

The Role of Facebook in Promoting Environmental Education and Awareness of Sustainable Goal 13 (Climate Action) Among Cambodian University Students

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Abstract

The purpose of this study is to explore how Facebook supports climate action awareness (SDG 13) among Cambodian university students and which content formats students perceive as most effective. A quantitative online survey was conducted with 81 undergraduates from Cambodian universities. The questionnaire measured Facebook engagement, exposure to climate-related content, and perceived effectiveness of different content formats. Using descriptive statistics and inferential tests, including regression and t-tests (SPSS). The findings indicate that Facebook engagement is significantly associated with environmental awareness ($R^2 = 0.752$, $p < .001$). Students reported moderate but consistent exposure to climate-related content on Facebook ($M = 3.25$ – 3.52), with motivation to learn emerging as the most common response. Visually rich content formats were perceived as the most effective for environmental learning, particularly videos ($M = 3.67$) and infographics ($M = 3.62$), while active engagement behaviors such as commenting and sharing remained relatively limited. These findings suggest that Facebook can function as an informal learning space for environmental learning when content is visual, accessible, and designed to encourage engagement. The study provides Cambodia-based evidence that can inform educators, NGOs, and policymakers in developing more effective social media for climate literacy in higher education.

Keywords: Facebook, environmental education, climate change awareness

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Introduction

Environmental change remains one of the most critical global challenges, requiring both effective policy action and sustained public awareness. In this context, Facebook as an influential social media platform has become a significant tool for communicating environmental issues, engaging people, and encouraging sustainable attitude among younger audiences. Previous research shows that NGOs use Facebook strategically to increase public interaction emotionally engaging and action-oriented, messages and posts that highlight environmental impacts, evoke positive emotions, and include clear calls to action are associated with higher levels of engagement such as likes and comments (Barkallah et al., 2020; Ghermandi et al., 2023).

In the Cambodian context, digital inclusion is shaping how people access and understand sustainability awareness in response to the emerging issues. The stronger understanding of the environmental issues and the awareness of the eco-friendly practices are associated with greater access to the digital tools and a higher level of digital literacy. This suggests that digital platforms such as Facebook may be a practical tool for environmental education, particularly for Cambodian youth (Ly et al., 2024).

A study examining environmental awareness among Cambodian university students found that although students were generally aware of climate-related issues, misconceptions and a noticeable gap between awareness and actual behavior still existed. Many students show a strong interest in the issues of climate-related topics and pursuing environmentally related careers. Meanwhile, opportunities for serious engagement with environmental learning remained limited. Therefore, access to digital platforms, such as Facebook, can enhance environmental knowledge and encourage more sustainable practices among students (Barkallah et al., 2020).

Although prior research suggests that social media can support environmental advocacy, empirical evidence remains limited on how Cambodian university students engage with climate-related content on Facebook and whether such engagement is associated with awareness of Sustainable Development Goal 13 (Climate Action).

Research Objective

The primary objectives of this study are:

1. To examine the relationship between Facebook engagement and Cambodian university students' understanding of environmental issues and awareness of SDG 13 (Climate Action).
2. To measure how frequently Cambodian university students are exposed to climate change and environmental education content on Facebook.
3. To identify which Facebook content formats students perceive as most effective for promoting environmental education and climate literacy.

Literature Review

Facebook as an Informal Learning Space for Environmental Education

Facebook is often viewed as a supplemental educational tool that supports informal learning. This platform provides continuous access to information and learning materials due to the content can be posted, stored and revisited over time, the platform can function as a convenient repository for educational resources and announcements. Facebook is embedded in students' daily routines and encourages ongoing participation beyond the classroom. The empirical studies commonly describe Facebook's educational use through three core functions such as communication, resource sharing and collaboration. It enables active interaction among students, educators, and university personnel for course coordination and updates. For resource sharing, it supports the exchange of ideas, projects, documents, and multimedia materials such as videos and audio. For collaboration, Facebook groups provide structured spaces where students discuss course content, divide responsibilities and complete shared academic tasks (Yousef & Yousef, 2022).

In addition, Facebook is recognized as a popular social media network designed to connect people across distances; however, it has evolved into a useful platform for academic learning and information exchange. Facebook supports educational use among students through three key determinants such as motivation, Perceived benefits, Perceived disadvantages. Motivation refers to student desire to stay connected with peers, keeping update and discussing course material. Perceived benefits include gaining knowledge, sharing ideas and discovering new learning resources. Perceived disadvantages such as distraction or misinformation, were acknowledge but did not significantly deter Facebook usage (Alwreikat et al., 2021).

In the Cambodia context, research on digital technology and environmental sustainability typically emphasizes broader dimensions or digital inclusion such as digital access, digital literacy, and the use of digital platforms rather than focusing on specific social media brands. Within this perspective, digital platforms function as important tools for sustainability education by disseminating environmental information and raising public awareness. Internet access expands opportunities for citizens to learn about local and global environmental issues and to apply sustainable practices in everyday life. In addition, the digital environment can facilitate community building by enabling individuals to share ideas and develop collective awareness and around environmental issues. However, the effectiveness of these platforms depends on the level of digital literacy especially the ability to locate and evaluate information as well as the reliability of digital infrastructure (Ly et al., 2024).

Environmental Education: Concepts and Key Objectives

According to the Tbilisi Declaration (1997) provides core framework for Environmental Education (EE) by giving the five core definition goals. First, EE aims to develop awareness, helping individuals and social groups become sensitive to the environment and its related problems. Second, it promotes knowledge by building understanding of environmental systems and issues to support informed decision-making. Third, EE cultivates attitudes, encouraging values and concern that motivate people to protect and improve the environment. Fourth, it develops skills by equipping learners with practical abilities to identify environmental problem, investigate cause, and evaluate alternative solutions. Finally, EE emphasizes participation, providing opportunities for individuals and groups to actively engage at multiple levels in addressing environmental challenges. These goals describe environmental education as a

process that moves from awareness and understanding toward skill development and meaningful action (Fang et al., 2023; Uddin, 2023).

Moreover, Hungerford et al. (1980), as cited in Fang et al. (2023), introduced a curriculum-oriented framework for environmental education that organizes learning goals into four progressive levels. The first level emphasizes building ecological knowledge as a foundation for understanding environmental problems and making informed decisions. The second level focuses on developing conceptual awareness of environmental issues and values, helping learners recognize how individual and collective actions affect both environmental quality and overall quality of life. The third level examines issue investigation and evaluation, where learners develop skills to analyze environmental problems and compare alternative solutions while clarifying their own values. The fourth level moves toward action competence and participation, aiming to equip learners with practical skills to take positive environmental action and contribute to a balance between human well-being and environmental health. This framework is useful for positioning environmental education not only as knowledge acquisition but also as a pathway from awareness to critical evaluation and responsible action as cite in (Fang et al., 2023).

Furthermore, The Three Threads framework, developed in the Schools Council's Project Environment (1974), provides a foundational structure for environmental education by explaining how learners interact with the environment through three interconnected approaches. The first thread, education about the environment, focuses on developing knowledge and understanding of environmental systems, human impacts, and environmental issues. The second thread, education through the environment, emphasizes learning through direct experience, using the environment as a resource for inquiry, observation, and interdisciplinary learning. The third thread, education for the environment, aims to cultivate environmental values and responsibility, encouraging learners to take informed actions to protect and sustain the environment. Together, these three dimensions highlight that environmental education should integrate knowledge, experiential learning, and responsible action (Neal, 1994).

Following the Tbilisi Declaration, UNESCO further emphasized that environmental education should not be taught as a passive or purely theoretical subject. Instead, it should adopt a critical and participatory approach that encourages learners to understand the multiple social, economic, and ecological factors involved in environmental issues. This perspective promotes active student involvement in planning and shaping their own learning experiences, rather than relying solely on teacher-centered instruction. Environmental education is also encouraged to take place in diverse learning environments beyond the traditional classroom, allowing learners to explore real-world contexts and develop practical understanding. In addition, the approach highlights the importance of collaborative and participatory decision-making, where students are encouraged to engage in discussion, evaluation, and collective problem-solving related to environmental challenges (Gough & Gough, 2010).

Sustainable Development Goals

Sustainability is widely recognized as a key factor in maintaining and improving human quality of life. Environmental degradation can lead to serious consequences such as natural disasters, health risks, and declining living conditions, making sustainability education increasingly important in higher education. Universities play a critical role in promoting sustainability awareness by integrating environmental topics into teaching, campus practices, and student

engagement activities. Awareness is often strengthened not only through formal education but also through visible sustainability practices such as recycling programs, energy conservation, and waste reduction initiatives. In addition, social media platforms have become important tools for sharing sustainability information and promoting environmentally responsible behaviors. By disseminating environmental knowledge and highlighting green practices, digital platforms can encourage students to engage with sustainability issues and adopt more environmentally conscious lifestyles (Hamid et al., 2017).

Ban Ki-Moon (2019), former Secretary-General of the United Nations, asserted that former eighth secretary-general of the United Nations emphasized that young people have an important role as global citizens and should take the lead in calling for climate justice. He also pointed out the value of informal education tools like social media in raising awareness (Ki-moon, 2019). From a policy point of view, Long et al. (2023) explain that the SDGs are carried out using goals, targets and indicators to help countries take action. These ideas support the use of environmental education and digital platforms such as Facebook to support people to understand about climate literacy (Long et al., 2023).

Cambodia Case Study

A study of the exploring the nexus of digital inclusion and environmental sustainability: insights from Cambodia examined how digital transformation can support environmental awareness and sustainable practices. Using survey data from 380 participants in Siem Reap province, the study found that digital access and digital literacy play a key role in improving environmental knowledge and encouraging sustainable behavior. Access to online resources enables individuals to learn about climate change, conservation, and environmental protection through digital materials such as articles, documentaries, and interactive tools. The findings explain that digital literacy particularly the ability to search for and evaluate information can positively influence behavioral changes, including waste reduction and energy conservation. These results indicate that digital platforms can support environmental education by expanding access to sustainability knowledge and promoting environmentally responsible practices within the Cambodian context (Ly et al., 2024).

A case study conducted under the GREENCAP Project (2020) assessed environmental awareness among students from several universities. The findings indicated that students generally demonstrated high awareness and concern about climate change. Most participants understood that climate change is occurring, expressed concern about its impact on nature and human health, and recognized that personal lifestyles and corporate behavior contribute to environmental problems. Despite this strong awareness, the study also highlighted a gap between knowledge and action, suggesting that universities should focus less on basic awareness and more on practical engagement and informal learning opportunities such as projects, field activities, and community initiatives. These findings highlight the importance of exploring additional channels, including digital platforms, that can strengthen environmental learning and encourage more active engagement among students (Barkallah et al., 2020).

Therefore, exploring how digital platforms such as Facebook support environmental education among Cambodian students becomes important.

Methodology

This study employed a quantitative research design using an online survey to investigate the relationship between Facebook engagement and environmental awareness among Cambodian university students. The questionnaire was developed based on relevant literature and distributed through Google Forms. To ensure content validity, the instrument was reviewed by experts and evaluated using the Index of Item–Objective Congruence (IOC). A total of 117 responses were collected, and after data screening, 81 valid responses were retained for analysis. The data were analyzed using SPSS, applying descriptive statistics and inferential tests, including regression analysis and independent samples t-tests, to examine the relationship between Facebook engagement and awareness of Sustainable Development Goal 13 (Climate Action).

Finding

Descriptive statistics were used to summarize the demographic characteristic of the respondents. These characteristics provide context for understanding students' engagement with Facebook and environmental learning.

Table 1
Demographic Characteristic of Respondents

Characteristic	Category	n	%
Gender	Male	47	58
	Female	34	42
Age (years)	18–20	47	58
	21–22	22	27.2
	23–24	8	9.9
	25–30	4	4.9
Daily Facebook use	1–2 hours	28	34.6
	2–3 hours	14	17.3
	Less than 1 hour	18	22.2
	More than 3 hours	21	25.9
Total		81	100

Note. N = 81

Table 1 shows that 58% of the participants were male and 42% were female. Most respondents were between 18–20 years old, followed by 21–22 years, while smaller proportions were 23–24 years and 25–30 years. Regarding Facebook usage, the largest group of students reported spending 1–2 hours per day on Facebook, followed by more than 3 hours, less than 1 hour, and 2–3 hours.

Table 2*Regression Analysis: Facebook Engagement Predicting Environmental Awareness*

Variable	B	SE	β	t	p
Constant	0.24	0.217		1.104	0.273
Facebook Engagement	0.945	0.061	0.867	15.491	< .001
R ²	.752				
Adjust R ²	.749				
F (1,79)	239.965				
p	< .001				

Note. N = 81. Dependent variable = Environmental Awareness. β = standardized coefficient.

Table 2 indicates that Facebook engagement significantly predicts environmental awareness among Cambodian university students ($\beta = 0.867$, $p < .001$). The model explains a substantial proportion of variance in environmental awareness, with $R^2 = .752$, indicating that approximately 75.2% of the variation in environmental awareness can be explained by Facebook engagement. The regression model was statistically significant ($F(1,79) = 239.965$, $p < .001$), suggesting a strong relationship between students' engagement with Facebook content and their awareness of environmental issues related to Sustainable Development Goal 13 (Climate Action).

Table 3*Perceived Effectiveness of Facebook Content Types for Environmental Education*

Content Type	Mean Rank	M	SD
Videos	5.49	3.67	1.111
Articles	5.28	3.66	1.085
Infographics	5.26	3.62	1.067
Visual content (images)	5.22	3.64	1.088
Infographic posts	5.16	3.62	1.079
Article posts	4.71	3.52	0.976
Influencer content	4.83	3.47	1.119
Activist content	4.5	3.43	1.106
Interest-based video content	4.54	3.44	1.194
$\chi^2(8)$	20.028		
p	.01		

Note. N = 78. Rankings based on Friedman test. Higher mean rank = greater perceived effectiveness.

Table 3 shows that the Friedman test results indicate a statistically significant difference in the perceived effectiveness of content formats ($\chi^2(8) = 20.028$, $p = .01$). Among the content types, videos were ranked as the most effective format for environmental learning (Mean Rank = 5.49, M = 3.67), followed by articles (Mean Rank = 5.28) and infographics (Mean Rank = 5.26). Visual-based content such as images and infographic posts also received relatively high rankings. In contrast, activist content and video content focused on interest were perceived as less effective compared to other formats. These results suggest that multimedia and visually engaging content formats are more effective in supporting environmental education on Facebook.

Discussion

The first objective explore how Facebook engagement influences students' comprehension of environmental issues and awareness of Sustainable Development Goal 13 (Climate Action). The findings demonstrated a strong and statistically significant relationship between Facebook engagement and environmental awareness, indicating that higher levels of interaction with environmental content are associated with deeper understanding of climate issues (Fang et al., 2023; Yousef & Yousef, 2022). Students reported that Facebook contents helped them recognize the urgency of climate action, suggesting that the platform can effectively support cognitive awareness of sustainability topics. However, active behaviors such as sharing environmental content were less common, indicating that while Facebook contributes to awareness building, it may be less effective in encouraging participatory engagement or advocacy.

The second objective specifically examines on how students encounter climate-related content on Facebook. The results indicate moderate exposure to environmental information on the platform. Students reported feeling motivated to learn about environmental issues through Facebook, yet interactive behaviors such as commenting remained relatively limited. This pattern suggests that students are likely to consume environmental information passively rather than actively engaging in discussions. Such behavior aligns with existing research on social media usage, which shows that users often act as content consumers rather than active contributors in online discussions (Caers et al., 2013; Hamid et al., 2017; van Dijck, 2011).

The third objective aimed at recognizing the most effective Facebook content formats for environmental education. The results showed that videos, articles, and infographics were perceived as the most effective formats for learning about environmental issues. These findings highlight the importance of visually engaging and multimedia content in supporting environmental literacy among students. The result is consistent with the cognitive theory of multimedia learning, which suggests that combining visual and textual information enhances comprehension and knowledge retention more effectively than text-based content alone. Overall, this study provides evidence that Facebook, when used intentionally, can support environmental education efforts and promote climate literacy (Barkallah et al., 2020; Hamid et al., 2017; Ly et al., 2024; Neal, 1994).

Conclusion

This study examined the role of Facebook in promoting environmental education and awareness of Sustainable Development Goal 13 (Climate Action) among Cambodian university students. The findings indicate that Facebook engagement significantly contributes to students' environmental awareness, suggesting that social media can serve as an effective platform for climate education. Students perceived videos, infographics, and articles as the most useful content formats for learning about environmental issues, highlighting the importance of visually engaging materials. However, while students frequently consume environmental content, active participation such as sharing and commenting remains relatively limited. These results suggest that Facebook can support environmental learning, but greater emphasis on interactive engagement may further strengthen its educational impact.

Implication and Limitation

Based on the findings, it is recommended that educators, NGOs, and environmental communicators utilize Facebook more strategically by developing engaging multimedia content that promotes both awareness and interaction. Videos, infographics, and visually engaging materials appear particularly effective for environmental education. Universities may also consider integrating social media platforms into environmental literacy campaigns or sustainability education initiatives to enhance students' engagement with climate-related topics.

However, this study has several limitations. First, the research focused only on students who actively use Facebook, which may not represent students who use the platform less frequently or prefer other social media platforms. Second, the participants were limited to undergraduate students from a small number of universities, which may affect the generalizability of the findings. Third, the study relied heavily on self-reported survey responses, which may not fully reflect students' actual behaviors. Future research should cover a broader range of participants, incorporate qualitative methods such as interviews or focus groups, and examine other social media platforms to better understand how digital environments influence environmental learning and awareness.

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Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

This manuscript was refined with the assistance of AI-based language generation and editing tools, specifically ChatGPT, Gemini, and NotebookLM. The AI was used to enhance clarity, coherence and structure in support of the discussion.

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