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Impact of Persuasive Instagram Posts on Gen Z Mangrove Ecosystem Concern

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Abstract: Mangroves are a type of tree that play an important role in maintaining the balance of the coastal ecosystem. The decline in mangrove area and function due to urbanization pressures requires the active involvement of the younger generation in conservation efforts, particularly through digital media. Mangrove conservation activities necessitate the involvement and knowledge of Generation Z. Communication is an aspect that can impact knowledge of mangrove conservation. However, communication delivered in the form of visual images, audio, or graphics that explain the negative impacts makes people feel compelled to participate or vice versa. The purpose of this study is to examine the effectiveness of persuasion of positive and negative information posted on the Jakarta Mangrove Community's Instagram social media account on Generation Z's understanding of the mangrove forest ecosystem in Jakarta. The method employed is a quantitative survey with data collection procedures utilizing a questionnaire. An examination of survey data for Generation Z reveals a good association between the type of Instagram social media material and environmental awareness of the mangrove ecosystem. Whereas the substance of Instagram posts providing positively or negatively packaged critical information on mangrove forests and their environmental impact has a large overall influence on Generation Z's understanding of the need for mangrove forest ecosystems. Using Instagram as a social media platform to raise awareness among Generation Z communities about the efforts that can be made to conserve mangrove forest ecosystems is an effective technique.

Keywords: Communication; Community; Generation Z; Instagram; Mangrove Ecosystem.

Introduction

Mangrove ecosystems play a critical role in maintaining the balance of coastal environments by preventing erosion, supporting biodiversity, and serving as carbon sinks (Asari et al., 2021; Li et al., 2018; Zhu & Yan, 2022). However, in recent years, the area of mangrove forests in Jakarta has significantly decreased due to encroachment and land-use conversion. This decline has raised concerns about the sustainability of coastal ecosystems and the long-term impacts on both biodiversity and human communities relying on these resources. As urbanization intensifies, the exposure of Generation Z to environmental issues diminishes, creating a gap in ecological awareness among young people who are the next stewards of the environment. Therefore, it is crucial to understand how communication strategies, particularly through digital platforms, can enhance environmental concern and engagement among this demographic.

In the digital era, rapid technological advancement has enabled information to be accessed quickly and easily, particularly by Generation Z (Sahrina et al., 2025). Social media has become one of the primary platforms for information seeking, communication, and self-presentation, serving not only as a space for information

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exchange and network expansion but also as a medium for promotion, community representation, and personal branding (Arora et al., 2023). Its influence has grown significantly across various sectors, including business and public communication.

Although existing studies recognize social media as an effective tool for environmental communication, most research has focused on general awareness campaigns rather than examining the persuasive characteristics of content directed at youth audiences. Furthermore, prior studies tend to emphasize engagement indicators such as likes and shares, while giving limited attention to how visual and narrative content shapes the cognitive and affective dimensions of environmental awareness among Generation Z. This gap highlights the need to examine the persuasive impact of social media content on environmental attitudes and awareness. Among various platforms, Instagram is one of the most widely used media-sharing platforms, enabling users to distribute visual and audiovisual content accompanied by captions. Its visual-oriented features make Instagram an effective medium for delivering information in a concise and engaging manner, contributing to its widespread use across different age groups and its growing role in digital communication and education.

In Indonesia, the growth of communities in recent years has experienced significant development, whether in social communities, religious communities, hobby communities, sports communities, and other special communities. So far, communities are known as social bonds that function to obtain and disseminate information and build unity to achieve common goals. The involvement of digital technology is undeniably one part of the success of community recognition within society. Therefore, it is undeniable that every community will utilize social media, be it Instagram or Facebook, as promotional media for the community. The diverse uses of the internet in searching for information attract people in mass media to move from old media to new media such as Instagram, Pinterest, and YouTube. Mass media such as newspapers, radio, and television are no longer the only source of information, and new media in the online world, especially social media, have become a daily necessity because they facilitate daily work or business activities, so that social media becomes a forum for communication and also a tool for promoting products and services, even as an educational tool.

As of late 2025, Indonesia had approximately 180 million social media user identities, accounting for 62.9% of the total population, with users spending an average of 21 hours and 50 minutes per week on social media (Campaign Brief Asia, 2025). This high level of usage indicates that social media plays a central role in communication and information dissemination in Indonesia. Among these platforms, Instagram is widely used for sharing educational content and important information, as its interactive features support easy access and two-way communication, making it an effective medium for public education (Gunawan et al., 2021).

According to the APJII *2025 Indonesia Internet Profile Survey*, the number of internet users in Indonesia reached 229.4 million people, equivalent to an internet penetration rate of 80.66 % of the total population in 2025, up from 79.50 % in the previous year. This indicates a continued positive trend in internet adoption across the country, with more than eight out of ten Indonesians now connected to the internet. The survey also shows that internet access and usage are spreading across geographic regions and demographic groups, highlighting the pervasive role of digital connectivity in contemporary Indonesian society and underscoring the continued expansion of internet use as an integral part of daily life.

According to *We Are Social and Meltwater's Digital 2026: Indonesia* report, Indonesia's digital environment continued to grow rapidly in 2025. The number of social media user identities reached approximately 180 million, representing 62.9% of the total population (Campaign Brief Asia, 2025). Indonesian users spend an average of 21 hours and 50 minutes per week on social media across multiple platforms, indicating that social media has become an integral part of daily life and an important source of information.

Data from the Ministry of Environment and Forestry show that Indonesia's mangrove ecosystems cover approximately 3,440,464 hectares, with an additional 701,326 hectares identified as potential mangrove habitats. These data reflect ongoing changes in mangrove conditions and highlight the importance of sustainable management and conservation of coastal ecosystems.

Table 1. Mangrove Ecosystem Category

Category	Area (ha)	Percentage (%)
Existing Mangroves	3,440,464	83.07
Mangrove Habitat Potential	701,326	16.93
Total Area of Mangrove Ecosystem	4,141,790	100.00

The total area of mangrove ecosystems in DKI Jakarta Province is 749 Ha, with an area for each category of existing mangroves and potential mangrove habitat of 682 Ha and 67 Ha, respectively.

Table 2. Area of mangrove forest inside and outside forest areas according to BPDASHL working areas in DKI Jakarta Province

Mangrove Existing	In the forest area			Number in the area	Outside the APL forest area	Number outside the area	Total
	HL	HP	HK				
Rare mangroves	-	2	14	16	156	156	172
Dense mangroves	16	77	44	137	169	169	306
Medium mangroves	32	3	112	146	58	58	204
Total	48	82	170	300	382	382	682

Spatially, the distribution of existing mangroves and potential mangrove habitats can be seen in Figure 1.

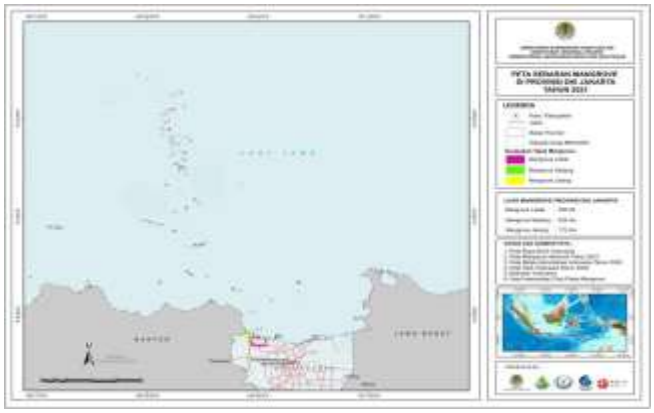

Figure 1. Map of Mangrove Distribution in Jakarta 2021

Recent assessments indicate that mangrove forests worldwide cover about 14.8 million hectares, a figure based on the FAO *Global Forest Resources Assessment 2020* and reflecting the most recent global mapping of mangrove extent. Indonesia ranks first globally for mangrove area, with an estimated 3.44 million hectares of mangrove forests based on national mapping in 2023, accounting for approximately 20 % of the global total. These extensive mangrove ecosystems are distributed along Indonesia's long coastline and provide critical ecological functions, including coastal protection, habitat provision, and carbon sequestration. Despite conservation efforts, mangrove loss has continued in many regions, though the overall rate of decline has slowed in recent decades according to FAO reports.

If mangrove degradation continues unchecked, it will lead to serious environmental consequences that ultimately threaten human well-being. Mangrove loss is driven by land conversion, resource exploitation, infrastructure development, and tourism activities, all of which degrade coastal ecosystems and intensify climate-related impacts. Therefore, community awareness, particularly among younger generations, is essential for mangrove conservation. In this context, social media platforms such as Instagram, supported by community-based initiatives, serve as effective tools for raising environmental awareness and promoting mangrove protection.

The Instagram account *mangrovejakarta.id*, owned by the Mangrove Jakarta Community, has become an active platform for environmental education and engagement since its launch in 2020. As of now, the account has around 9.1 thousand followers and has shared more than 2,200 posts that feature important information about mangroves, conservation efforts, activities, and collaborations with various partners on ecosystem restoration and community engagement. This active presence on social media supports the community's mission to raise awareness and educate the public about the ecological importance of mangroves and the benefits of planting and protecting these ecosystems in Jakarta and beyond.

Through its Instagram account mangrovejakarta.id, the Mangrove Jakarta Community communicates environmental messages using visual content such as images, graphics, and concise captions, while encouraging interaction through comments and direct messages. The content prioritizes accuracy, clarity, and relevance to increase effectiveness and credibility, particularly among its primary audience of teenagers and young adults.

The degradation of mangrove forests in Indonesia heightens the risk of coastal disasters, ecosystem damage, and economic vulnerability for fishing communities. Given the ecological and economic importance of mangroves, public involvement, especially from younger generations, is essential for conservation efforts. In line with its mission, the Mangrove Jakarta Community utilizes Instagram and digital campaigns, including online fundraising initiatives, to raise awareness and promote mangrove conservation, making the community a relevant and valuable focus for this research.

Method

The object of this study is the phenomenon of environmental communication conducted through Instagram by the *Mangrove Jakarta Community*, particularly in relation to mangrove conservation issues in an urban coastal context. This research focuses on how Instagram content produced by the community functions as a persuasive communication tool capable of shaping environmental awareness among Generation Z.

The phenomenon under investigation arises from the limited public attention given to mangrove ecosystems despite their ecological significance and the increasing reliance of younger generations on social media as a primary information source. By examining this phenomenon, the study positions Instagram not merely as a digital platform but as a communicative space where environmental meanings are constructed and negotiated. The selection of the *Mangrove Jakarta Community* as the research object is based on its active role in producing environmental content and engaging urban youth through Instagram-based communication initiatives.

This study investigates the causal relationship between environmental consciousness and the efficacy of Instagram posts using quantitative research design and explanatory methodology. For measuring latent variables and testing hypotheses obtained from the research objectives, quantitative approaches are thought to be suitable. Both primary and secondary data were employed in this investigation. A structured survey was used to gather primary data directly from respondents regarding their perceptions of the efficacy of Instagram posts and their degree of environmental awareness. Secondary data supporting the conceptual framework and contextual understanding of environmental communication and mangrove conservation were gathered from academic literature, institutional records, and pertinent documents. A thorough study that blends empirical measurement with a theoretical foundation is made possible by the integration of primary and secondary data.

The primary data sources in this study are followers of the Instagram account mangrovejakarta.id who fall within the Generation Z age category. These respondents were selected because they represent the primary target audience of the community's Instagram-based environmental communication. Generation Z was chosen as the main source of information due to their characteristics as digital natives who actively consume and interact with visual content on social media platforms (Ahmed, 2024; Elkatmış, 2024). Secondary data sources include peer-reviewed academic journals, official publications, and institutional documents related to environmental communication, social media studies, and mangrove conservation (Lestari et al., 2025). The use of diverse data sources strengthens the analytical depth of the study and ensures that empirical findings are interpreted within a broader academic and contextual framework.

Several methodical steps were taken in the research process to guarantee the precision and dependability of the information gathered. To gauge respondents' opinions of the efficacy of Instagram content and their degree of environmental consciousness, the first step included creating a research tool in the form of a questionnaire. Google Forms, a technology chosen for its accessibility and effectiveness in reaching digitally active respondents, was used to distribute the questionnaire online (Alcott, 2024).

Data collection was carried out online to align with the media consumption patterns of Generation Z, who predominantly engage with digital platforms (Jain, 2024). Prior to analysis, the collected data were screened for completeness and consistency to minimize response bias and data entry errors (Ahmed, 2024). In addition, validity and reliability tests were conducted to ensure that the measurement instruments accurately captured the intended constructs. These procedures demonstrate that data collection was conducted through controlled and methodologically sound processes.

With the use of SmartPLS software, Partial Least Squares–Structural Equation Modeling (PLS-SEM) was used for data analysis in this study. Because PLS-SEM is robust when applied to relatively small sample sizes and can be used to analyze complex models containing latent variables, it was chosen (Sarstedt et al., 2021). To evaluate convergent and discriminant validity, the measurement model (outer model) was first evaluated using outer loadings, Average Variance Extracted (AVE), and cross-loadings. To guarantee internal consistency, construct reliability was assessed using Cronbach's Alpha and Composite Reliability. The structural model (inner model) was evaluated to examine causal relationships between variables using path coefficients, t-statistics, and p-values once the measurement model satisfied the necessary requirements (Hair et al., 2013). This analytical approach enabled the study to empirically assess the influence of Instagram content effectiveness on environmental awareness among Generation Z in a comprehensive and statistically rigorous manner.

This study employs a quantitative research approach to investigate the impact of Instagram postings from mangrovejakarta.id on Generation Z's development of environmental consciousness, particularly regarding mangrove ecosystems. The research methodology employed by the author is a survey. Research that is methodical, planned, structured, and uses numbers is referred to as quantitative research (Ahmed, 2024). Using a questionnaire approach that will be covered in more detail later, the researcher attempted to examine the effectiveness of Instagram social media mangrovejakarta.id on the development of environmental awareness. The population in this study is generation Z and followers of the @mangrovejakarta Instagram account, which total approximately 9,075

followers. The sample of this study consisted of Generation Z or Instagram followers of the @mangrovejakarta.id account. Researchers used the Slovin formula to determine the sample size.

$$n = \frac{N}{1 + N(e)^2}$$
$$n = \frac{9.075}{1 = 9.075(0,01)}$$
$$n = \frac{9,075}{1 + 90,75}$$
$$n = \frac{9.075}{91,75}$$
$$n = 98,92 \quad (1)$$

The Slovin formula can be used to calculate the sample size. The sample in this study consisted of 99 respondents taken from a population of 9,075 followers of the @mangrovejakarta.id social media account. Based on the existing Slovin formula, the researcher needed to obtain a minimum of 99 respondents with an error rate of 10%. To distribute questionnaires, researchers used Google Forms. The validity test and reliability test were used by researchers to validate the data. In addition, researchers also used sources from Miller (2025) which state that quantitative research focuses on recording as much data as possible from a large population through statistical formulas. According to Alcott (2024), quantitative research can use probability sampling or non-probability sampling.

Result and Discussion

The results indicate that the effectiveness of Instagram content published by the mangrovejakarta.id account exerts a significant influence on environmental awareness, as demonstrated by the PLS-SEM structural model analysis. Based on the inner model results, the relationship between Instagram content effectiveness and environmental outcomes yields a path coefficient of 0.517, a t-statistic value of 4.280, and a p-value of 0.000, indicating a positive and statistically significant relationship. This finding is reinforced by the measurement model results, where the dimensions forming Instagram content effectiveness—accessibility, content quality, and posting material—each demonstrate strong outer loading values. Accessibility records a coefficient of 0.913, content quality 0.850, and posting material 0.959, indicating substantial contributions to the latent construct. These values suggest that respondents perceive the Instagram content of the *Mangrove Jakarta Community* as easy to access, substantively relevant, and visually engaging. Overall, the empirical data confirms that Instagram content effectiveness is a measurable construction composed of validated indicators, as confirmed through the PLS-SEM approach (Sarstedt et al., 2021).

Table 3. Hypothesis Test Results Direct Effect

Parameters	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Effectiveness of Instagram Content -> Impact on the Environment	0.517	0.512	0.121	4.280	0.000
Instagram Content Effectiveness -> Access	0.913	0.916	0.019	47.652	0.000
Instagram Content Effectiveness -> Content	0.850	0.850	0.062	13.763	0.000
Instagram Content Effectiveness -> Posting Material	0.959	0.960	0.008	113.759	0.000
Impact on the Environment -> Awareness	0.920	0.923	0.030	31.099	0.000
Impact on the Environment -> Attention to the Environment	0.938	0.940	0.026	36.078	0.000

The high path coefficient and statistical significance associated with Instagram content effectiveness indicate that message design, accessibility, and the quality of posting materials play a critical role in shaping respondents' perceptions of environmental messages (Kapoor et al., 2021). The particularly high value for posting material suggests that visual elements, graphics, and narrative framing employed by the *Mangrove Jakarta Community* are effective in attracting attention and facilitating message comprehension. This aligns with principles of digital visual communication, which emphasize that the integration of visual aesthetics and clear informational structures enhances message processing among social media audiences (San Cornelio et al., 2024). Furthermore, the strong accessibility dimension reflects the importance of ease of access and

interaction in determining the success of digital environmental communication. These findings indicate that content effectiveness is not determined solely by informational substance, but also by how messages are delivered and distributed within platform-specific environments. In this regard, Instagram content effectiveness emerges as the result of the interaction between message quality and digital distribution mechanisms aligned with Generation Z's media consumption patterns.

The relationship between Instagram content effectiveness and the empirical research problem can be understood in the context of limited urban environmental awareness regarding mangrove conservation. The empirical data indicate that content produced by the *Mangrove Jakarta Community* can bridge the informational gap between the complexity of mangrove ecosystem issues and Generation Z's level of understanding as a digital audience. The statistically significant relationship between Instagram content effectiveness and environmental outcomes demonstrates that social media can function as a strategic instrument in urban environmental communication. Within Jakarta's urban context, where mangrove degradation is driven by coastal development pressures, effective Instagram content serves as an alternative educational medium capable of reaching young audiences sustainably (Ghufronudin et al., 2025; Ikhsan, 2025; Lu et al., 2025). These findings suggest that low environmental awareness is not merely the result of information scarcity, but rather of suboptimal communication strategies. When environmental communication is strategically designed and aligned with digital audience characteristics, environmental awareness can be developed in a more systematic and measurable manner.

The results for the environmental awareness variable indicate that this construction is significantly formed through two primary dimensions: awareness and attention to the environment, as reflected in the PLS-SEM measurement model. The awareness dimension records a coefficient of 0.920, while the attention to the environmental dimension yields a coefficient of 0.938, both exceeding the minimum validity thresholds. Most indicators within these dimensions demonstrate outer loading values above 0.70, confirming their validity in representing the latent construct. These findings indicate that respondents not only possess cognitive understanding of environmental issues but also demonstrate a relatively high level of concern and attentiveness toward mangrove ecosystem problems. This result is consistent with digital environmental communication perspectives that emphasize the integration of knowledge and affect in shaping environmental awareness (Pranata et al., 2025; Xie et al., 2024). Overall, the data suggest that environmental awareness among Generation Z respondents has been empirically established and validated through measurable indicators.

The design of this model illustrates how the latent variable relationship refers to hypothesis, problem formulation, and theoretical study. Figure 3 presents the design of the inner model of SmartPLS software processing results, where the blue elements symbolize the dimensions in the latent variable of Instagram content effectiveness as variable X and the impact on the environment as variable Y.

Table 4. Loading Factor Results and Loading Factor Value Table

Variable	Dimension	Indicator	Outer Loading
Effectiveness of Instagram Content	Content	X1.1	0.829
		X1.2	0.874
		X1.3	0.901
		X1.4	0.884
	Posting Material	X2.1	0.862
		X2.2	0.907
		X2.3	0.775
		X2.4	0.826
		X2.5	0.740
	Access	X3.1	0.867
		X3.2	0.909
		X3.3	0.894
		X3.4	0.861
Impact on the Environment	Awareness	Y1.1	0.501
		Y1.2	0.488
		Y1.3	0.870
		Y1.4	0.850
		Y1.5	0.874
	Attention to the Environment	Y2.1	0.857
		Y2.2	0.862
		Y2.3	0.888
		Y2.4	0.723
		Y2.5	0.715

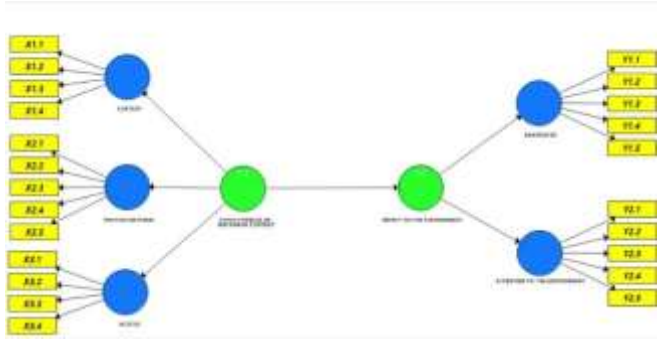

Figure 3. Inner Model

For this investigation, researchers employed the model shown in Figure 3. Inner Model. There are 10

indicators for environmental impact and thirteen indicators for the efficacy of Instagram posts. To determine each indicator's value, the researcher first examined the loading factor's validity.

It is known that each indicator of the study variable has several outside loading values > 0.5 based on the data presentation in the table and figure above. According to the information presented above, all variable indicators are deemed viable or legitimate for use in research, and therefore all indicators can be employed.

A construct's validity is assessed using the convergent validity value. If the factor loading value (original sample value) is greater than 0.5, the indicators are considered legitimate. The standardized loading factor can be used to assess convergent validity by looking at individual item dependability. The degree of correlation between each measurement item (indicator) and its construct is described by the standardization loading factor. The outer loading values of each indicator on the study variables are as follows.

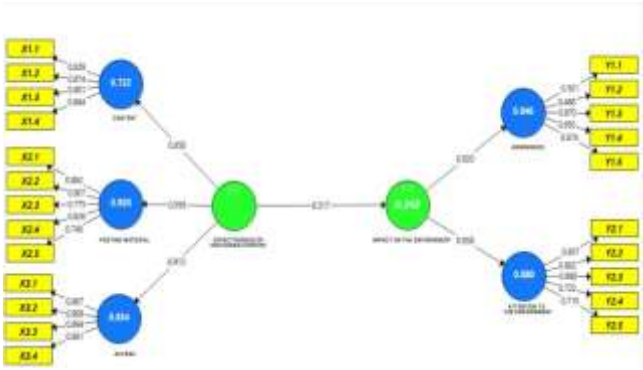

Figure 4. Outer Model

It states that testing the validity of the AVE, cross loading, and testing the reliability of Cronbach alpha and composite reliability come next after assessing the model modifications using the loading factor.

Table 5. Cronbach's Alpha Value Table

Parameters	Cronbach's Alpha
Effectiveness of Instagram Content	0.946
Content	0.895
Posting Material	0.880
Access	0.906
Impact on the Environment	0.889
Awareness	0.782
Attention to the Environment	0.869

According to the data displayed in the above table, each research variable's Cronbach's alpha value is 0.946 for variable X (efficacy of Instagram content) and 0.889 for variable Y (impact on the environment).

Table 6. Cross loading value table

Parameters	Impact on the Environment	Effectiveness of Instagram Content
X1.1	0.293	0.706
X1.2	0.320	0.745
X1.3	0.383	0.719
X1.4	0.302	0.791
X2.1	0.410	0.808
X2.2	0.462	0.837
X2.3	0.335	0.779
X2.4	0.370	0.785
X2.5	0.386	0.739
X3.1	0.486	0.787
X3.2	0.550	0.811
X3.3	0.402	0.830
X3.4	0.516	0.795
Y1.1	0.704	0.431
Y1.2	0.656	0.416
Y1.3	0.808	0.323
Y1.4	0.790	0.239
Y1.5	0.820	0.282
Y2.1	0.783	0.215
Y2.2	0.802	0.360
Y2.3	0.835	0.344
Y2.4	0.741	0.505
Y2.5	0.630	0.313

Each indicator in the research variable has the highest cross-loading value on the variable it measures when compared to the cross-loading value on other variables, according to the data presentation in the above table. Based on the results obtained, it can be stated that the indicators used in this study have good discriminant validity in constructing their respective variables. It shows that all variables have an AVE value > 0.5 so that all variables are classified as valid.

The relatively high coefficients for environmental awareness and attention suggest that respondents tend to internalize messages conveyed through Instagram content. This may be related to the combination of informational and visually engaging elements in digital environmental communication (Liao, 2024). The attention dimension indicates sustained engagement with mangrove-related issues rather than brief exposure. In environmental communication theory, attention is considered a prerequisite for attitude formation and pro-environmental intention (Afianto et al., 2024; Confetto et al., 2023). These findings indicate that Instagram-based communication is associated with both cognitive and affective aspects of environmental awareness among Generation Z (Lestari et al., 2025).

The relevance to the research problem is apparent in the context of limited public concern for mangrove conservation in urban areas. The results show that

structured dissemination of environmental messages via social media is associated with higher environmental awareness among Generation Z. This is particularly important in Jakarta, where formal environmental education is limited. Community-based digital communication can thus complement existing educational efforts by providing an alternative space for environmental learning.

The findings also show that Generation Z respondents actively engage with Instagram content produced by the Mangrove Jakarta Community. Respondents reported positive responses to visual content, narrative framing, and participatory elements. As digital natives, Generation Z tends to interact with environmental messages rather than receiving them passively (Jain, 2024). Such engagement can be considered an important indicator of effective environmental communication targeting younger audiences.

The high engagement of Generation Z respondents can be attributed to the alignment between message format and audience media preferences. Generation Z tends to respond positively to content that is visually appealing, authentic, and socially relevant (Rajput & Gandhi, 2025). Instagram content from the Mangrove Jakarta Community presents local environmental issues through concise visual narratives, enhancing accessibility and relatability. Interactive features such as comments and direct messages further facilitate two-way communication, increasing audience involvement. These findings suggest that environmental communication strategies leveraging platform-specific features are more likely to resonate with Generation Z.

The high engagement of Generation Z with Instagram content from the Mangrove Jakarta Community can be attributed to the alignment between message design and audience media preferences. Visually appealing, authentic, and locally relevant content, combined with interactive features, enhances accessibility, attention, and participation (Agrawal et al., 2023; Rajput & Gandhi, 2025). These findings suggest that Instagram-based environmental communication can effectively foster both cognitive understanding and affective engagement with mangrove conservation among urban youth.

The study also indicates that Generation Z's low participation in conservation activities may result from ineffective communication rather than lack of interest. Strategically designed digital content, emphasizing visual narratives and platform-specific features, can bridge complex ecological issues and audience understanding. The findings reinforce digital environmental communication frameworks and provide practical guidance for environmental communities, NGOs, and policymakers to integrate conservation messages into young audiences' daily digital practices, thereby strengthening awareness and engagement.

Conclusion

This study demonstrates that Instagram-based environmental communication functions not only as a medium for information dissemination but also as an effective mechanism for shaping environmental awareness among Generation Z in a structured and measurable manner. The findings show that well-designed Instagram content characterized by accessibility, content quality, and strong visual presentation can generate sustained awareness and attention toward mangrove conservation issues. These results challenge the assumption that low environmental awareness among young urban audiences is caused by apathy, instead indicating that awareness is highly influenced by the effectiveness of communication strategies employed. The study contributes theoretically by strengthening environmental communication models through empirical evidence of social media content effectiveness as a key factor linking environmental information and audience awareness. Practically, the findings provide strategic insights for environmental communities, practitioners, and policymakers regarding the use of Instagram as a platform aligned with Generation Z's digital preferences. Although this research focuses on a single community and platform, it offers a foundation for future studies to explore broader contexts, longitudinal impacts, and qualitative perspectives. Overall, the findings support the integration of social media-based communication into environmental education initiatives to enhance awareness and participation among younger generations.

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The authors declare no conflict of interest.

References

Afianto, R. A., Putra, D., Akhmad, N., & Nikmatussholekha, N. F. (2024). Peran social media influencer dalam menciptakan product

value sebagai pendorong green lifestyle sustainability. *Jurnal Penelitian Ekonomi, Manajemen Dan Bisnis*, *3*(3), 221–236. https://doi.org/10.55606/jekombis.v3i3.4018

Agrawal, M., Kalia, P., Nema, P., Zia, A., Kaur, K., & John, H. B. (2023). Evaluating the influence of government initiatives and social platforms on green practices of Gen Z: The mediating role of environmental awareness and consciousness. *Cleaner and Responsible Consumption*, *8*. https://doi.org/10.1016/j.clrc.2023.100109

Ahmed, S. K. (2024). How to choose a sampling technique and determine sample size for research: A simplified guide for researchers. *Oral Oncology Reports*, *12*. https://doi.org/10.1016/j.oor.2024.100662

Alcott, B. (2024). Reflexive approaches to sampling, survey design and quantitative research. *Journal of Quantitative Methods in Social Science*, *15*(4), 243–260. https://doi.org/10.1080/1743727X.2024.2432282

Arora, N., Rana, M., & Prashar, S. (2023). How does social media impact consumers' sustainable purchase intention? *Review of Marketing Science*, *21*(1), 143–168. https://doi.org/10.1515/roms-2022-0072

Asari, N., Suratman, M. N., Mohd Ayob, N. A., & Abdul Hamid, N. H. (2021). Mangrove as a natural barrier to environmental risks and coastal protection. In *Mangroves: ecology, biodiversity and management* (pp. 305–322). Springer. https://doi.org/10.1007/978-981-16-2494-0_13

Confetto, M. G., Covucci, C., Addeo, F., & Normando, M. (2023). Sustainability advocacy antecedents: How social media content influences sustainable behaviours among Generation Z. *Journal of Consumer Marketing*, *40*(6), 758–774. https://doi.org/10.1108/JCM-11-2021-5038

Elkatmış, M. (2024). Examination of social media usage habits of Generation Z. *Frontiers in Psychology*, *15*, 11284647. https://doi.org/10.3389/fpsyg.2024.1370823

Ghufronudin, Hastuti, & Efianingrum, A. (2025). From Critical Consciousness to Collective Action: A Freirean Netnographic Study on Public Engagement in Watchdoc's Mangrove Restoration Advocacy. *International Journal of Social Sustainability in Economic, Social & Cultural Context*, *21*(2). https://doi.org/10.18848/2325-1115/CGP/v21i02/187-212

Gunawan, A. I., Amalia, F., Senalasari, W., & Gaffar, V. (2021). Pengukuran Aktivitas Pemasaran pada Media Sosial Instagram. *Jurnal Administrasi Bisnis*, *10*(2), 133–142. https://doi.org/10.14710/jab.v10i2.35768

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2013). Partial least squares structural equation modeling: Rigorous applications, better results and higher acceptance. *Long Range Planning*, *46*(1–2), 1–12. https://doi.org/10.1016/j.lrp.2013.01.001

Ikhsan, M. H. (2025). *Bakaus: the effectiveness of virtual reality game as a learning tool for understanding mangroves and their regulating services* [Master's thesis: Nanyang Technological University, Singapore]. https://doi.org/10.32657/10356/182978

Jain, S. (2024). The impact of social media content on Gen Z engagement: A comprehensive analysis. *International Journal for Multidisciplinary Research*, *6*(4). https://doi.org/10.36948/ijfmr.2024.v06i04.26194

Kapoor, P. S., Balaji, M. S., & Jiang, Y. (2021). Effectiveness of sustainability communication on social media: role of message appeal and message source. *International Journal of Contemporary Hospitality Management*, *33*(3), 949–972. https://doi.org/10.1108/IJCHM-09-2020-0974

Lestari, E. Y., Purwanti, A., & Herawati, R. (2025). Environmental Awareness in Generation Z on Pandawaragroup Content on Instagram Social Media. *IOP Conference Series: Earth and Environmental Science*, *1537*(1), 12037. https://doi.org/10.1088/1755-1315/1537/1/012037

Lestari, R., Nurmandi, A., Younus, M., Lawelai, H., & Suardi, W. (2025). Optimizing social media platforms to foster active public engagement in tackling climate change. *Society*, *13*(1), 18–34. https://doi.org/10.33019/society.v13i1.742

Li, S.-B., Chen, P.-H., Huang, J.-S., Hsueh, M.-L., Hsieh, L.-Y., Lee, C.-L., & Lin, H.-J. (2018). Factors regulating carbon sinks in mangrove ecosystems. *Global Change Biology*, *24*(9), 4195–4210. https://doi.org/10.1111/gcb.14322

Liao, C. H. (2024). Exploring social media determinants in fostering pro-environmental behavior. *Frontiers in Psychology*, *15*. https://doi.org/10.3389/fpsyg.2024.1445549

Lu, C. Y., Suhartanto, D., Amalia, F. A., & Chen, B. (2025). Modelling sustainable behaviour in Mangrove ecotourism: cross-national insights from Indonesia and Taiwan. *Journal of Ecotourism*, 1–21. https://doi.org/10.1080/14724049.2025.2604492

Miller, A. (2025). Online Surveys, Disabilities, and Multi-Method Accessibility Conformance Evaluation: A Domain Analysis and Procedures for Improving the User Experience. *Including Disability*, *6*. https://doi.org/10.51357/id.v6i.310

Pranata, R. T. H., Satria, A., Budiarto, T., Bachtiar, W., & Muthohharoh, N. H. (2025). Communication Strategy of Mangrove Rehabilitation in Muara Gembong, Bekasi District--West Java. *Jurnal Komunikasi Ikatan Sarjana Komunikasi Indonesia*, *10*(2), 359–372. https://doi.org/10.25008/jkiski.v10i2.1190

Rajput, A., & Gandhi, A. (2025). Impact of social media influencer content on Generation Z sustainable tourism choices. *Discover Sustainability*, *6*, 1121. https://doi.org/10.1007/s43621-025-02004-z

Sahrina, A., Fadlan, M. S., Abidin, M. Y., Rosyida, F., Adi, K. R., & Ulfa, M. (2025). Gen Z Students Participation in Fieldwork at Mangrove Conservation Areas to Foster Environmental Awareness. *KnE Social Sciences*, *10*(31). https://doi.org/10.18502/kss.v10i31.20385

San Cornelio, G., Martorell, S., & Ardèvol, E. (2024). Emerging visual narratives on environmental crisis on Instagram. *Frontiers in Communication*, *8*. https://doi.org/10.3389/fcomm.2023.1265466

Sarstedt, M., Ringle, C. M., & Hair, J. F. (2021). Partial least squares structural equation modeling. In *Handbook of market research* (pp. 587–632). Springer. https://doi.org/10.1007/978-3-319-57413-4_15

Xie, P., Zhang, Y., Chen, R., Zhang, H., & Liu, Y. (2024). Social media's impact on environmental awareness. *BMC Public Health*, *24*. https://doi.org/10.1186/s12889-024-20721-4

Zhu, J.-J., & Yan, B. (2022). Blue carbon sink function and carbon neutrality potential of mangroves. In *Science of the total environment* (Vol. 822, p. 153438). Elsevier. https://doi.org/10.1016/j.scitotenv.2022.153438