareness of moral accountability forms the inner basis for ethical deliberation prior to acting in digital spaces
Just and Civilized Humanity (*Kemanusiaan yang Adil dan Beradab*)	Respect for human dignity and empathy toward others	Critical information evaluation	Assessing the veracity of information requires simultaneously considering its impact on the dignity of others who may be harmed by misinformation
The Unity of Indonesia (*Persatuan Indonesia*)	Social cohesion and rejection of polarization	Collective civic responsibility	Preserving unity demands awareness that individual digital actions affect the collective interest, not merely the self
Democracy Guided by the Inner Wisdom in the Unanimity Arising Out of Deliberations Amongst Representatives (*Kerakyatan yang Dipimpin oleh Hikmat Kebijaksanaan …*)	Deliberation and popular sovereignty in decision-making	Democratic digital participation	The principle of deliberation directly calls for citizen engagement in public deliberative spaces, including digital ones
Social Justice for the Whole of the Indonesian People (*Keadilan Sosial bagi Seluruh Rakyat Indonesia*)	Equitable access and shared welfare	Equitable access to AI literacy	Social justice requires equitable access to digital knowledge so that gaps in AI literacy do not widen existing social inequality

The mapping presented in Table 3 demonstrates that the relationship between each principle of Pancasila and its corresponding competency is grounded in the alignment between the normative values embedded in each principle and the ethical-civic character of the competency. Rather than representing arbitrary pairings, each competency derives its normative orientation from a specific principle of Pancasila. Accordingly, Sila 1 guides digital ethical reasoning through moral accountability, Sila 2 underpins critical information evaluation by emphasizing respect for human dignity, Sila 3 strengthens collective civic responsibility in preserving social cohesion, Sila 4 directs democratic digital participation through deliberative engagement, and Sila 5 positions equitable access to AI literacy as an expression of social justice.

Collectively, these findings demonstrate that the identified competencies constitute an integrated system of civic competencies rather than a collection of independent digital skills. Accordingly, strengthening civic resilience against AI-generated misinformation requires the balanced development of ethical reasoning, critical information evaluation, democratic participation, collective civic responsibility, and equitable access to AI literacy. Grounded in this conceptual foundation, the proposed Pancasila-Based Digital Citizenship Education Framework integrates these competencies into a systematic educational process designed to strengthen civic resilience against AI-generated misinformation. The overall conceptual structure of the proposed framework is presented in Figure 1.

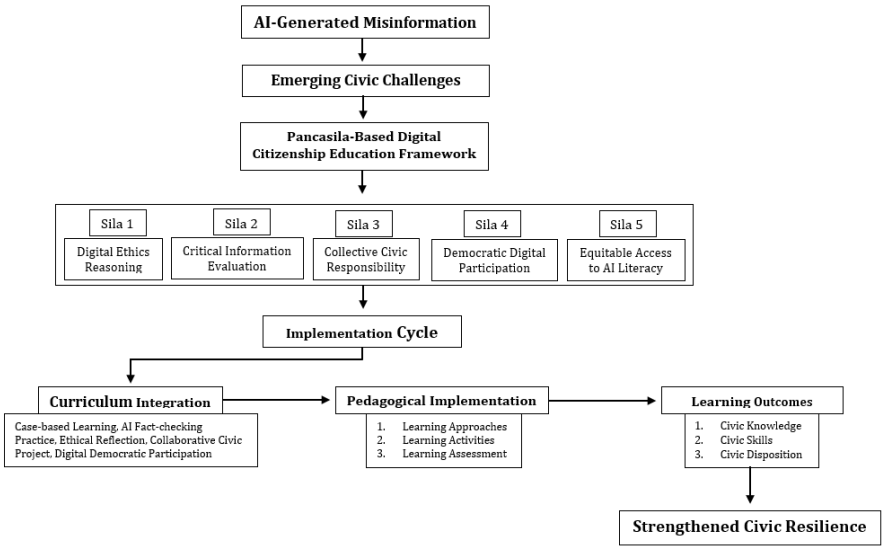


Figure 2. Pancasila-Based Digital Citizenship Education Framework

Figure 1 illustrates the Pancasila-Based Digital Citizenship Education Framework developed from the thematic synthesis as a conceptual model for strengthening civic resilience against AI-generated misinformation. The framework conceptualizes AI-generated misinformation as the starting point of emerging civic challenges that extend beyond information accuracy to include ethical, social, and democratic concerns. In response, the framework positions Pancasila as the philosophical foundation that provides normative direction for developing five interrelated competencies: digital ethical reasoning, critical information evaluation, collective civic responsibility, democratic digital participation, and equitable access to AI literacy. Rather than functioning as independent digital skills, these competencies form an integrated civic capacity grounded in the values of Pancasila.

The framework further demonstrates that strengthening civic resilience requires these competencies to be operationalized through a systematic educational process. This process is represented by an implementation cycle that connects curriculum integration, pedagogical implementation, and learning outcomes. Within this cycle, Pancasila values are embedded into curriculum content, learning approaches, learning activities, and assessment practices to foster civic knowledge, civic skills, and civic dispositions. Through this integrated process, learners are expected to develop the capacity to critically evaluate AI-generated information, make ethical decisions, participate responsibly in democratic digital environments, and collectively safeguard the integrity of the digital information ecosystem. Ultimately, the framework positions civic resilience not merely as an individual ability to resist misinformation, but as a collective civic capacity cultivated through contextually grounded Digital Citizenship Education informed by the philosophical values of Pancasila.

D. CONCLUSION

This study emphasizes that addressing AI-generated misinformation requires more than technological solutions; it also calls for education that enables citizens to assess information critically, act ethically, and participate responsibly in digital spaces. Drawing on a Systematic Literature Review guided by PRISMA 2020, the proposed Pancasila-Based Digital Citizenship Education framework places five core competencies at the center of efforts to strengthen civic resilience in the AI era. The framework is also relevant to the context of Islamic Education, particularly through the principles of *aql*, *tabayyun*, *akhlak*, and responsible use of knowledge, which share points of convergence with Pancasila values without conflating the two value systems. This perspective offers

further space to examine the ethical and epistemological dimensions of digital citizenship, particularly as citizens increasingly encounter AI-generated information. While the framework remains conceptual and requires empirical validation, it provides an initial basis for developing curricula and pedagogical practices that connect AI literacy, Pancasila values, and the context of Islamic Education in fostering citizens who are critical, ethical, and resilient.

REFERENCES

Alfarwan, A. (2025). Generative AI Use in K-12 Education: A Systematic Review. *Frontiers in Education*, *10*, 1–12. https://doi.org/10.3389/feduc.2025.1647573

Ardiansyah, S., Yorman, & Rassyi, S. F. (2026). Digital Citizenship Education for Good Governance : A Character-Based Approach Rooted in Local Wisdom. *Innovations in Pedagogy and Technology*, *02*(01), 24–37. https://doi.org/10.63385/ipt.v2i1.223

Bencsik, A., Szalai, S. M., & Jenei, S. (2026). Generative AI and Knowledge Management in Higher Education : the Impact of Human Development on Student Perceptions. *Journal of Knowledge Management*, *30*(11), 293–318. https://doi.org/10.1108/JKM-07-2025-0995

Bilo-thomas, P., Hogan-taylor, C., Weninger, T., & Yankoski, M. (2021). Pilot Study Suggests Online Media Literacy Programming Reduces Belief in False News in Indonesia. *ArXiv Preprint*, 1–13. https://doi.org/10.48550/arXiv.2107.08034

Boulianne, S. (2020). Twenty Years of Digital Media Effects on Civic and Political Participation. *Communication Research*, *47*(7), 947–966. https://doi.org/10.1177/0093650218808186

Boulianne, S., & Humprecht, E. (2024). Perceived Exposure to Misinformation and Trust in Institutions in Four Countries Before and During a Pandemic. *International Journal of Communication*, *17*(2023), 2024–2047. https://ijoc.org/index.php/ijoc/article/view/20110

Chen, C., & Shu, K. (2024). Can LLM-Generated Misinformation be Detected? *International Conference on Learning Representations*, 1–40.

Chu-ke, C., & Dong, Y. (2024). Misinformation and Literacies in the Era of Generative Arti fi cial Intelligence : A Brief Overview and a Call for Future Research. *Emerging Media*, *2*(1), 70–85. https://doi.org/10.1177/27523543241240285

Cinelli, M., Francisci, G. De, Galeazzi, A., & Quattrociocchi, W. (2021). The Echo Chamber Effect on Social Media. *Proceedings of the National Academy of Sciences*, 118(9). https://doi.org/10.1073/pnas.2023301118

Damanik, P. C. I. C., Chaled, M. I., Husaeni, R. A., Uli, A. A., & Jayanti, F. D. (2026). Reconceptualizing Pancasila-Based Citizenship Education in the Digital Age: Integrating Artificial Intelligence, Digital Ethics, and Project-Based Learning. *PENDAS: Jurnal Pendidikan Dasar Indonesia: Jurnal Pendidikan Dasar Indonesia*, *11*(1). https://doi.org/10.23969/jp.v11i01.42780

Hakim, H. Al, & Susilo, M. J. (2026). Tabayyun-Based Digital Literacy: Strategies for Strengthening Student Competencies in PAI Learning. *Al-Mudarris: Jurnal Ilmiah Pendidikan Islam*, *9*(1), 161–172. https://doi.org/10.23971/mdr.v9i1.11188

Jaidka, K., Chen, T., Chesterman, S., Hsu, W., Kan, M.-Y., Kankanhalli, M., Lee, M. L., Seres, G., Sim, T., Taeihagh, A., Tung, A., Xiao, X., & Yue, A. (2025). Misinformation, Disinformation, and Generative AI: Implications for Perception and Policy. *Digit. Gov. Res. Pract*, *6*(1), 1–15. https://doi.org/10.1145/3689372 1

Ji, Z., Lee, N., Frieske, R., Yu, T., Su, D. A. N., Xu, Y. A. N., Ishii, E., Bang, Y. E. J. I. N., Madotto, A., & Fung, P. (2023). Survey of Hallucination in Natural Language Generation. *ACM Computing Surveys*, *55*(12), 248. https://doi.org/10.1145/3571730

Lewandowsky, S., Ecker, U. K. H., Cook, J., Linden, S. Van Der, Roozenbeej, J., & Oreskes, N. (2024). Europe PMC Funders Group Misinformation and the Epistemic Integrity of Democracy. *Curr Opin Psychol*, *19*, 1–9.

https://doi.org/10.1016/j.copsyc.2023.101711
Lewandowsky, S., & Smillie, L. (2020). *Technology & Democracy: Understanding the Influence of Online Technologies on Political Behaviour & Decision-Making*. Office of the European Union. https://doi.org/10.2760/709177
Long, D., & Magerko, B. (2020). What is AI Literacy? Competencies and Design Considerations. *Conference on Human Factors in Computing Systems - Proceedings*, 1–16. https://doi.org/10.1145/3313831.3376727
Lorenz-spreen, P., Oswald, L., Lewandowsky, S., & Hertwig, R. (2023). A Systematic Review of Worldwide Causal and Correlational Evidence on Digital Media and Democracy. *Nature Human Behaviour*, *7*(January). https://doi.org/10.1038/s41562-022-01460-1
Mahmud, A., Kalamollah, M., & Mustakim. (2026). Rekonstruksi Digital Citizenship Berbasis Nilai-Nilai Pendidikan Agama Islam dalam Menghadapi Tantangan Artificial Intelligence di Perguruan Tinggi. *Jurnal Pemikiran Dan Pendidikan Islam*, *16*(66), 285–306. https://doi.org/10.54180/elbanat.2026.16.1.285- 306
Mukaromah, M., Janah, S. M., & Bin, M. A. (2026). Reframing Islamic Education in the Post-Truth Era: Integrating Islamic Epistemology and Digital Ethics through Tabayyun Literacy. *Edukasia: Jurnal Penelitian Pendidikan Islam*, *21*(1), 65–84. https://doi.org/10.21043/edukasia.v21i1.36098
Mutmainnah, A., Suhandi, A. M., & Herlambang, Y. T. (2024). Problematika Teknologi Deepfake Sebagai Masa Depan Hoax yang Semakin Meningkat: Solusi Strategis Ditinjau dari Literasi Digital. *UPGRADE: Jurnal Pendidikan Teknologi Informasi*, *1*(2), 67–72. https://doi.org/10.30812/upgrade.v1i2.3702
Otero, L. C., Catala, A., Morante, C. F., Taboada, M., Cebreiro, B., & Barro, S. (2023). AI Literacy in K-12 : a Systematic Literature Review. *International Journal of STEM Education*. https://doi.org/10.1186/s40594-023-00418-7
Page, M. J., Mckenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-wilson, E., Mcdonald, S., … Moher, D. (2021). The PRISMA 2020 Statement : an Updated Guideline for Reporting Systematic Reviews. *RESEARCH METHODS AND REPORTING*. https://doi.org/10.1371/journal.pmed.1003583
Pawelec, M. (2022). Deepfakes and Democracy (Theory): How Synthetic Audio - Visual Media for Disinformation and Hate Speech Threaten Core Democratic Functions. In *Digital Society*. Springer International Publishing. https://doi.org/10.1007/s44206-022-00010-6
Purwantiningsih, A., Riyanti, D., Cabe, J., Cabe, R.-P., Selatan, T., & Danang Prasetyo, I. (2022). Digital Citizenship in Indonesia: Digital Literacy and Digital Politeness Using Social Media. *Jurnal Ilmiah Pendidikan Pancasila Dan Kewarganegaraan*, *7*(November), 628–637. https://doi.org/10.17977/um019v7i3p628-637
Sarjito, A. (2024). Hoaks, Disinformasi, dan Ketahanan Nasional: Ancaman Teknologi Informasi dalam Masyarakat Digital Indonesia. *Journal of Governance and Local Politics*, *6*(2), 175–186. https://doi.org/10.47650/jglp.v6i2.1547
Storey, V. C., Thoo, W., Leon, Y. J., & Roman, Z. (2025). Generative Artificial Intelligence: Evolving Technology, Growing Societal Impact, and Opportunities for Information Systems Research. *Information Systems Frontiers*, *27*(5), 2081–2102. https://doi.org/10.1007/s10796-025-10581-7
Thomas, J., & Harden, A. (2008). Methods for the Thematic Synthesis of Qualitative Research in Systematic Reviews. *BMC Medical Research Methodology*, *8*(45), 1–10. https://doi.org/10.1186/1471-2288-8-45
Valverde-berrocoso, J., González-fernández, A., & Acevedo-borrega, J. (2022). Disinformation and Multiliteracy: A Systematic Review of the Literature. *Comunicar: Media Education Research Journal*, *30*(70), 93–105.

https://doi.org/10.3916/C70-2022-08
Yu, H. (2024). The application and challenges of ChatGPT in educational transformation: New demands for teachers' roles. *Heliyon*, *10*(2), e24289. https://doi.org/10.1016/j.heliyon.2024.e24289
Zaun, D., Jones, E., & Chandrasekharan, E. (2024). Measuring Epistemic Trust : Towards a New Lens for Democratic Legitimacy , Misinformation , and Echo Chambers. *Proceedings of the ACM on Human-Computer Interaction*, *8*(CSCW2). https://doi.org/10.1145/3687001
Zhou, J., & Parker, A. G. (2023). Synthetic Lies : Understanding AI-Generated Misinformation and Evaluating Algorithmic and Human Solutions. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*. Association for Computing Machinery. https://doi.org/10.1145/3544548.3581318