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Key Drivers of AI Utilization for Environmental Sustainability among Indonesia's Educated Gen Z

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A B S T R A C T

Artificial Intelligence (AI) plays an important role in shaping environmentally friendly behavior such as saving physical resources, reducing costs, and improving waste management. However, an understanding of the factors that influence The use of AI products in Educated Generation Z and their impact on environmental sustainability is still limited, especially in developing countries. To overcome this gap, this research seeks to determine and analyze the determining factors that influence the utilization of AI by Educated Gen Z and its implications for environmental sustainability in Indonesia. This research adopts a modified UTAUT Model. This research uses a PLS-SEM approach with data collected from 180 Educated Gen Z respondents, who are currently pursuing undergraduate education and have used AI. Data was collected during the period March – May 2024. These findings reveal that factors such as effort expectancy, response cost, response efficacy, and self-efficacy significantly encourage environmental sustainability among Educated Gen Z in Indonesia. This research also confirms that green behavior among Educated Gen Z in Indonesia is able to increase environmental sustainability. These findings contribute to the literature on AI and green behavior and offer valuable insights for practitioners, policymakers, and AI product developers.

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INTRODUCTION

Environmental sustainability has become an important global concern as society faces increasing challenges related to limited resources, waste management, and climate change (Rimadias, 2019). Research on environmental sustainability is important to carry out because it is based on culture and changes in behavior in society. Environmental issues have made consumers gradually change their behavior to carry out environmentally friendly practices (Ogiemwonyi et al., 2020).

Generation Z or often referred to as iGen or Centennials refers to the generation born between 1997 and 2012 (Gomes et al., 2023). Furthermore, other research explains that Generation Z or Gen Z is a cohort group born after 1995 that stands out from other generations in at least one aspect, namely that this group has never seen a world without the Internet (Chillakuri, 2020). This generation spends a lot of time on various social media channels (Rimadias et al., 2022), and the content posted on social media is a source of information, motivation and, inspiration for them (Zatwarnicka-Madura et al., 2022). Gen Z is a demographic group known for its technology-savvy nature (Haque et al., 2023) and environmental awareness (Dewi et al., 2024). Indonesia has shown positive developments in implementing a sustainable lifestyle (Rimadias, 2019). Based on the Snapcart TASC Online Survey (2023), it was recorded that 84% of Indonesian people have purchased environmentally friendly products. In line with these findings, a Deloitte report (2023) revealed that 75% of the younger generation or Gen Z have used environmentally friendly products (Pertamina, 2024).

This study addresses this gap by focusing on Generation Z. Previous research explains that only a few studies discuss environmental issues exclusively in the generational domain (Gomes et al., 2023). Research conducted on Generation Z in China explains that eco-friendly labeling and environmental awareness tend to increase in Gen Z in China (Song et al., 2020).

Among the various technological innovations contributing to this goal, Artificial Intelligence (AI) has emerged as a powerful tool for promoting environmentally friendly practices (Al-Sharafi et al., 2023). AI technology has demonstrated the ability to optimize resource use, reduce energy consumption, improve water management, and improve waste-handling processes, making them invaluable in efforts to achieve sustainability goals (Yigitcanlar et al., 2021).

A previous study conducted in China in 2023 explained that there is a strong and positive correlation between AI and green innovation, highlighting the important role of AI in promoting environmental sustainability (Wang et al., 2023). Furthermore, research conducted in Poland explains that Generation Z is sensitive to environmental and ecological issues (Zatwarnicka-Madura et al., 2022). Adopt AI by creating a data-driven, digital, and conducive culture, as well as positively strengthening the skills and competencies of human resources to influence environmental sustainability practices (Prasanta Dey et al., 2020).

Despite rapid technological advances, the adoption and utilization of AI products in driving sustainable behavior remains underexplored, especially in

developing countries. Based on the latest survey from Statesman Consumer Insights, Indonesia is ranked fourth as a country with high enthusiasm for the use of artificial intelligence (AI) in everyday life (MiiTel, 2024). Understanding the factors that influence the use of AI technology is critical, as these insights can guide stakeholders in maximizing AI's potential to drive environmentally friendly behavior. However, there is an important gap in the literature regarding the determinants of AI adoption and its impact on environmental sustainability in this context.

By using a formulation approach *Unified Theory of Acceptance and Use of Technology* **(**UTAUT) model with The four critical constructs include performance expectations, effort expectations, social influence, and facilitating conditions (Sair & Danish, 2018) which has been modified with perceived severity, perceived vulnerability, self-efficacy, response efficacy, response costs (Al-Sharafi et al., 2023), this research aims to identify and analyze the main driving factors for the use of AI for environmental sustainability in Educated Gen Z in Indonesia. It is hoped that the results of this research will contribute to the growing body of literature on AI and sustainability while providing actionable insights for practitioners, policymakers, and AI product developers to effectively encourage environmentally friendly practices.

LITERATURE REVIEW

Unified Theory of Acceptance and Use of Technology (UTAUT) Model

Formulation Unified Theory of Acceptance and Use of Technology **(**UTAUT) The model is based on eight research models, namely the technology acceptance model, the theory of reasoned action, the TAM–TPB hybrid model, the motivation model, the theory of planned behavior, the PC utilization model, the diffusion of innovation theory, and the social cognitive theory (Rahi et al., 2019). The UTAUT model proposes four critical constructs from the theories listed above including performance expectations, effort expectations, social influence, and facilitating conditions (Sair & Danish, 2018).

The Influence of Social Influence on Green Behavior

In research on social influence, it was found that group identity is the foundation central to most individual existence and behavior (Spears, 2021). If an individual decides to carry out or not carry out a behavior, then this depends on the intentions of that individual. This also explains green behavior (Ogiemwonyi et al., 2020). Consumers who are influenced by social influences tend to consider the opinions of people who are important to them, which in turn will influence their green behavior (Sadiq et al., 2021). In this research, Gen Z who are currently pursuing undergraduate education tend to consider the opinions of people who are important to them, which in turn will influence their green behavior.

H1: Social influence influences green behavior.

The Influence of Performance Expectancy on Green Behavior

Performance expectancy is defined as the level of individual belief that their work performance will improve by using innovative technology (Sair &

Danish, 2018). Another study explains that performance expectancy is an individual's perception that using the system will improve performance (Rahi et al., 2019). Performance expectancy refers to the extent to which an individual considers that using a system will improve expected performance and be more beneficial in economic and environmental terms (Majeed & Rasheed, 2024). In research, Gen Z who are currently pursuing undergraduate education are thought to think that using AI will increase green behavior.
H2: Performance expectancy influences green behavior

The Influence of Effort Expectancy on Green Behavior

Effort expectancy can be defined in relation to ease, namely how individuals perceive that they use technology in a way that is easy to use technology (Sair & Danish, 2018). Individuals become more skilled and adopt technology when it is easier to use (Kartikasari et al., 2020). Furthermore, the perceived ease of using technology determines students' behavior in using intentions to support learning (Sari et al., 2024). In this research, Gen Z who are currently pursuing undergraduate education are thought to be more skilled and adopt AI technology in green behavior.
H3: Effort expectancy influences green behavior

The Influence of Facilitating Conditions on Green Behavior

Facilitating conditions refer to the extent to which an individual perceives that the organizational and technical infrastructure required to use the system is available (Onaolapo & Oyewole, 2018). Perception of positive facilitating conditions will improve the expected performance in economic and environmental terms (Majeed & Rasheed, 2024). Facilitating conditions that are perceived to support learning determine students' learning behavior (Sari et al., 2024). Facilitating conditions are factors in an environment that enable the use of artificial intelligence for Gen Z who are currently pursuing undergraduate education to adopt green behavior.
H4: Facilitating conditions influential to green behavior

The Influence of Perceived Severity on Green Behavior

Perceived severity is an individual's belief about the consequences of a particular problem, such as a health threat, environmental problem, or technological risk (Hsiao & B, 2020). Perceived severity influences behavior in using technology applications (Azmi et al., 2023). Perceived severity of environmental problems is felt to significantly influence green product purchasing behavior by consumers (Zhang et al., 2024). In the educated Generation Z, their beliefs about the consequences of technology risks will be green behavior.
H5: Perceived Severity influences green behavior

The Influence of Perceived Vulnerability to Green Behavior

Rather than being an objective or absolute standard, perceived vulnerability is the result of comparing one's ability to handle negative events with the abilities of others. When a negative event occurs, individuals first

evaluate whether they can cope better than similar others rather than examining the event or their own abilities (Tanner & Su, 2019). In the younger generation, perceived vulnerability refers to individuals' beliefs about their possibility of experiencing danger or negative consequences from a particular issue such as environmental issues, health risks, or technological threats (Giuliani et al., 2023). In the educated Generation Z, individuals' beliefs about the possibility of experiencing negative consequences from environmental issues and technological threats influence green behavior.
H6: Perceived vulnerability has an effect on green behavior

The influence of Self-efficacy on Green Behavior

Self-efficacy refers to an individual's capacity to produce an impact or play an important role. Individuals who realize that they are able to make a difference feel happy and therefore take the initiative; individuals who perceive themselves as helpless are unhappy and unmotivated to act (Flammer, 2018). Self-efficacy plays an important role in the causal structure because influences human functioning not only directly, but also through its impact on a group of other important determinants which include goal aspirations, incentives, and disincentives rooted in outcome expectations (Bandura, 2017). The research results (Sh. Ahmad et al., 2022) explain that self-efficacy has a significant influence on environmentally friendly behavior.
H7: Self-efficacy influences Green Behavior

The Influence of Response Efficacy on Green Behavior

Response efficacy is an individual's belief in the effectiveness of certain actions or solutions in reducing or preventing threats (Bigsby & Albarracín, 2022). Furthermore, response efficacy, also known as perceived instrumentality, refers to the belief that one's actions will be effective if they have desired consequences (Bradley et al., 2020). Conceptually, a positive response efficacy will increase self-confidence in recommended behavior as a solution to system dangers or threats (Klyver et al., 2023).). In this study, response costs are estimated influence environmentally friendly behavior in educated Gen Z.
H8: Response efficacy influences green behavior

The Effect of Response Costs to Green Behavior

Response costs refer to the perceived barriers, efforts, or sacrifices associated with implementing a particular behavior or action. These include financial, time, energy, social, or psychological costs (Al-Sharafi et al., 2023). Environmental quality is highly dependent on human behavior patterns. Previous research explains that pro-environmental behavior is influenced by response costs in students in Iran (Shafiei & Maleksaeidi, 2020).). In this study, response costs are estimated influence environmentally friendly behavior in educated Gen Z.
H9: Response costs influence green behavior

The Influence of Green Behavior on Environmental Sustainability

Individual behavior that supports environmental sustainability initiatives in an organization is referred to as green behavior (Fawehinmi et al., 2020). Green behavior is an individual action that consciously minimizes impacts and negative impacts on the environment, by optimizing the use of paper, reducing dependence on physical resources, promoting distance learning, and reducing travel-related carbon emissions (Fawehinmi et al., 2020). The level of ecosystem damage due to human actions increases the call for individuals to become more responsible for the environment. Concern for the environment plays an important role in encouraging environmental sustainability (Fawehinmi et al., 2022). In this research, green behavior is thought to influence environmental sustainability in educated Gen Z.
H10: Green behavior has an impact on environmental sustainability

The research model can be seen in Figure 1, where using a formulation approach *Unified Theory of Acceptance and Use of Technology* **(**UTAUT) model with The four critical constructs including performance expectations, effort expectations, social influence and facilitating conditions (Sair & Danish, 2018) which has been modified with perceived severity, perceived vulnerability, self-efficacy, response efficacy, response costs (Al-Sharafi et al., 2023), this research aims to identify the main driving factors for the use of AI for environmental sustainability among Educated Gen Z in Indonesia.

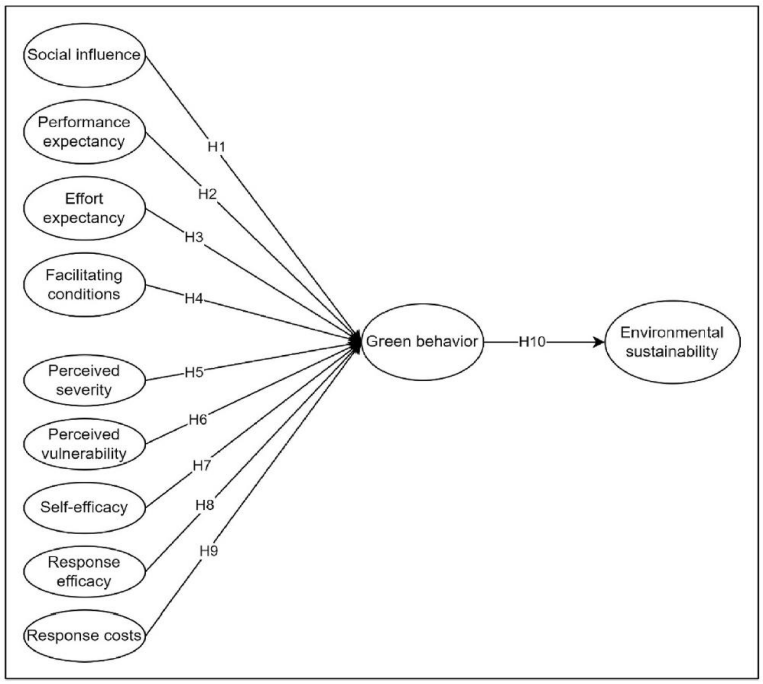

Figure 1. Research Model

METHODOLOGY

This study employed an explanatory survey to collect data and gain a deeper understanding of the target population. To streamline the data collection process, a convenience sampling approach was utilized, selecting participants based on their willingness to take part (Malhotra, 2017).

Population is a group of items that have the same characteristics and have an equal chance of being selected as a sample. Gen Z students who are currently enrolled in undergraduate programs and have used Artificial Intelligence (AI) in Indonesia are the population of this study. A questionnaire instrument taken from previous studies was used to collect data, and a Likert scale with a range of 1 to 6 was used according to the hypothesis. Data collection was carried out through a questionnaire between March and May 2024.

The questionnaire was developed based on research variables, including Social Influence, Performance Expectancy, Effort Expectancy, Facilitating Conditions, Perceived Severity, Perceived Vulnerability, Self-efficacy, Response efficacy, Response Costs, Green Behavior, and Environmental Sustainability. All indicators for each variable were adopted from (Al-Sharafi et al., 2023). Indicators of the social influence variable include 3 (three) items. Performance expectancy variable indicators include 4 (four) items. Furthermore, indicators variable effort expectancy includes 4 (four) items. In the facilitating conditions variable, indicators include 4 (four) items. Indicator variable perceived severity includes 3 (three) items. Indicators of variable perceived vulnerabilities include 3 (three) items. Furthermore, indicators of variable self-efficacy include 3 (three) items. Furthermore, indicators on the response efficacy variable include 3 (three) items. Indicators of variable response costs include 4 (four) items. Indicators of variable green behavior include 4 (four) items. Finally, indicators on variable environmental sustainability, include 3 (three) items.

The suggested hypothesis is tested using the influence model, and the analysis approach is the Equation Model (SEM). A multivariate analytic technique called SEM is employed to look at cause-and-effect connections (Rimadias et al., 2021). Partial Least Squares (PLS) are used in the analytical process. In this study, Smart PLS 4.0 software was utilized.

Measurement Model (Outer Model)

The Outer Model includes testing indicators for each variable to determine its effectiveness in measuring latent variables (Dante M. Pirouz, 2006). The convergent validity of an indicator can be assessed through its outer loading, ideally above 0.70 to determine reliability. Ghozali (2014) shows that an outer loading value of up to 0.60 is still acceptable, while 0.50 for early-stage research (pre-test) is considered sufficient (Haenlein & Kaplan, 2004). Discriminant validity is evaluated by comparing the square root of the average variance extracted (AVE) of each construct with the correlation between constructs in the model. A greater AVE of correlations with all other constructs indicates good discriminant validity. Cross-loadings were examined to test the measurement model for discriminant validity. Therefore, an AVE value greater than 0.50 is recommended (Haenlein & Kaplan, 2004). Construct reliability (CR) is usually assessed using a rule of thumb, with composite reliability values above 0.70 considered acceptable. CR indicates the level of common latent variables and internal consistency of construct indicators. Although not an absolute standard, the accepted cutoff for the CR rate is 0.70 (Haenlein & Kaplan, 2004).

Structural Model (Inner Model)

The structural model, also known as the inner model, follows the assessment of the outer model. Several checks are carried out at this stage, such as R-Square or coefficient of determination, which evaluates how much the endogenous construct can be explained by the exogenous construct. Ideally, the value R Square ranges between 0 and 1, where 0.75, 0.50, and 0.25 indicate a strong, moderate, and weak model respectively (Dante M. Pirouz, 2006). Another test in the deep model is the t-test, which is used to evaluate hypotheses. This model consists of variables with a causal relationship between endogenous and exogenous variables. The p-value of the significance of causal relationships in all models was used to test the hypothesis. A p-value of less than 0.05 indicates a significant hypothesis that is supported by the data, while a value greater than 0.05 indicates the hypothesis is not significant and is not supported. The original sample value (O) can show a positive or negative direction in the causal relationship between endogenous and exogenous variables (Haenlein & Kaplan, 2004).

Google Forms was used to distribute the online questionnaire, serving as the primary method of data collection. The collection period took place during the period March-May 2024 and included Educated Gen Z respondents, namely Gen Z who were pursuing undergraduate education and had used AI.

RESEARCH RESULTS

In this research, the respondents used were Educated Gen Z, that is, they are currently pursuing undergraduate education and have used AI (chatbots, virtual assistants, smart applications, etc. The characteristics of the 180 respondents collected during the March-May 2024 period can be seen in Table 1.

Table 1. Characteristics of Respondents

	Demographics	Percentage
Gender	Woman	70%
	Man	30%
Residence Location	Jakarta	72%
	Bogor	2%
	Depok	12%
	Tangerang	2%
	Bekasi	2%
	Bandung	3%
	Banten	1%
	Solo	2%
	Yogyakarta	2%
	Lampung	1%
	Salatiga	1%
	Malang	1%
	Bali	1%
	Kalimantan	1%

Source: Data processed (2024)

In Table 1, it can be concluded that the majority of respondents are women and live in large cities in Indonesia.

Outer Model Evaluation

Evaluation of the research model or outer model is presented in Figure 2. As a result of processing using SmartPLS 4.0.

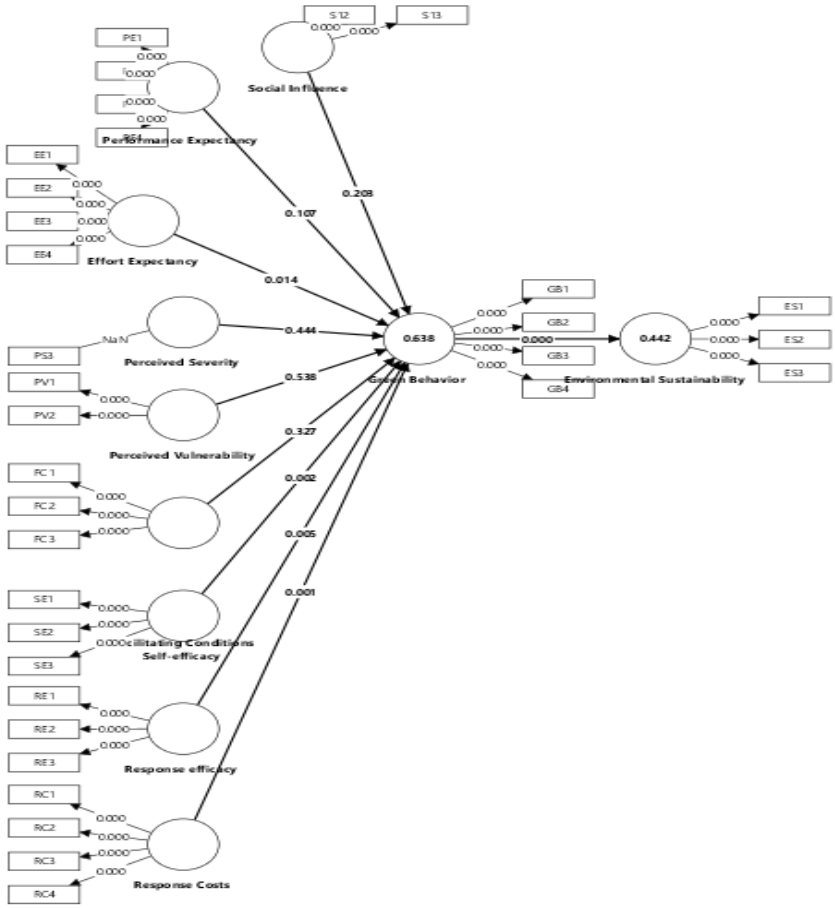

Figure 2. Outer Model
Source: Data processed (2024)

Convergent Validity

In Outer Loading above, an indicator that meets each of the criteria variables if the model has a Factor Loading above 0.50, it meets Convergent Validity. All AVE values in this study show construct values greater than 0.50.

Discriminant Validity

From the Cross Loadings results it can be concluded that all indicators that meet the criteria have a greater coefficient for each construct compared to the correlation coefficient value of the indicators in the block construct other columns. So it can be concluded that the Discriminant Validity in this research is in accordance with the predetermined criteria.

Construct Reliability

On test reliability, the construct is measured by Cronbach's Alpha value And Composite Reliability. Next for value Cronbach's Alpha of all constructs must be > 0.7. In this study, all Cronbach's Alpha values were > 0.7. So it can be concluded that all indicators that meet the criteria in this research are consistent in measuring the construct.

Table 2. Construct Reliability Test Results

	Cronbach's alpha	Average variance extracted (AVE)
Effort Expectancy	0.892	0.752
Environmental Sustainability	0.790	0.705
Facilitating Conditions	0.865	0.788
Green Behavior	0.919	0.806
Perceived Vulnerability	0.911	0.918
Performance Expectancy	0.899	0.769
Response Costs	0.854	0.693
Response efficacy	0.899	0.832
Self-efficacy	0.743	0.662
Social Influence	0.727	0.783

Source: Data processed (2024)

Evaluation of the Structural Model or Inner Model

In the inner model evaluation, the R-Square value for each endogenous latent variable is analyzed as the predictive ability of the structural model is the first step in assessing the structural model with PLS.

Tabel 3. R-Square Value

Variable	R square adjusted
Environmental sustainability	0,439
Green behavior	0,618

Source: Data processed (2024)

Table 3 shows that 43.90% of the variance in environmental sustainability is explained by green behavior, while the remaining 56.1% is explained by other variables. Likewise, the total variance in green behavior of 61.80% is explained by social influence, performance expectancy, effort expectancy, facilitating conditions, perceived severity, perceived vulnerability, self-efficacy, response efficacy, and response costs with the remaining xxx explained by other variables.

Hypothesis Testing

In the structural model stage, researchers carry out data analysis by looking at several significant relationships between exogenous variables and endogenous variables. Shown by the T-statistic value calculated using calculate PLS Bootstrapping. For all indicators with a T-statistic value > 1.96 (rounded to two), it can be said that H0 is rejected or significant, or if the P-value value is < 0.05 as in Table 4.

Table 4. Hypothesis Testing Results

	Original sample (O)	P-Values	Decision
H1: Social Influence -> Green Behavior	-0,079	0,203	Rejected
H2: Performance Expectancy -> Green Behavior	0,133	0,107	Rejected
H3: Effort Expectancy -> Green Behavior	0,231	0,014	Accepted
H4: Facilitating Conditions -> Green Behavior	0,100	0,327	Rejected
H5: Perceived Severity -> Green Behavior	-0,063	0,444	Rejected
H6: Perceived Vulnerability -> Green Behavior	-0,057	0,538	Rejected
H7: Self-efficacy -> Green Behavior	0,279	0,002	Accepted
H8: Response efficacy -> Green Behavior	0,198	0,005	Accepted
H9: Response Costs -> Green Behavior	0,233	0,001	Accepted
H10: Green Behavior -> Environmental Sustainability	0,665	0,000	Accepted

Source: Data processed (2024)

DISCUSSION

The Effect of Social Influence on Green Behavior

Social influence has no effect on green behavior among educated Gen Z in Indonesia, as shown by the p-value 0.203 > 0.05. Social influence refers to the degree to which an individual's behavior is shaped by the opinions or expectations of important people around them, such as colleagues, friends, or professors. In this research, it was found that social influence had no effect on environmentally friendly behavior among Educated Generation Z in Indonesia, which means that they were not strongly driven by external social pressure in terms of adopting AI for environmental sustainability. Rather than relying on direct social influence from colleagues or lecturers, educated Gen Z may be more influenced by online content, influencers, and the global digital community when it comes to adopting AI for sustainability.

The Effect of Performance Expectancy on Green Behavior

Performance expectancy has no effect on green behavior educated Gen Z in Indonesia, as shown by the p-value 0.107 > 0.05. This means that even though educated Generation Z recognizes AI as useful, efficient, and productivity-

enhancing, it may not necessarily impact AI adoption for environmental sustainability. Environmental awareness and personal beliefs may be stronger drivers than performance expectancy.

The Effect of Effort Expectancy on Green Behavior

Effort expectancy has a positive effect on green behavior among educated Gen Z in Indonesia, as shown by the p-value 0.014 < 0.05. The original sample value shows the causal relationship between endogenous and exogenous variables in the positive direction, namely 0.309. This finding is in line with previous research which explains that the perceived ease of use of technology determines green behavior (Sari et al., 2024).

When educated Gen Z find AI tools easy to learn and use, they are more likely to integrate them into their daily lives and adopt environmentally friendly behavior. Educated Gen Z are generally tech-savvy, and therefore tend to adopt sustainability-focused AI solutions when they do not require significant effort or technical expertise. Educated Gen Z values efficiency and ease of access to technology. If AI solutions for sustainability require minimal effort, they align with their digital lifestyle, making eco-friendly behavior a more natural choice.

The Effect of Facilitating Conditions on Green Behavior

Facilitating conditions have no effect on green behavior among educated Gen Z in Indonesia, as shown by the p-value 0.327 > 0.05. Facilitating conditions refer to the availability of resources, technology compatibility, helpfulness, and perceived safety when using an AI product. In this research, it was found that facilitating conditions had no effect on environmentally friendly behavior among Educated Generation Z in Indonesia. This suggests that having access to AI resources and support does not necessarily lead to AI adoption for environmental sustainability. Just because an AI product is compatible with other technologies they use doesn't mean they will leverage it for environmentally friendly behavior unless they see a direct personal or social benefit.

The Effect of Perceived Severity on Green Behavior

Perceived severity has no effect on green behavior among educated Gen Z in Indonesia, as shown by the p-value 0.444 > 0.05. This suggests that concerns about security risks associated with the use of AI neither hinder nor encourage AI-driven sustainability efforts.

Educated Gen Z are digital natives who are accustomed to using AI and other digital tools, despite potential security risks. Even if educated Gen Z consider security risks to be serious, it does not change their decision to adopt AI for sustainability, because these risks are not directly related to environmental actions.

The Effect of Perceived Vulnerability on Green Behavior

The perceived vulnerability has no effect on green behavior among educated Gen Z in Indonesia, as shown by the p-value 0.538 > 0.05. In this

research, the perceived vulnerability indicator focuses on security risks (such as data protection issues), not on environmental sustainability. Educated Gen Z may recognize the security risks of AI but not relate them to their decisions to engage in environmentally friendly behavior.

The Effect of Self-Efficacy on Green Behavior

Self-efficacy has a positive effect on green behavior among educated Gen Z in Indonesia, as shown by the p-value 0.002 < 0.05. The original sample value shows the causal relationship between endogenous and exogenous variables in the positive direction, namely 0.279. This finding is in line with research results (Sh. Ahmad et al., 2022) which explain that self-efficacy has a significant influence on environmentally friendly behavior.

Educated Gen Z who feel confident in using AI are more likely to engage in AI-driven environmental sustainability efforts. Self-motivated Educated Gen Z are more likely to explore AI applications for sustainability. Because sustainability efforts often require individual initiative, educated Gen Zers who believe in their ability to use AI are more likely to take action themselves. If they feel capable of using AI effectively, they tend to explore AI tools for environmental impacts, such as reducing paper use, reducing dependence on physical resources, promoting distance learning, and reducing travel-related carbon emissions.

Furthermore, educated Gen Z believe AI security is more willing to integrate AI into their daily activities, including environmental sustainability efforts. If they feel AI devices are safe, they may be more inclined to use environmentally friendly applications driven by their AI without fear of data breaches or system failure. This trust in the safety of AI reduces doubts and allows them to focus on the benefits of AI for environmental sustainability.

The Effect of Response Efficacy on Green Behavior

Response efficacy has a positive effect on green behavior among educated Gen Z in Indonesia, as shown by the p-value of 0.005 $\leq$ 0.05. The original sample value shows the causal relationship between endogenous and exogenous variables in the positive direction, namely 0.198. This finding is in line with the results of previous research which explains that Conceptually, a positive response efficacy will increase self-confidence in recommended behavior as a solution to system dangers or threats (Klyver et al., 2023). For educated Gen Z there is no direct influence between AI security capabilities and their decision to engage in sustainability efforts. Instead, they are more likely to adopt AI for environmentally friendly behavior if they see clear environmental benefits.

The Effect of Response Costs on Green Behavior

Response costs have a positive effect on green behavior among educated Gen Z in Indonesia, as shown by the p-value 0.001 < 0.05. The original sample value shows the causal relationship between endogenous and exogenous variables in the positive direction, namely 0.233. This finding is in line with

research results previously explaining that pro-environmental behavior is influenced by response costs in students in Iran (Shafiei & Maleksaeidi, 2020).

Although some products of AI have a price relatively expensive, there are many low-cost or free AI tools available for sustainability efforts, such as open-source AI models for environmental analysis. If educated Gen Z does not find AI-based green solutions expensive, then cost will not be a barrier to their adoption. Furthermore, if educated Gen Z view AI as an essential part of modern life, they may accept its costs as unavoidable, for example, they already use AI for everyday activities (e.g., chatbots, virtual assistants, smart apps) and may see AI tools as environmentally friendly just another extension of the technology they already rely on.

The Effect of Green Behavior on Environmental Sustainability

Green behavior has a positive effect on green behavior among educated Gen Z in Indonesia, as shown by the p-value 0.000 < 0.05. The original sample value shows the causal relationship between endogenous and exogenous variables in the positive direction, namely 0.665. This finding is in line with the results of previous research explaining that concern for the environment plays an important role in encouraging environmental sustainability (Fawehinmi et al., 2022).

When educated Gen Z actively uses AI for environmentally friendly practices, their daily actions contribute to sustainability. AI tools optimize resource use, reduce waste, and promote environmentally responsible decisions. For example, an application driven by AI can help reduce paper use, reduce dependence on physical resources, promote distance learning, reduce travel-related carbon emissions, or promote sustainable shopping habits.

Furthermore, educated Gen Z in Indonesia are technology savvy and appreciate digital solutions, so AI-driven suggestions for sustainable choices are likely to influence their actions. When sustainability is embedded in daily routines through the help of AI, long-term environmental benefits will increase. These findings suggest that self-efficacy plays an important role in encouraging environmentally friendly behavior among educated Gen Z, especially in the context of using AI to promote environmental sustainability. For managers and organizations, fostering self-confidence, ensuring the safety and ease of use of AI tools, and creating incentives and community support systems will help Gen Z confidently adopt and integrate AI into their daily lives for a sustainable life. This approach will not only empower Gen Z but also create long-term environmental benefits through widespread AI adoption.

CONCLUSION AND RECOMMENDATION

This research aims to identify the main driving factors for the use of AI for environmental sustainability among Educated Gen Z in Indonesia. Research findings explain that green behavior is proven to be positively influenced by effort expectancy, self-efficacy, response efficacy, and response costs. Furthermore, green behavior has a positive effect on environmental sustainability among educated Gen Z in Indonesia. Meanwhile, social influence,

performance expectancy, facilitating conditions, perceived severity, and perceived vulnerability have no effect on green behavior.

The research results reveal that green behavior is the main determining factor in environmental sustainability among educated Generation Z in Indonesia, driven by the active use of AI tools for sustainable practices. If green behavior increases, environmental sustainability will also increase as well as educated Gen Z in Indonesia. Educators and HR managers can offer workshops, webinars, and online courses on AI applications in environmental sustainability involving educated Gen Z to reduce waste, save energy, and encourage sustainable consumption.

Another valuable finding from this research is, that self-efficacy is a factor the main determinant of green behavior in educated Generation Z in Indonesia. When self-efficacy increases, then green behavior will also increase. These findings suggest that self-efficacy plays an important role in encouraging environmentally friendly behavior among educated Gen Z, especially in the context of using AI to promote environmental sustainability. For managers and organizations, fostering self-confidence, ensuring the safety and ease of use of AI tools, and creating incentives and community support systems will help Gen Z confidently adopt and integrate AI into their daily lives for a sustainable life. This approach will not only empower Gen Z but also create long-term environmental benefits through widespread AI adoption. This research also confirms that response costs, effort expectancy, and response efficacy have a role in encouraging environmentally friendly behavior.

ADVANCED RESEARCH

This research has several limitations. First, the majority of respondents reside in large cities in Indonesia; Second, online surveys limit data detail and depth of research results. Therefore, future research is recommended to expand geographical coverage and use qualitative methods to obtain more in-depth research findings.

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