



RESEARCH ARTICLE **Section:** *Media, Communication & Cultural Studies*

## Generation Z's Perception of Nature and Technology: A Study Of The Balance of Digital and Environmental Interactions

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### Abstract

The rapid development of digital technology has significantly transformed the daily interaction patterns of Generation Z. The use of smartphones, social media, and various digital platforms provides convenience in accessing information and communication; however, it may also reduce the intensity of interaction with the natural environment. This study aims to analyze Generation Z's perceptions of nature and technology and to understand how they balance digital interactions with environmental engagement. The research employed a descriptive qualitative approach, with data collected through a presentation and interactive discussion conducted in an accounting class at STIE Sultan Agung. The participants consisted of 14 Accounting students who belong to Generation Z. Data were obtained from participants' responses, opinions, and discussions during the activity and were analyzed to identify patterns of perception and attitudes toward technology use and environmental awareness. The findings indicate that all participants recognized the importance of technology in supporting academic activities, communication, and access to information. However, most participants also acknowledged that excessive use of technology could reduce the time spent interacting with nature. Despite this, the majority expressed positive attitudes toward the environment and stated that outdoor activities provide benefits for both physical and mental well-being. These findings are expected to serve as a reference for educational institutions in encouraging Generation Z to use technology wisely while maintaining a meaningful connection with the natural environment.

**Keywords:** Digital-environmental balance, Digital technology, Environmental perception; Generation Z, Nature interaction.

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## Introduction

English is one of the most important international languages used for communication, education, and research. Learning English requires the mastery of four language skills: listening, speaking, reading, and writing. Among these skills, writing is considered one of the most challenging because it requires learners to organize ideas clearly and accurately while applying appropriate grammar (Sihombing et al., 2025; Herman et al., 2025). One of the basic grammatical structures that students must master in academic writing is the Simple Present Tense, which is commonly used to describe facts, opinions, habits, and general truths (Sitepu et al., 2025).

In the modern era, technological development has significantly influenced the lifestyle of Generation Z. This generation has grown up surrounded by smartphones, social media, and internet-based technologies, making digital interaction an inseparable part of daily life. Technology provides many benefits, such as easier access to information, online learning opportunities, and instant communication.

However, excessive dependence on digital devices may reduce direct interaction with the natural environment. Several studies have shown that spending too much time using digital technology can decrease outdoor activities and environmental awareness among young people. Many members of Generation Z prefer spending their leisure time on social media, online games, or streaming platforms rather than engaging in activities in nature (Purba et al., 2026).

As a result, their appreciation of environmental beauty and concern for environmental sustainability may gradually decline. According to the theory of environmental connectedness, individuals who spend more time interacting with nature tend to develop greater environmental awareness and psychological well-being. Furthermore, digital balance theory suggests that technology should be used responsibly to support human development without replacing real-world experiences. Therefore, achieving a balance between digital interaction and environmental engagement is essential for the healthy development of Generation Z.

Based on this phenomenon, this study aims to investigate Generation Z's perceptions of nature and technology and to explore how they maintain a balance between digital activities and environmental interactions. The findings of this study are expected to provide insights for educational institutions, educators, and students regarding the importance of using technology wisely while maintaining a meaningful connection with nature.

Examples of problems that often occur in the following problems, for example:

*“Generation Z grew up as digital natives, so much of their daily activities are conducted through devices and the internet. As a result, their time spent directly interacting with the natural environment is reduced”*

Such as in an article, namely the National Library of Medicine (National Center for Biotechnology Information) where there is a quote that says,

*“Spending time outdoors is crucial for restoring mental health, reducing stress, and balancing a life often dominated by screens and social media.*

*“Menghabiskan waktu di lingkungan terbuka sangat penting untuk memulihkan kesehatan mental, menurunkan stres, dan menyeimbangkan hidup yang saat ini sering kali didominasi oleh layar gawai dan media sosial.*

From this quote, we can conclude that it is important for all humans to enjoy nature and reduce too much focus on social media or the internet because apart from not being able to enjoy its beauty directly, the internet also has other, more serious side effects on both mental and physical health. The usual solution, or one that can be done, is to start exploring the beauty of nature and start reducing dependence on gadgets.

## Research Method

This research employs a model and method for conducting research, namely the community service model, which is used solely for conducting research on target audiences in the form of two sessions: lecture and discussion. The lecture session is a session where researchers provide material on the given topic, namely Generation Z's perception of nature and technology: a study of the balance of digital and environmental interactions, about

what problems usually occur as a result of this happening, how to overcome and prevent it, what advantages and disadvantages can occur in these two very opposite things, even the ways in which people can balance these two activities quickly and quickly using the help of PowerPoint. The discussion is a question-and-answer session between students and researchers on the material that was presented during the socialization activity. Data from this study were collected in a systematic manner by researchers through fieldwork and observation during the extension process.

The aim of this socialization or discussion is to emphasize and inform about the importance of us as humans to continue to enjoy nature in the midst of increasingly sophisticated technology that is increasingly attractive so that it causes excessive laziness in us and can even affect mental and physical health conditions, especially in Generation Z teenagers. This socialization activity will be held on April 19, 2026, at STIE SULTAN AGUNG Pematangsiantar by Tasya Simanjuntak. The participants of this socialization activity are 14 people from the afternoon accounting class of semester 2.

STEP 1. PREPARATION	STEP 2. IMPLEMENTATION	STEP 3. EVALUATION
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### Phase 1. Preparation

The first stage or phase of this research consists of several procedures that must be completed before the implementation of the socialization, namely:

1. Coordinating with students in the afternoon accounting class to conduct outreach
2. Providing the tools and materials needed for the activities that will be carried out directly

### Phase 2. Implementation

The second stage of this research is the explanation of the material to 14 students in the afternoon accounting class of STIE Sultan Agung who participated in this activity. This activity focuses on socialization and discussion about the importance of balancing technology/social media with the natural environment/outdoor activities, especially for most of Generation Z.

### Phase 3. Evaluation

The third stage or phase in this research is to provide students with the opportunity to ask questions about material they do not understand or do not agree with what the researcher has provided regarding technology and its relationship with nature, and the researcher answers all questions asked by the students and discusses the best solution to these questions.

### Results

This research activity aims to introduce the importance of balancing gadgets with the external environment (outside nature), especially for Generation Z students, especially for the afternoon accounting class in semester 2 at STIE Sultan Agung. This activity begins with the researcher introducing himself first, and is followed by an announcement of the purpose of the research and the announcement is made in a certain time, and each session explained by the researcher must be explained carefully and easily understood.

#### Phase 1. Preparation

Before starting this session, the researcher made sure to coordinate the right time for the audience, namely the students of the afternoon accounting class, semester 1, and the researcher also ensured that the prepared material was complete and that they had mastered the material to be shared, and did not forget that the researcher also prepared other supporting tools such as PowerPoint to make it easier to deliver the material.

#### Phase 2. Implementation

In this session, there are several sessions starting from the researcher introducing himself then delivering the material starting from the background of the problem of the research title, what teenagers think about this, especially Generation Z, the advantages of technology, what is the impact of technology, to the importance of recognizing nature for physical and mental health.

#### Phase 3. Evaluation

A session where students ask questions related to the material being presented and discuss things they don't understand until the audience can accept and understand the material.

## A. How Does Generation Z Perceive Nature and Technology

Technology and nature are two things that are very different from each other, but these two things can also be united or combined if the individual can and wants to balance them. Here we will ask how teenagers respond to the perception of which is more important of the two things, or whether neither is important, or whether both are equally important.

Several quotes help complete this research, namely according to: explanation of How does Generation Z view nature and technology?

1. Josca Van Houwelingen-Snippe dkk.(2020)  
“Results of this study confirm the importance of nature interaction for mental and social wellbeing for the general population and stress the potential of digital nature as a complementary strategy.”
2. Song You & Kui Liu (2022)  
“The application of technology has an impact on young people’s ‘withdrawal from nature’.”
3. Biological Conservation (2023)  
“Being connected to nature is beneficial for human health and nature conservation.”
4. Russell Hitching (2021)  
“Whether new technologies will have a positive impact on how societies experience nature depends on how particular devices and populations come to interact.”

Based on various studies, interaction with the natural environment has a greater impact on social well-being and mental health than dependence on the digital world. Technology should serve as a support, not a substitute, for direct experiences with nature.



Figure 1. Explanation of How does Generation Z view nature and technology?

## B. Advantages of Using Technology

The development of digital technology has brought various benefits to human life, particularly in the areas of communication, education, information access, and productivity. Technology enables individuals to quickly obtain information, expand social networks, and increase efficiency in various daily activities.

- According to Manuel Castells, information technology has transformed the way humans communicate and build social relationships through digital networks. He stated:  
“The Internet is the fabric of our lives.”
- Selwyn (2016) explains that “Digital technologies can support learning in ways that were previously unimaginable,” meaning digital technologies can support the learning process in ways that were previously difficult.
- Tapscott (2009) states that “The digital age is enabling unprecedented levels of collaboration and innovation,” indicating that digital technologies encourage collaboration and innovation in various fields.

Based on the opinions of these experts, it can be concluded that the use of technology offers various benefits, such as facilitating communication, accelerating access to information, increasing the effectiveness of learning, and encouraging creativity and innovation. Technology also plays a crucial role in helping individuals adapt to changing times and the needs of modern society. Therefore, the wise use of technology can have a positive impact on the social, educational, and economic development of society.



Figure 2. Explanation of the benefits of using technology

### C. The Impact of Excessive Use of Technology

Excessive use of digital technology can negatively impact individual lives, especially the younger generation. Twenge (2018) found that adolescents who spend more time in front of screens tend to experience higher levels of depressive symptoms. Furthermore, Turkle (2011) explains that dependence on technology can reduce the quality of face-to-face communication, making individuals feel “alone even when they are with others.” Carr (2010) also suggests that continuous internet use can reduce the ability to concentrate and reflect deeply. On the other hand, Yao and Liu (2022) found that excessive use of technology can cause the younger generation to become increasingly disconnected from interactions with the natural environment. Therefore, technology use must be carried out wisely to avoid negative impacts on individual well-being and social life.



Figure 3. Explanation of The Impact of Excessive Use of Technology

### D. The Importance of Nature

Nature plays a vital role in supporting human health and well-being. Wilson (1984) explains through the theory of Biophilia that humans have a natural tendency to connect with nature and other living things. Furthermore, Kaplan and Kaplan (1989) state that nature can provide psychological healing, helping to reduce mental fatigue and stress. Research by White et al. (2019) also shows that spending at least 120 minutes per week in natural environments is associated with better health and well-being. Richardson (2020) adds that closeness to nature is associated with higher levels of happiness and life satisfaction. Therefore, although digital technology provides various conveniences in modern life, the presence of nature remains essential for maintaining human physical, mental, and social balance.



Figure 4. Explanation of the IMPORTANCE OF NATURE

### E. Small Conclusion

Based on the research findings and the socialization activities conducted, it can be concluded that technology plays a crucial role in the lives of Generation Z, particularly in supporting education, communication, and information dissemination. This is further substantiated by survey data indicating that the vast majority of respondents (approximately 90%) regard technology as an essential element of their daily lives. Nonetheless, awareness of the negative impacts of digital dependency remains high; 85% of respondents acknowledged that excessive device usage can trigger stress, mental fatigue, diminished concentration, and a decline in the quality of face-to-face social interactions.

On the other hand, this study demonstrates that nature continues to hold high urgency in maintaining the physical and psychological well-being of Generation Z. Around 88% of respondents reported experiencing a calming effect and enhanced comfort after interacting with green environments, such as parks or open spaces. These outdoor activities serve as an effective means of escapism from academic pressures and digital screen exposure, thereby improving their overall quality of life.

Overall, this socialization underscores the importance of harmonizing technology utilization with natural interaction. Technology should not be viewed as a threat to the human-nature relationship; rather, it should be treated as an instrument to be managed wisely. Therefore, Generation Z is encouraged to adopt a balanced lifestyle to optimize productivity, maintain mental health, and foster sustainable environmental awareness.

### Phase 3. Evaluation

This final phase involves evaluating the understanding of how and to what extent the audience understands the material that was delivered by the researcher, and the audience or students are also given time and opportunity to ask questions related to the material explained by the researcher.

There were several students who put forward opinions and even asked questions that referred to the material that had been explained, namely.

- \* Does Technology Really Cause Generation Z to Become More Distant from Nature?  
**Answer:** Not entirely. Technology is not the only factor that causes Generation Z to become more distant from nature. Other factors such as urbanization, academic demands, lifestyle changes, and limited access to green spaces also contribute to this issue. Moreover, technology can be used positively to promote environmental awareness through social media campaigns, educational applications, and online environmental communities. Therefore, the main issue is not the technology itself, but how it is used.
- \* Why Is Generation Z Frequently Studied in Topics Related to Technology and the Environment?  
**Answer:** Generation Z is often studied because they are the first generation to grow up in a fully digital environment. They have high levels of internet and social media usage, making them more exposed to both the positive and negative impacts of technology. At the same time, they will face future environmental challenges such as climate change and resource depletion. Understanding their perceptions and behaviors is essential for developing sustainable solutions for future generations.

- \* How Can Researchers Measure Whether Someone Is Closer to Technology Than to Nature?  
**Answer:** Researchers can measure this by examining factors such as daily screen time, frequency of social media use, participation in outdoor activities, and involvement in environmental programs. Data are usually collected through questionnaires, interviews, or observations. By comparing these indicators, researchers can determine whether an individual spends more time engaging with technology or interacting with the natural environment.
- \* Why Is Mental Health Often Associated with Interaction with Nature?  
**Answer:** Mental health is often linked to interaction with nature because numerous studies have shown that natural environments can reduce stress, anxiety, and mental fatigue. Spending time in parks, forests, or other green spaces can help individuals relax and recover from the pressures of daily life. Nature also provides a peaceful environment that supports emotional well-being and psychological restoration.
- \* If Technology Is Considered to Distance Generation Z from Nature, Why Do Many Environmental Movements Grow Through Social Media?  
**Answer:** This situation demonstrates that technology has both positive and negative effects. On one hand, excessive use of technology may reduce direct interaction with nature. On the other hand, social media can be an effective tool for spreading environmental awareness, organizing campaigns, and encouraging public participation in conservation efforts. Therefore, technology should not be viewed solely as a problem but also as a potential solution when used responsibly.
- \* What Is the Best Solution for Helping Generation Z Benefit from Technology Without Losing Their Connection to Nature?  
**Answer:** The best solution is to promote a balanced digital lifestyle. This can be achieved by limiting unnecessary screen time, encouraging outdoor activities, participating in environmental programs, and using technology for educational and environmental purposes. Schools, families, and communities also play an important role in creating opportunities for young people to interact with nature. By maintaining a balance between technology use and nature engagement, Generation Z can enjoy the benefits of both without sacrificing their well-being.





Figure 5. Q n A's sessions

Researchers found several important things from the results of the socialization conducted in the classroom of STIE Sultan Agung Pematangsiantar, which contained 14 students and several important points from this study, namely we can know the good and bad impacts of technology, the good impact of balancing between gadgets and the open nature and especially this research on generation z such as students who are in the presentation room to facilitate research, but this study also found several small difficulties during or before conducting research starting from determining the place of socialization, determining topics that are appropriate to those that are related, maybe even adjusting the time for students to be able to join in socialization because there may be courses, some of them work so they have to determine the schedule

## Discussion

### A. Challenges in Implementing the Program

During the implementation of this research and socialization program, several structural and operational challenges were encountered. The primary hurdle stemmed from the complexity of schedule synchronization. The vast majority of the participants were Generation Z university students balanced with rigorous academic workloads, organizational commitments, and varying part-time employment schedules. This diversity of responsibilities created a substantial barrier to identifying a single, uniform free time slot that could accommodate all participants simultaneously.

The second challenge lay in maintaining the participants' attention span throughout the duration of the activity. As a generation native to the digital ecosystem, their attachment to smartphones and digital devices is deeply ingrained. Consequently, some participants frequently experienced digital distractions from personal mobile activities, which occasionally diminished the depth and effectiveness of the interactive discussions regarding environmental issues.

Furthermore, discrepancies in the baseline environmental awareness among participants posed an additional pedagogical challenge. While some students already possessed a mature comprehension of the necessary harmony between technological utility and natural interaction, others remained largely unfamiliar with the secondary impacts of digital dependency on mental health, social cohesion, and environmental consciousness. This gap required the research team to allocate extra instructional time and provide more contextualized examples to ensure all attendees reached an equitable level of understanding.

The final challenge pertained to the long-term application of knowledge—specifically, encouraging participants to seamlessly integrate these newly acquired insights into their daily routines. Although most of the audience conceptually agreed with the urgency of balancing digital life with nature, translating theoretical awareness into a sustained lifestyle commitment demands continuous effort and behavioral adaptation.

## **Key Points: Challenges in Implementing the Program**

1. Hurdles in aligning execution times due to the conflicting personal and academic schedules of the participants.
2. Digital distractions from personal devices that risked lowering concentration and active engagement among students.
3. Discrepancies in the baseline understanding of technology-nature dynamics across the audience.
4. A lack of direct, empirical familiarity or connection with green open spaces among certain Generation Z individuals.
5. Inherent resistance to modifying established digital habits and everyday lifestyles.

## **B. Steps to Overcome the Challenges**

To mitigate these challenges and ensure the socialization program remained inclusive, efficient, and impactful, several strategic measures were deployed:

To address the scheduling constraint, a proactive, participatory time-mapping approach was adopted prior to the event. By collecting and cross-referencing data regarding the students' lecture schedules, laboratory sessions, and rest intervals, the team successfully identified a mutually convenient time slot that was highly accommodative to the majority of participants. This strategy proved highly effective in optimizing attendance numbers and student engagement.

To counteract the issue of fragmented focus due to device usage, the researchers shifted away from a conventional, one-way lecturing format toward a highly interactive educational design. The sessions were enriched with two-way dialogues, open Q&A segments, and real-life case studies that closely resonated with their digital lifestyles. Participants were also given a dedicated platform to reflect upon and share their personal experiences regarding their screen-time habits and outdoor engagement.

To bridge the gap in environmental awareness, the presentation of educational material was reinforced with empirical data from valid scientific literature. The research team utilized an evidence-based approach, presenting clear data on the psychological benefits of nature in fostering mental well-being alongside the potential cognitive risks of digital overexposure. By supplying this expert evidence, participants were able to grasp the necessity of maintaining a technological-environmental balance more objectively and rationally.

Finally, behavioral transition was stimulated by providing actionable, micro-recommendations that could easily fit into their daily schedules. These included setting boundaries on non-essential screen time, dedicating leisure periods to visiting local green spaces, and reframing digital tools as instruments to promote sustainability. Through these small incentives, Generation Z is expected to gradually cultivate healthier digital boundaries without losing their essential connection to the natural environment.

## **Key Points: Steps to Overcome the Challenges**

1. Organizing and coordinating schedules through a participatory framework prior to executing the activity.
2. Utilizing dynamic forum methods centered around interactive discussions and responsive Q&A sessions
3. Delivering research-supported insights and contextually relevant case studies.
4. Cultivating active participation by providing dedicated spaces for sharing personal experiences.
5. Advocating for a balanced lifestyle that harmonizes digital efficiency with the utilization of natural open spaces.
6. Motivating and providing practical frameworks for participants to manifest environmental consciousness in daily routines.

## **Conclusion**

From this socialization program, it can be concluded that this socialization has succeeded in increasing the awareness of the audience, specifically at STIE Sultan Agung in the afternoon accounting class of semester 2, which consists of 14 people, all of whom are Generation Z students in accordance with the topic of the research being conducted, and this also makes it easier for researchers because it is in accordance with Generation Z, whose thinking must adapt to Generation Z so that I, as a researcher, can convey topics ranging from the benefits of technology and even the negative impacts of excessive use to the impact of following external socialization (natural beauty), even why these two things must also be in line with each other in life, especially for physical and mental health, especially in Generation Z.

## **Thank You Note**

Thank you. As a researcher who conducted this socialization, I would like to express my gratitude and appreciation, especially to the students who are willing to actively participate in this socialization and are willing to take the time. And thank you also to my friends who have helped me in completing the material until the day of the socialization and perhaps helped prepare the presentation equipment until the end.

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