







“Effects of environmental orientation and environmental knowledge on the willingness to reduce plastic waste among Gen Z in Indonesia and Thailand”

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EFFECTS OF ENVIRONMENTAL ORIENTATION AND ENVIRONMENTAL KNOWLEDGE ON THE WILLINGNESS TO REDUCE PLASTIC WASTE AMONG GEN Z IN INDONESIA AND THAILAND

Abstract

The purpose of this study is to explore the willingness to reduce plastic waste analyzing the effect of environmental orientation and environmental knowledge. The analysis was conducted at three universities, with respondents being 430 students who are categorized as Gen Z. The universities involved are State University of Surabaya, State Polytechnic of Malang, Indonesia, and College of Local Khon Kaen University, Thailand. Using path analysis, the paper revealed that environmental orientation and environmental knowledge significantly influence the willingness to reduce plastic waste. All variables used in the research model are significant for both the outer and inner models. This study confirms a positive and significant influence on the relationship between independent variables, as well as between independent and dependent variables. All relationships produce T statistic $>$ T table (1.96). Environmental knowledge is positively and significantly influenced by environmental orientation by 32% (T Stat = 3.535), willingness to reduce plastic waste (T Stat = 6.874) is influenced by environmental orientation by 50%, and willingness to reduce plastic waste (T Stat = 5.454) is influenced by environmental knowledge by 41%. The findings of this study are important, considering that Gen Z will be decision-makers not only for personal interests in their consumption behavior but also for Gen Z's position as policymakers in the future.

Keywords

environmental issues, consumption behavior, young generations, developing countries

JEL Classification

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INTRODUCTION

The impact of environmental damage is already being felt today, considering several recent natural phenomena, such as global warming, acid rain, smoke, and health problems for humans and other living things. This will also impact future generations.

Young people (under 30 years old) tend to be more conscious about the environment by preferring to buy more expensive green products (Maichum et al., 2016); people's concern for the environment is reflected in their daily behavior and preferences. Studies related to Gen Z's views on environmental orientation are needed because they are future decision-makers, and their behavior will significantly affect the environment (Mandic et al., 2024). Gen Z, who were born in the digital era, are described as a generation that is well-educated and tech-

nologically savvy. They are innovative, creative, and open-minded toward social issues (Priporas et al., 2020) and have good motivation when asked to discuss environmental issues. For them, having environmental awareness is a trendy lifestyle (Schönherr & Pikkemaat, 2024).

Gen Z leaders should be able to make moves and change environmental policies (Mohiuddin et al., 2018). This generation has adequate knowledge about environmental issues, so their preferences to show deep generative concern, proportional attitude, and consuming environmentally friendly products can be seen in their daily life as an attempt to reduce plastic waste (Ribeiro et al., 2023). According to the Indonesian Statistics Agency, Gen Z is the largest age group in Indonesia today, comprising 30% of the total population (Somad & Fatmasari, 2024). Meanwhile, in Thailand, according to the local statistics office, Generation Z is estimated to be 20% of the total population (U-Dee et al., 2022). Since Generation Z is the largest group in the workforce and will eventually replace aging generations like baby boomers and Generation X, their characteristics must be intensively studied.

1. LITERATURE REVIEW AND HYPOTHESES

Environmental damage causes ecosystem destruction, and the longer the damage occurs, the more difficult it is for humans to preserve nature (Kim et al., 2020). The environment is a symbol that is closely related to culture, aesthetics, religion, morals, and science, and it has no standards; only humans need to be wise in managing it (Purba & Marbun, 2020). In addition, there are places of worship and historical sites, so people must have an environmental orientation to keep them clean, tidy, and free from all forms of vandalism.

One of the largest contributors to plastic waste is single-use packaging. People have used plastic-based packaging too often, reaching 25% of the total waste. This plastic is generally made of polyethylene, which is classified as non-biodegradable and takes a long time to decompose (Solekah et al., 2022; Herabadi et al., 2023). “Unprocessed plastic will cause pollution and pose a risk to human health and other living things” (Christania, 2020). In addition, in developing countries like Indonesia, plastic waste management is still inadequate, which causes the continuous accumulation of plastic waste (Sydow & Bienczak, 2018). Many food and beverage products use plastic-based packaging because it is more efficient and cheaper. “Consisting of synthetic organic polymers, plastic is one of the most commonly used materials because of its durable, lightweight, adaptable, and cost-effective properties to produce” (Amir et al., 2022). “That is why plastic is more commonly used than natural packaging, which is actually easier to decompose and mix with the soil” (Northcott, 2020).

When humans behave based on environmental orientation, their behavior will represent it. They will start by maintaining the surrounding environment, such as reducing the use of plastic bags by bringing their own shopping bags, using reusable food and beverage containers, and efforts to choose natural products (Choi & Johnson, 2019) and other environmental care activities. The importance of the environment is not only to be known but also to be implemented in real terms. “Environmental orientation is a worldview encompassing beliefs, attitudes, and perceptions that are culturally rooted” (Solekah et al., 2022). “It underpins behaviors aimed at protecting nature, driven by the belief in an emotional connection between humans and the natural world” (Mostafa, 2007). “There are four environmental orientations” (Cohen et al., 1976), instrumental orientation, territorial orientation, sentimental orientation, and symbolic orientation. Instrumental orientation shows that natural resource is part of the ongoing life system; this resource is precious and qualified, so it is worth utilizing and exploiting. A good way to exploit these resources is needed to make them effective and provide good value. The more natural resources are available, the more people can take the opportunity to use them, so everyone should have thoughts oriented toward preserving the natural resource.

Territorial orientation is to avoid the emergence of territorial struggle, so it requires the role of a leader, a person, or an organization to manage the utilization mechanism in a territory in accordance with the applicable legal provisions. In comparison, sentimental orientation is defined as a strong

influence of an organization, social group, or other form of association. This orientation is formed due to social background, education, tradition, symbols, and others. Symbolic orientation has a symbolic meaning related to culture, aesthetics, religion, morals, and knowledge believed by certain communities. Environmental orientations encourage people to believe that their environment is special and has historical value or is sacred, so people make efforts to keep it sustainable. “Every person appreciates their surrounding environment by carefully behaving when they are around, not throwing rubbish, and by the end, it can create a personal characteristic that has the willingness to reduce any kind of waste” (Moisander, 2007). “Having this environmental orientation is tightly related to reducing plastic waste since people will consider nature by not choosing plastic-based packaging or at least they strive to decrease plastic reliance” (Solekah et al., 2022). “The attitude of willingness to minimize plastic use is crucial because plastic nowadays is part of human lifestyle” (Paterson, 2019), and “plastic is light, water resistant, durable and has attractive shape” (Herabadi et al., 2023). Based on the data, today, most plastic waste is from disposable beverage packaging (Herabadi et al., 2023).

As mentioned by Ncube et al. (2021), “now companies are competing themselves in reducing the use of plastic for their food products in accordance with the customer awareness toward the danger of plastic.” In addition, Solekah et al. (2022) also mentioned that the millennial generation has a stronger view of environmental issues, so they are actively reducing their purchases of products that use plastic packaging. Herabadi et al. (2023) discovered that Gen Z is willing to be engaged in the efforts to recycle disposable plastic packaging.

Knowledge on the environment relates to an individual’s familiarity with how their actions affect the environment. For example, using plastic in food and beverage packaging can be harmful to both health and the environment when disposed of improperly (Solekah et al., 2022). “Many people realize the dangers of plastic use, but they do not know what the dangers are and how to reduce plastic waste. Besides, the plastic waste also needs to be recycled to create economic circular” (Boca et al., 2023). People also have to reduce

plastic use to cut pollution and its impact on the Earth. Environmental knowledge is considered successful if all four aspects are involved: economy, technology, social, and culture (Z. Hidayat & D. Hidayat, 2020). The adaptive skill of Gen Z toward technology is one of the factors that create an understanding gap between Gen Z and the previous generation. “Education is also able to be used to strengthen Gen Z awareness of environmental knowledge since this generation is mostly student-age” (Kollmuss & Agyeman, 2002).

Environmental knowledge pertains to a person’s comprehension of elements and objects within the ecosystem (Manucom et al., 2023). “Knowledge of the environment, which is derived from the social sciences, anthropology, and the natural world, must be taught in schools” (Otto & Pensini, 2017). Environmental knowledge is sometimes also tied to ethics, such as values and the establishment of authority (Manucom et al., 2023). The extent of environmental knowledge is vast, and the basic needs of human life cannot be met without the environment. Therefore, any knowledge that is relevant to human life will be relevant to environmental knowledge.

Some customs are being implemented at schools, such as bringing reusable water containers (Solekah et al., 2022), not providing plastic packages in the school canteen (Bahij et al., 2021), and teaching how to recycle plastic waste (Manucom et al., 2023). Those customs are part of knowledge about the environment to stimulate Gen Z awareness. Besides, “Gen Z also pay attention to their pride and seek recognition, which also become factors that make them interested in environmental activity” (Kymäläinen et al., 2021). “Knowledge about the environment needs to be spread out since some research revealed that environmentalists mostly work based on social issues instead of knowledge” (Liobikiene & Poškus, 2019). “Environmental knowledge is needed to push the environment-friendly culture to encourage them to behave wisely toward their surroundings wherever they are” (Michelsen & Fischer, 2017). “Environmental knowledge is used as the basis for an individual in making their choice of activity that is more environmental-friendly” (Otto & Pensini, 2017). Environmental knowledge is also related to pro-environment activity (Zsóka et al., 2013).

Gen Z has more knowledge about which companies recycle their plastic waste (Nikolić et al., 2022). “Though Gen Z is still relatively young, they keep on growing to become a more responsible group and have the ability to critically analyze their consumption preference” (Herabadi et al., 2023). As a digital era generation, it is easier for them to access information faster via social media or any other online media. Many environmentalists use social media to spread their messages. Gen Z can easily catch their messages, and some of them even take some action to be involved in environmental awareness activities such as cleaning the sea, mountains, or rivers of plastic waste (Kusumawati et al., 2020). “Gen Z cares about recycling products, diet, and reducing consumption of environmentally unfriendly products” (Djafarova & Foots, 2022). They also choose natural-based makeup products and companies that implement recycling programs like switching the bottle package with points for the next buying (Shalmont, 2020). Wang et al. (2022) mentioned that Gen Z has some factors behind their actions: they show pride, self-actualization, and self-expression that affect their awareness of reducing plastic waste. Kwistianus et al. (2020) stated that college students tend to choose eco-friendly products though they are more expensive, for they know the danger of plastic to human health.

This concern is not enough; Gen Z needs also to know about environmental knowledge. It is necessary for them to be in the surroundings that motivate them to keep their concern on environmental orientation. Environmental knowledge is defined as common knowledge about facts, concepts, and relations between nature and the surrounding ecosystem (Sali et al., 2015). People with environmental knowledge will try to balance their daily lifestyle with nature (Nurhidayati et al., 2021). Environmental knowledge can be gained by formal education and community and family interactions. The educational organization is the proper place to give knowledge about the environment because providing environmental knowledge education can guarantee environmental sustainability (Chen & Deng, 2018). Aikowe and Mazancova (2021) mentioned that the universities tried to support the government in reducing plastic waste by voluntarily giving incentives to students who use plastic-recycled bags. Environmental orientation

and environmental knowledge lead to awareness of managing waste better (Solekah et al., 2022). Environmental orientation and environmental knowledge refer to environmental behavior change, which means some of the following factors affect people’s attitudes, actions, and behavior to protect the environment (Situmorang et al., 2020).

This study examines the influence of environmental orientation and environmental knowledge on willingness to reduce plastic waste. This study attempts to identify the contribution of independent to the dependent variable, and the hypotheses in this study are as follows:

- H1: *Environmental orientation positively influences environmental knowledge.*
- H2: *Environmental orientation positively influences willingness to reduce plastic waste.*
- H3: *Environmental knowledge positively influences willingness to reduce plastic waste.*

2. METHODOLOGY

The analysis was conducted at three public universities, including two in Indonesia and one in Thailand. A quantitative approach was used, with questionnaires to collect and analyze the data regarding the relationship between variables (Appendix A). Random sampling was utilized, resulting in 430 usable responses from 500 distributed questionnaires. The questionnaires that were left were discarded because of incomplete or erroneous responses. There were two sections in the questionnaire: (1) demographic information and (2) items related to the research constructs. Data collection took place from November 10, 2023, to January 15, 2024, with strict adherence to ethical principles, ensuring the confidentiality of respondents’ identities and responses. Inferential statistical analyses, including validity and reliability tests, were used to process the quantitative data and test the hypotheses.

This study surveyed 430 Gen Z students from two public universities in Indonesia and one in Thailand, with 70% of respondents from Indonesia

and 30% from Thailand. The sample consisted of 45% male and 55% female students, aged between 18 and 25 years old, representing various academic departments and graduating classes.

Environmental variable is measured by adopting Purba and Marbun's (2020) scale with three items. For the environmental knowledge, the study adopted Mohiuddin et al. (2018); six items for the willingness to reduce plastic waste were taken from Solekah et al. (2022). All items are measured using 5-point Likert scale.

3. RESULTS AND DISCUSSION

3.1. Measurement model (outer model)

The first measurement model analysis is convergent validity. Convergent validity assesses the accuracy of an indicator in quantifying variables. It is influenced by the size of the loading factor. An indicator is deemed valid if its loading factor exceeds 0.6. Table 1 presents the outcomes of the convergent validity tests.

Table 1. Convergent validity

Variable	Indicator	Loading Factor	Standard Error	T Statistics
Environmental orientation	EO1	0.945	0.011	85.296
	EO2	0.944	0.010	92.756
	EO3	0.909	0.017	52.841
Environmental knowledge	EK1	0.702	0.058	12.072
	EK2	0.821	0.041	19.871
	EK3	0.816	0.031	26.484
	EK4	0.816	0.036	22.708
	EK5	0.773	0.064	12.013
	EK6	0.817	0.048	17.109
Willingness to reduce plastic waste	WR1	0.808	0.044	18.177
	WR2	0.908	0.020	45.431
	WR3	0.910	0.021	43.375
	WR4	0.897	0.027	33.474
	WR5	0.899	0.021	43.233
	WR6	0.843	0.034	25.113

Drawing from the examination of the first-order measurement model, all indicators measuring environmental orientation variables have loading factor values exceeding 0.6, indicating their validity in measuring these variables. Similarly, the environmental knowledge variable, measured by six indicators, demonstrates loading factor values

above 0.6 for all indicators, confirming their validity. Likewise, the willingness to reduce plastic waste variable, also measured by six indicators, shows loading factor values greater than 0.6 for all indicators, indicating their validity in measuring this variable. Convergent validity can additionally be evaluated through the AVE, with a value exceeding 0.5 indicating satisfactory convergent validity.

As shown in Table 2, it is clear that the variables of environmental orientation, environmental knowledge, and willingness to reduce plastic waste produce an AVE value greater than 0.5. Hence, the indicators that quantify the variables of environmental orientation, environmental knowledge, and willingness to reduce plastic waste are considered valid.

Table 2. Average variance extracted

Variable	AVE
Environmental orientation	0.870
Environmental knowledge	0.627
Willingness to reduce plastic waste	0.771

The second measurement model analysis is reliability measurement. Methods for assessing construct reliability include composite reliability and Cronbach's alpha. According to the test criteria, a composite reliability greater than 0.7 and a Cronbach's alpha exceeding 0.6 indicate that the construct is reliable. Table 3 presents an overview of the findings of Cronbach's alpha and composite reliability.

Table 3. Reliability testing

Variable	Composite Reliability	Cronbach's Alpha
Environmental orientation	0.952	0.925
Environmental knowledge	0.910	0.881
Willingness to reduce plastic waste	0.953	0.940

Referencing Table 3, it is evident that the composite reliability value for the variables of environmental orientation, environmental knowledge, and willingness to reduce plastic waste is greater than 0.7. Hence, following the composite reliability analysis, every indicator that quantifies the variables of environmental orientation, environmental knowledge, and willingness to reduce plastic waste are deemed reliable.

3.2. Structural model (inner model)

This study uses goodness of fit (GoF) to analyze the inner model. To put it another way, the goodness of fit model is used to calculate how well endogenous variables can explain the diversity of exogenous factors or how much exogenous variables contribute to endogenous variables. In PLS analysis, *R*-Square and *Q*-Square predictive relevance (*Q*²) are used to determine the goodness of fit model. Table 4 provides a summary of the findings of the goodness of fit.

Table 4. Goodness of fit testing

Endogenous variable	R-Square
Environmental orientation	0.108
Environmental knowledge	0.570

$$Q^2 = 1 - [(1 - R_1^2)(1 - R_2^2)], \quad (1)$$

$$Q^2 = 1 - [(1 - 0.108)(1 - 0.570)] = 0.616. \quad (2)$$

The *R*-squared value for the environmental orientation variable is 0.108, confirming that 10.8% of the variation in the environmental knowledge variable is elucidated by the environmental orientation variable. This means that the environmental orientation variable contributes 10.8% to explaining the environmental knowledge variable, while the remaining 89.2% is attributed to other unexplored factors. For the willingness to reduce plastic waste variable, the *R*-squared value is 0.570, confirming that 57.0% of the variation in the willingness to reduce plastic waste variable can be explained by the environmental orientation and environmental knowledge variables. In other words, the combined contribution of the environmental orientation and environmental knowledge variables to the willingness to reduce plastic waste variable is 57.0%, while the remaining 43.0% is due to other unexplored factors. The *Q*-squared value for the willingness to reduce plastic waste variable is 0.616, indicating that 61.6% of the variability in the willingness to reduce plastic waste

can be explained by the model as a whole. This means that the combined contribution of environmental orientation and environmental knowledge to the willingness to reduce plastic waste is 61.6%, while the remaining 38.4% is due to other unexplored factors.

3.3. Hypotheses testing

Hypotheses testing is utilized to determine if exogenous variables have an impact on endogenous variables. According to the test requirements, exogenous variables significantly affect endogenous variables if the *T* statistics coefficient $\leq T$ table (1.96, with an alpha of 5%). Table 5 presents the findings of the hypotheses testing.

Referencing the tests in Table 5, it can be noted that the effect of environmental orientation on environmental knowledge produces a *T* statistic of 3.535. The test outcomes show that the *T* statistic $> T$ table (1.96). This implies that there is a notable impact of environmental orientation on environmental knowledge. The effect of environmental orientation on willingness to reduce plastic waste resulted in a *T* statistic of 6.874.

The test findings indicate that the *T* statistic $> T$ table (1.96). This implies that environmental orientation significantly influences a person's willingness to reduce plastic waste. Knowledge of the environment's impact on a person's willingness to reduce plastic waste resulted in a *T* statistic of 5.454.

Table 5 indicates that the *T* statistic $> T$ table (1.96). This implies that environmental knowledge significantly influences willingness to reduce plastic waste. Whether the coefficient is signed positive or negative, the biggest total coefficient can be used to identify exogenous variables that have a dominant influence on endogenous variables, as demonstrated in Table 6.

The analysis's findings indicate that, with a total coefficient of 0.643, the environmental orientation

Table 5. Hypotheses testing

Exogenous variable	Endogenous variable	Path coefficient	Standard error	T statistics
Environmental orientation	Environmental knowledge	0.328	0.093	3.535
Environmental orientation	Willingness to reduce plastic waste	0.506	0.074	6.874
Environmental knowledge	Willingness to reduce plastic waste	0.418	0.077	5.454

Table 6. Testing results on the most dominant variable effect toward the endogen variable

Exogenous variable	Endogenous variable	Total coefficient
Environmental orientation	Environmental knowledge	0.328
Environmental orientation	Willingness to reduce plastic waste	0.643
Environmental knowledge	Willingness to reduce plastic waste	0.418

variable has the highest total coefficient on the willingness to reduce plastic waste. Therefore, the factor that most strongly influences willingness to reduce plastic waste is environmental orientation.

The study's findings revealed that environmental orientation has a positive and significant effect on environmental knowledge (*H1* is accepted). Environmental orientation can be considered as a level of commitment and emotion toward various environmental issues (Purba & Marbun, 2020). Some people feel that their environmental orientation has an impact on environmental knowledge. Those who are environmentally oriented become more knowledgeable about the environment. Environmental orientation that starts from oneself fosters some environmental knowledge, such as choosing not to use plastic because they are aware of the dangers of plastic for human health and environmental sustainability. Environmental orientation is an opener for some people to finally have knowledge about the environment. Its focus provides awareness to learn more about the importance of environmental sustainability until someone understands and has environmental knowledge.

The study's findings revealed that environmental orientation has a positive and significant effect on willingness to reduce plastic waste (*H2* is accepted). It means that Gen Z knows environmental sustainability is vital for their present and future lives. Reducing plastic waste is one of the ways to preserve nature. Environmental orientation teaches how to exploit nature wisely (Purba & Marbun, 2020), as some places in the environment are considered sacred and protected. However, it is necessary to keep all places in the environment clean for a convenient life (Cohen et al., 1976).

Plastic waste is a big issue all over the world; the use of packaging, containers, and other daily necessities from plastic makes the plastic pile up (Solekah et al., 2022), worsened by the unavailability of plastic waste management because plas-

tic is considered undecomposed (Herabadi et al., 2023). In this study, environmental orientation among Gen Z individuals is characterized by their conscientious use of natural resources, exposure to environments that promote environmental awareness, and participation in conservation efforts. This result is substantiated by Ribeiro et al. (2023), Herabadi et al. (2023), and Solekah et al. (2022), who stated that Gen Z is highly intentionally involved in environmental sustainability. Gen Z employs age-appropriate methods to engage with environmental conservation, including accessing information through social media, joining environmental communities, and advocating for nature preservation online. Their heavy use of information technology is influenced by the fact that they are an Internet generation. Their focus on environmental issues is driven by health awareness, which extends to the environment's well-being. They integrate environmental care into their daily routines, such as conserving water, minimizing waste, and adopting nature-friendly practices.

The willingness to reduce plastic trash is positively and significantly impacted by environmental awareness (*H3* is accepted). Knowing environmental knowledge makes the youngsters aware more about the recycling process (Kymäläinen et al., 2021). They prefer food and beverage products that are nature-friendly and commonly symbolize certain related environmental concerns (Ariestya et al., 2022), so in the end, they can reduce the number of waste (Solekah et al., 2022). Gen Z gains knowledge about the environment faster because they are accustomed to the Internet, and even their days are filled with Internet-related activities. They are aware of current environmental issues (Manucom et al., 2023), and they will intentionally share their story and knowledge with the people around them (Schönherr & Pikkemaat, 2024). They also agree to reduce the amount of waste (Solekah et al., 2022; Mohiuddin et al., 2018). Environmental knowledge holds significant importance for Gen Z, as they will inherit the responsibility of safeguarding the planet. Equipping

them with adequate knowledge influences various actions, including the adoption of environmentally friendly purchasing habits. Many young individuals are actively engaged in environmental initiatives and even aspire to establish eco-conscious businesses. With their knowledge, Gen Z is anticipated to embrace change, shaping the future of human civilization.

Environmental orientation and environmental knowledge profoundly impact Gen Z's proactive approach to environmental sustainability. They get used to carrying their tumblers (Herabadi et al., 2023), choosing glass-made containers rather than plastic ones to enjoy their coffee, juice, or other drinks in the café, and some of them even bring their own bag when shopping. Gen Z often consciously seeks out environmentally friendly products with unique designs, such as stainless steel straws, reusable food containers, stylish tumblers, recycled or natural bags, and cosmetics made from safe, natural ingredients. They actively participate in environmental campaigns and join communities dedicated to raising awareness about the dangers of plastic pollution.

As for the male Gen Zs in a study conducted by Solekah et al. (2022), they prefer using metal razors that can be reused several times rather than plastic disposable ones. During their trip, they choose to rest in a café without taking away the food and drink using plastic packaging (Ribeiro et al., 2023). Unlike previous generations, Gen Z holds a distinct view on lifestyle and consumption, prioritizing sustainability. They emphasize prevention over cure and maintain a healthy lifestyle through regular exercise, balancing serious pursuits with leisure activities, and enjoying both in-person and online social interactions. Gen Z is open to spending more on goods and services that do not harm the environment, including eco-friendly travel options like staying in green hotels and supporting local communities (Prayag et al., 2022).

The results of the study showed that environmental orientation and environmental knowledge have a direct (positive) and significant influence on willingness to reduce plastic waste. According to Choi and Johnson (2019), Solekah et al. (2022), and Mostafa (2007), when someone has an envi-

ronmental orientation, it will be internalized in their daily life in protecting the environment, either by maintaining their consumption methods, being involved in environmental protection, and actively voicing others to care about the environment. Gen Z has the opportunity for that. They have easy access to technology, so they can easily mobilize others through social media or other technological channels.

A daily habit is considered small, but the willingness to reduce plastic waste will save the Earth from the accumulation of plastic waste (Ribeiro et al., 2023). The accumulation of plastic waste is a result of unsustainable consumption, which is characterized by excessive consumption, purchasing single-use products, and improper waste management. This is the root of various environmental problems, including loss of biodiversity, waste pollution, and global warming. The latest statistics show that more than 300 million tons of plastic waste are generated annually worldwide, with only 9% being recycled, while the rest ends up in landfills or polluting the environment (Somad & Fatmasari, 2024).

The results show that Gen Z has a strong environmental orientation and environmental knowledge toward the willingness to reduce plastic waste, which can be used to overcome consumption patterns such as purchasing, using, and disposing of goods that do not have an impact on environmental sustainability and human quality of life. Some examples of sustainable consumption behavior to reduce plastic waste include purchasing environmentally friendly products that are not made of plastic (Herabadi et al., 2023) and reusing products to reduce waste (Solekah et al., 2022). Gen Z students easily play a role in the willingness to reduce plastic waste; they can participate in campus activities such as nature lovers' associations and research communities or mobilize fellow students to reduce plastic waste.

Gen Z's willingness to reduce plastic waste must continue to be encouraged. Although brands already have an environmental orientation and environmental knowledge, efforts toward this awareness must still be appreciated. For example, for cheaper subsequent purchases by exchanging bottles with previous purchases, several banks

have implemented a bottle exchange program with a value of a certain amount of rupiah that is directly transferred to the account. This program is expected to be effective for Gen Z because they process information faster. The willingness to reduce plastic waste can become a lifestyle if packaged in a fun, adaptive, and easy-to-practice way. Several schools have also implemented minimizing plastic consumption by not providing plastic bags in the canteen and using cutlery that can be washed and reused.

Encouraging the willingness to reduce plastic waste is so that the actions of the current generation do not endanger the needs of future genera-

tions for a green and comfortable planet. Gen Z plays an important role in the willingness to reduce plastic waste because they are currently living on the Earth and will also be the future inhabitants of this planet. As the future generation, Gen Z will face serious challenges caused by the increasing accumulation of plastic waste, which will impact environmental damage. Therefore, if Gen Z becomes a business actor in the future, they will be responsible for producing products that minimize the use of plastic; as a consumer, Gen Z will choose to consume products by reducing the use of plastic. Whatever Gen Z's position in the future, it is hoped that their orientation and knowledge will remain focused on environmental concerns.

CONCLUSION

This study assesses Gen Z's internalized environmental orientation and environmental knowledge as an integral aspect of their identity. As an environmentally conscious generation, Gen Z realizes the importance of willingness to reduce plastic waste for the quality of human life in the present and the future. The willingness to reduce plastic waste is an effort to preserve nature because it is the same as preserving the future of humanity. The willingness to reduce plastic waste is able to maintain personal sustainability, the sustainability of others, and the sustainability of nature.

This study contributes to the theoretical understanding of environmental sustainability, particularly concerning Gen Z. Firstly, it highlighted Gen Z's environmental orientation, which is shown by a deep concern for sustainability, starting with personal actions and extending to participation in environmental conservation initiatives. Secondly, the study emphasizes Gen Z's environmental knowledge, revealing a strong understanding of environmental issues. This is proven by their readiness to make larger payments for eco-friendly products and their prioritization of health, avoiding plastic-based products (Ribeiro et al., 2023). Thirdly, this study admits that Gen Z is willing to reduce plastic waste by doing simple things, but they have a huge impact on their environment, such as bringing their own tumblers (Herabadi et al., 2023).

This paper offers practical implications for addressing environmental sustainability. While human activities must continue, they should not come at the expense of the environment. Companies need to adapt their production practices not only to fulfill their responsibility for nature preservation but also to align with evolving consumption trends, particularly those of Gen Z. As the future's predominant consumer group, Gen Z shows a heightened sensitivity to environmental issues, warranting careful consideration. To address this, there should be a concerted effort to reduce plastic use and transition to more sustainable materials, as Gen Z is eager to pay extra for eco-friendly products. It is crucial to nurture Gen Z's environmental concerns by reinforcing their environmental orientation and knowledge. This can be achieved through creating an environment conducive to sustainability within their immediate surroundings, including family, education, and social circles.

This analysis aligns with the imperative for future environmental sustainability. However, one limitation lies in the spreading nature of the data collected from two diverse countries, Indonesia and Thailand. Despite being developing Southeast Asian nations, they possess distinct natural attributes and cultural traits. Yet, the use of identical questionnaire items may obscure the nuanced differences among Gen

Z respondents from these countries. Despite this, the study reveals relatively similar characteristics among Gen Z individuals in Indonesia and Thailand. Future research should address this limitation by tailoring questionnaire items to capture the unique traits of respondents, thereby providing more accurate insights into the characteristics of Gen Z within specific national contexts. Such findings serve as valuable references for policymakers in formulating targeted strategies for environmental sustainability.

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APPENDIX A

Table A1. Description of research instruments

No.	Items	References
Environmental orientation		
1	I exploit nature carefully because I know that natural resources are valuable (EO1)	Purba and Marbun (2020)
2	I live in an environment that cares about nature sustainability (EO2)	
3	I join a community that cares about nature (EO3)	
Environmental knowledge		
1	I know a lot about recycling (EK1)	Mohiuddin et al. (2018)
2	I understand the symbols about the environment in the food and beverages package (EK2)	
3	I know how to choose the product to reduce the waste (EK3)	
4	I know about environmental issues (EK4)	
5	I am willing to share my knowledge about the environment with other people (EK5)	
6	I use my knowledge to reduce the waste (EK6)	
Willingness to reduce plastic waste		
1	I stopped using a plastic straw	Solekah et al. (2022)
2	I use a recycled bag	
3	I bring my own bag when I go shopping	
4	I use a refillable water bottle	
5	I choose non-plastic daily tools	
6	I sort between my plastic waste and decomposed waste at home	