

Students' green consumption behaviour: The mediating role of perceived benefits

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Abstract

This study investigates the determinants of students' green consumption behaviour, with particular attention to the mediating role of perceived benefits. A quantitative research design was adopted, and data were collected from university students using a structured questionnaire measured on a five-point Likert scale. The survey was conducted through both online and direct approaches. After screening the data, 280 valid responses were used for analysis. The proposed model and hypotheses were tested using Partial Least Squares Structural Equation Modelling (PLS-SEM) with SmartPLS software. The results show that attitude toward green consumption, subjective norms, and environmental concern all have significant positive effects on perceived benefits. Among these antecedents, environmental concern has the strongest influence. The findings also reveal that perceived benefits have a strong positive effect on students' green consumption behaviour and mediate the relationships between attitude toward green consumption, subjective norms, environmental concern, and green consumption behaviour. These results emphasize the importance of perceived benefits in translating psychological, social, and environmental factors into actual green consumption practices. The study offers practical implications for universities, businesses, and policymakers by suggesting that students' green consumption can be encouraged through environmental education, supportive social influence, and communication strategies that clearly highlight the concrete benefits of green products.

Keywords: Green consumption behaviour, perceived benefits, university students

Introduction

The increasing severity of environmental problems, climate change, and the rapid depletion of natural resources have intensified global concerns about sustainable consumption. In response, green consumption behaviour has emerged as an important strategy for mitigating environmental problems and promoting sustainable development. Green consumption refers to consumer behaviours that prioritize green products and services that minimize environmental harm and promote resource efficiency^[1]. Prior studies have suggested that green consumption can significantly reduce environmental impacts while simultaneously encouraging businesses to adopt sustainable production practices^[2]. Among different consumer groups, university students represent an important segment, as they are generally more educated, environmentally aware, and capable of shaping future consumption patterns in society^[3]. Consequently, understanding the factors influencing students' green consumption behaviour has become an increasingly important research topic in sustainability and consumer behaviour literature.

Despite growing environmental awareness, previous research has identified a persistent attitude-behaviour gap, where individuals who express positive environmental attitudes do not always translate these attitudes into actual green consumption behaviour^[4]. This discrepancy suggests that psychological mechanisms may influence how environmental attitudes and perceptions are transformed into actual behaviour. One important factor that may explain this process is perceived benefits, which refers to the extent to which consumers believe that engaging in green consumption will provide environmental, personal, or social benefits^[5]. From a theoretical perspective, both the Theory of Planned Behavior (TPB)^[6] and the Value-Belief-Norm

theory (VBN)^[7] emphasize the role of cognitive evaluations and perceived outcomes in shaping pro-environmental behaviours. When individuals perceive that green consumption can generate meaningful benefits-such as protecting health, improving environmental quality, or enhancing social responsibility- they tend to make more sustainable consumption choices.

Although prior empirical studies have shown that perceived benefits are positively associated with green consumption behaviour^[3, 5], existing research has primarily focused on direct relationships between environmental awareness, attitudes, and green consumption behaviour. Relatively limited attention has been given to the mediating mechanism through which perceived benefits influence green consumption behaviour, particularly among university students in emerging economies. Understanding this mechanism is important because students often face constraints such as limited income, social influence, and varying levels of environmental knowledge, which may shape how perceived benefits translate into actual green consumption decisions.

Therefore, this study aims to examine the mediating role of perceived benefits in shaping students' green consumption behaviour. By investigating this mechanism, this study adds to current knowledge in several ways. First, it enriches the theoretical understanding of green consumption by clarifying the psychological process through which perceived benefits shape students' green consumption behaviour. Second, it provides empirical evidence from the student population, a consumer segment that may significantly influence the development of sustainable consumption practices in the future. Finally, the findings provide useful practical insights for policymakers, educational institutions, and businesses seeking to

encourage green consumption through environmental education, marketing strategies, and sustainability initiatives.

Literature review

1. Concept of green consumer behaviour

Green consumerism is widely regarded as an important consumption trend that supports sustainable development. This concept refers to the tendency of consumers to prioritize products and services that are produced in environmentally friendly and sustainable ways. According to Mabaso *et al.* [8], green consumerism can be understood as the purchasing of products manufactured through environmentally responsible processes, thereby contributing to the reduction of environmental harm and the advancement of sustainable consumption practices. This movement is aligned with the global sustainability agenda, especially SDG 12 on Responsible Consumption and Production, which promotes both individuals and organizations to adopt environmentally responsible consumption behaviours. In this study, green consumption behaviour is understood as a broader concept that includes not only purchasing environmentally friendly products but also using recycled products, reducing waste, and recycling household waste.

Within this perspective, green consumption behaviour is considered a specific manifestation of green consumerism in actual consumption practices. Green consumption behaviour describes consumers' choices and practices related to the use of products that reduce environmental harm, such as those that are recyclable, energy-efficient, made from natural materials, or certified as eco-friendly. According to Hlaba and Shava [9], green consumption behaviour reflects consumers' preference for products that minimize negative environmental impacts as part of sustainable consumption. Similarly, Mabaso *et al.* [8] argue that green consumption behaviour represents conscious consumption decisions aimed at reducing pollution and environmental harm by prioritizing eco-friendly products over conventional products that may damage the environment. Therefore, green consumption behaviour can be understood as a form of environmentally responsible consumption in which environmental considerations are incorporated into consumers' purchasing decisions to support environmental protection and sustainable development.

2. Theoretical Background

The Theory of Planned Behaviour (TPB) proposed by Ajzen [6] provides a useful lens for understanding the formation of individuals' behavioural intentions and actions. The central assumption of this theory is that behaviour is largely guided by behavioural intention, which represents an individual's readiness to carry out a specific behaviour. Behavioural intention is formed through three key determinants: personal evaluation of the behaviour, perceived normative influence, and perceived behavioural control. Within this framework, attitude captures an individual's positive or negative appraisal of performing the behaviour, while subjective norms indicate the perceived approval, expectations, or pressure from important social referents. Perceived behavioural control reflects individuals' perceived ability, resources, and opportunities to perform the behaviour. These factors are shaped by underlying behavioural, normative, and control beliefs, which together form the

cognitive basis for intention and behaviour. Ajzen [6] also noted that perceived behavioural control may directly affect behaviour when actual conditions either enable or limit individuals' ability to perform that behaviour.

In the context of green consumption, TPB provides a relevant theoretical foundation for examining how consumers' psychological evaluations and social influences shape environmentally responsible behaviour. Empirical evidence has demonstrated the significant influence of attitudes, subjective norms, and perceived behavioural control in predicting consumers' intentions and behaviours toward green products [2, 10]. Therefore, TPB is appropriate for analysing the psychological and social factors that influence students' green consumption behaviour.

In addition to TPB, the Value–Belief–Norm (VBN) theory is also regarded as an important theoretical foundation in the study of environmental behaviour and sustainable consumption. This theory suggests that individuals' personal values and environmental beliefs play a fundamental role in shaping personal moral norms, which in turn motivate environmentally responsible behaviours [7]. Consequently, integrating TPB with VBN provides a more comprehensive perspective for explaining green consumption behaviour. While TPB emphasizes the individual and social factors underlying behavioural intentions, VBN focuses on the influence of personal values and moral norms in encouraging sustainable consumption behaviours.

3. Hypotheses and Research Model

Hypothesis

Attitude toward green consumption and Perceived benefits

In green consumption research, attitude is often considered a key psychological element that influences how consumers perceive and assess green products. Based on the Theory of Planned Behaviour, attitude refers to the extent to which a person evaluates a given behaviour positively or negatively [6]. In the case of green consumption, individuals who hold favourable views toward green products tend to be more aware of the benefits these products can provide, such as reducing environmental harm, supporting personal health, and contributing to sustainable development.

Empirical research has further demonstrated a close association between environmental attitudes and consumers' perceptions of green product benefits. Joshi and Rahman [2] argued that individuals with positive environmental attitudes are more likely to recognize the advantages of green products, which can encourage more sustainable consumption choices. In a similar direction, Paul *et al.* [10] reported that favourable evaluations of green products may enhance consumers' understanding of their environmental and social value. These findings suggest that attitude toward green consumption is likely to contribute to the formation of perceived benefits. Therefore, the following hypothesis is proposed:

H1: Attitude toward Green Consumption positively influences Perceived Benefits.

Subjective norm and Perceived benefits

From the perspective of the Theory of Planned Behaviour, subjective norms reflect the extent to which individuals perceive social expectations or encouragement from people who are important to them [6]. In the context of green

consumption, support from family members, friends, peers, lecturers, or other reference groups may lead consumers to view environmentally friendly products more positively. Such social influence can shape how individuals perceive the benefits of green consumption, including its contributions to environmental protection, personal well-being, and sustainable development.

Empirical findings further indicate that social norms significantly influence how consumers assess green products. Joshi and Rahman [2] indicated that social influence from family and the wider community can affect how consumers perceive the value and benefits of green products. Similarly, Paul *et al.* [10] found that social norms may strengthen consumers' awareness of green product benefits and encourage more sustainable consumption choices. These arguments suggest that when individuals perceive stronger social support for green consumption, they tend to perceive greater value in green products. Based on this reasoning, the following hypothesis is developed:

H2: Subjective Norm positively influences Perceived Benefits.

Environmental concern and Perceived benefits

Environmental concern is often considered a significant driver of green consumption behaviour, as it represents consumers' recognition of environmental challenges and their readiness to support actions aimed at minimizing ecological harm. From the perspective of the Value–Belief–Norm theory, environmental values and beliefs shape how individuals perceive the consequences of environmental problems and develop a personal responsibility for protecting the environment [7]. Accordingly, consumers who demonstrate greater concern for environmental issues are more inclined to assess green consumption positively and acknowledge the advantages of environmentally responsible decisions.

From a sustainable consumption perspective, environmental concern may influence how consumers perceive the value of green products. Individuals with stronger environmental concern tend to develop a stronger understanding of the advantages associated with green products, such as reducing pollution, conserving natural resources, supporting human health, and contributing to sustainable development. Empirical research has further indicated that environmental concern is associated with how consumers assess the value and advantages of green products. Joshi and Rahman [2], for instance, argued that individuals with greater concern for environmental issues are more inclined to perceive the benefits offered by eco-friendly products. In a similar vein, Paul *et al.* [10] reported that environmental concern may enhance consumers' recognition of the environmental and social value of green products, which can in turn encourage more sustainable consumption practices. Drawing on these theoretical insights and empirical findings, the following hypothesis is formulated:

H3: Environmental Concern positively influences Perceived Benefits.

Perceived benefits and Students' Green consumption Behaviour

Perceived benefits of environmentally friendly behaviours play an important role in promoting sustainable

consumption behaviours [7]. When individuals clearly understand the benefits derived from green products, they are more inclined to evaluate green consumption behaviours positively as valuable and consistent with their personal moral norms, thereby increasing the likelihood of engaging in environmentally responsible consumption. Existing empirical work has identified a positive link between perceived benefits and green consumption behaviour. For instance, Joshi and Rahman [2] found that perceptions of environmental and personal benefits associated with green products significantly influence consumers' green consumption behaviour. Paul *et al.* [10] found that consumers tend to translate their perceptions into actual consumption decisions when they clearly recognize the benefits of green products. In a similar vein, Chen and Chang [5] emphasized that consumers' perceptions of green product value and benefits are important drivers of both their purchase intentions and actual environmentally friendly consumption behaviour.

For students, who often demonstrate relatively high awareness of environmental issues and have greater access to information related to sustainable consumption, perceived benefits may play an even more critical role. When students clearly recognize the benefits associated with environmentally friendly products, they tend to evaluate green product choices more positively and translate these perceptions into actual purchasing decisions. Therefore, perceived benefits are expected to be an important factor influencing students' green consumption behaviour. Accordingly, the following hypothesis is proposed:

H4: Perceived Benefits positively influence Students' Green consumption Behaviour.

Mediating role of Perceived benefits

According to Ajzen [6], attitudinal evaluation, normative influence, and perceived behavioural control can influence behaviour through individuals' cognitive evaluations of the outcomes and benefits associated with that behaviour, such as environmental benefits, health benefits, and social benefits. From the perspective of the Value–Belief–Norm (VBN) theory, individuals' environmental values and beliefs may strengthen their awareness of the positive consequences of environmentally friendly behaviours, thereby creating motivation for such behaviours [7]. When consumers clearly perceive the benefits associated with green products, this perception can function as an intermediate pathway through which cognitive and social factors are translated into actual consumption behaviour.

Numerous empirical studies have provided evidence that perceived environmental benefits of green products significantly influence consumers' sustainable consumption behaviour [2]. Similarly, Paul *et al.* [10] indicate that when consumers better recognize the value of green products, they tend to translate positive attitudes and social influences into actual purchasing decisions. In addition, perceptions of the value and benefits of green products make a significant contribution to promoting both purchase intentions and actual purchasing behaviour toward environmentally friendly products [5]. Furthermore, psychological factors such as environmental attitudes and social norms may influence green consumption behaviour through cognitive mechanisms related to the perceived benefits and value of green products [3]. Likewise, Testa *et al.* [11] demonstrate that

the perceived personal and environmental value of green products substantially influences consumers' transition from positive attitudes to actual green consumption behaviour. For students, who often demonstrate relatively high awareness of environmental issues and are strongly influenced by social norms within academic environments, perceived benefits may play an even more important role. When students hold positive attitudes toward green consumption, receive encouragement from peers or their community, and demonstrate a high level of environmental awareness, they tend to perceive the value and advantages of green products more clearly. Such perceptions may motivate them to translate their attitudes and awareness into actual green consumption decisions. Therefore, perceived benefits may function as an important mediating mechanism linking cognitive and social factors to students' green

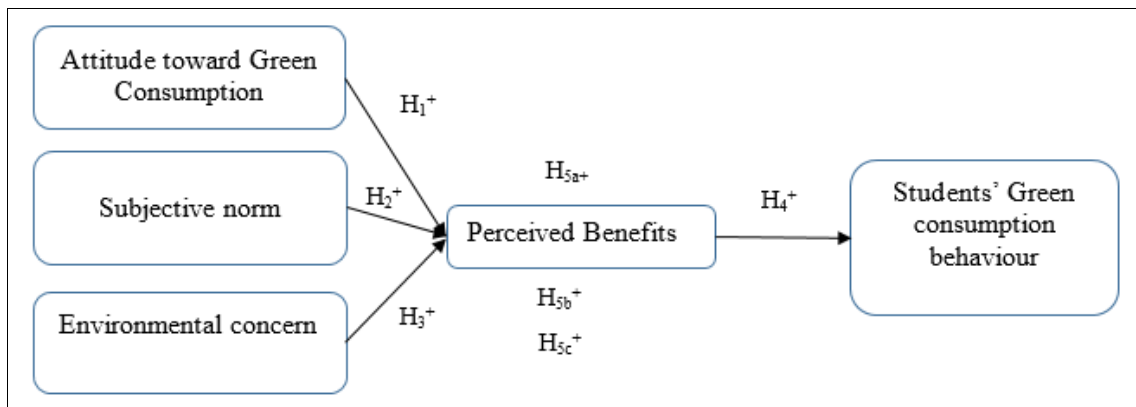
consumption behaviour. Drawing on the above discussion, this study proposes the following hypotheses:

H5a: Perceived Benefits mediate the relationship between Attitude toward Green Consumption and Students' Green consumption Behaviour.

H5b: Perceived Benefits mediate the relationship between Subjective Norm and Students' Green consumption Behaviour.

H5c: Perceived Benefits mediate the relationship between Environmental Concern and Students' Green consumption Behaviour.

Research Model



Source: Proposed by the authors.

Fig 1: Research model.

4. Measurement Scales

The constructs in the proposed model were assessed through a structured questionnaire using a five-point Likert scale, with response options ranging from 1 = strongly disagree to 5 = strongly agree. This scale was selected because it is commonly applied in social and behavioural research to

quantify respondents' perceptions, attitudes, and evaluations in a systematic way [12, 13]. The observed items used to measure each construct were adapted from validated instruments in prior studies and incorporated into the survey questionnaire. The specific items for each construct are presented below:

Table 1: Initial Measurement Scales

Dimensions	Statements	Sources	Expectation
Attitude toward Green Consumption			+
AGC1	I like the idea of choosing green products.	Adapted from [14, 15]	
AGC2	Green consumption is a good idea.		
AGC3	I have a favourable attitude toward choosing green products.		
Subjective norm			+
SN1	People who are important to me think that I should consume green products.	Adapted from [3, 10]	
SN2	My family members encourage me to consume green products.		
SN3	Friends and peers whose opinions I value prefer that I consume green products.		
SN4	Lecturers or people in my academic environment encourage green consumption.		
SN5	People who influence me (e.g., celebrities, role models) encourage green consumption.		
Environmental concern			+
EC1	Plants and animals have as much right as humans to exist.	Adapted from [16]	
EC2	When humans interfere with nature it often produces disastrous consequences.		
EC3	The balance of nature is very delicate and easily upset.		
EC4	Human ingenuity alone cannot ensure that the Earth remains livable without responsible environmental actions.		
EC5	Despite our special abilities, humans are still subject to the laws of nature.		
Perceived Benefits			+
PB1	I think environmentally friendly products are more trustworthy.	Adapted from [17]	

PB2	I think environmentally friendly products are of better quality.		
PB3	I think practicing green consumption is delightful.		
PB4	I think consuming environmentally friendly products can provide long-term economic benefits.		
Students' Green consumption Behaviour			+
GPB1	I buy environmentally friendly products whenever possible.	Adapted from [18, 19]	
GPB2	I buy organic food, whenever possible.		
GPB3	I use products made from recycled materials, whenever possible.		
GPB4	I reduce household waste whenever possible.		
GPB5	I recycle household waste whenever possible.		

Source: Authors' compilation

Methodology

A quantitative approach was used to analyse the factors associated with students' green consumption behaviour. The proposed model included five constructs: attitude toward green consumption, subjective norms, environmental concern, perceived benefits, and green consumption behaviour. Data were collected from university students through a structured survey measured on a five-point Likert scale.

This study used convenience sampling, a form of non-probability sampling, because the target respondents were university students who were accessible during the data collection period. The sample size was calculated based on Hair *et al.* [13], who recommend a minimum of 10 observations for each estimated parameter in SEM. With 24 estimated parameters in the questionnaire, the minimum sample size required for analysis was 240 respondents. To enhance the diversity and stability of the dataset, the study aimed to collect 288 responses, which was approximately 20% higher than the minimum requirement.

Data were collected through two methods: an online survey administered via Google Forms and distributed by email, and a direct survey conducted through face-to-face interviews with students. This combined approach helped broaden access to the target respondents and increase the diversity of the research sample. A total of 93 online responses and 195 direct responses were obtained from students representing different faculties and academic disciplines. After the screening process, questionnaires with unreliable responses were removed, leaving 280 usable responses for the final analysis.

The dataset was analysed using the PLS-SEM technique in SmartPLS. This method was employed to assess both the measurement model and the structural model, as well as to test the proposed hypotheses. The final sample of 280 valid observations was considered sufficient for the analytical requirements of the study and provided an appropriate basis for interpreting the empirical findings.

When approaching respondents for the survey, they were informed about the purpose and significance of the study. Participation was entirely voluntary, and respondents had the right to withdraw from the survey at any time. The questionnaire did not collect any personally identifiable information, and the authors assured that all responses would be kept confidential and used solely for academic research purposes. The data were analysed in aggregate form to protect the privacy of all interview participants.

Results and Discussion

1. Description of the survey sample

Table 2: Descriptive Statistics of the Survey Sample

Category	Frequency	Percentage (%)
1. Gender		
Female	143	51.1
Male	137	48.9
2. Year of study		
First year	44	15.7
Second year	21	7.5
Third year	127	45.4
Fourth year	88	31.4
3. Academic discipline		
Social and behavioural sciences	46	16.4
Business and management	76	27.1
Law	42	15.0
Natural sciences	116	41.4
Total	280	100

Source: Authors' survey results, 2025

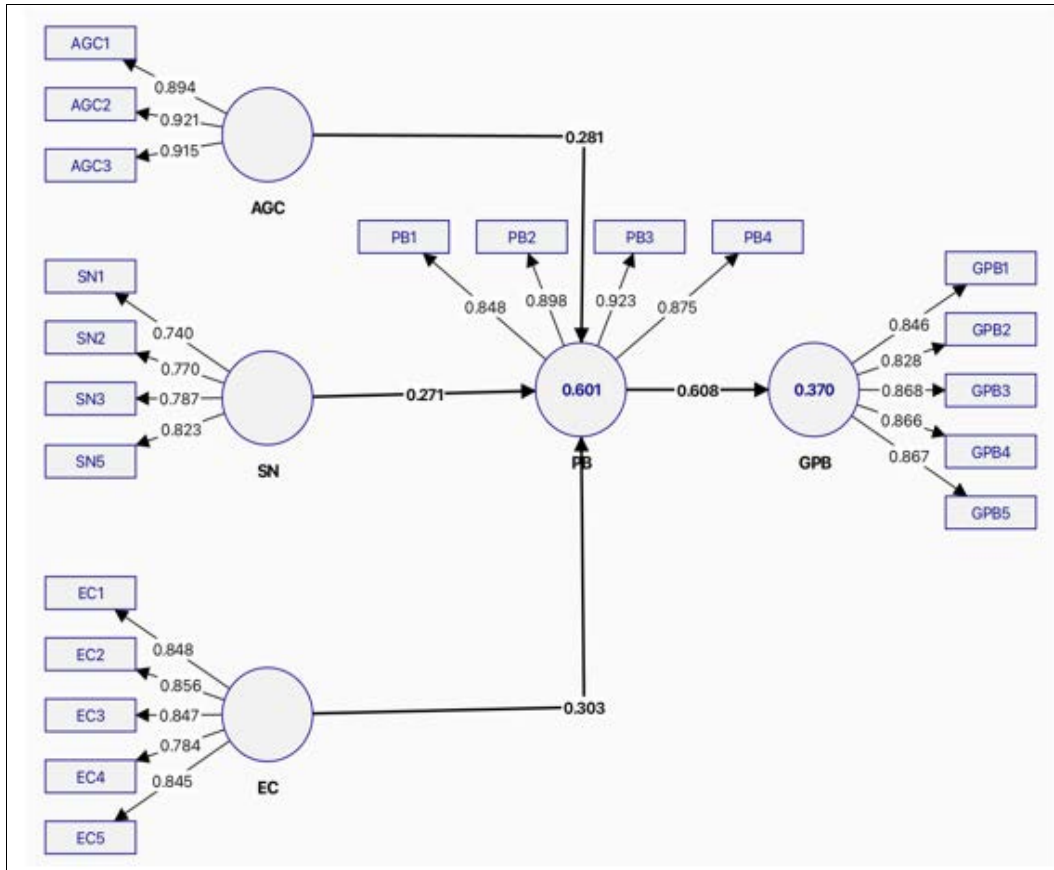
Table 2 presents the sample structure, comprising 280 students, of whom females accounted for 51.1% and males for 48.9%, indicating a relatively balanced gender distribution. The sample structure also shows that third-year students represented the highest percentage, at 45.4%, followed by fourth-year students at 31.4%, while first-year and second-year students accounted for 15.7% and 7.5%, respectively. In terms of academic disciplines, the natural sciences group constituted the largest share, at 41.4%, followed by business and management at 27.1%, social and behavioural sciences at 16.4%, and law at 15.0%. Overall, the distribution of respondents indicates a diverse sample structure, offering an appropriate foundation for examining the determinants of students' green consumption behaviour.

2. Evaluating the coefficients of the consumer behaviour model

During the assessment of the measurement model, outer loading coefficients were used to evaluate the suitability of the observed variables for their respective latent constructs. According to Hair *et al.* [20], observed variables with outer loadings of 0.70 or higher are generally considered acceptable, whereas indicators with loadings between 0.40 and below 0.70 should be considered for removal if their exclusion improves the quality of the measurement scale. The initial results show that most observed variables achieved acceptable outer loading values. However, SN4, which belongs to the subjective norm scale, had an outer loading of only 0.624, which is below the recommended threshold of 0.70. This indicates that SN4 did not adequately reflect the construct of subjective norm compared with the

other indicators within the same scale. Therefore, this study decided to remove SN4 from the measurement model in order to improve indicator reliability, convergent validity,

and the overall quality of the scale. After removing SN4, the subjective norm scale retained four observed variables, namely SN1, SN2, SN3, and SN5 (Figure 2).



Source: Authors’ data analysis using SmartPLS, 2025

Fig 2: The results of the SEM model

The quality of the indicators was examined through their outer loading values across the AGC, EC, GPB, PB, and SN constructs, with the results summarized in Table 3.

Table 3: Outer Loadings of Measurement Indicators.

	AGC	EC	GPB	PB	SN
AGC1	0.894				
AGC2	0.921				
AGC3	0.915				
EC1		0.848			
EC2		0.856			
EC3		0.847			
EC4		0.784			
EC5		0.845			
GPB1			0.846		
GPB2			0.828		
GPB3			0.868		
GPB4			0.866		
GPB5			0.867		
PB1				0.848	
PB2				0.898	
PB3				0.923	
PB4				0.875	
SN1					0.740
SN2					0.770
SN3					0.787
SN5					0.823

Source: Authors’ data analysis using SmartPLS, 2025

After SN4 was removed, the outer loading results in Table 3 show that all retained indicators met the recommended criterion, with values above 0.70 [13]. The loading values ranged from 0.740 to 0.923. More specifically, AGC recorded loadings between 0.894 and 0.921, EC between 0.784 and 0.856, GPB between 0.828 and 0.868, and PB between 0.848 and 0.923. For the SN construct, the remaining items, namely SN1, SN2, SN3, and SN5, had loadings from 0.740 to 0.823, which were all higher than the 0.70 cut-off point. These findings suggest that the retained indicators have satisfactory reliability and can be used for the next stage of measurement model evaluation.

The measurement scales were further examined in terms of reliability and convergent validity using Cronbach’s Alpha, Composite Reliability, and Average Variance Extracted (AVE). The results are presented in Table 4.

Table 4: Construct reliability and validity

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
AGC	0.897	0.897	0.936	0.829
EC	0.893	0.895	0.921	0.700
GPB	0.909	0.918	0.931	0.731
PB	0.909	0.909	0.936	0.786
SN	0.794	0.835	0.861	0.609

Source: Authors’ data analysis using SmartPLS, 2025

Table 4 presents the results of the reliability and convergent validity assessment of the measurement scales. The evaluation was based on Cronbach's Alpha, Composite Reliability, and Average Variance Extracted (AVE). Following the criteria suggested by Hair *et al.* [13], Cronbach's Alpha and Composite Reliability values should reach at least 0.70 to confirm acceptable reliability, whereas AVE values should be higher than 0.50 to establish convergent validity.

The findings show that all constructs meet the required reliability standards. Cronbach's Alpha coefficients vary from 0.794 to 0.909, which are all above the 0.70 benchmark, suggesting a satisfactory level of internal consistency for the items within each construct. The Composite Reliability values also meet the required level, with rho_a ranging between 0.835 and 0.918 and rho_c ranging between 0.861 and 0.936. These results indicate that the constructs demonstrate acceptable composite reliability. For convergent validity, the AVE coefficients fall between 0.609 and 0.829, exceeding the recommended benchmark of 0.50. This indicates that the constructs capture an acceptable amount of variance from their corresponding indicators. Among the constructs, AGC records the highest AVE value at 0.829, followed by PB at 0.786, GPB at 0.731, EC at 0.700, and SN at 0.609. Overall, the findings show that the measurement scales achieve acceptable reliability, internal consistency, and convergent validity, supporting their use in the subsequent assessment of discriminant validity and the structural model.

Table 5: Discriminant validity

	AGC	EC	GPB	PB	SN
EC	0.824				
GPB	0.815	0.812			
PB	0.788	0.777	0.658		
SN	0.868	0.814	0.786	0.774	

Source: Authors' data analysis using SmartPLS, 2025

The Heterotrait–Monotrait ratio (HTMT) was used to examine discriminant validity among the constructs. Henseler *et al.* [21] noted that HTMT values below 0.85 are appropriate for constructs that are clearly different from one another, while values below 0.90 may be accepted when constructs have close theoretical relationships. Hair *et al.* [13] also suggested using the 0.90 benchmark when evaluating discriminant validity in PLS-SEM.

The HTMT results in Table 5 show that most construct pairs fall below the 0.85 benchmark, including EC–AGC = 0.824, GPB–AGC = 0.815, GPB–EC = 0.812, PB–AGC = 0.788, PB–EC = 0.777, PB–GPB = 0.658, SN–EC = 0.814, SN–GPB = 0.786, and SN–PB = 0.774. These values indicate that the constructs can be clearly differentiated from one another. The only relationship exceeding the stricter 0.85 criterion is SN–AGC, with an HTMT value of 0.868. Nevertheless, this value remains lower than the 0.90 cut-off. Since subjective norms and attitude toward green consumption are theoretically related in behavioural research, the discriminant validity between these constructs is still acceptable. Overall, all HTMT values are below 0.90, confirming that the model meets the discriminant validity requirement and can be used for further structural model analysis.

3. Factors influencing students' green consumption behaviour

A significance threshold of 5% ($p = 0.05$) was used to determine whether the proposed relationships were statistically supported. Accordingly, relationships with p-values lower than 0.05 were treated as significant, while those with p-values of 0.05 or higher were considered unsupported. Table 6 summarizes the structural model results, including path coefficients, t-values, and p-values. These indicators were used to assess the direction, magnitude, and statistical relevance of each relationship in the proposed model.

Table 6: Testing the research hypotheses

Hypothesis	Effect	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ((O/STDEV))	P values	Result
H1	AGC -> PB	0.281	0.281	0.098	2.859	0.004	Accept the hypothesis
H2	SN -> PB	0.271	0.276	0.100	2.700	0.007	Accept the hypothesis
H3	EC -> PB	0.303	0.301	0.079	3.833	0.000	Accept the hypothesis
H4	PB -> GPB	0.608	0.612	0.048	12.678	0.000	Accept the hypothesis
H5b	SN -> PB -> GPB	0.165	0.167	0.057	2.866	0.004	Accept the hypothesis
H5a	AGC -> PB -> GPB	0.171	0.174	0.066	2.577	0.010	Accept the hypothesis
H5c	EC -> PB -> GPB	0.184	0.186	0.055	3.323	0.001	Accept the hypothesis
R-square							
GPB							0.370
PB							0.601
R-square adjusted							
GPB							0.367
PB							0.597

Source: Authors' data analysis using SmartPLS, 2025

Table 6 summarizes the outcomes of the structural model evaluation and hypothesis testing. In this study, relationships with p-values below 0.05 were treated as statistically significant; therefore, the related hypotheses were accepted. In PLS-SEM, the significance and magnitude of structural relationships are commonly examined through path coefficients, t-values, and p-values

[13]. The model's explanatory capacity for endogenous variables was assessed using R-square values. Following Hair *et al.* [13], R-square values of 0.75, 0.50, and 0.25 can be viewed as high, moderate, and low levels of explanatory power, respectively, in behavioural studies. The analysis shows that all proposed hypotheses were accepted. For H1, attitude toward green consumption had a

positive and statistically significant influence on perceived benefits (AGC → PB), with $\beta = 0.281$, $t = 2.859$, and $p = 0.004$. This finding implies that students with more favourable views of green consumption tend to perceive greater benefits from green products. The result is consistent with the Theory of Planned Behaviour, which highlights attitude as an important factor shaping individuals' evaluations and behavioural tendencies [6]. It also aligns with Paul *et al.* [10] and Yadav and Pathak [3], who found that attitude contributes to green purchase intention and environmentally responsible behaviour. In the university student context, positive attitudes toward green consumption may be linked to stronger awareness of environmental responsibility, interest in sustainable lifestyles, and preference for safer products.

Subjective norms also exerted a positive and statistically significant effect on perceived benefits (SN → PB), with $\beta = 0.271$, $t = 2.700$, and $p = 0.007$. This result suggests that students' perceptions of the benefits of green consumption may be enhanced by encouragement and expectations from key social referents, including family, friends, lecturers, and the broader community. The finding is consistent with Ajzen's [6] argument that subjective norms reflect perceived social expectations that can influence individuals' evaluations and behavioural choices. It also aligns with Yadav and Pathak [3], who emphasized that social influence can encourage green consumption in developing economies. For university students, peer groups and the academic environment may be particularly influential because their consumption choices are often shaped by social interaction, group acceptance, and current lifestyle trends.

The results further show that environmental concern significantly enhances perceived benefits (EC → PB), with $\beta = 0.303$, $t = 3.833$, and $p = 0.000$. Among the three antecedent variables, environmental concern showed the strongest effect on perceived benefits. This suggests that students who are more concerned about environmental issues are more likely to recognize the value of green products, including their contributions to personal health, quality of life, social responsibility, and environmental protection. This finding is consistent with Stern's [7] Value–Belief–Norm theory, which emphasizes the role of environmental values and beliefs in promoting environmentally responsible behaviour. This result also corresponds with prior research by Mostafa [16], Paul *et al.* [10], and Yadav and Pathak [3], which identified environmental concern as an important antecedent of attitudes, intentions, and green consumption behaviour.

Perceived benefits showed a strong positive effect on students' green consumption behaviour (PB → GPB), with $\beta = 0.608$, $t = 12.678$, and $p = 0.000$. This represents the strongest direct relationship in the model, suggesting that perceived benefits are a central factor in encouraging students to engage in green consumption. In practical terms, students tend to choose and use green products when they believe that these products offer clear value, such as safety, quality, trustworthiness, health advantages, and environmental benefits. This finding is consistent with studies suggesting that perceived value and perceived benefits are important factors driving green consumption intentions and behavior [2, 5, 17]. In the university student context, this finding indicates that green communication should move beyond general environmental appeals and

emphasize the concrete personal and social benefits of green consumption.

The results of the indirect effects provide further evidence for the mediating function of perceived benefits in the proposed model. Specifically, subjective norms had a statistically significant indirect effect on green consumption behaviour through perceived benefits (SN → PB → GPB), with $\beta = 0.165$, $t = 2.866$, and $p = 0.004$. This means that social influence may affect students' green consumption behaviour by enhancing their recognition of the value offered by green products. In addition, attitude toward green consumption also showed a significant indirect effect on green consumption behaviour through perceived benefits (AGC → PB → GPB), with $\beta = 0.171$, $t = 2.577$, and $p = 0.010$. This finding implies that favourable attitudes are more likely to lead to green consumption behaviour when students clearly perceive the practical value and benefits of such behaviour.

Environmental concern also showed a significant indirect effect on green consumption behaviour through perceived benefits (EC → PB → GPB), with $\beta = 0.184$, $t = 3.323$, and $p = 0.001$. Among the three mediation paths, this was the strongest indirect effect. This finding suggests that perceived benefits serve as a key pathway through which students' concern about environmental issues can be converted into green consumption practices. It also supports the argument of Kollmuss and Agyeman [4] that environmental awareness or concern does not automatically lead to actual behaviour unless there are appropriate psychological or contextual mechanisms that facilitate this transition. In this study, perceived benefits help explain how environmental concern can be converted into more concrete green consumption actions.

For the model's explanatory capacity, the R-square value of perceived benefits (PB) was 0.601, while the adjusted R-square was 0.597. This means that attitude toward green consumption, subjective norms, and environmental concern together accounted for 60.1% of the variance in perceived benefits. Following Hair *et al.* [13], R-square values of 0.75, 0.50, and 0.25 can be classified as high, moderate, and low levels of explanatory power, respectively, in behavioural studies. Therefore, the R-square value of 0.601 indicates that the model explains perceived benefits at a relatively good level.

For students' green consumption behaviour (GPB), the R^2 value reached 0.370, and the adjusted R^2 was 0.367. This indicates that perceived benefits accounted for 37.0% of the variation in students' green consumption behaviour. Although this explanatory level is lower than that of perceived benefits, it remains reasonable in consumer behaviour studies, as actual consumption behaviour is usually shaped by various factors beyond psychological perceptions, including price, income, product availability, trust in green labels, consumption habits, and convenience.

The small differences between the R-square and adjusted R-square values for both PB and GPB indicate that the model is relatively stable and is not inflated by the number of explanatory variables included. Overall, the R-square and adjusted R-square results suggest that the proposed model has adequate explanatory power for examining students' green consumption behaviour.

Overall, the findings provide both theoretical and practical insights. From a theoretical perspective, this study highlights the influence of attitude, subjective norms, and

environmental concern on perceived benefits, while also confirming perceived benefits as a mediating factor that encourages green consumption behaviour. From a practical perspective, the results indicate that initiatives designed to foster green consumption among students should prioritize environmental awareness, positive social influence, and clear communication of the specific benefits of green products. When students not only hold positive attitudes or environmental awareness but also perceive green consumption as offering practical benefits, the likelihood of transforming awareness into green consumption behaviour will be higher.

Table 7 summarizes the results of the multicollinearity test based on the Variance Inflation Factor (VIF) for the observed indicators. In PLS-SEM, VIF values lower than 5 are commonly considered to indicate the absence of serious multicollinearity problems in PLS-SEM analysis; however, VIF values of 3 or higher should be interpreted with greater caution [13, 22]. The findings indicate that all observed indicators had VIF values below the threshold of 5, ranging from 1.476 to 4.151. Therefore, the model does not exhibit serious multicollinearity issues.

Table 7: Variance Inflation Factor (VIF) Results

AGC	AGC1	AGC2	AGC3		
	2.417	3.052	2.922		
SN	SN1	SN2	SN3	SN5	
	1.767	2.034	1.686	1.476	
EC	EC1	EC2	EC3	EC4	EC5
	2.986	3.151	2.373	2.462	2.800
PB	PB1	PB2	PB3	PB4	
	2.155	3.473	4.151	2.538	
GPB	GPB1	GPB2	GPB3	GPB4	GPB5
	2.231	2.328	2.813	2.697	2.955

Source: Authors' data analysis using SmartPLS, 2025

As shown in Table 7, the VIF scores of the observed indicators vary between 1.476 and 4.151. Because these scores are lower than the commonly accepted cut-off value of 5, the measurement model does not show evidence of serious multicollinearity. Among the constructs, the SN indicators have the lowest VIF scores, ranging between 1.476 and 2.034, which indicates a weak level of collinearity. The indicators of AGC, EC, and GPB mostly fall within the range of 2 to 3, which remains acceptable. The PB indicators show relatively higher VIF values, particularly PB3 = 4.151 and PB2 = 3.473, indicating a stronger association among items within this construct. However, these values are still within the acceptable range, and therefore no serious multicollinearity issue is identified.

Practical Implications

First, environmental education and communication should be strengthened within universities.

The results reveal that environmental concern is the most influential predictor of perceived benefits, and this perception, in turn, positively contributes to students' green consumption behaviour. Therefore, universities should integrate green consumption, environmental protection, and sustainable development into academic courses, seminars, extracurricular activities, and student communication campaigns. Activities such as "Green Consumption Week", green innovation competitions, waste sorting at source, product recycling, or waste-for-gifts events can help

students become more aware of the environmental impacts of their daily consumption behaviour.

Second, the specific benefits of green products should be emphasized rather than merely promoting general messages about environmental protection.

Since perceived benefits have a strong effect on green consumption behaviour, communication messages should clarify that green products are not only environmentally friendly but also safe for health, high in quality, trustworthy, cost-effective in the long term, and compatible with a modern lifestyle. For students, information regarding reasonable prices, durability, safety, and health benefits should be clearly presented to help them easily recognize the practical value of green consumption.

Third, greater attention should be given to social referents and peer influence as drivers of students' green consumption behaviour.

The findings show that subjective norms positively affect perceived benefits and indirectly support sustainable consumption practices. Therefore, universities and businesses can involve outstanding students, environmental clubs, lecturers, celebrities, or social media influencers in disseminating green consumption messages. Peer-based communication campaigns, green consumption challenges on social media, or "green student" programmes can create positive social pressure and encourage student participation.

Fourth, businesses should improve students' access to green products.

Although students may be concerned about the environment, green consumption behaviour is strongly promoted only when they perceive green products as beneficial and accessible. Therefore, businesses should develop green product lines at prices suitable for students and distribute them through canteens, convenience stores on campus, or popular e-commerce platforms. In addition, discounts, reward points, product trials, or cost-saving bundles may help reduce cost-related barriers.

Fifth, the transparency of green product information should be enhanced.

As young consumers are often concerned about product trustworthiness, businesses should provide clear information on product ingredients, origins, green certifications, production processes, and environmental impacts. The use of green labels, QR codes for information traceability, environmental certifications, and transparency commitments can help students develop greater trust in green products, thereby enhancing perceived benefits and promoting consumption behaviour.

Sixth, efforts should go beyond building positive attitudes toward green consumption.

Although attitude toward green consumption positively influences perceived benefits, a favourable attitude alone may not be enough to translate into actual environmentally responsible consumption. Therefore, initiatives designed to promote green consumption should not only foster positive attitudes but also emphasize the practical benefits of green products, improve students' access to these products, and strengthen positive social influence.

Conclusion, limitations and future research

Conclusion

This study explored the factors associated with students' sustainable consumption practices by focusing on the mediating function of perceived benefits. The results indicate that attitude toward green consumption, subjective norms, and environmental concern all contribute positively to students' perceptions of green product benefits. Among these factors, environmental concern shows the strongest influence. The findings also confirm that perceived benefits significantly promote students' green consumption behaviour and serve as a mediating mechanism linking the three antecedent factors to actual behaviour. These results suggest that students are more likely to engage in green consumption when positive attitudes, social influence, and environmental concern are translated into clear perceptions of practical benefits. Therefore, universities, businesses, and policymakers should strengthen environmental awareness, encourage supportive social influence, and communicate the concrete benefits of green products more effectively.

Limitations and future research

Although this research offers several theoretical and practical contributions, some limitations need to be noted. First, the sample consisted only of university students, which may limit the applicability of the findings to broader consumer populations. Second, the use of convenience sampling may result in certain sampling bias. Third, the research was based on self-reported questionnaire data; therefore, the findings may be affected by respondents' subjective evaluations and social desirability bias. In addition, the model mainly focused on psychological and cognitive factors, while several contextual conditions, such as price, income, product availability, access to green products, trust in green labels, and convenience, were not examined in depth.

Future research should extend the scope of investigation by involving broader respondent groups and different geographical settings. The adoption of probability sampling or a mixed-method design could also provide richer insights into the drivers, obstacles, and contextual conditions influencing green consumption behaviour. In addition, future studies may include other relevant factors, such as perceived price, income, convenience, green trust, environmental knowledge, and green communication, to build a more complete research framework. Further comparisons among student groups by gender, academic year, discipline, or income level may also help identify meaningful differences in environmentally responsible consumption.

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