

The Role of Student Digital Activism in Strengthening Ecological Citizenship and Environmental Health in Indonesia

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Abstract

The escalating environmental crisis requires higher education institutions to foster ecological citizenship through innovative forms of civic participation, including digital activism. However, empirical evidence on how students' digital activism contributes to ecological citizenship and environmental health remains limited, particularly in vocational education. This study investigates the role of student digital activism in strengthening ecological citizenship and environmental health among polytechnic students in Indonesia. A mixed-methods sequential explanatory design was employed, with this article reporting quantitative descriptive-correlational findings. The study involved 71 students from diverse academic disciplines selected through purposive sampling. Data were collected using a 36-item Likert-scale questionnaire measuring digital activism, ecological citizenship, and environmental health perceptions. Descriptive analysis revealed an overall mean score of 3.467, indicating a moderate-to-high level. Pearson correlation analysis demonstrated a strong positive relationship between digital activism and ecological citizenship ($r = .726, p < .001$), while regression analysis showed that digital activism explained 52.7% of the variance in ecological citizenship ($R^2 = .527$). These findings suggest that meaningful digital activism is an effective pedagogical strategy for cultivating ecological citizenship and promoting environmental awareness. The study recommends integrating digital environmental activism into citizenship education curricula to strengthen civic engagement and sustainability competencies in vocational higher education.

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Introduction

The ecological crisis currently gripping the world is not merely a technical or scientific issue, but has evolved into a fundamental civic issue. Climate change, environmental degradation, air and water pollution, and the destruction of biodiversity are real challenges that demand a collective response from all levels of society, including young people educated in universities. In this context, the concept of ecological citizenship has emerged as a relevant framework for understanding citizens' responsibilities towards the environment, not only locally but also globally (Mravcová, 2023; Petersen et al., 2026; Rutti-Marín et al., 2022; Zeng & Sweet, 2025). Ecological citizenship transcends conventional notions of citizenship, which are limited to the relationship between individuals and the state. This concept emphasizes citizens' moral and ethical obligations to the ecosystems in which they live, while recognizing that the right to a healthy environment is an integral part of human rights. From this perspective, environmental health is not seen solely as a technical matter within the domain of scientists or government officials, but rather as an arena for the active participation of empowered citizens. Students, as a group in the process of forming their civic identity, are strategically positioned to embody the values of ecological citizenship in real life (Rodríguez-Labajos, 2022; San Cornelio et al., 2023).

In the digital era, marked by the massive penetration of information technology, forms of citizen participation have undergone significant transformation. Activism, previously predominantly conducted in physical spaces through demonstrations, written petitions, or community meetings, is now increasingly conducted through digital platforms. Social media platforms such as Instagram, Twitter/X, TikTok, YouTube, and various other online platforms have become new arenas for citizens to voice concerns, mobilize support, and push for policy change. This phenomenon is known as digital activism, a form of collective action that utilizes digital technology as the primary medium to achieve social and political goals. However, the relationship between digital activism and strengthening ecological citizenship is not yet fully understood, particularly in the context of higher education in Indonesia. A fundamental question that arises is the extent to which students' involvement in digital environmental activism contributes to the internalization of ecological citizenship values and increased awareness of environmental health. On the one hand, there are arguments that digital activism is superficial, often referred to as slacktivism, a form of participation that lacks commitment and does not produce real change (Kristofferson et al., 2014). On the other hand, several studies have shown that structured and meaningful digital engagement can foster a transition to concrete action that impacts behavioral and policy change (Haines, 2024; Saud et al., 2020).

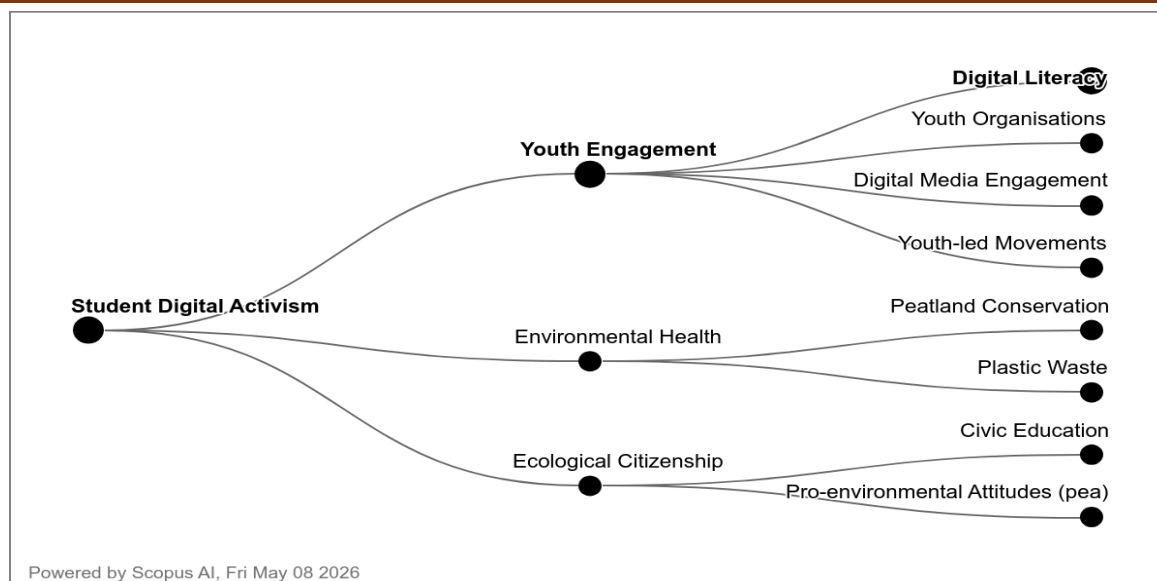
In the context of civic education (PKn) in Indonesia, environmental issues and ecological sustainability have not received a proportional portion in the curriculum and learning practices. Civic education tends to focus more on the political and legal dimensions of citizenship, while the ecological dimension is often neglected or reduced to supplementary material that is not systematically integrated. Yet, integration between civic education and environmental education is a necessity in an era of global ecological crisis. Students need to be equipped not only with knowledge of their rights and obligations as citizens, but also with ecological competencies that enable them to actively contribute to solving environmental

problems (Hussain et al., 2023; Karakaş, 2024). The phenomenon of student digital activism on environmental issues in Indonesia has shown interesting developments in recent years. Various student communities concerned with the environment have utilized social media to disseminate educational content on climate change, campaign for sustainable lifestyles, and document and report cases of environmental destruction in various regions. Platforms like Instagram and TikTok are being used to reach a wider audience, while Twitter/X is being leveraged to push environmental issues onto the public and policy agenda. However, the question of how effective this digital activism is in shaping and strengthening students' ecological citizenship still requires more in-depth empirical study.

Table 1. The Difference between Digital Activism Communication and Slacktivism

Slacktivism (Kristofferson et al., 2014)	Dimension	Meaningful Digital Activism (Haines, 2024; Saud et al., 2020)
Form of participation Likes, shares, signing petitions	Participation	Form of participation Content creation, advocacy, mobilization
Level of commitment Low, minimal effort	Commitment	Level of commitment High, structured, sustained
Motivation Social image, conformity	Motivation	Motivation Ecological values, responsibility
Impact on behavior Negligible	Behavior	Impact on behavior Drives concrete behavioral change
Impact on policy No meaningful change produced	Policy	Impact on policy Contributes to policy change
Civic identity Not deeply formed	Identity	Civic identity Formed and strengthened

This study aims to address this academic gap by comprehensively examining the role of student digital activism in strengthening ecological citizenship and environmental health. By selecting 71 students as subjects, this study aims to map patterns of student engagement in environmental digital activism, analyze the relationship between digital activism and ecological citizenship competencies, and identify factors that mediate and moderate this relationship. The results are expected to provide both theoretical and practical contributions, particularly in developing civics learning models that integrate ecological dimensions and the meaningful use of digital technology. More specifically, this study aims to: (1) describe the forms of student digital activism in environmental issues; (2) analyze the contribution of digital activism to improving students' knowledge, attitudes, and behavior of ecological citizenship; (3) examine the relationship between students' digital activism and their perceptions of environmental health; and (4) develop pedagogical recommendations for integrating environmental digital activism in civics learning in higher education.



Picture 1. Conceptual Maps of Student Digital Activism (Source: Scopus AI)

The diagram above shows the relationship between student digital activism and three main dimensions: youth engagement, environmental health, and ecological citizenship. Student digital activism encourages youth engagement through organizations, youth-based movements, digital literacy, and digital media participation. Furthermore, this activism contributes to environmental health through peat conservation and plastic waste management. Furthermore, ecological citizenship is strengthened through civic education and the formation of pro-environmental attitudes (PEA) as a foundation for the younger generation's ecological awareness (Ardianto et al., 2026; Binawan, 2023).

Method

This research uses an approach *mixed methods* with design *sequential explanatory*, a combination of quantitative and qualitative methods implemented sequentially. In the first stage, quantitative data were collected and analyzed to obtain an overview of students' digital activism patterns and their relationship to ecological citizenship and perceptions of environmental health. In the second stage, qualitative data were collected to explain and deepen the quantitative findings, thus obtaining a more comprehensive understanding of the phenomenon under study (Ariadne Shinta Dewi et al., 2025; Cer, 2019). Analysis of Quantitative data provides a statistical overview of the distribution, frequency, and relationships between variables, while qualitative data provides a deeper understanding of the meanings, experiences, and processes underlying the phenomenon it means, this article contains Descriptive-Correlational Quantitative Study. The integration of these two types of data allows researchers for more valid interpretations (Frisancho et al., 2025; Gao et al., 2021). The subjects of this study were 71 students selected through purposive sampling technique by considering several criteria. *Environmental Digital Activism Scale (SADL)* is instrument for this research. This instrument was developed to measure the level and form of student involvement in digital activism related to environmental issues. Second instrument for this research is *Ecological Citizenship Scale (ECC)*. This instrument was developed to measure students' ecological citizenship competency,

adapted from Dobson's (2003) framework and adapted to the Indonesian context. Third, *Environmental Health Perception Scale (SPKL)*. This instrument was designed to measure students' perceptions of environmental health conditions around them and their relationship to human health.

Results and Discussion

Results

This study involved 71 university students who voluntarily participated by completing an online questionnaire. All respondents were active students, with active social media accounts and online engagement in environmental issues. The demographic characteristics of the respondents are presented in Table 1.

Table 1. Demographic Characteristics of Respondents (n = 71)

Characteristics	Category	n (%)
Gender	Woman	49 (69,0%)
	Man	22 (31,0%)
Age	18 years	9 (12,7%)
	19 years old	25 (35,2%)
	20 years	34 (47,9%)
	21 years	3 (4,2%)
Region of Origin	Urban (City)	45 (63,4%)
	Rural	26 (36,6%)
Domicile	Urban (City)	58 (81,7%)
	Rural	13 (18,3%)

Source: Primary data, 2026

Based on Table 1, the majority of respondents were female, 49 (69.0%), while 22 (31.0%) were male. The age range of respondents was 18 to 21 years, with the largest group being 20 years old (47.9%), followed by 19 years old (35.2%), 18 years old (12.7%), and 21 years old (4.2%). The average age of respondents was 19.44 years, reflecting the characteristics of students in their first and second years of study. In terms of geographic background, 45 respondents (63.4%) came from urban areas, while 26 respondents (36.6%) came from rural areas. However, at the time of the study, the majority of respondents lived in urban areas (81.7%), indicating the process of adaptation of students from rural areas to urban environments as part of their academic experience.

Descriptive analysis was conducted on eight indicators that form three main dimensions: environmental digital, ecological citizenship, and perceived environmental health.

Measurement of the instrument is measured based on statistical processing. The mean score, standard deviation, and categorization of each indicator are presented in Table 2.

Table 2. Measurement of environmental digital, ecological citizenship, and perceived environmental health

No	Indicator	Item	Rerata	SD	Category
1	Environmental Digital Content Consumption	4	3,539	0,666	High
2	Digital Content Production & Distribution	5	3,023	0,593	Currently
3	Digital Mobilization & Networking	4	2,535	0,802	Low
4	Digital Advocacy & Pressure	4	3,461	0,621	High
5	Ecological Citizenship Knowledge	5	3,648	0,636	High
6	Ecological Citizenship Attitudes	5	4,023	0,558	High
7	Ecological Citizenship Behavior	5	3,285	0,676	Currently
8	Environmental Health Perception	4	4,197	0,567	Very high
Overall Average			3,467	0,485	Medium-High

Source: Results of primary data analysis, 2026

Based on Table 2, there is significant variation among the eight indicators. In the digital activism dimension, Indicator 1 (Environmental Digital Content Consumption) and Indicator 4 (Digital Advocacy and Pressure) are in the High category with averages of 3.539 and 3.461, respectively. Conversely, Indicator 3 (Digital Mobilization and Networking) obtained the lowest score among all indicators with an average of 2.535 (Low category), indicating that student involvement in organized environmental digital networks and communities is still limited. In the ecological citizenship dimension, Indicator 6 (Ecological Citizenship Attitudes) recorded the highest score in this group ($M = 4.023$; High), while Indicator 7 (Ecological Citizenship Behavior) actually obtained a lower score ($M = 3.285$; Moderate). This pattern confirms the existence of a gap between attitudes and behavior (attitude-behavior gap) commonly found in environmental education research. Indicator 8 (Environmental Health Perceptions) obtained the highest score among all indicators ($M = 4.197$; Very High), indicating that students have a strong awareness of the relationship between environmental conditions and public health. The overall score categorization of 36 instrument items in 71 respondents is presented in Table 3. The categorization refers to the ranges: Very Low (1.00–1.80), Low (1.81–2.60), Medium (2.61–3.40), High (3.41–4.20), and Very High (4.21–5.00).

Table 3. Distribution of Respondents' Total Score Categorization (n = 71)

Category	n	Percentage (%)
Very Low	0	0,0%
Low	1	1,4%
Currently	31	43,7%
High	33	46,5%
Very high	6	8,5%
Total	71	100%

Source: Results of primary data analysis, 2026

The distribution results show that the majority of respondents (46.5%) are in the High category, followed by the Medium category (43.7%), and Very High (8.5%). Only 1 respondent (1.4%) is in the Low category, and none are in the Very Low category. With an overall mean of 3.467 (SD = 0.485), the respondents' profile generally falls on the border between the Medium and High categories, indicating significant development potential through appropriate educational interventions.

A Pearson correlation analysis was conducted to examine the relationship between three main dimensions: Digital Activism (DCA), Ecological Citizenship (ECC), and Perceived Environmental Health (SPKL). The results of the correlation analysis are presented in Table 4.

Table 4. Correlation Matrix Between Main Dimensions (n = 71)

Dimensions	SAD (r)	SPOON(s)	SPKL (r)
Activism Digital / SAD	1,000	0,726**	0,385**
Ecological Citizenship / SKE	0,726**	1,000	0,614**
Environmental Health Perception / SPKL	0,385**	0,614**	1,000

** $p < 0.01$ (significant at 1% level)

Source: Results of primary data analysis, 2026

Table 4 shows that all interdimensional relationships are positive and statistically significant at $p < 0.01$. The strongest correlation was found between SAD and SKE ($r = 0.726$), indicating a strong relationship between the intensity of digital activism and the level of ecological citizenship. The correlation between SKE and SPKL was also quite strong ($r = 0.614$), while the SAD-SPKL relationship was moderate ($r = 0.385$). Simple regression analysis confirmed the correlation findings. Digital activism significantly predicted ecological citizenship ($\beta = 0.690$; $R^2 = 0.527$; $p < 0.001$), meaning that 52.7% of the variance in ecological citizenship scores could be explained by digital activism. Digital activism also significantly predicted perceived environmental health ($\beta = 0.391$; $R^2 = 0.148$; $p < 0.001$), albeit with lower

predictive power. A test of differences in SKE scores based on gender showed no significant difference between male ($M = 3.552$) and female ($M = 3.697$) respondents with a t -value of -1.070 ($p = 0.288$), indicating that ecological citizenship was not significantly influenced by gender factors in this sample.

Discussion

The findings of this study reveal an interesting pattern in students' digital activism related to the environment. The majority of respondents showed tendencies as active consumers and disseminators of environmental information (Indicators 1 and 2, High category), but not many were involved in organized digital networks and mobilization (Indicator 3, Low category). This pattern reflects what Schradie (2019) calls the asymmetry of digital participation, where content consumption far exceeds the capacity for organized production and collaboration. In the context of Indonesian students, this condition is understandable because the ecosystem of organized environmental digital communities on major platforms is still in its early stages of development. Interestingly, the score for Indicator 4 (Digital Advocacy and Pressure) is actually in the High category ($M = 3.461$), primarily supported by students' belief that consistent digital activism can encourage policy change (Item 17; $M = 4.24$) and their ability to constructively criticize environmentally damaging policies (Item 16; $M = 3.97$). This indicates that although formal networks are not yet strong, students have a fairly strong advocacy orientation with significant potential that requires a structured platform to develop optimally.

The most significant finding in the ecological citizenship dimension is the clear gap between the attitude domain ($M = 4.023$; High) and the behavior domain ($M = 3.285$; Moderate). Students have a strong affective concern and commitment to the environment, but this has not yet been fully translated into consistent concrete actions. This attitude-behavior gap phenomenon has long been identified in environmental education literature (Kollmuss & Agyeman, 2002) and is one of the most complex challenges in developing ecological citizenship. Analysis of the items in Indicator 7 revealed that behavioral barriers do not lie in a single aspect. The weakest activities were reporting environmental violations (Item 32; $M = 2.99$) and consistent application of the 3R principles (Item 28; $M = 3.04$). In contrast, more easily implemented behaviors such as influencing others (Item 30; $M = 3.58$) and participating in environmental physical activities (Item 29; $M = 3.52$) showed higher scores. These findings indicate that the main barriers are structural and systemic, not motivational: students want to act, but the infrastructure and mechanisms that facilitate such action are limited.

The very strong positive relationship between SAD and SKE ($r = 0.726$; $R^2 = 0.527$) is a key finding of this study. More than half of the variance in ecological citizenship scores can be explained by digital activism, a finding that surpasses the results of similar studies in other contexts (Boulianne, 2020). This finding provides strong empirical evidence that digital activism is not merely superficial activity (slacktivism), but rather a vehicle for genuine citizenship formation. The active process of accessing, producing, and disseminating environmental content, and promoting change through digital platforms, appears to create a learning loop that strengthens knowledge, shapes attitudes, and gradually encourages pro-environmental behavior. The more moderate correlation between SAD and SPKL ($r = 0.385$) compared to the correlation between SKE and SPKL ($r = 0.614$) supports the argument that ecological citizenship

acts as a bridge between digital activism and perceived environmental health. In other words, digital activism does not directly influence environmental health perceptions, but is mediated by the strengthening of ecological citizenship. The stronger a person's ecological citizenship, the sharper and more comprehensive their perception of environmental threats to health, and the greater their confidence in the collective ability of citizens to address them.

Overall, the findings of this study have important implications for the development of ecological citizenship education in higher education. First, the integration of digital environmental activism as a structured learning component within Civics courses has the potential to be an effective strategy for developing holistic ecological citizenship competencies. A digital civic action project-based learning model that tasks students with designing and implementing authentic digital environmental campaigns can provide a tangible bridge between academic knowledge and socio-ecological realities (Carter et al., 2024; Hamm et al., 2024; Huang, 2026). The findings of this study yield several relevant and pressing pedagogical implications for the development of citizenship education in vocational education settings, particularly polytechnics. These implications touch on three main areas: curriculum design, learning strategies, and the development of a digital-based ecological education ecosystem.

First, the integration of digital activism as a structured component of the curriculum. This research provides strong justification for positioning environmental digital activism not as a mere supplementary activity but as a core component of the civics curriculum. Authentic assignments based on environmental digital campaigns need to be designed in such a way that students not only learn the theory of ecological citizenship but also directly practice it through content production, online community mobilization, and digital environmental policy advocacy. *Digital Civic Action Project* can serve as a concrete framework that allows students to design, implement, document, and reflect on a full cycle of environmental digital campaigns. With this approach, civics learning no longer stops at the cognitive level but becomes an arena for real citizenship practices with measurable impacts on the surrounding community (Adigüzel & Eryilmaz, 2023; Pavan & Earl, 2025; Quynh & Thanh, 2025; Vetrivel et al., 2026).

Second, action-based learning to bridge awareness and action. One of the most consistent findings is the gap between students' concern for the environment and their actual actions. The main obstacle lies not in a lack of motivation, but rather in the absence of spaces and mechanisms that enable students to act meaningfully. Civic education needs to shift towards a model *action-oriented learning*, namely learning that explicitly connects the classroom with the surrounding community and environment. In the context of polytechnics, this can be realized through cross-program collaboration, where students from various departments jointly design environmental monitoring and improvement projects, the results of which are communicated to the public through digital platforms. This interdisciplinary approach not only strengthens ecological citizenship competencies but also aligns with the character of vocational education, which emphasizes the application of knowledge in real-life contexts (Anggraeni, Azis, et al., 2025; Anggraeni, Saepudin, et al., 2025; Houle et al., 2017).

Third, strengthening digital networks and communities at the campus level. Students acknowledge that their involvement in organized digital environmental activism networks

remains very limited. They tend to operate individually and sporadically, without connecting with broader communities or movements. Therefore, it is necessary to facilitate the formation of digital environmental communities at the campus level as incubators for student ecological activism. These communities can then be connected to networks of civil society environmental organizations, national ecological youth movements, and established environmental advocacy platforms, so that students no longer act alone but become part of a broader movement ecosystem that has a real impact on socio-ecological change (Anggraeni et al., 2024).

Fourth, utilizing environmental health sensitivity as an entry point for learning. Students consistently state that their concern for environmental issues first arises from direct experience with the impact of the environment on their own health and that of their communities, rather than from mere exposure to academic material. This lived awareness has proven to be more powerful and lasting than formal knowledge. Therefore, a learning process that begins with students' lived experiences and concerns about the quality of air, water, and soil in their surroundings will be far more effective in fostering a systemic understanding of responsible ecological citizenship. This approach is consistent with Mezirow's principles of transformative education, which emphasize the importance of initiating learning from authentic experiences rooted in students' real lives.

Conclusion

This study successfully described the profile of students' digital activism and its relationship to ecological citizenship and environmental health perceptions among 71 respondents. Three main findings can be drawn: (1) students' digital activism is stronger in the dimensions of consumption and advocacy than mobilization and organized networks; (2) there is a clear gap between ecological citizenship attitudes and behaviors that requires structural intervention; and (3) digital activism is a strong and significant predictor of ecological citizenship ($R^2 = 0.527$), which in turn contributes to better environmental health perceptions. These findings emphasize the importance of integrating environmental digital activism as a primary pedagogical strategy in citizenship education in the digital era. Practically, strengthening the perception of ecological citizenship needs to be done not only through formal education, but also through informal education in the social environment and education in social units.

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Authors' Note

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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