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THE IMPORTANCE OF DIGITAL CAMPAIGNS FOR STUDENTS: CRITICAL SOLUTIONS TO ECOSYSTEM CHANGE FOR FOSTERING ENVIRONMENTAL AWARENESS IN ECOLOGY COURSES

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Abstract

The accelerating changes in ecosystems caused by human activities demand a critical response from students as agents of change; therefore, this study aims to examine the importance of digital campaigns as a strategic pedagogical tool for students to critique ecosystem changes while cultivating environmental awareness. This research employs a qualitative descriptive approach by providing an intervention in the form of a Digital Campaign assignment in an Ecology course, where students at Universitas Tangerang Raya produced and shared educational content such as videos and infographics on social media. Data were collected through an Environmental Attitude Questionnaire covering cognitive, affective, and conative components and analyzed using qualitative descriptive techniques. The results indicate that digital campaigns serve as a vehicle for transformative learning that builds ecological awareness and critical thinking skills by requiring students to identify environmental problems contextually and relate them to social and policy dimensions. Furthermore, students who were actively involved showed an increase in pro-environmental attitudes and an internalization of environmental values, demonstrating that digital campaigns effectively bridge the gap between theoretical knowledge and real-world environmental responsibility.

Keywords : *Digital campaigns, students, ecosystem change, environmental attitudes, ecological literacy.*

INTRODUCTION

Ecosystem change is one of the crucial issues of the 21st century, with simultaneous ecological, social, economic, and educational implications (Putriani & Hudaiddah, 2021). The rate of environmental degradation, characterised by declining terrestrial and aquatic ecosystem quality, reduced biodiversity, increased pollution, and the increasingly apparent impacts of climate change, shows that environmental issues are no longer local and sectoral in nature, but rather systemic and global. Various scientific reports and international policies emphasise that the root cause of ecosystem change does not lie solely in natural factors but is closely related to human behaviour patterns, resource management, and low ecological awareness among the public.

This gap indicates that an informative and cognitive approach to environmental learning alone is not effective enough to foster sustainable environmental attitudes. A pedagogical strategy is needed that is able to fully integrate cognitive, affective, and conative aspects, while also being relevant to the characteristics of the current generation of students. The contemporary student generation is a generation of digital natives who live in an ecosystem of information technology, social media, and rapid information flows. Therefore, environmental education approaches that do not adapt to the digital context risk losing their reach and influence.

On the other hand, the development of digital media has changed the way people obtain, produce, and distribute information. Social media is not only a space for entertainment, but also an arena for public discourse, opinion formation, and social advocacy, including environmental issues. In this context, digital campaigns have emerged as an effective communication strategy for spreading environmental messages, building collective awareness, and encouraging changes in public attitudes and behaviour. Digital campaigns enable the rapid, visual, and interactive delivery of messages and have the potential to reach a wide audience beyond geographical boundaries.

However, from an academic perspective, digital campaigns should not be narrowly

understood as content sharing activities or merely increasing engagement on social media. A major challenge that often arises is the tendency for digital campaigns to be trapped in symbolic activism (slacktivism), where participation is limited to minimal actions without critical reflection and real impact (Meyers et al., 2013). Therefore, the integration of digital campaigns into higher education requires a strong academic framework based on scientific studies and aimed at developing students' critical thinking skills regarding ecosystem change issues (Hasanah et al., 2024).

In the context of environmental education, digital campaigns have great potential as a vehicle for transformative learning if they are designed systematically and reflectively. Through the process of designing campaigns, students are required to identify environmental problems contextually, analyse their causes and impacts, and relate them to social, economic and policy dimensions. This process trains students to not only be consumers of environmental information, but also producers of knowledge and responsible educational messages. In addition, students' direct involvement with public responses through digital media opens up authentic learning spaces that are difficult to obtain through conventional classroom learning.

Digital campaigns in environmental education are not only practically relevant but also have theoretical contributions. Analysis of public responses to student digital campaigns can provide an overview of the effectiveness of environmental messages, patterns of public acceptance, and the dynamics of science communication in the digital space (Rachmawati, Rohman, Novianti, et al., 2024). Thus, research on student digital campaigns is not only oriented towards learning outcomes but also enriches the academic discourse on environmental education, digital literacy, and environmental communication (Rachmawati, Rohman, & Novianti, 2024).

Based on this description, this article positions digital campaigns as a relevant pedagogical and research strategy for training students' environmental attitudes while examining public responses to ecosystem change education (Mulyani, D.T., Huda, M.R., Rachmawati, 2025; Rachmawati, Rizqi Nur,

Mulyani, D.T., Rizkiyah, F., Maulani, 2025). This approach is expected to bridge the gap between environmental knowledge and attitudes, as well as strengthen the role of higher

METHOD

This study employs a qualitative descriptive approach to explore and describe how digital campaign processes can train students' environmental attitudes as a critical response to ecosystem change. The research design focuses on an intervention within an Ecology course, where students are assigned to produce educational content such as videos, infographics, or digital essays highlighting ecosystem issues and sharing them on social media. The research subjects consist of students from Universitas Tangerang Raya who were actively involved in this project, selected through purposive sampling. Data collection primarily utilizes an Environmental Attitude Questionnaire that measures three key components: cognitive (knowledge and beliefs), affective (feelings and emotions), and conative (intentions for concrete action). Finally, the collected data is processed using Qualitative Descriptive Analysis techniques, which include data reduction (grouping answers based on indicators), data display (presenting trends in tables or narratives), and drawing conclusions to interpret the role of digital campaigns in fostering environmental responsibility.

Research Design This study focuses on providing an intervention in the form of a Digital Campaign assignment in an Ecology course. Students are asked to produce educational content (videos, infographics, or digital essays) that highlight the issue of ecosystem change, then share it on social media as a form of real action.

Research Subject The subjects in this study were students biology education programme who were taking the Ecology course in the seventh semester. Subject selection was carried out using purposive sampling, namely students who were actively involved in the digital campaign project.

Data Collection Techniques

The main data was collected through an Environmental Attitude Questionnaire (Milfont & Duckitt, 2010). This questionnaire consisted of statements covering three components of attitude, This study employs a qualitative

education institutions in responding to ecosystem sustainability challenges through digital-based learning innovations (Mulyani et al., 2025).

descriptive approach to explore and describe how digital campaign processes can train students' environmental attitudes as a critical response to ecosystem change. The research design focuses on an intervention within an Ecology course, where students are assigned to produce educational content such as videos, infographics, or digital essays highlighting ecosystem issues and sharing them on social media. The research subjects are seventh-semester students who were taking the Ecology course at Universitas Tangerang Raya. Subject selection was carried out using purposive sampling, specifically targeting students who were actively involved in the digital campaign project. Data collection primarily utilizes an Environmental Attitude Questionnaire consisting of 20 statements designed to measure three key components: cognitive (knowledge and beliefs), affective (feelings and emotions), and conative (intentions for concrete action). The questionnaire was administered during or after the campaign process to capture students' reflections on their digital activities. Finally, the collected data is processed using Qualitative Descriptive Analysis techniques, which include data reduction (grouping answers based on environmental attitude indicators), data display (presenting trends in narratives or tables), and drawing conclusions to interpret the role of digital campaigns in fostering environmental responsibility :

- a. Cognitive: Students' knowledge and beliefs about ecosystem issues.
- b. Affective: Students' feelings or emotions towards environmental damage.
- c. Conative (Psychomotor): Students' tendencies or intentions to take concrete action to protect the environment.

The questionnaire was administered after (post-test) or during the campaign process to capture students' reflections on their digital activities.

1. Data Analysis Techniques

The data obtained from the questionnaire was analysed using Qualitative Descriptive Analysis techniques through the following steps:

- a. Data Reduction: Grouping students' answers based on environmental attitude indicators (cognitive, affective, conative).
- b. Data Display: Presenting excerpts of responses or trends in student attitudes in the form of tables or descriptive narratives.

RESEARCH RESULTS

The following are the results of campaigns conducted in various villages in Tangerang Regency.



Figure 1. Posters as a Campaign Medium

Digital Campaigns in the Perspective of Environmental Education

Digital campaigns are defined as systematic efforts to convey specific messages through digital platforms, such as social media, blogs, online videos, and infographics, with the aim of influencing the knowledge, attitudes, and behaviors of the audience (Ali et al., 2023). In the perspective of environmental education, digital campaigns are not merely a one-way communication tool, but can be designed as an active learning process that involves students in problem analysis, message production, and critical reflection (Fitriani et al., 2020; Herman, 2025; Seibert, 2021). Various scientific articles show that student involvement in environmental digital campaigns can increase ecological literacy and awareness of local and global environmental issues (Mawarni, 2024). The process of designing campaign content requires students to find reliable sources, verify scientific data, and relate ecosystem change phenomena to social, economic, and political contexts. Thus, digital campaigns serve as a medium for problem based learning and contextual learning (Bahri et al., 2018).

Criticizing Ecosystem Change through Digital Campaigns

- c. Drawing Conclusions: Interpreting how digital campaigns play a role in fostering critical attitudes and responsibility towards the environment based on the questionnaire results.

One of the main strengths of digital campaigns is their ability to encourage students to think critically about ecosystem change (Mulyani, D.T., Huda, M.R., Rachmawati, 2025). Instead of simply accepting information, students are trained to question the causes, actors involved, and short- and long-term impacts of an ecosystem change. For example, in a campaign about mangrove destruction, students not only highlight ecological aspects but also critique coastal development policies, industrial practices, and community behavior. This critical approach is in line with the objectives of higher education, which emphasizes the development of higher order thinking skills (Vieira & Tenreiro-Vieira, 2016). Students learn that ecosystem change is not merely a natural phenomenon, but the result of complex interactions between humans and the environment. Digital campaigns provide a space for students to voice data based criticism and scientific arguments, while also training them to have the academic courage to express their opinions in the public sphere (Desi, 2020).

Digital Campaigns as a Means of Fostering Environmental Awareness

Environmental awareness encompasses cognitive, affective, and conative components. Digital campaigns have the potential to address all three components simultaneously (Hazami

et al., 2015; Siahaya et al., 2021). Cognitively, students deepen their understanding of ecosystem change issues. From an affective perspective, the use of visual narratives, videos, and stories based on real-life situations can evoke empathy and concern for environmental damage. From a conative perspective, digital campaigns are often followed by calls to action that encourage behavioral change, both among students and a wider audience (Mustaqimah et al., 2020). Research results show that students who are actively involved in digital environmental campaigns tend to show an increase in pro-environmental attitudes, such as awareness to reduce waste, save energy, and engage in conservation activities. This shows that digital campaigns can be an effective means of internalizing environmental values, not just adding to knowledge (Köse et al., 2011).

The Role of Lecturers in Overseeing Student Digital Campaigns

As critical and analytical lecturers, the role of educators does not stop at assigning digital campaigns. Lecturers need to ensure that student campaigns are based on valid scientific studies, do not fall into shallow activism (slacktivism), and uphold academic ethics. Faculty guidance is essential throughout the process from issue formulation, data analysis, media selection, to evaluating the campaign's impact. Additionally, faculty members should encourage critical reflection among students after the campaign is conducted. This reflection is crucial for assessing the extent to which the digital campaign genuinely contributes to environmental attitude change, both among students as actors and among the audience. Thus, digital campaigns become an integral part of reflective and transformative learning processes (Rizkiyah et al., 2025). In this context, higher education has a strategic responsibility to shape students who not only understand ecological concepts theoretically but also possess critical attitudes and environmental concerns that are internalized in real behavior (Rasyid et al., 2024).

Students, as a group of young intellectuals, hold a unique position: they are relatively tech savvy, have broad access to information, and have the potential to become opinion leaders in society. However, various studies show that students' environmental

knowledge does not always correlate with their attitudes.

Challenges and Implications

Despite its great potential, digital campaigns also face various challenges, such as the spread of inaccurate information, the dominance of sensational content, and limitations in measuring attitudes and behaviors (Ningsih & Widodo, 2021). Therefore, the integration of digital campaigns into learning needs to be accompanied by strengthening digital literacy and information literacy (Putriani & Hudaidah, 2021). As a result, universities need to design policies and curricula that support the use of digital campaigns as an environmental learning strategy. Cross-disciplinary collaboration, for example between education, biology, communication, and information technology, is also key to producing high quality and impactful digital campaigns (Setyaningsih et al., 2019).

Conclusion and suggestion

Digital campaigns are a relevant and effective strategy for engaging students in critiquing changes in the ecosystem while fostering environmental awareness. Based on a synthesis of various scientific articles, it can be concluded that digital campaigns are capable of integrating cognitive, affective, and conative aspects in environmental education. With the guidance of critical and analytical lecturers, digital campaigns not only serve as a means of disseminating information, but also as a vehicle for transformative learning that shapes students into academically minded individuals who are caring, critical, and responsible for the sustainability of the ecosystem.

Based on the findings of this study, several strategic recommendations are proposed to strengthen the role of digital campaigns in environmental education. First, higher education institutions are advised to integrate digital literacy and environmental campaigns into interdisciplinary curricula so that environmental awareness becomes a generic competency for all students, fulfilling the university's social responsibility toward ecosystem sustainability. Educators and lecturers should transition from traditional delivery to becoming critical and analytical facilitators who provide space for students to design evidence based digital

campaigns that are not only visually aesthetic but also possess the academic depth necessary to trigger critical thinking in the public sphere. Furthermore, there is a pressing need for the standardization of project-based learning models that formally utilize social media platforms to ensure clear learning outcomes across cognitive, affective, and conative domains. Students are also encouraged to utilize diverse digital platforms and formats, such as short videos, interactive infographics, or podcasts, to reach a broader and more heterogeneous audience, ensuring that messages about the ecosystem crisis are transformed into real action within society. Finally, future researchers should conduct longitudinal studies to measure the long-term impact of these digital campaigns on actual behavioral change among students (conative aspect) among students. In addition, it is necessary to analyse the effectiveness of specific social media algorithms in disseminating environmental information so that campaigns can be more targeted.

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