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Digital Citizenship Education and Youth Resilience in the Face of Disinformation and Brain Drain Tendencies: An SDG 16 Perspective

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Abstract:

The transformation of the digital landscape has enhanced young people's access to information while simultaneously increasing their exposure to disinformation factors that can influence their understanding of public issues, levels of trust, and future outlooks. This study aims to explore the role of Digital Citizenship Education in strengthening the civic resilience of young people against disinformation and to understand brain drain orientations within the framework of Sustainable Development Goal (SDG) 16. A qualitative approach with a descriptive exploratory design was employed at Mulawarman University. The study involved 10 students selected purposively based on their use of social media as a source of public and national information, their experience encountering suspected hoaxes or disinformation, and their involvement in organizations, communities, social initiatives, or civic activities. Data were collected through interviews and analyzed thematically through stages of data familiarization, coding, categorization, theme development, and interpretation. The results indicate that while students actively use social media to access information regarding social, educational, political, and national matters, their information evaluation skills vary. Some students verify sources and cross-reference information before trusting or sharing it, whereas others remain influenced by headlines, popularity, and source familiarity. Civic resilience is demonstrated through critical thinking, information verification, ethical communication, the upholding of civic values, and responsible participation. Brain drain orientations were not perceived as a direct consequence of disinformation but were instead linked to perceptions regarding opportunities and the future. These findings underscore the relevance of Digital Citizenship Education in bolstering civic resilience and supporting the achievement of SDG 16 by fostering a generation of young people who are critical, responsible, and constructive participants in the digital public sphere.

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Introduction (مقدمة)

Digital transformation has altered information consumption patterns among the younger generation. Ahmad and Nurhidaya (2020) indicate that the internet has become the primary source of information. Global Statistics (2026) records 204.7 million internet users representing a 73.7% penetration rate and 191.4 million social media users. The dominance of the 15–34 age group, numbering over 66 million individuals, reinforces the younger generation's position within the digital ecosystem. However, high levels of access have not been matched by adequate literacy. Disinformation remains rampant, creating a paradox between widespread access and limited ability to evaluate information. Data from the OECD (2023) specifically the PISA 2022 results show improvements in literacy; however, performance remains below the global average, with a mathematics score of 472, trailing behind nations such as Singapore and Finland. This improvement has not yet been transformational, as the focus remains on access rather than the quality of critical thinking a skill essential for understanding and verifying information in the digital era.

Limited critical thinking skills contribute to vulnerability regarding disinformation. Komdigi (2025) reports a high volume of negative content, including over 234,000 cases of gambling in January alone, alongside thousands of instances involving pornography, fraud, and radicalism. Hoaxes also remain a significant issue, with hundreds of recorded cases. Dame (2022) asserts that disinformation thrives in societies with low levels of literacy. Consequently, the younger generation is susceptible to misleading information that shapes their perceptions of and trust in national issues. This vulnerability impacts their future outlook. BPS (2023) recorded a NEET (Not in Education, Employment, or Training) rate of 15.10%, rising to 29.39% among the 19–24 age group. A brain drain phenomenon also emerges as young people choose not to return home after studying abroad. Chen et al. (2024) attribute this to declining confidence in domestic opportunities, while Arif (2020) highlights the role of non-economic factors, such as trust in social and political systems. These conditions point to a crisis of citizenship, characterized by a weakening of the younger generation's attachment to and sense of responsibility toward the nation.

The issues of disinformation and limited critical thinking skills are relevant to Sustainable Development Goal (SDG) 16, which emphasizes the development of peaceful, just, and inclusive societies, as well as the strengthening of effective and accountable institutions. In this context, Digital Citizenship Education plays a vital role in shaping a young generation capable of accessing, evaluating, and utilizing information critically and responsibly. Strengthening civic resilience is crucial to ensure that young people are not easily swayed by disinformation, maintain trust and constructive engagement in public life, and are able to contribute to nation-building. Thus, Digital Citizenship Education is relevant not only as a response to the challenges

of digital transformation but also as part of the effort to cultivate citizens who are critical, inclusive, participatory, and resilient in support of achieving SDG 16.

This situation raises questions regarding the role of civic education in shaping a young generation that is not only intelligent but also possesses a commitment to the nation. Ongesa (2020) asserts that civic education must go beyond the mere transfer of normative knowledge by fostering critical thinking, global awareness, and social responsibility. In **Civic Education for Democratic Citizens**, Journell (2024) explains that the primary goal is to mold citizens who are participatory, critical, and oriented toward social justice. In the Indonesian context – faced with disinformation and low levels of critical literacy – conventional approaches are proving inadequate. This situation demands a transformation toward a more adaptive and contextual form of civic education. Approaches need to be grounded in digital critical literacy so that young people can evaluate information and construct rational arguments. Furthermore, it is essential to cultivate a sense of connection to and responsibility for the nation's future. Thus, civic education can serve as a strategic pillar in shaping a generation that is competent, possesses integrity, and is committed to Indonesia.

While research on digital citizenship, digital literacy, and disinformation has expanded, existing studies tend to address these aspects in isolation. Various studies indicate that digital citizenship education can strengthen learners' ability to use digital media safely, critically, and responsibly, whereas research on media literacy highlights the importance of evaluating information credibility when confronted with misinformation and disinformation. Other studies have examined the civic engagement of young people in digital spaces and institutional factors related to the mobility of skilled labor. However, there is limited empirical research integrating digital citizenship education, civic resilience, disinformation, and brain drain orientation into a single analytical framework, particularly regarding university students in Indonesia. Studies on disinformation generally focus on information identification skills or media literacy, while research on brain drain tends to emphasize economic factors, job opportunities, institutional quality, and migration decisions. Consequently, the relationship between young people's ability to navigate the digital information ecosystem, their civic resilience, and their orientation toward a future either at home or abroad remains underexplored from the perspective of citizenship education.

This gap is particularly significant in the Indonesian context, as young people are highly active in the digital sphere while simultaneously navigating social, educational, economic, and institutional changes that shape their future orientations. This study offers a novel approach by framing Digital Citizenship Education not merely as a set of technology-use competencies, but as a process of fostering civic resilience encompassing the ability to verify information, think critically, build trust reflectively, communicate ethically, and maintain civic engagement amidst a landscape of uncertain information. Specifically, the research explores how Mulawarman University students' experiences with disinformation relate to the development of civic resilience, and how orientations toward overseas educational or employment opportunities are understood in relation to civic attachment, trust, and responsibility. Thus, the study contributes by developing an integrative perspective that links the dimensions of information literacy, civic resilience, and the future orientations of young people within the framework of Digital Citizenship Education and SDG 16.



Method (منهج)

This study employs a qualitative approach with an exploratory-descriptive design to gain an in-depth understanding of the experiences, perceptions, and views of the younger generation regarding Digital Citizenship Education, civic resilience, disinformation, and orientations toward

brain drain within the context of digital life. The research was conducted with students from Mulawarman University, representing a demographic of young people who actively use digital technology and social media.

Research informants were selected using purposive sampling, taking into account the relevance of their experiences and characteristics to the research focus. Informants were categorized into three groups: (1) students who actively use social media as a source of information regarding public and national affairs; (2) students who have encountered or been exposed to information suspected of being a hoax or disinformation; and (3) students active in student organizations, communities, social initiatives, or civic activities. These categories were employed to capture a diversity of perspectives regarding information evaluation skills, institutional trust, civic resilience, and future orientation.

The number of informants was determined incrementally based on the principle of information adequacy, with data collection ceasing once interviews yielded repetitive information and no new substantive themes emerged. Initially, the study involved 10 students, with a proportional distribution of informants across categories. Diversity among informants was also considered based on faculty, semester level, and type of student activity – to ensure a broader range of perspectives.

Result (نتائج)

Research findings indicate that Mulawarman University students are part of a young generation that actively engages with the digital space to acquire, process, and disseminate information. Social media and various digital platforms serve as sources of information for students to keep up with social, educational, political, and national issues, as well as developments in their local environment. While this landscape offers students opportunities to access information quickly and broaden their horizons, it simultaneously presents challenges regarding the prevalence of inaccurate, manipulative, and misleading information.

In dealing with disinformation, students show diverse experiences. Some students have the habit of checking sources and comparing information before believing or sharing it, while others still tend to receive information based on the title, popularity of the content, or sources that are considered familiar. These findings indicate that the high intensity of digital media use is not always accompanied by adequate information evaluation capabilities. The context of Mulawarman University is important because students are in an academic environment that brings together various social, cultural and regional backgrounds in East Kalimantan. Apart from that, the development of the Indonesian Capital City provides a new context for the young generation in East Kalimantan to deal with social, economic, technological, educational and civic changes. In this situation, students' ability to sort information and maintain a critical attitude becomes an important part of their readiness as citizens.

The research findings also indicate that strengthening civic resilience involves not only the ability to reject false information but also the capacity of students to uphold civic values, build critical trust in information and institutions, and participate responsibly in the digital public sphere. Consequently, Digital Citizenship Education is considered relevant for equipping Universitas Mulawarman students to navigate the dynamics of the digital space and the social changes occurring in East Kalimantan. Overall, the findings point to a need to strengthen Citizenship Education so that it is more contextual to students' lives – specifically through the development of digital literacy, critical thinking, information verification skills, media ethics, and experiences of civic participation in the digital realm. This aligns with Sustainable Development Goal (SDG) 16, which emphasizes building peaceful, just, and inclusive societies, as well as

strengthening effective, accountable, and responsive institutions. In the context of this study, students' abilities to confront disinformation, build trust in credible information, respect diverse perspectives, and participate responsibly in the digital public sphere serve to support these values. Thus, strengthening civic resilience through Digital Citizenship Education offers a viable approach to preparing the young generation at Universitas Mulawarman to contribute critically, inclusively, and responsibly to societal life and sustainable development.

Overall, the research findings indicate a need to strengthen Digital Citizenship Education at Mulawarman University through learning that is contextual, grounded in real-world issues, and focused on developing critical thinking skills and civic participation. Such strengthening is not only relevant for addressing disinformation but also supports the development of resilient young citizens capable of contributing to the achievement of SDG 16.



Discussion (مناقشة)

The Experiences of the Younger Generation in Facing Disinformation in the Digital Space

The Ministry of Education, Culture, Research, and Technology (Kemendikbudristek, 2023) reported that PISA 2022 results indicate an improvement in Indonesia's ranking compared to 2018, reflecting post-pandemic resilience. However, this achievement remains relative and does not yet substantively reflect literacy excellence. Literacy extends beyond basic skills to encompass the analysis and evaluation of information. Moustaghfir and Brigui (2024) emphasize that critical thinking serves as the foundation for rational decision-making in the digital era. Consequently, the rise in PISA scores does not sufficiently guarantee the younger generation's readiness to navigate disinformation and social complexities; therefore, efforts to strengthen literacy must focus on critical thinking within the context of civic education.

Limited critical thinking results in a weak ability to sort information. Nasution et al. (2025) shows that individuals with low analytical abilities are more susceptible to inaccurate information. This condition is strengthened by social media algorithms which form filter bubbles (Areeb et al., 2023) and develop into echo chambers (Rodrigues, 2024), so that perspective exposure is limited. Abbasi and Hassan (2026) also found that disinformation spreads more among groups with low information literacy. As a result, the younger generation is not only consumers, but also has the potential to become disinformation spreaders without adequate verification capabilities. The high content of hoaxes, slander and radicalism shows that the problems faced are structural in nature. Komdigi (2025) recorded hundreds to thousands of negative content every month, which indicates that disinformation has become a systemic phenomenon. Monsees (2023) calls it part of information disorder which is influenced by political, economic and social motives. Gjerazi and Skana (2023) show its impact on public opinion, while Chambers (2021) emphasizes that disinformation spreads faster than factual information. As a result, the quality of public deliberation declines, social cohesion weakens, and trust in public institutions erodes. This condition reflects a civic crisis due to limited literacy, critical awareness and participatory responsibility.

The younger generation, expected to serve as agents of change, is instead vulnerable to becoming both victims and spreaders of disinformation. Oladokun et al. (2024) demonstrate that high levels of information exposure are not necessarily accompanied by the ability to evaluate that information. Pennycook and Rand (2021) emphasize that the dissemination of misinformation often stems from a lack of critical reflection. Given the high intensity of social media usage in Indonesia (The Global Statistics, 2026), this risk is further amplified. This indicates that civic education has not yet been optimal in equipping young people with digital literacy and civic awareness. Georgopoulou et al. (2025) stress that digital literacy must encompass the

evaluation of information credibility, an understanding of socio-political contexts, and ethical participation in the digital space. Without such strengthening, the younger generation risks losing its strategic role and instead reinforcing a cycle of disinformation that harms democracy and the nation's future.

The phenomenon of "brain drain" – the tendency of highly educated individuals to work and settle abroad – serves as another indicator of the younger generation's crisis of confidence regarding the nation's future. Oliinyk et al. (2021) demonstrate that the mobility of skilled labor from developing to developed nations continues to rise, driven by career opportunities, the quality of advanced education, and more competitive work environments. However, this phenomenon is not driven solely by economic factors; Panagiotakopoulos (2020) emphasizes that migration decisions are also linked to institutional quality, social stability, and the level of confidence in the home country's future. In the Indonesian context, the younger generation's vulnerability to future uncertainty is evident in data from Statistics Indonesia (BPS, 2023), which shows that approximately 15.10% of young people fall into the "Not in Employment, Education, or Training" (NEET) category. Among the 19–24 age group, this figure reaches 29.39%, highlighting the challenges involved in the transition from education to the workforce. This situation reflects limited opportunities and uncertainty regarding the future path. Under these circumstances, the choice to seek opportunities abroad becomes a rational strategy. At the same time, this decision reflects an emerging emotional and psychological distance between individuals and their country, signaling a weakening of civic attachment.

Digital Citizenship Education as a Means to Strengthen Civic Resilience from the Perspective of SDG 16

Students at Mulawarman University view Digital Citizenship Education as encompassing not only the ability to use technology but also the capacity to understand, evaluate, and respond to information critically and responsibly. This finding is evident from the students' experiences in encountering various information on social media regarding social, political, educational, and national issues, as well as the development of East Kalimantan.

The first empirical finding indicates that the ability to verify information constitutes an early form of civic resilience among university students. Students who habitually check information sources, cross-reference them with other sources, and refrain from immediately sharing information demonstrate a tendency to be more cautious when responding to disinformation. These practices reveal that digital literacy within Civic Education extends beyond the mere ability to access technology; it evolves into the capacity to make decisions based on reliable and accountable information.

From the perspective of civic education, this situation indicates that education has not yet fully instilled a sense of social responsibility and national belonging. Through PISA 2022, the OECD (2023) confirms that education systems remain focused on cognitive achievement, while aspects such as values, attitudes, and civic engagement receive insufficient attention. Findings from the ICCS study by Schulz et al. (2025) similarly reveal that while students possess adequate civic knowledge, their participation and social engagement remain low. In Indonesia, a dominant academic orientation tends to render character-building efforts merely normative; consequently, individuals may be globally competent yet lack national commitment. Obiagu (2024) asserts that civic education must cultivate citizens who are participatory and oriented toward social justice. Without transformation, the gap between global competence and national commitment will continue to widen. Theoretically, civic education aims to shape active and responsible citizens (Fuentes et al., 2020), whereas digital literacy emphasizes the ability to critically understand and evaluate information (Martínez et al., 2022).

The relevance of both is increasingly stronger with Indonesia's high internet penetration, which has reached 204.7 million users with an access duration of more than 8 hours per day (The Global Statistics, 2026). Without integration of civic values and digital literacy, high access actually increases the risk of disinformation and polarization. Falloon (2020) emphasized that digital literacy must be directed at forming critical and responsible citizens. Therefore, the integration of civic education and digital literacy is the key to ensuring that the young generation is able to manage information ethically and contribute to democratic life. Critical thinking theory emphasizes that the ability to analyze and evaluate information is an essential skill that needs to be developed through contextual and participatory education. Plummer (2022) explains that critical thinking includes interpretation, analysis, evaluation, and evidence-based decision making. These skills cannot be formed through memorization, but through discussion and reflection. UNESCO (2021) shows that internet users in developing countries are still limited in evaluating the credibility of information, while the World Economic Forum (2023) ranks disinformation as a major global risk. Without this ability, young people are more vulnerable to information manipulation. Therefore, strengthening critical thinking is the foundation of civic education so that individuals are able to participate rationally and ethically. Several countries have succeeded in integrating civic education with digital literacy. Finland is developing a national media literacy policy that is integrated at all levels of education. UNESCO (2020) explains that this approach is comprehensive and supported by cross-sector collaboration. The curriculum places media literacy as a core competency so that students are able to analyze and evaluate information critically. Initiatives such as Media Literacy Week and the role of institutions such as KAVI show that digital literacy is not only the responsibility of schools, but also society. This approach strengthens resilience to disinformation through the integration of education, policy, and public participation.

Digital Citizenship Education plays a role in forming a critical attitude towards information related to public life. Students not only question whether information is true or false, but also begin to consider the source, context, importance and impact of the information on society. This ability is important because digital information can influence the way the younger generation understands social issues and determines attitudes in social life.

Singapore has demonstrated success in integrating character education, citizenship and digital literacy through the Character and Citizenship Education (CCE) program. Mitsuhiro Ikeda (2023) explains that since 2014, CCE shifted its approach from normative to contextual and student-centered. This program aims to form individuals who are critical, adaptive, and have global awareness. The curriculum also integrates contemporary issues such as globalization and diversity so that a balance is achieved between national identity and readiness to face the digital era

In Indonesia, the normative foundation is actually already strong through Law Number 20 of 2003 and Law Number 12 of 2012 which emphasize character building and social responsibility. However, its implementation is still dominant in the cognitive aspect so that the integration of digital literacy, critical thinking and civic values is not yet optimal. The experiences of Finland and Singapore show that transformation requires a systemic approach involving policy, learning and supporting ecosystems. UNESCO (2020) emphasizes Finland's success through comprehensive integration of media literacy, while Mitsuhiro Ikeda (2023) shows the effectiveness of CCE in Singapore. This emphasizes that strengthening civic education in Indonesia needs to be carried out in a more integrated manner to answer the challenges of disinformation and global dynamics.

Aspect	Finlandia	Singapura	Indonesia
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Educational Focus	Critical Thinking and Media Literacy	Digital Character and Citizenship	Academic (dominant)
Digital Literacy Integration	Integrated into the national curriculum	Integrated into CCE	Still Partial
Learning Approach	Contextual and problem-solving oriented	Globally adaptive structured	Tends to be theoretical
Regulations	Competency-based curriculum	Integrated national curriculum	National Education System Law/UU Sisdiknas
Output	Resilient against disinformation	Adaptive and disciplined citizens	Civic and literacy challenges

Table 1. Comparison of Civic Education Integration and Digital Literacy

Based on this comparison, Finland and Singapore both integrate digital literacy with citizenship education through different approaches. Finland emphasizes critical thinking through media literacy in the curriculum, while Singapore emphasizes the formation of adaptive character and civic identity. Indonesia still faces challenges because education tends to focus on academic achievement and has not optimally developed critical literacy and contextual citizenship awareness. This shows the gap between the normative objectives in the law and practice in the field. Therefore, learning from the two countries is important as a reference for the transformation of civic education through systematic integration of digital literacy, critical thinking, and civic values to deal with disinformation and strengthen the young generation's attachment to the nation. To answer these problems, a comprehensive transformation of civic education and based on empirical evidence is needed.

First, civic education needs to be more contextual and experience-based. Ongesa (2020) and Journell (2024) emphasize the importance of analyzing real issues so that students are able to link knowledge with social reality. The high level of disinformation in Indonesia (Komdigi, 2025) can be used as case based learning. This approach is in line with Plummer (2022) who emphasizes that critical thinking develops through a dialogic and participatory process. Second, the integration of digital literacy is a primary need. Martinez et al. (2022) states that digital literacy includes the ability to access, verify and evaluate information. With 204.7 million internet users and access duration of more than 8 hours per day (The Global Statistics, 2026), the risk of disinformation is increasingly high without verification capabilities. UNESCO (2021) also emphasizes the limitations of information evaluation in developing countries. Third, strengthening civic engagement through digital platforms needs to be improved. Schulz et al. (2025) shows that civic participation is still low despite adequate knowledge. With 191.4 million social media users, digital space has the potential to become a means of public participation. However, without proper management, it can trigger polarization and echo chambers (Rodrigues, 2024). Fourth, education needs to instill a sense of ownership and responsibility towards the nation. The high number of NEET (BPS, 2023) shows the weak involvement of the younger generation. Panagiotakopoulos (2020) and Oliinyk (2021) link this condition to a tendency to brain drain. Therefore, experiential learning such as social projects and community service is important to strengthen civic engagement. Overall, civic education transformation must integrate digital literacy, critical thinking, and social engagement. With this approach, civic

education can function as a strategic instrument in forming a young generation who is critical, participatory and committed to Indonesia's future.

Digital citizenship education can be positioned as a tool to strengthen the civic resilience of Universitas Mulawarman students. This strengthening process occurs through several interconnected competencies: the ability to verify information, think critically, make decisions based on credible sources, communicate ethically, respect diversity, and participate responsibly in the digital public sphere.

The findings also highlight the link between Digital Citizenship Education and SDG 16, particularly regarding the development of a young generation capable of fostering peaceful, inclusive, and just societies, while maintaining trust in and constructively engaging with public life and institutions. Thus, the contribution of Digital Citizenship Education to SDG 16 lies not merely in technological proficiency, but in building the capacity of citizens to engage critically with information, maintain social connections, respect diversity, and participate responsibly. Empirically, the research findings can be summarized into four key patterns: (1) information verification as a defense against disinformation; (2) critical thinking as the foundation for civic decision-making; (3) digital ethics and responsibility as forms of constructive participation; and (4) contextual learning as a strategy to strengthen civic resilience in support of SDG 16 values.



Conclusion (خاتمة)

This study reveals that the younger generation – specifically students at Mulawarman University – faces digital citizenship challenges such as exposure to disinformation, the need to assess information credibility, and shifting future orientations amidst technological advancements and social dynamics. The findings indicate that Digital Citizenship Education plays a role in strengthening civic resilience by fostering critical thinking, information verification skills, ethical communication, civic values, and participation in digital public spaces. This civic resilience serves as a vital capacity for young people to navigate change without losing their connection to, sense of responsibility for, and concern for the life of society and the nation. From the perspective of SDG 16, strengthening this capacity supports the development of citizens who can participate responsibly, respect diversity, and contribute to peaceful and inclusive public life. Thus, Digital Citizenship Education is essential in shaping a younger generation that is adaptable to digital changes while possessing resilience and a sense of civic responsibility.

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