Research and Innovation in Social Science Education Journal
Vol. 3 No. 2 December 2025 (48-56)
https://ejournal.ump.ac.id/index.php/rissej
ISSN: 3026-457X

The Effect of TikTok Exposure on Attitudes, Subjective Norms, and Intentions to Promote Pro-Environmental Behavior among Universitas Padjadjaran Students

Naura Azzalya Arjani[1]✉, Kunto Adi Wibowo[2], Detta Rahmawan[3], Ikhsan Fuady[4]
[1,2,3,4]Department of Communication Science, University of Padjadjaran, Sumedang, 45363, Indonesia

ARTICLE INFO

Keywords:

College Students, Pro-Environmental Behavior, Social Media, TikTok Exposure

ABSTRACT

Climate change necessitates behavioral transformation among Generation Z, who are heavily influenced by TikTok. This study analyzes the impact of TikTok exposure on pro-environmental behavior among Universitas Padjadjaran students using the Theory of Planned Behavior. Data from 310 respondents were processed using SEM-PLS. Results indicate that TikTok exposure significantly is significantly associated with attitudes and subjective norms, driving environmental intentions and actions. A critical finding reveals that attitude (T-Stat 10.761) serves as a stronger mediator than subjective norms (T-Stat 6.943), suggesting that personal conviction outweighs social pressure. The model shows strong predictive power, with behavioral intention demonstrating a strong association with pro-environmental behavior (T-Stat 101.724). In conclusion, TikTok effectively mobilizes environmental action by internalizing personal values rather than mere social conformity.

DOI: 10.30595/rissej.v3i2.409

1. Introduction

Researchers state that the average global temperature is currently higher than it was in the 1960s. This increase in temperature is primarily driven by human activities as well as natural climate variability. The impacts of this climate crisis are evident in shifting rainfall patterns, the emergence of extreme weather events such as heatwaves, and rising sea levels (Ben-Enukora et al., 2025). These conditions highlight the urgency of enhancing public awareness and transforming societal behavior to become more environmentally responsible. Young people, particularly Generation Z, represent a crucial group in these efforts.

In the era of digital communication, TikTok has become a dominant medium shaping the awareness and attitudes of young people. The TikTok platform is regarded as a powerful and inclusive communication mechanism because it enables users to actively participate in the creation and dissemination of environmental messages (Arnot et al., 2024; Pearce et al., 2019). As one of the short-video sharing platforms with the largest youth user base, TikTok has emerged as a popular channel for climate change advocacy and sustainability initiatives. International studies demonstrate that environmental campaigns on TikTok are capable of improving users' knowledge, attitudes, and adaptive practices related to climate change, as evidenced by research conducted in Nigeria (Ben-Enukora et al., 2025).

In the Indonesian context, TikTok ranks among the platforms with the largest number of users worldwide, the majority of whom are young people, including university students. Students at Universitas Padjadjaran, as part of Generation Z, possess significant potential to act as agents of change in

[1] *Naura Azzalya Arjani. Department of Communication Science, University of Padjadjaran, Sumedang, 45363, Indonesia
E-mail address: naura24019@mail.unpad.ac.id

Received 22 September 2025; Received in revised form 7 October 2025; Accepted 10 December 2025; Available online 30 December 2025

environmental issues. However, empirical studies examining how exposure to environmental content on TikTok influences students' attitudes and subjective norms remain limited.

Despite the growing number of studies examining environmental communication through social media, several gaps remain in the literature. Previous research has largely focused on the role of general social media platforms such as Twitter and Instagram in shaping environmental awareness and activism (Pearce et al., 2019; Xiao et al., 2023). While emerging studies have begun to explore TikTok as a platform for climate communication, most of them emphasize message dissemination or user engagement rather than examining the psychological mechanisms that translate social media exposure into pro-environmental behavioral outcomes. Furthermore, empirical evidence from developing country contexts, particularly Indonesia, remains limited. Therefore, the present study integrates TikTok exposure into the Theory of Planned Behavior framework to investigate how digital environmental communication shapes attitudes, subjective norms, behavioral intention, and pro-environmental behavior among university students. By examining these relationships within the Indonesian context, this study contributes to extending TPB by positioning social media exposure as a key antecedent influencing environmental behavioral formation.

1.1 TikTok and Social Media in Environmental Communication

TikTok, with more than 1.8 billion active global users in 2023, is predominantly used by individuals under the age of 34, with Generation Z (aged 18–24) representing the largest and most active demographic group on the platform. Data from DataReportal (2023) indicate that 38% of TikTok users are between 18 and 24 years old, and approximately 90% of them are daily users who spend an average of 52 minutes per day on the platform. In the context of environmental communication, TikTok offers distinct advantages due to its short-video format, which enables information to be conveyed in an engaging and easily comprehensible manner. The platform also allows users to interact directly with content through likes, comments, and video sharing, thereby creating two-way communication channels. This interactivity is particularly important for raising awareness of environmental issues, as audiences are not merely passive recipients but also active participants in disseminating messages. Studies (Pearce et al., 2019; Arnot et al., 2024) demonstrate that social media plays a critical role due to its participatory nature, enabling audiences not only to receive information but also to create and distribute messages related to climate issues. TikTok, with its large global user base and strong dominance among younger generations, has evolved into one of the primary channels for advocating sustainability concerns. Various digital movements using hashtags such as #SaveTheEarth, #ClimateChange, and #ZeroWaste function both as educational tools and as mechanisms for mobilization. Recent research further indicates that exposure to environmental campaigns on TikTok contributes to improvements in users' knowledge, attitudes, and adaptive practices, as evidenced by a study conducted in Nigeria (Ben-Enukora et al., 2025).

1.2 TikTok and Social Media Exposure (TikTok Exposure)

Social media exposure refers to the extent to which individuals encounter and engage with information presented on digital platforms. In the context of TikTok, exposure does not only involve passive viewing of content but also includes various forms of user interaction such as liking, commenting, sharing, and participating in content circulation. These interactive features distinguish TikTok from many traditional media channels, as users are simultaneously positioned as information consumers and contributors within the communication process.

One important characteristic of TikTok exposure lies in its algorithmic recommendation system. The platform's "For You Page" algorithm continuously curates personalized content based on users' viewing history, interaction patterns, and engagement behavior. As a result, users may repeatedly encounter content aligned with their interests, including environmental campaigns and sustainability messages. This algorithmic exposure increases the likelihood that environmental information becomes embedded within users' everyday digital experiences.

In addition to algorithmic exposure, user engagement intensity also plays a crucial role in shaping the influence of social media content. Engagement activities such as commenting, sharing videos, or creating related content can strengthen message diffusion and reinforce social influence among peer networks. Previous studies indicate that interactive engagement with environmental content on social media can contribute to increased awareness and encourage environmentally responsible actions among young audiences (Hajri & Daife, 2024; Liao et al., 2024).

Therefore, TikTok exposure should be understood not merely as the frequency of viewing environmental content but as a broader process that combines algorithmic exposure and interactive participation. Through these mechanisms, TikTok has the potential to influence users' perceptions, attitudes, and social norms related to environmental issues, particularly among Generation Z students who are highly active in digital environments.

H1: TikTok Exposure positively influences Pro-Environmental Attitudes.

H2: TikTok Exposure positively influences Subjective Norms.

1.3 Pro-Environmental Attitudes

Pro-environmental attitudes can be defined as an individual's positive evaluation of actions that contribute to environmental protection. These attitudes encompass three components: knowledge (cognitive dimension), feelings (affective dimension), and the intention to act (behavioral dimension) (Bamberg & Möser, 2007). According to the Theory of Planned Behavior proposed by Icek Ajzen (1991), attitudes play a crucial role in shaping individuals' intentions and subsequent behaviors toward the environment. Empirical studies have demonstrated that social media exerts a substantial influence on the development of positive attitudes toward climate change issues. Liao et al. (2024) report that engagement with diverse environmental content on digital platforms enhances students' pro-environmental attitudes. Similarly, Ben-Enukora et al. (2025) find that activities involving the dissemination of climate-related information on TikTok significantly contribute to improving both attitudes and adaptive behaviors among younger generations. Thus, pro-environmental attitudes function as a mediating bridge between social media exposure and students' actual behaviors.

H3: Pro-Environmental Attitudes have a positive effect on Behavioral Intention.

1.4 Subjective Norms

Subjective norms refer to an individual's perception of social pressure or expectations from significant others, such as friends, family members, or the broader community, to perform particular behaviors. According to Icek Ajzen (1991), subjective norms constitute one of the key determinants influencing behavioral intention within the Theory of Planned Behavior. Injunctive norms focus on perceived social expectations from individuals or groups considered important. For instance, close friends or influencers followed on TikTok may create social pressure or expectations to engage in certain behaviors. For example, when a TikTok influencer with a large following advocates reducing plastic waste, students who follow this influencer may feel encouraged to conform to these perceived expectations. In contrast, descriptive norms relate to perceptions of what most people actually do within one's social environment. For example, when students observe many of their peers actively participating in campaigns such as #ZeroWaste on TikTok, they may feel more motivated to adopt similar behaviors because these actions are perceived as common and socially accepted among their peer group.

Because TikTok enables users to interact directly with social content through likes, comments, and sharing, the social norms formed through such interactions can reinforce pro-environmental behavior among students. This phenomenon is commonly referred to as the bandwagon effect, whereby the greater the number of people engaging in a particular behavior, the more likely others are to follow. In the context of pro-environmental behavior, subjective norms on TikTok are shaped through social interactions with peers and influencers who promote environmentally responsible actions. Influencers with large followings, in particular, possess substantial capacity to shape social norms by encouraging followers to adopt eco-friendly practices, such as reducing plastic consumption or participating in sustainability campaigns through hashtags such as #EcoFriendly. Therefore, subjective norms are not merely individual perceptions but function as important social factors that connect TikTok usage with students' propensity to engage in pro-environmental behavior.

H4: Subjective Norms positively influence Behavioral Intention.

1.5 Students' Pro-Environmental Behavior

Pro-environmental behavior refers to concrete actions undertaken by individuals with the aim of reducing environmental degradation, such as minimizing the use of single-use plastics, engaging in recycling practices, conserving energy, and adopting sustainable lifestyles (Kollmuss & Agyeman, 2002). In the context of students at Universitas Padjadjaran, such behaviors not only reflect environmental awareness but also represent their social identity as members of a younger generation that is concerned with sustainability issues.

Previous studies indicate that pro-environmental behavior is influenced by psychological and social factors, including individuals' attitudes and perceived norms (Bamberg & Möser, 2007). Recent research further reveals that social media can transform environmental awareness into concrete actions, particularly among

Generation Z, who tend to be more open and actively engaged in social initiatives through digital platforms. Liao et al. (2024) demonstrate that exposure to pro-environmental content on social media, including TikTok, can influence young people's attitudes and behaviors toward environmental issues. Ben-Enukora et al. (2025) also report that climate advocacy on TikTok, by directly engaging users, encourages them to participate in sustainability-supporting actions, such as reducing waste or adopting environmentally friendly lifestyles.

H5: Behavioral Intention has a positive effect on Pro-Environmental Behavior.

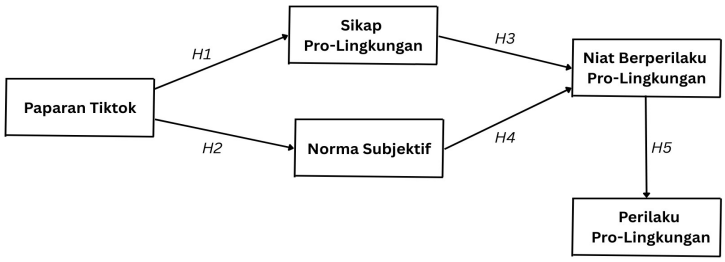

Figure 1 Research Model

Figure 1 illustrates the research framework that examines the effect of TikTok exposure on pro-environmental behavior through a modified Theory of Planned Behavior approach. TikTok exposure functions as an initial stimulus that shapes students' pro-environmental attitudes (H1) and subjective norms (H2). Subsequently, attitudes (H3) and subjective norms (H4) simultaneously foster the development of behavioral intention, which serves as the primary determinant of the actual realization of pro-environmental behavior (H5) among students at Universitas Padjadjaran. This model demonstrates how digital information is internalized into concrete actions through the reinforcement of both personal and social values.

2. Method

2.1 Procedures and Participants

The population of this study consisted of active students at Universitas Padjadjaran who are TikTok users. The university was selected because its student population largely represents Generation Z, a cohort characterized by high digital literacy and frequent engagement with social media platforms. The respondents were within the age range of 18 to 25 years, which represents the most dominant demographic group consuming value oriented content on digital media (Liao et al., 2024).

The sample size determination followed the guideline proposed by Hair et al. (2017), which suggests that the minimum sample size for PLS SEM analysis should be at least ten times the number of indicators used in the measurement model. Because the questionnaire initially consisted of 21 indicators, the minimum required sample size was 210 respondents. The study successfully collected 310 valid responses, exceeding the recommended threshold and thereby ensuring adequate statistical power.

A purposive sampling technique was employed to ensure that respondents met the relevant criteria for the study. Participants were required to be active university students and have been exposed to pro environmental content on TikTok within the past six months. Although purposive sampling allows the study to target respondents with relevant experience, this approach may limit the generalizability of the findings beyond the studied population.

2.2 Measurement and Instruments

Data were collected through an online questionnaire distributed using Google Forms. The measurement items were adapted from established constructs in previous studies related to the Theory of Planned Behavior and social media exposure (Ajzen, 1991; Liao et al., 2024). The questionnaire measured five constructs: TikTok Exposure, Pro Environmental Attitude, Subjective Norms, Behavioral Intention, and Pro Environmental Behavior.

All items were assessed using a five point Likert scale ranging from strongly disagree (1) to strongly agree (5). Prior to analysis, the measurement model was evaluated to ensure validity and reliability. During the preliminary assessment, two indicators (SIKAP4 and NS3) were removed because their factor loadings did not meet the recommended threshold of 0.70. The removal of these indicators was conducted to improve construct validity and measurement accuracy.

2.3 Data Analysis Technique

This study employed Partial Least Squares Structural Equation Modeling (PLS SEM) using SmartPLS software. The analysis was conducted in two stages. First, the measurement model was evaluated to assess convergent validity and reliability using factor loadings, Average Variance Extracted (AVE), Cronbach's Alpha, and Composite Reliability. Second, the structural model was assessed to examine the relationships between constructs using path coefficients, T statistics, and P values obtained through a bootstrapping procedure with 5000 subsamples.

3. Result and Discussion

Table 1 Respondent Demographic Characteristics

Category	Classification	Frequency	Percentage
Gender	Male	148	47.7%
	Female	162	52.3%
Age	18–20 years	111	35.8%
	21–23 years	185	59.7%
	24 years and above	14	4.5%
Faculty	Law	30	9.7%
	Economics and Business	40	12.9%
	Medicine	28	9.0%
	Agriculture	33	10.6%
	Social and Political Sciences	30	9.7%
	Humanities	27	8.7%
	Psychology	25	8.1%
	Communication Science	32	10.3%
	Fisheries and Marine Sciences	23	7.4%
	Pharmacy	23	7.4%
	Geological Engineering	10	3.2%
	Vocational School	7	2.3%
	Graduate School	2	0.6%
Length of TikTok Use	< 6 months	10	3.2%
	6–12 months	83	26.8%
	> 1 year	217	70.0%
Daily Usage Duration	< 1 hour	15	4.8%
	1–3 hours	141	45.5%
	> 3 hours	154	49.7%

Based on the demographic characteristics presented in the table above, the respondents in this study were predominantly female (52.3%), with the majority belonging to the productive age group of 21–23 years (59.7%). Most respondents were long-term active TikTok users, with 70% having used the

platform for more than one year and demonstrating high usage intensity, spending more than three hours per day on the application. These findings indicate that the research sample consists of students at Universitas Padjadjaran who exhibit strong familiarity with and reliance on digital information disseminated through social media, particularly TikTok.

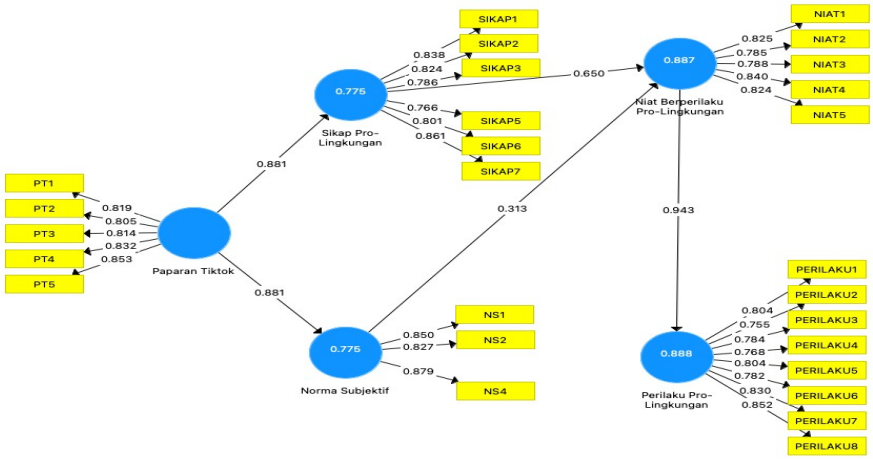

Figure 2 Measurement Model Evaluation (Outer Model)

Table 2 Reliability and Validity Assessment Results

Construct	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)	Average Variance Extracted (AVE)
TikTok Exposure (X)	0.882	0.883	0.914	0.680
Attitude (M1)	0.897	0.900	0.921	0.661
Subjective Norm (M2)	0.811	0.811	0.888	0.726
Behavioral Intention (Y1)	0.871	0.871	0.907	0.660
Pro-Environmental Behavior (Y2)	0.918	0.919	0.933	0.637

Based on the analysis results presented in Table 2, the model construction demonstrates solid statistical performance while still requiring careful interpretation. In terms of the Cronbach's Alpha values obtained, all variables range from 0.811 to 0.918, indicating that the reliability of the instruments falls into a very high category, as all values exceed the minimum threshold of 0.70. This internal consistency is further supported by Composite Reliability values that remain stable above 0.80, ensuring that each construct in the model possesses an adequate level of reliability for hypothesis testing.

However, regarding the Average Variance Extracted (AVE), some variation is observed, in which the Behavior variable (Y2) shows a value of 0.637, representing the lowest value when compared to other variables such as Subjective Norms (0.726). Despite these differences in indicator strength, all values exceed the minimum standard of 0.50, demonstrating that the indicators employed possess good convergent validity in explaining the variance of their respective constructs. The elimination of the SIKAP4 and NS3 indicators during the initial stage proved effective as a data-cleaning step, allowing each latent variable to adequately, consistently, and accurately represent its conceptual meaning within the research model.

Table 3 R Square Test Results

Endogenous Construct	R Square	Adjusted R Square
Pro-Environmental Behavioral Intention	0.887	0.886
Pro-Environmental Behavior	0.775	0.775
Pro-Environmental Attitude	0.888	0.888
Subjective Norm	0.775	0.775

The evaluation of the R Square values presented in Table 3 indicates outcomes that require a more in-depth analysis regarding the predictive strength of the model. Endogenous constructs such as Pro-Environmental Attitude (0.888) and Behavioral Intention (0.887) demonstrate very high values, which can be categorized as exhibiting very strong predictive power. These results suggest that 88.8% of the variance in students' attitude formation is predominantly influenced by exposure to TikTok content. Although the R^2 values are relatively high, this result may reflect the strong conceptual relationship between constructs within the Theory of Planned Behavior framework. On the other hand, the Pro-Environmental Behavior and Subjective Norm constructs show identical values (0.775). Although these figures fall within the strong category, they still indicate the presence of potential influences from other external factors beyond those included in the research model. This disparity in R Square values suggests that the current indicators in the model have not yet fully and evenly explained all aspects of environmental behavior in a comprehensive manner.

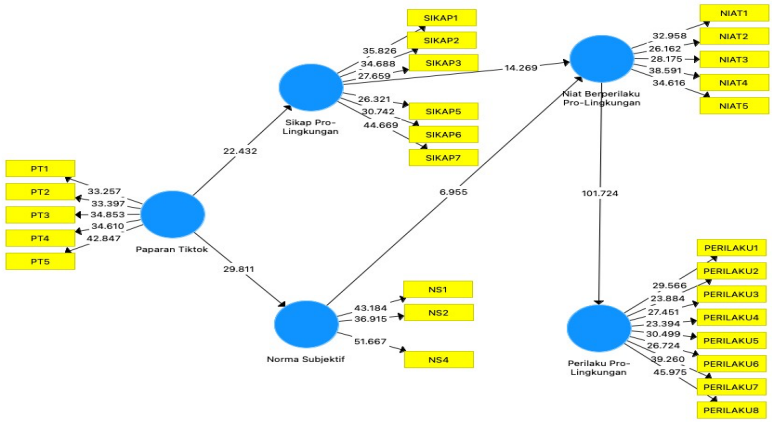

Figure 3 Structural Model Evaluation (Inner Model)

Table 4 Structural Model Hypothesis Testing Results

Hypothesis	Path Relationship	Path Coefficient	T-Statistic	P-Value
H1	TikTok Exposure → Pro-Environmental Attitude	0.881	22.432	0.000
H2	TikTok Exposure → Subjective Norm	0.881	29.811	0.000
H3	Pro-Environmental Attitude → Pro-Environmental Behavioral Intention	0.650	14.269	0.000
H4	Subjective Norm → Pro-Environmental Behavioral Intention	0.313	6.955	0.000

Hypothesis	Path Relationship	Path Coefficient	T-Statistic	P-Value
H5	Pro-Environmental Behavioral Intention → Pro-Environmental Behavior	0.943	101.724	0.000

The structural model results indicate that all hypothesized relationships are statistically significant. TikTok exposure shows a strong positive association with both pro-environmental attitudes and subjective norms among students. The relatively higher T-statistic for the relationship between TikTok exposure and subjective norms suggests that environmental content on TikTok may first shape students' perceptions of prevailing social expectations within their digital environment. In other words, repeated exposure to environmental messages and sustainability campaigns on the platform may contribute to the perception that pro-environmental behavior is socially encouraged among peers and online communities.

However, when examining the formation of behavioral intention, pro-environmental attitudes demonstrate a stronger effect compared to subjective norms. This finding indicates that although social influence on digital platforms may shape perceptions of environmental expectations, students' intentions to engage in pro-environmental actions are more strongly associated with their internal evaluations and personal beliefs regarding environmental responsibility. This result supports the central assumption of the Theory of Planned Behavior that attitudes play a critical role in shaping behavioral intentions (Ajzen, 1991).

Furthermore, behavioral intention shows a strong positive association with pro-environmental behavior. This finding suggests that students who express stronger intentions to support environmental sustainability are more likely to report engaging in environmentally responsible practices. Overall, these results highlight the importance of both social influence and internalized values in explaining how exposure to environmental communication on social media relates to pro-environmental behavioral tendencies among university students.

Table 5 Indirect Effects (Mediation) Testing Results

Indirect Path Relationship	Path Coefficients	T-Statistic	P-Value
TikTok Exposure → Pro-Environmental Attitude → Pro-Environmental Behavioral Intention	0.572	10.761	0.000
TikTok Exposure → Subjective Norm → Pro-Environmental Behavioral Intention	0.276	6.943	0.000

Based on the indirect effects analysis presented in Table 5, a statistical phenomenon emerges that provides deeper insight into the pathways underlying the formation of students' behavioral intentions. In terms of the T-statistics values, both mediation paths are significant at the 0.05 level. However, there is a substantial difference in the magnitude of effects between the two mediators. The mediation pathway through Pro-Environmental Attitude demonstrates a considerably more dominant performance, with a T-statistic value of 10.761, whereas the pathway through Subjective Norm exhibits a weaker effect, with a value of 6.943.

4. Conclusion

This study examined the relationship between TikTok exposure and pro-environmental behavior among university students by applying the Theory of Planned Behavior framework. The findings indicate that exposure to environmental content on TikTok is positively associated with students' pro-environmental attitudes and subjective norms. Both attitudes and subjective norms are associated with stronger behavioral intentions, which in turn show a strong relationship with reported pro-environmental behavior. The results further suggest that attitudes demonstrate a stronger association with behavioral intention than subjective norms, indicating that students' internal evaluations of environmental responsibility may play a more prominent role than perceived social pressure in shaping behavioral tendencies.

These findings highlight the relevance of social media platforms, particularly TikTok, as communication channels for disseminating environmental messages among younger audiences. Environmental communication strategies delivered through short video formats may contribute to strengthening environmental awareness and encouraging sustainable behavioral intentions among university students.

Nevertheless, this study has several limitations. First, the use of purposive sampling limits the generalizability of the findings beyond the studied population. Second, the cross-sectional design restricts the ability to establish causal relationships between variables. Third, the study focuses specifically on TikTok exposure and does not consider the influence of other digital platforms that may also shape environmental attitudes and behavior. Future research may further examine additional psychological factors that influence pro-environmental behavior, including empathy and moral engagement toward environmental issues (Ienna, 2022; Russell & Blackburn, 2017). Longitudinal approaches and comparative analyses across different social media platforms may also provide a more comprehensive understanding of how digital environmental communication influences behavioral change over time.

References

Ajzen, I. (1991). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50(2), 180–211. https://doi.org/10.1016/0749-5978(91)90020-T

Arnot, G., Pitt, H., McCarthy, S., Cordedda, C., Marko, S., & Thomas, S. L. (2024). Australian youth perspectives on the role of social media in climate action. Australian and New Zealand Journal of Public Health, 48(1), 100111. https://doi.org/10.1016/j.anzjph.2023.100111

Bamberg, S., & Möser, G. (2007). Twenty years after Hines, Hungerford, and Tomera: A new meta-analysis of psycho-social determinants of pro-environmental behaviour. Journal of Environmental Psychology, 27(1), 14–25. https://doi.org/10.1016/j.jenvp.2006.12.002

Ben-Enukora, C. A., Soroaye, M. P., Ejem, A. A., Asogwa, C. E., Ojih, S. E. U., & Amobi, I. T. (2025). Correlation between post-pandemic climate change advocacy on TikTok and knowledge, attitude, and adaptation practices among TikTok users in Nigeria. Journalism and Media, 6(1), 36. https://doi.org/10.3390/journalmedia6010036

Hajri, O., & Daife, Y. (2024). The role of social media in engaging young people in environmental issues. E3S Web of Conferences, 477, 00079. https://doi.org/10.1051/e3sconf/202447700079

Kaplan, A. M., & Haenlein, H. (2010). Users of the world, unite! The challenges and opportunities of Social Media. Business Horizons, 53(1), 59-68. Elsevier / ScienceDirect. https://doi.org/10.1016/j.bushor.2009.09.003

Kemp, S. (2023, January 26). Digital 2023: Global Overview Report — DataReportal – Global Digital Insights. DataReportal. Retrieved September 22, 2025, from https://datareportal.com/reports/digital-2023-global-overview-report

Kollmuss, A., & Agyeman, J. (2002). Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? Environmental Education Research, 8(3), 240–258. Carfax Publishing. https://doi.org/10.1080/13504620220145401

Liao, C.-H., Huang, C.-L., & Wang, Y.-H. (2024). Exploring social media determinants in fostering pro-environmental behavior: A TPB perspective. Frontiers in Psychology, 15, 1-16. Frontiers. https://doi.org/10.3389/fpsyg.2024.1445549

Ienna, M. (2022). The relative role of knowledge and empathy in predicting pro-environmental attitudes and behavior. Sustainability, 14(8), 4622. https://doi.org/10.3390/su14084622

Pearce, W., Niederer, S., Özkula, S. M., & Sánchez Querubín, N. (2019). The social media life of climate change: Platforms, publics, and future imaginaries. WIREs Climate Change, 10(2), e569. https://doi.org/10.1002/wcc.56

Russell, J. C., & Blackburn, T. M. (2017). The rise of invasive species denialism. Trends in Ecology & Evolution, 32(1), 3–6. https://doi.org/10.1016/j.tree.2016.10.012 https://doi.org/10.1177/107769900408100112

Xiao, M., Wang, R., & Chan-Olmsted, S. (2023). Environmental communication on Twitter: The impact of message framing, bandwagon, and source credibility on message sharing.

Sustainability, 15(20), 1-23. MDPI. https://doi.org/10.3390/su152014732