

Knowledge-Based and Social Determinants of Environmental Performance Among Young Adults in Klang Valley: The Mediating Role of Green Innovation Practice

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Abstract: Environmental sustainability has become a major global concern, particularly among young adults who play an important role in shaping future environmental outcomes. This study examines the influence of knowledge-based and social determinants on environmental performance among young adults in Klang Valley, Malaysia, with Green Innovation Practice as a mediating variable. Specifically, this study investigates the effects of Green Knowledge, Environmental Knowledge Learning, Peer Pressure, and Social Media Influence on Environmental Performance. This study is grounded in the Ability–Motivation–Opportunity (AMO) Theory. A quantitative research approach was employed using a structured questionnaire distributed to 160 young adults aged 18 to 35. Data were analyzed using Partial Least Squares Structural Equation Modelling (PLS-SEM). The findings indicate that while Green Knowledge and Social Media Influence directly enhance Environmental Performance, Environmental Knowledge Learning and Peer Pressure do not have a direct effect. Furthermore, Green Innovation Practice serves as a critical behavioral mechanism that fully mediates the impact of Environmental Knowledge Learning and Peer Pressure, and partially mediates the effect of Social Media Influence on Environmental Performance. It does not, however, mediate the relationship for Green Knowledge. Finally, these findings extend the AMO Theory within the environmental context, providing policymakers and educators with clear, evidence-based strategies to drive actual environmental performance.

Keywords: *Environmental Performance, Green Knowledge, Environmental Knowledge Learning, Peer Pressure, Social Media Influence, Green Innovation Practice*

1. Introduction

Environmental problems are escalating globally with regard to issues including climate change, resource degradation, and pollution, which requires that individuals, organizations, and government bodies transition toward more environmentally friendly practices (Demir et al., 2025; Javed et al., 2026). As an individual's primary method to achieve environmental improvement is through changing his or her daily behaviors by decreasing his or her generation of waste, decreasing energy consumption, and transitioning to environmentally friendly lifestyle choices they contribute to the long-term sustainability of ecosystems (Hejazi et al., 2023; Asmar et al. 2022). Since young adults are both significant consumer groups and future decision-making entities their current environmental attitudes and behaviors will have significant implications regarding the future of sustainability (Zhang et al., 2024; Bai & Lyu, 2023).

Despite the increasing environmental awareness among young adults, research has demonstrated empirically that environmental awareness may not always result in pro-environmental behavior. Young adults often face psychological, motivational, and social obstacles that prevent them from making changes in their behavior (Su et al., 2020). Research related to environmentalism in Malaysia — especially within cities similar to the Klang Valley — has been limited due to a lack of comprehensive models that include social influence factors, knowledge-related factors, and green innovation factors in a holistic manner. This study seeks to fill this gap by investigating the relationships between Green Knowledge (GK), Environmental Knowledge Learning (EKL), Peer Pressure (PP), Social Media Influence (SMI), and Environmental Performance (EP); also examining the mediational effects of Green Innovation Practices (GIP) to determine how environmental awareness and social influences can lead to environmental performance among young adult populations in the Klang Valley region.

2. Literature Review

Knowledge-Based Determinants

Green Knowledge (GK). Green Knowledge (GK) has long been recognized as a pivotal factor in fostering pro-environmental behavior. GK refers to an individual's comprehension of environmental issues, eco-friendly products, and sustainable practices, encompassing an awareness of how daily actions impact the natural environment (Zhang et al., 2024). Individuals possessing higher levels of GK typically exhibit greater awareness of pressing ecological crises, such as climate change, pollution, and resource depletion, which consequently heightens their concern for environmental protection. Previous studies such as Zhang et al. (2024), Masri et al. (2017) and xxx underscored that GK does more than raise awareness; it significantly enhances an individual's capacity to evaluate sustainable options, thereby bolstering their confidence to implement green practices. This indicates that GK is instrumental in facilitating informed decision-making regarding sustainability. When individuals possess a robust understanding of environmental issues, they are more inclined to purchase eco-friendly products, minimize waste, and engage in conservation efforts. Furthermore, GK significantly shapes environmental attitudes and values. An understanding of the long-term ecological consequences of human action fosters positive attitudes toward sustainability, which subsequently guides behavioral intentions and improves overall environmental performance (Hejazi et al., 2023). For young adults, who are highly receptive to information from educational institutions and digital media, GK is a critical independent variable for elucidating disparities in environmental performance.

Environmental Knowledge Learning (EKL). While GK represents the possession of information, Environmental Knowledge Learning (EKL) denotes the continuous, dynamic process through which individuals acquire, develop, and apply environmental knowledge. EKL distinguishes itself from general awareness by emphasizing ongoing learning through formal education, informal experiences, and persistent exposure to environmental discourse (Su et al., 2020). Su et al. (2020) highlighted that individuals who actively engage in EKL are more likely to deepen their comprehension of complex ecological issues, thereby cultivating a stronger commitment to environmental preservation. Through continuous education, individuals become more adept at understanding the ecological footprint of their actions, leading to a highly responsible culture and lifestyle choices (Pham et al., 2019). This indicates that EKL not only facilitates the acquisition of knowledge but also fosters enduring pro-environmental attitudes and behavioral inclinations. For young adults constantly exposed to educational content and environmental campaigns, EKL serves as a crucial determinant for understanding behavioral variations in environmental performance.

Social Determinants

Peer Pressure (PP). In addition to cognitive factors, social environments exert a profound influence on environmental behavior. Peer Pressure (PP) refers to the influence that friends, peers, and social groups have on an individual's attitudes and actions. In the context of sustainability, PP represents the degree to which an individual's social circle encourages or discourages eco-friendly behaviors. Rahnama Haratbar et al. (2023) emphasized that peer influence significantly impacts the development of sustainable attitudes, particularly among young adults who are highly susceptible to social norms. PP operates through social expectations and the desire for social conformity. When individuals observe their peers prioritizing environmental protection and engaging in sustainable actions, they are more likely to adopt similar behaviors to gain social approval. This normative pressure can successfully drive positive behaviors such as recycling and waste reduction. Conversely, weak environmental norms within a peer group may inhibit the adoption of sustainable practices. Because young adults spend considerable time within close-knit social networks, PP functions as a powerful social mechanism shaping their environmental actions.

Social Media Influence (SMI). The digital era has elevated Social Media Influence (SMI) as a primary determinant of environmental behavior. SMI refers to the impact that content exposure and social interactions on digital platforms (e.g., Instagram, TikTok, Facebook) have on individuals' perceptions and actions regarding sustainability. Sun and Xing (2022) highlighted that social media has emerged as a vital medium for disseminating environmental information and shaping users' behavioral intentions. SMI operates through content exposure, online engagement, and digital social interaction. Frequent exposure to environmental

content educates users on sustainable living, while likes, shares, and endorsements from influencers signal social acceptability. This digital validation makes environmental responsibility appear increasingly important, thereby changing societal expectations. For young adults, whose worldview is heavily influenced by online communities and trending content, SMI is a profound catalyst for adopting environmentally responsible behaviors.

Green Innovation Practice (GIP) as a Behavioral Mechanism. Green Innovation Practice (GIP) refers to the degree to which individuals incorporate innovative, eco-friendly behaviors into their daily routines, such as adopting green technologies and supporting sustainable practices. Wang et al. (2021) characterized GIP as pragmatic initiatives that convert environmental consciousness into concrete actions, highlighting that GIP embodies the *behavioral application* of green concepts rather than mere cognitive awareness. GIP is essential for bridging the intention-behavior gap. Individuals may possess extensive environmental knowledge and experience positive social pressure, yet these factors do not always culminate in real behavioral change. GIP acts as the mechanism through which knowledge and social motivation are translated into tangible actions, such as altering consumption patterns and supporting green initiatives (Anwar et al., 2020; Paillé et al., 2020). Leveraging green human resource practices to achieve environmental sustainability. For young adults, who are generally more receptive to experimenting with new ideas and technologies, GIP serves as an essential framework for understanding how cognitive and social influences materialize into tangible environmental behavior.

Environmental Performance (EP). Environmental Performance (EP) represents the dependent variable in this study, defined as the extent to which individuals engage in actions that mitigate negative environmental impacts, such as reducing waste, conserving resources, and minimizing pollution. Hejazi et al. (2023) defined EP as the outcome of individuals' environmental consciousness and their active efforts to safeguard the environment. EP is increasingly prioritized as an outcome variable in sustainability research because cumulative individual actions generate significant macro-environmental effects. Common indicators of robust EP include the reduction of single-use plastics, energy conservation, and active participation in environmental initiatives. Enhancing EP among young adults is particularly critical, as their current daily habits and lifestyle choices will dictate long-term ecological sustainability.

Hypothesis Development

The Direct Effects on Environmental Performance. Knowledge is essential in shaping pro-environmental attitudes. GK provides the awareness necessary to recognize the ecological consequences of daily actions, which encourages responsible environmental stewardship (Zhang et al., 2024). Consequently, GK is widely regarded as a crucial prerequisite for enhancing EP (Hejazi et al., 2023). Similarly, EKL facilitates a continuous deepening of this understanding, ensuring that knowledge evolves into enduring behavioral patterns (Su et al., 2020).

H1: Green Knowledge has a significant positive relationship with Environmental Performance.

H2: Environmental Knowledge Learning has a significant positive relationship with Environmental Performance.

Social environments also establish normative rules for behavior. PP enhances an individual's motivation to pursue sustainable actions through the psychological reward of social approval (Rahnama Haratbar et al., 2023; Sheikh et al., 2024). Concurrently, SMI reinforces these norms digitally, where online social validation encourages the consistent adoption of eco-friendly habits (Sun & Xing, 2022; Hejazi et al., 2023).

H3: Peer Pressure has a significant positive relationship with Environmental Performance.

H4: Social Media Influence has a significant positive relationship with Environmental Performance.

The Direct Effects on Green Innovation Practice. To successfully adopt innovative green behaviors, individuals require both the requisite knowledge and social motivation (Yong et al., 2020). GK and EKL provide the mental framework needed to evaluate eco-friendly solutions and the confidence to embrace novel sustainable practices (Zhang et al., 2024). Furthermore, PP and SMI supply the social validation necessary to encourage individuals to experiment with new green technologies and integrate them into their daily routines (Rahnama Haratba et al., 2023; Wang et al., 2021).

H5: Green Knowledge has a significant positive relationship with Green Innovation Practice.

H6: Environmental Knowledge Learning has a significant positive relationship with Green Innovation Practice.
H7: Peer Pressure has a significant positive relationship with Green Innovation Practice.
H8: Social Media Influence has a significant positive relationship with Green Innovation Practice.

The Mediating Role of Green Innovation Practice. When individuals actively adopt GIP such as changing consumption habits and experimenting with sustainable alternatives they demonstrate higher levels of EP (Wang et al., 2021).

H9: Green Innovation Practice has a significant positive relationship with Environmental Performance.

Recent sustainability research increasingly utilizes mediation models to elucidate how knowledge and social factors translate into tangible behavioral outcomes. Rather than assuming a direct, frictionless path from awareness to performance, researchers emphasize the necessity of behavioral mechanisms. While GK, EKL, PP, and SMI motivate individuals to seek sustainable solutions (Zhang et al., 2024; Su et al., 2020; Rahnama Haratbar et al., 2023; Sun & Xing, 2022), these influences may not produce improved environmental outcomes without the active execution of green practices. Therefore, GIP functions as the crucial conduit converting cognitive, psychological, strategic pathway and social inputs into concrete sustainability outcomes (Hejazi et al., 2023; Alharethi et al., 2026).

H10: Green Innovation Practice mediates the relationship between Green Knowledge and Environmental Performance.

H11: Green Innovation Practice mediates the relationship between Environmental Knowledge Learning and Environmental Performance.

H12: Green Innovation Practice mediates the relationship between Peer Pressure and Environmental Performance.

H13: Green Innovation Practice mediates the relationship between Social Media Influence and Environmental Performance.

Underpinning Theory

The Ability-Motivation-Opportunity (AMO): This theory suggests that an employee's job performance can be influenced by three factors: ability, motivation, and opportunity. Bos-Nehles et al. (2013) further suggest that employees will perform at higher levels if they have the relevant knowledge and skills (ability), there are motivating factors inside or outside of the organization that influence behavior (motivation), and they have the right conditions or ways to implement what they intend to do (opportunity). The AMO theory serves as a strong theoretical basis for this study; it enables us to understand how both cognitive abilities and social determinants can facilitate the environmental performance of young adults. Within the structure of this research framework, this study maps the independent and mediating variables to each dimension of the AMO theory.

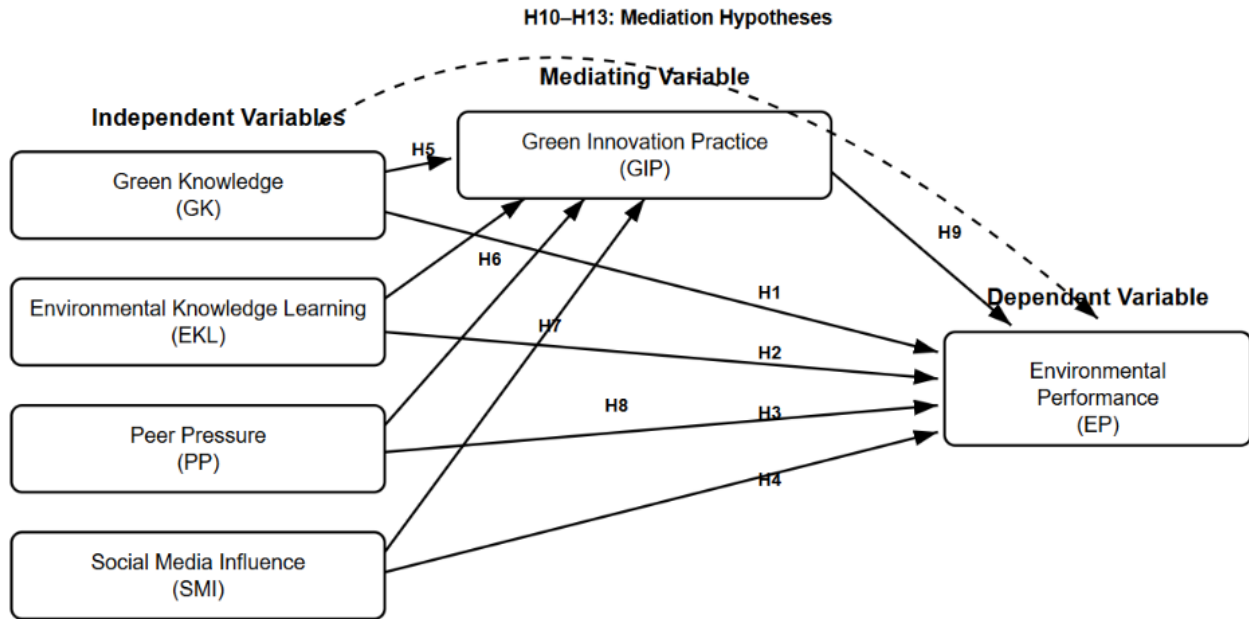
Ability (Knowledge and Skills): Ability is defined as being related to one's level of knowledge or skill. This study measures ability through two concepts: Green Knowledge (GK) and Environmental Knowledge Learning (EKL). When young adult learners possess basic knowledge about environmental topics, and continue to develop new knowledge, they will be able to assess environmental problems and find effective, long-term solutions (Su et al., 2020; Zhang et al., 2024).

Motivation (Incentives and Drive): Motivation is defined as incentives or drive. The definition of motivation is measured by Peer Pressure (PP) and Social Media Influence (SMI). The social pressure from peers, adherence to peer norms, and exposure to environmental content on social media serve as powerful psychological drivers that lead young adults to engage in and maintain environmentally friendly behaviors (Rahnama Haratbar et al., 2023; Sun & Xing, 2022).

Opportunity (Avenues for Action): This study defines opportunity as the avenue for taking action and opportunity measures as Green Innovation Practices (GIP). GIP provides the framework for behavior and practical means for young adults to apply their knowledge and motivation to real-world situations (Wang et al., 2021).

Overall, the AMO theory provides a comprehensive theoretical framework for the proposed research model. The AMO theory also supports the main hypothesis of this study that Young Adults' Environmental Performance (EP) is optimal when they have sufficient cognitive capacity (knowledge) (Green Knowledge [GK] and Environmental Knowledge Learning [EKL]), sufficient social motivation (Peer Pressure [PP] and Social Media Influence [SMI]), and enough opportunities to engage in green innovation practices (GIP) (Hejazi et al., 2023). Importantly, the AMO theory demonstrates that ability and motivation need to be converted into a form of practice to produce measurable environmental performance.

Figure 1: Conceptual Framework of the Relationship Between Green Knowledge, Environmental Knowledge Learning, Peer Pressure, Social Media Influence, Green Innovation Practice and Environmental Performance.



Notes:

H1–H4 = Direct effects of Independent Variables on Environmental Performance (EP).
H5–H8 = Direct effects of Independent Variables on Green Innovation Practice (GIP).
H9 = Direct effect of Green Innovation Practice (GIP) on Environmental Performance (EP).
H10–H13 = Mediating effects of GIP between Independent Variables and EP.

Source:

Meng Zhang et al., 2024;
Xiaofeng Su et al., 2020;
Hassan Rahnama Haratbar et al., 2023;
Yongbo Sun et al., 2022;
Haijun Wang et al., 2021;
Mohammed Taj Hejazi et al., 2023.

Figure 1 presents the conceptual framework developed for this study. The framework proposes that Green Knowledge (GK), Environmental Knowledge Learning (EKL), Peer Pressure (PP), and Social Media Influence (SMI) directly influence Environmental Performance (EP) (H1–H4). In addition, the framework hypothesizes that Green Innovation Practice (GIP) mediates the relationships between the four independent variables and environmental performance (H5–H8). A direct relationship between Green Innovation Practice and Environmental Performance is also proposed (H9). The framework is grounded in the premise that knowledge, learning, and external social influences encourage the adoption of green innovation practices, which subsequently enhance organizational environmental performance. Accordingly, Green Innovation Practice is expected to function as an important mechanism through which organizational and social factors translate into improved environmental outcomes. The conceptual framework was developed based on previous empirical studies (Meng Zhang et al., 2024; Su et al., 2020; Rahnama Haratbar et al., 2023; Sun et al., 2022; Wang et al., 2021; Hejazi et al., 2023).

3. Methodology

Research Design and Sampling

This study employed a quantitative, non-experimental correlational research design utilizing a cross-sectional survey methodology. This design was selected as it effectively facilitates the examination of the strength and direction of relationships between multiple variables at a specific point in time without the manipulation of variables (Creswell & Creswell, 2023; Sekaran & Bougie, 2020).

The target population for this research comprised young adults residing in the Klang Valley, Malaysia. This demographic was purposefully targeted because young adults are significant consumers who are heavily influenced by digital platforms and social dynamics, making them ideal subjects for studying environmental awareness and sustainable behaviors. Data were gathered using a non-probability purposive sampling technique to ensure respondents met specific inclusion criteria: (1) aged between 18 and 35 years, (2) currently residing in the Klang Valley, and (3) possessing fundamental awareness or experience regarding environmental issues.

To determine an adequate sample size, a statistical power analysis was conducted using G*Power software. Based on parameters of a 0.05 significance level (α), a statistical power of 0.95, an effect size of 0.15, and five predictors within the structural model, the minimum required sample size was calculated to be 138 respondents. The actual data collection exceeded this requirement, yielding 160 valid responses, thereby ensuring robust statistical power and reliable results (Hair et al., 2022).

Research Instrument

Data were collected via a structured, self-administered online questionnaire. The instrument utilized established measurement scales adapted from prior validated empirical studies to ensure accuracy and contextual relevance. All construct items were measured using a 7-point Likert scale, ranging from 1 ("Strongly Disagree") to 7 ("Strongly Agree").

The questionnaire was divided into specific sections:

Demographic Background: Captured data on gender, age, race, location, and educational attainment.

Green Knowledge (GK): Adapted from Meng Zhang et al. (2024), consisting of 4 items assessing respondents' comprehension of environmental issues and sustainable products.

Environmental Knowledge Learning (EKL): Adapted from Su et al. (2020), comprising 3 items evaluating the continuous acquisition of environmental information.

Peer Pressure (PP): Adapted from Rahnama Haratba et al. (2023), including 4 items measuring the influence of friends and family on sustainable behaviors.

Social Media Influence (SMI): Adapted from Sun and Xing (2022), consisting of 4 items examining the impact of digital environmental content on awareness and actions.

Green Innovation Practice (GIP): Adapted from Wang et al. (2021), featuring 4 items measuring the practical adoption of eco-friendly products and technologies.

Environmental Performance (EP): Adapted from Hejazi et al. (2023), comprising 4 items assessing daily environmental responsibility, such as waste reduction and resource conservation.

Prior to full-scale data collection, content validity was verified by academic experts, and a pilot test involving 22 respondents was conducted. The pilot test confirmed the clarity of the items and demonstrated excellent internal consistency, with all Cronbach's Alpha values exceeding the 0.70 threshold (e.g., GK = 0.933, GIP = 0.905, EP = 0.908), indicating that the instrument was highly reliable and required no significant alterations.

Data Collection Procedure

Data collection was executed from November to December 2025 using an online survey distributed via social media platforms (e.g., WhatsApp, Instagram, Facebook) and university networks. Online distribution was chosen to maximize reach, accelerate response times, and reduce missing data by implementing mandatory response fields (Creswell & Creswell, 2023). A screening question was included at the beginning of the survey to ensure respondents met the inclusion criteria. Participation was strictly voluntary, and all responses were kept anonymous and confidential in adherence to ethical research standards.

Data Analysis Strategy

The collected data were analyzed using IBM SPSS Statistics and SmartPLS software. Initially, SPSS was utilized for data screening identifying missing values and unengaged responses and for generating descriptive statistics to summarize the demographic profile of the respondents (Sekaran & Bougie, 2020).

Subsequently, inferential analysis was conducted using Partial Least Squares Structural Equation Modelling (PLS-SEM) via SmartPLS. PLS-SEM was selected for its robust capability to simultaneously analyze complex relationships among multiple latent constructs, including mediation effects (Hair et al., 2022). The analysis followed a systematic two-stage approach:

Measurement Model Assessment: Evaluated internal consistency reliability (via Cronbach's Alpha and Composite Reliability), convergent validity (via Average Variance Extracted, AVE > 0.50), and discriminant validity (via the Fornell-Larcker criterion and Heterotrait-Monotrait Ratio, HTMT < 0.90) (Hair et al., 2022).

Structural Model Assessment: Tested the proposed hypotheses by evaluating path coefficients, statistical significance via bootstrapping, the coefficient of determination (R^2), effect sizes (f^2), and the model's predictive relevance (Q^2) (Hair et al., 2022).

4. Findings and Discussion

This section presents the empirical findings of the study, which investigated the interconnections among Green Knowledge (GK), Environmental Knowledge Learning (EKL), Peer Pressure (PP), Social Media Influence (SMI), Green Innovation Practice (GIP), and Environmental Performance (EP). Data analysis was conducted using IBM SPSS for initial data screening and descriptive statistics, followed by Partial Least Squares Structural Equation Modelling (PLS-SEM) via SmartPLS to assess the measurement and structural models.

Data Screening and Demographic Profile

A total of 160 valid responses were collected from young adults in the Klang Valley, yielding a 100% response rate with no missing data. This sample size surpasses the minimum requirement of 138 respondents determined via G*Power analysis, confirming its adequacy for PLS-SEM. Skewness and kurtosis values for all measurement items ranged between -2 and +2, indicating that the data were normally distributed and suitable for multivariate analysis (Hair et al., 2022).

The demographic profile revealed a balanced gender distribution comprising 52.5% males and 47.5% females. The majority of respondents were aged 25–29 (45.0%), followed by 18–24 (34.4%). The sample reflected a multicultural urban demographic. Educationally, the respondents were highly qualified, with the majority holding a Bachelor's Degree (29.4%), a Diploma (27.5%), or a Master's Degree (26.9%).

Table 1: Demographic profile of respondents

	N	%
Gender		
Male	84	52.5
Female	76	47.5
Age		
18 – 24	55	34.4
25 – 29	72	45.0
30 - 35	33	20.6
Race		
Malay	50	31.3
Chinese	30	18.8
Indian	18	11.3
Iban Dayak	46	28.7
Others	16	10.0
Education Level		
Secondary School	17	10.6

Diploma	44	27.5
Bachelor's Degree	47	29.4
Master's Degree	43	26.9
Doctoral Degree	9	5.6

Measurement Model Assessment

The measurement model was evaluated based on indicator reliability, internal consistency, and convergent and discriminant validity.

Reliability and Convergent Validity.

Indicator reliability was confirmed as all outer loadings ranged from 0.757 to 0.914, exceeding the recommended 0.70 threshold (Hair et al., 2022). Internal consistency was established, with both Cronbach's Alpha and Composite Reliability (CR) values for all constructs well above 0.70. Convergent validity was achieved as the Average Variance Extracted (AVE) for all constructs exceeded the 0.50 threshold, confirming that each construct explains more than half of the variance in its indicators as shown in Table 2.

Table 2: Reliability and Convergent Validity

Construct	Item	Outer Loading	Cronbach's α	Composite Reliability (CR)	AVE
Environmental Knowledge Learning (EKL)	EKL1	0.848	0.804	0.884	0.718
	EKL2	0.844			
	EKL3	0.849			
Environmental Performance (EP)	EP1	0.845	0.890	0.924	0.752
	EP2	0.866			
	EP3	0.875			
	EP4	0.881			
Green Innovation Practice (GIP)	GIP1	0.877	0.915	0.940	0.797
	GIP2	0.914			
	GIP3	0.908			
	GIP4	0.873			
Green Knowledge (GK)	GK1	0.757	0.812	0.873	0.633
	GK2	0.781			
	GK3	0.814			
	GK4	0.828			
Peer Pressure (PP)	PP1	0.761	0.825	0.884	0.656
	PP2	0.792			
	PP3	0.842			
	PP4	0.841			
Social Media Influence (SMI)	SMI1	0.802	0.841	0.893	0.677
	SMI2	0.848			
	SMI3	0.811			
	SMI4	0.830			

Discriminant Validity

Discriminant validity was initially assessed using the Fornell-Larcker criterion shown in Table 3. The square root of the AVE for each construct was greater than its highest correlation with any other construct, fulfilling the criterion. Additionally, the Heterotrait-Monotrait Ratio (HTMT) was evaluated and shown in Table 4. While some HTMT values marginally exceeded the strict 0.90 threshold (e.g., GIP and EP at 0.902; EKL and SMI at 0.901), this is theoretically acceptable in PLS-SEM when constructs are conceptually intertwined and supported by robust theoretical frameworks, such as the AMO theory (Hair et al., 2022).

Table 3: Fornell-Larcker Criterion

Construct	EKL	EP	GIP	GK	PP	SMI
Environmental Knowledge Learning (EKL)	0.847					
Environmental Performance (EP)	0.687	0.879				
Green Innovation Practice (GIP)	0.742	0.879	0.893			
Green Knowledge (GK)	0.693	0.595	0.565	0.796		
Peer Pressure (PP)	0.730	0.657	0.698	0.684	0.810	
Social Media Influence (SMI)	0.774	0.775	0.760	0.656	0.722	0.823

Table 4: Heterotrait-Monotrait (HTMT)

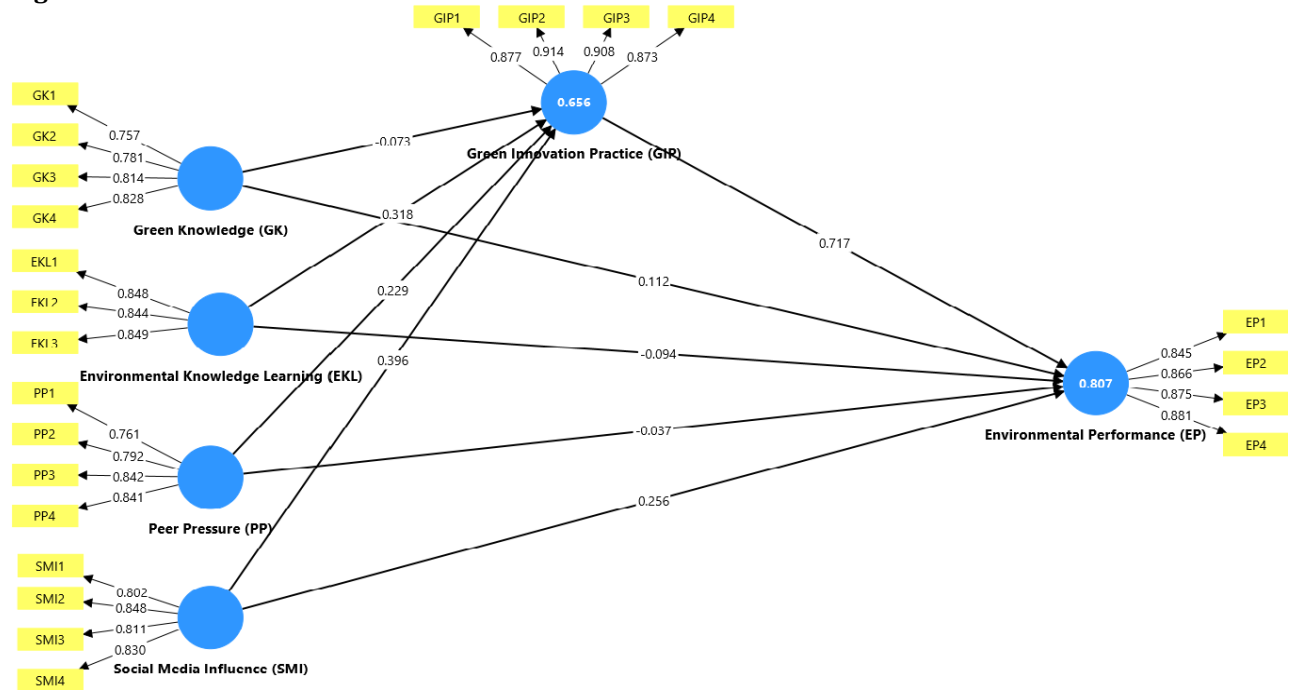
Construct	1	2	3	4	5	6
1. Environmental Knowledge Learning (EKL)	—					
2. Environmental Performance (EP)	0.810	—				
3. Green Innovation Practice (GIP)	0.865	0.902	—			
4. Green Knowledge (GK)	0.830	0.676	0.620	—		
5. Peer Pressure (PP)	0.891	0.754	0.793	0.804	—	
6. Social Media Influence (SMI)	0.901	0.895	0.867	0.775	0.855	—

Measurement Model Assessment

Figure 2 illustrates the outcomes of the measurement model assessment conducted via SmartPLS. This evaluation was performed to rigorously verify the reliability and validity of the six latent constructs employed in the study: Green Knowledge (GK), Environmental Knowledge Learning (EKL), Peer Pressure (PP), Social Media Influence (SMI), Green Innovation Practice (GIP), and Environmental Performance (EP). As depicted in the figure, the outer loadings for all measurement items significantly exceed the recommended threshold of 0.70 (Hair et al., 2022). Specifically, the indicator loadings range from a minimum of 0.757 (GK1) to a maximum of 0.914 (GIP2). These robust outer loadings confirm high indicator reliability, demonstrating that each item meaningfully captures a substantial portion of the variance in its respective latent construct. Because all items successfully met this criterion, no indicators required removal, and all were retained for subsequent analysis.

Furthermore, the strength of the outer model aligns perfectly with the study's broader assessments of internal consistency and convergent validity. The empirical findings confirm that all constructs achieved Composite Reliability (CR) scores well above the acceptable 0.70 benchmark, establishing strong internal consistency among the measurement items. Concurrently, the Average Variance Extracted (AVE) values for all constructs surpassed the critical 0.50 threshold. This indicates excellent convergent validity, verifying that each latent construct explains more than half of the variance of its corresponding indicators. In summary, the comprehensive evaluation of the measurement model provides compelling evidence that the research instrument is both highly reliable and valid. The constructs effectively and accurately measure the underlying phenomena linking Green Knowledge, Environmental Knowledge Learning, Peer Pressure, Social Media Influence, Green Innovation Practice, and Environmental Performance. Having firmly established the robust psychometric properties of the measurement model, the framework is deemed highly appropriate for proceeding to the structural model evaluation and subsequent hypothesis testing.

Figure 2: Results of the Measurement Model

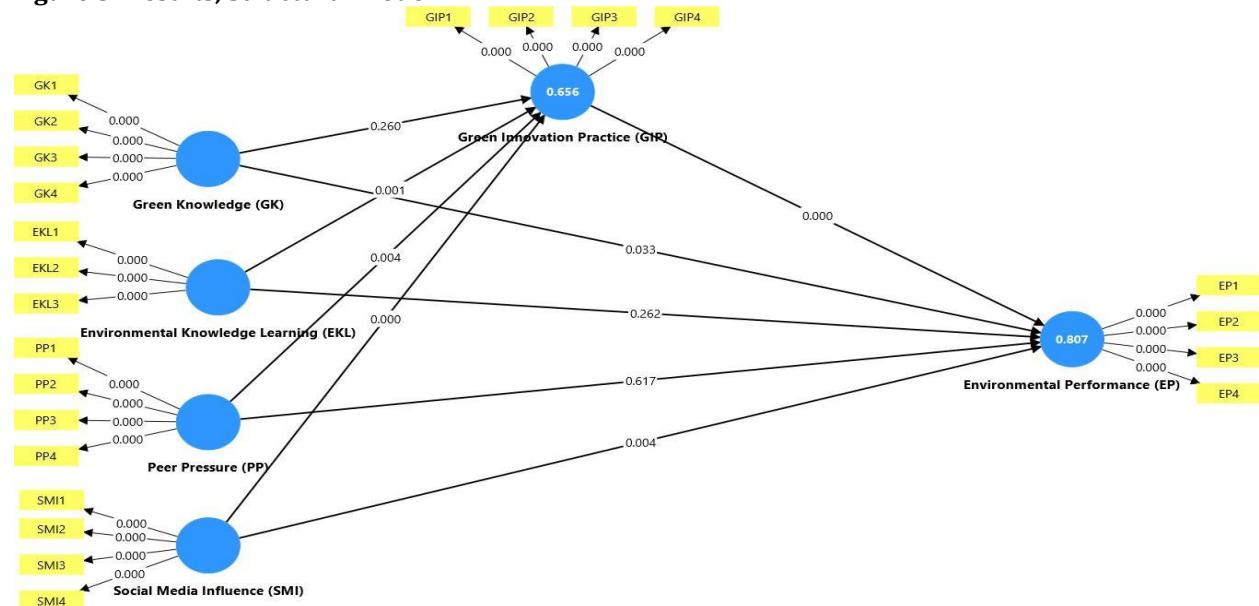


Structural Model Assessment

Prior to hypothesis testing, collinearity was assessed using the Variance Inflation Factor (VIF). All VIF values ranged between 2.282 and 3.469, which are well below the critical threshold of 5.0, confirming the absence of multicollinearity issues (Hair et al., 2022).

Explanatory Power (R^2) and Effect Size (f^2): The model demonstrated strong predictive accuracy. The R^2 value for Environmental Performance (EP) was 0.807, indicating that 80.7% of its variance is explained by the predictors. Similarly, the predictors explained 65.6% ($R^2 = 0.656$) of the variance in Green Innovation Practice (GIP). Analysis of effect sizes (f^2) revealed that GIP has a large effect on EP ($f^2 = 0.913$), while Social Media Influence has a medium effect on GIP ($f^2 = 0.156$).

Figure 3: Results, Structural Model



Hypothesis Testing (Direct Effects) Bootstrapping was employed to test the direct hypotheses. The results indicate that GK (β values= 0.112, $p = 0.033$) and SMI (β values= 0.256, $p = 0.004$) significantly and positively affect EP, supporting **H1** and **H4**. However, EKL (β values= -0.094, $p = 0.262$) and PP (β values = -0.037, $p = 0.617$) did not directly influence EP, leading to the rejection of **H2** and **H3**.

Regarding the antecedents of GIP, EKL ($\beta = 0.318$, $p = 0.001$), PP ($\beta = 0.229$, $p = 0.004$), and SMI ($\beta = 0.396$, $p = 0.000$) demonstrated significant positive effects, supporting **H6**, **H7**, and **H8**. GK did not significantly affect GIP, rejecting **H5**. Finally, GIP exerted a strong, significant positive effect on EP (β values = 0.717, $p = 0.000$), supporting **H9**.

Table 6: Hypothesis Testing (p-Value)

Hypothesis	Path Relationship	β (Original Sample)	t-value	p-value	Decision
H1	GK $\rightarrow$ EP	0.112	2.136	0.033	Supported
H2	EKL $\rightarrow$ EP	-0.094	1.123	0.262	Not Supported
H3	PP $\rightarrow$ EP	-0.037	0.500	0.617	Not Supported
H4	SMI $\rightarrow$ EP	0.256	2.885	0.004	Supported
H5	GK $\rightarrow$ GIP	-0.073	1.128	0.260	Not Supported
H6	EKL $\rightarrow$ GIP	0.318	3.459	0.001	Supported
H7	PP $\rightarrow$ GIP	0.229	2.892	0.004	Supported
H8	SMI $\rightarrow$ GIP	0.396	4.484	<0.001	Supported
H9	GIP $\rightarrow$ EP	0.717	5.942	<0.001	Supported

Mediation Analysis (Bootstrapping – Specific Indirect Effects) Mediation analysis was conducted to test the indirect effects of the predictors on EP via GIP.

The bootstrapping analysis examined the indirect effects of Peer Pressure (PP), Social Media Influence (SMI), and Environmental Knowledge Learning (EKL) on Environmental Performance (EP) through Green Innovation Practice (GIP). The results indicate that the mediating effect of GPI on the relationship between Green Knowledge GK and EP was not significant ($\beta = -0.052$, $t = 1.129$, $p = 0.259$). Therefore, no mediation effect was established. In contrast, SMI demonstrated a significant indirect effect through GIP towards EP ($\beta = 0.164$, $t = 2.950$, $p = 0.003$), indicating a full mediation effect. Additionally, EKL showed a significant indirect effect through GIP towards EP ($\beta = 0.228$, $t = 3.179$, $p = 0.001$), confirming a full mediation effect. The direct pathway involving GIP as a mediator between SMI and EP also showed a significant effect ($\beta = 0.284$, $t = 3.998$, $p < 0.001$), indicating partial mediation as shown in Table 7.

H10: GK $\rightarrow$ GIP $\rightarrow$ EP was insignificant ($\beta = -0.052$, $p = 0.259$), indicating no mediation. (Not Supported)

H11: EKL $\rightarrow$ GIP $\rightarrow$ EP was significant ($\beta = 0.228$, $p = 0.001$). Given the lack of a direct effect, this indicates *full mediation*. (Supported)

H12: PP $\rightarrow$ GIP $\rightarrow$ EP was significant ($\beta = 0.164$, $p = 0.003$). Similarly, this indicates *full mediation*. (Supported)

H13: SMI $\rightarrow$ GIP $\rightarrow$ EP was significant ($\beta = 0.284$, $p = 0.000$). Because the direct effect was also significant, this indicates *partial mediation*. (Supported)

Table 7: Mediation Results

Indirect Path	β	t-value	p-value	Result	Mediation Type
GK $\rightarrow$ GIP $\rightarrow$ EP	-0.052	1.129	0.259	Not Significant	No Mediation
EKL $\rightarrow$ GIP $\rightarrow$ EP	0.228	3.179	0.001	Significant	Full Mediation
PP $\rightarrow$ GIP $\rightarrow$ EP	0.164	2.950	0.003	Significant	Full Mediation
SMI $\rightarrow$ GIP $\rightarrow$ EP	0.284	3.998	0.000	Significant	Partial Mediation

Table 8 shows the summary of mediation analysis results which reveal how different factors drive EP through GIP. From the results, it indicates that GK shows No Mediation. GK has a direct, positive impact on Environmental Performance. However, it does not significantly influence the mediator (GIP). This suggests that individuals with high foundational green knowledge may directly engage in standard environmentally responsible behaviors without necessarily adopting green practices. Next, EKL and PP show Full Mediation.

Neither EKL nor PP directly improves Environmental Performance on their own. Instead, their impact is fully absorbed by the mediator. This means that EKL and PP act as motivational catalysts which it encourages young adults to adopt Green Innovation Practices, which in turn leads to better Environmental Performance. And SMI shows Partial Mediation. SMI is a powerful dual-driver of behavior. It directly enhances Environmental Performance while also indirectly boosting it by encouraging the adoption of Green Innovation Practices.

Table 8: Summary of Mediation Results

Independent Variable	Direct Effect (to EP)	Direct p-value	Indirect Effect (via GIP to EP)	Indirect p-value	Mediation Type
Green Knowledge (GK)	GK → EP	0.033 (Significant)	GK → GIP → EP	0.259 (Not Significant)	No Mediation
Environmental Knowledge Learning (EKL)	EKL → EP	0.262 (Not Significant)	EKL → GIP → EP	0.001 (Significant)	Full Mediation
Peer Pressure (PP)	PP → EP	0.617 (Not Significant)	PP → GIP → EP	0.003 (Significant)	Full Mediation
Social Media Influence (SMI)	SMI → EP	0.004 (Significant)	SMI → GIP → EP	0.000 (Significant)	Partial Mediation

Discussion

The empirical findings provide critical insights into how knowledge-based and social determinants drive Environmental Performance among young adults in the Klang Valley. A central finding is the profound role of Green Innovation Practice (GIP). The strong direct impact of GIP on EP aligns with previous studies (Wang et al., 2021; Hejazi et al., 2023; Bai & Lyu, 2023), confirming that behavioral implementation is crucial; awareness alone is insufficient without the translation of eco-friendly concepts into tangible daily practices. Interestingly, Environmental Knowledge Learning (EKL) and Peer Pressure (PP) did not directly affect Environmental Performance. However, they strongly influenced GIP, resulting in full mediation. This indicates that continuous environmental learning (Su et al., 2020) and peer validation (Rahnama Haratbar et al., 2023) primarily serve as motivational catalysts. They encourage young adults to adopt innovative green practices, which subsequently drive environmental performance.

Social Media Influence (SMI) emerged as a powerful dual driver, affecting Environmental Performance both directly and indirectly through GIP (partial mediation). This supports the assertions of Sun and Xing (2022), highlighting that digital platforms not only raise environmental awareness directly but also effectively mobilize young adults to experiment with and adopt sustainable lifestyle changes. Conversely, Green Knowledge (GK) exhibited a direct impact on EP but failed to significantly influence GIP. This suggests that individuals with high foundational green knowledge may execute standard environmentally responsible behaviors (such as basic recycling) directly without necessarily adopting novel "innovative" green practices. This finding aligns with Meng Zhang et al. (2024), who noted that fundamental knowledge directly predicts routine pro-environmental decision-making.

Overall, the findings validate the proposed conceptual framework. While knowledge and social influence are critical, their ultimate impact on environmental outcomes is largely dependent on their conversion into actionable Green Innovation Practices (Bai & Lyu, 2023; Hair et al., 2022).

5. Conclusion and Implications

This study successfully investigated the determinants of environmental performance among young adults, with a specific focus on the mediating role of green innovation practice. The findings indicate that while knowledge and social factors are important, they do not generally act as direct drivers of environmental outcomes. Specifically, Green Knowledge (GK) and Social Media Influence (SMI) have significant direct positive effects on Environmental Performance (EP). In contrast, the direct pathways from Environmental Knowledge Learning (EKL) and Peer Pressure (PP) to EP were found to be non-significant.

Instead, the most critical driver of environmental performance is the active engagement of individuals in green

innovation practices. Green Innovation Practice (GIP) was found to have the strongest direct effect on EP and serves as a vital behavioral bridge: it fully mediates the influence of EKL and PP, and partially mediates the effect of SMI. However, GIP does not mediate the relationship for foundational Green Knowledge. Ultimately, these results underscore that mere environmental awareness or social pressure is often insufficient on its own; it must be translated into tangible, action-oriented behaviors to achieve meaningful environmental outcomes (Singh et al., 2020; Javed et al., 2026)

Theoretical Implications

This research offers significant contributions to existing theoretical frameworks. Primarily, it provides empirical validation for applying the Ability–Motivation–Opportunity (AMO) Theory to elucidate environmental performance among young adults (Bos-Nehles et al., 2013). Within this context, knowledge-related variables represent ability, social influences denote motivation, and Green Innovation Practice embodies the opportunity and behavioral application required to form performance outcomes. Furthermore, this study enhances current literature by affirming that Green Innovation Practice serves as a pivotal behavioral mechanism (Wang, 2019). While prior research frequently emphasized the importance of knowledge and awareness (Farrukh et al., 2022), these findings support modern theories suggesting that behavioral engagement is an essential link between cognition and actual performance. Finally, by explicitly identifying the non-significant direct relationships (EKL and PP to EP) and contrasting them with significant direct and indirect effects, this study clarifies the divergent roles that cognitive and social factors play in influencing environmental outcomes.

Practical Implications

The results of this study offer actionable insights for educational institutions, policymakers, and environmental organizations. First, educational institutions should shift their environmental curricula from theoretical instruction to practical application (Luo et al., 2022; Afsar et al., 2018; Afsar et al., 2020; Gilal et al., 2019). Implementing project-based learning, green innovation contests, and hands-on sustainability programs will allow students to practice being environmentally responsible, thereby improving overall environmental performance. Second, policymakers and government agencies should design action-oriented environmental programs. Because Green Innovation Practice is highly influential, policies should explicitly encourage youth involvement in green entrepreneurship, community environmental projects, and sustainable lifestyle campaigns (Mehrajunnisa et al., 2022). Third, organizations and NGOs should strategically leverage social media platforms. By creating engaging digital campaigns, organizations can simultaneously raise awareness and directly encourage young adults to alter their behaviors (Nilashi et al., 2022; Jabbour et al., 2011; Jackson et al., 2011; Jackson et al., 2014). Finally, environmental initiatives should incorporate peer-based interventions. Since peer pressure affects behavior solely through indirect pathways via Green Innovation Practice (Huang et al., 2026; Muysioa et al., 2022; Okoye & Eze, 2023), initiatives such as group challenges, peer-led sustainability clubs, and collaborative green activities can significantly enhance practical engagement and effectiveness.

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