PUBLISHING KSI
• ISSN 2720 - 9644 (print)
• ISSN 2721 - 0877 (online)
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INTERNATIONAL JOURNAL OF ENVIRONMENTAL, SUSTAINABILITY AND SOCIAL SCIENCE
Indexed by : sinta 3 Crossref GARUDA Google scholar

PREDICTORS OF STUDENTS' SUSTAINABLE BEHAVIOR IN GREEN CAMPUS PROGRAMS: A THEORY OF PLANNED BEHAVIOR APPROACH AND STUDENT PERCEPTION ANALYSIS AT UNIVERSITAS SEBELAS MARET

Volume: 7
Number: 4
Page: 1063 - 1074

Article History:
Received: 2026-06-04
Revised: 2026-06-28
Accepted: 2026-07-07

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Abstract:
Although Green Campus initiatives have been widely implemented in higher education institutions, limited studies have simultaneously examined the psychological determinants of multidimensional sustainable behavior and students' perceptions of institutional sustainability performance. This study aims to analyze the influence of Theory of Planned Behavior (TPB) constructs, namely attitude, subjective norm, and perceived behavioral control, on students' sustainable behavior across four dimensions (pro-ecological, frugal, altruistic, and equitable), while mapping student perceptions of UI GreenMetric indicators to identify Green Campus intervention priorities at Universitas Sebelas Maret (UNS). A cross-sectional quantitative design was employed, involving 163 active UNS students selected through purposive sampling. Data were collected using validated questionnaires and analyzed using multiple linear regression and descriptive statistics. The TPB model significantly predicted sustainable behavior, with attitude and perceived behavioral control emerging as significant predictors, whereas subjective norm showed no significant effect at the aggregate level. Predictive power varied substantially across behavioral dimensions, indicating that psychological mechanisms beyond TPB influence equitable behavior. Student perception mapping further revealed a structural gap between institutional sustainability achievement and students' daily experience. Waste management, despite UNS ranking fourth nationally, was identified as the highest priority for improvement, while sustainable transportation emerged as the most critical intervention area. These findings demonstrate that institutional sustainability performance alone does not necessarily translate into students' sustainable behavior and highlight the need for integrated behavioral, infrastructural, and communication strategies to strengthen Green Campus implementation.

Keywords: Theory of Planned Behavior, Sustainable Behavior, Green Campus, Student Perception, Higher Education

INTRODUCTION

Environmental sustainability has become a critical global agenda as ecosystem degradation accelerates, with higher education institutions (HEIs) positioned as strategic actors in driving societal transitions toward sustainability (UNESCO, 2025). HEIs hold a dual role as agents of behavioral change through education and research, while simultaneously contributing directly to the achievement of the Sustainable Development Goals (SDGs), particularly SDG 4, SDG 6, SDG 7, SDG 11, SDG 12, SDG 13, and SDG 15. This urgency is reinforced by the recognition that human activity constitutes a primary driver of environmental degradation, making the promotion of sustainable behavior essential for mitigating ecological impacts (Cai et al., 2026). To evaluate institutional sustainability performance, UI GreenMetric provides a globally recognized ranking framework based on six indicators: Setting and Infrastructure (SI), Energy and Climate Change (EC),

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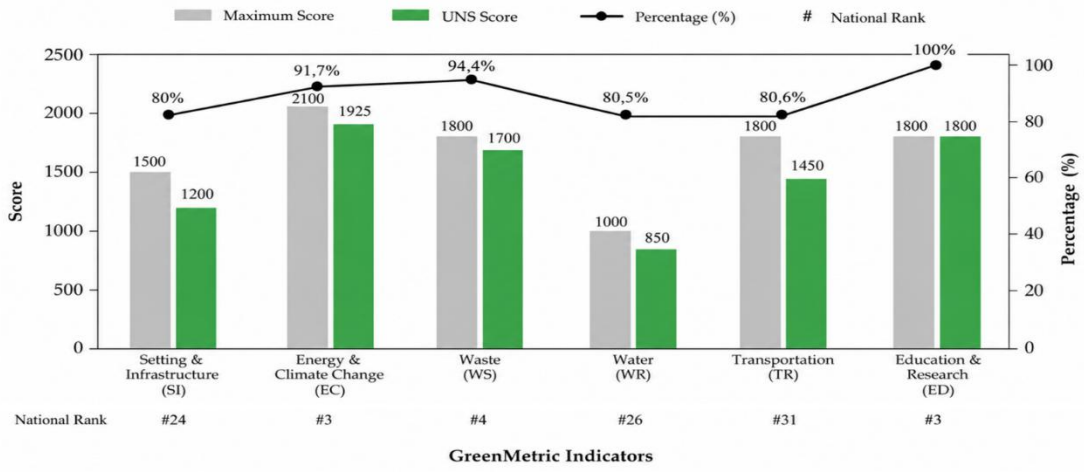
Waste (WS), Water (WR), Transportation (TR), and Education and Research (ED). In 2024, the ranking included 1,477 universities from 95 countries, highlighting the growing commitment of HEIs to sustainability and their role in fostering environmentally responsible campus communities (Gaitán-Angulo et al., 2022; Albedwawi et al., 2023). However, high institutional sustainability performance does not necessarily indicate that members of the academic community have successfully internalized sustainable behaviors. This issue is particularly relevant at Universitas Sebelas Maret (UNS), which has implemented Green Campus initiatives since 2013, evolving from three pillars (Green Rules, Green Attitude, and Green Lifestyle) to four pillars with the addition of Green Infrastructure (Nugrahaningsih et al., 2023), and achieving 6th place nationally and 39th globally in the 2025 UI GreenMetric World University Rankings. Figure 1 presents UNS's performance across the six UI GreenMetric indicators.



(Source: UI GreenMetric World University Ranking, 2025)

Figure 1. UNS Performance on UI GreenMetric World Rankings 2025 Indicators

Although UI GreenMetric provides a comprehensive institutional sustainability assessment, its aggregate ranking does not fully capture the different behavioral characteristics of its indicators. Conceptually, the six UI GreenMetric indicators can be positioned on a continuum based on the degree to which achievement is determined by institutional decisions versus the daily behavioral involvement of the academic community. This continum distinguishes institution-driven indicators (WR, SI, EC), whose sub-criteria are dominated by infrastructure provision and institutional policy; participatory indicators (WS, ED), whose effectiveness depends on both institutional foundations and active community participation; and the behavior-dependent indicator (TR), whose sub-criteria directly measure actual transportation choices and mobility patterns of individuals that cannot be optimized through facility provision alone. This behavioral dependency corresponds to what the Theory of Planned Behavior conceptualizes as perceived behavioral control, the individual's perception of the ease or difficulty of performing a behavior, reflecting not only access to external resources and facilities but also individual self-efficacy in executing the behavior (Ajzen, 2020). Despite documented institutional commitments at UNS, empirical evidence shows that these interventions do not automatically convert into student behavioral practice: participation in sustainable transportation remained low despite the implementation of Emission-Free Day policies (Handayani et al., 2024), and sustainable infrastructure at UNS has yet to be optimally utilized by the academic community (Nugrahaningsih et al., 2023). This reflects the widely documented attitude-behavior gap, where positive attitudes toward sustainability do not consistently translate

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into actual practice (Khattak et al., 2022; Mohammadi et al., 2023). Limited knowledge and insufficient integration of sustainability principles into individual daily activities have been identified as primary constraints on campus initiative effectiveness (Kaisu & Torbjörn, 2008; Puspadi et al., 2016; Gholami et al., 2020; Sun et al., 2024).

Research on the determinants of sustainable behavior has been conducted extensively, with particular emphasis on predictors such as attitude, intention, knowledge, and values (Kothe et al., 2019; Tamar et al., 2021). Nevertheless, several important research gaps remain. First, existing studies predominantly focus on pro-environmental behavior as a single ecological dimension and have not comprehensively examined the broader spectrum of sustainable behavior, including frugal, altruistic, and equitable dimensions. Second, although the Theory of Planned Behavior (TPB) has been widely applied in higher education settings (Nu'man & Noviati, 2021), previous studies have generally emphasized behavioral intention or specific environmental behaviors rather than actual multidimensional sustainable behavior. Third, prior research has rarely integrated psychological determinants with institutional sustainability frameworks, such as UI GreenMetric, to explain how institutional sustainability initiatives are translated into students' behavioral practices. Furthermore, most empirical evidence has been generated in Western contexts, limiting its applicability to higher education institutions in developing countries (Rizal & Nawanir, 2025). Consequently, limited evidence is available regarding how TPB predicts multidimensional sustainable behavior while simultaneously explaining students' perceptions of Green Campus implementation, particularly within the Indonesian higher education context.

Therefore, this study focuses on analyzing the determinants of students' sustainable behavior using a TPB framework and mapping student perceptions of UI GreenMetric indicators at UNS. This study contributes to the literature in two ways. Conceptually, it integrates TPB with a comprehensive multidimensional sustainable behavior scale extending beyond the single ecological dimension dominant in prior literature; contextually, it targets UNS students as the unit of analysis in a developing country, enabling the identification of specific and contextualized sustainable behavioral determinants.

Accordingly, this study has two objectives: (1) to analyze the influence of attitude, subjective norm, and perceived behavioral control on students' sustainable behavior across the pro-ecological, frugal, altruistic, and equitable dimensions; and (2) to map student perceptions of the six UI GreenMetric indicators to identify priority areas for Green Campus interventions at Universitas Sebelas Maret. Guided by the Theory of Planned Behavior, this study examines the extent to which TPB explains multidimensional sustainable behavior while integrating students' perceptions of institutional sustainability performance to provide a more comprehensive understanding of Green Campus implementation.

METHODS

This study employed a cross-sectional quantitative descriptive-analytical design conducted at Universitas Sebelas Maret (UNS), Surakarta, Indonesia, between January and February 2026. A total of 163 active UNS students were selected through purposive sampling based on three criteria: registered as active students, having at least one semester of campus experience, and willing to participate voluntarily. The minimum sample size was determined using a priori power analysis in G*Power 3.1 (Faul et al., 2009), with parameters of medium effect size (f^2=0.15), significance level (α=0.05), and statistical power of 0.80 for a regression model with three predictors (Cohen, 1992), yielding a minimum of 77 respondents. Sustainable behavior was measured using the (Tapia-Fonllem et al., 2013) scale, comprising 19 final items across four dimensions — pro-ecological, frugal,

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altruistic, and equitable — and TPB constructs were developed based on (Ajzen, 1991, 2020), comprising 13 final items covering attitude, subjective norm, and perceived behavioral control. Both instruments used a four-point Likert scale without a neutral option, as this approach encourages respondents to provide decisive answers and reduces central tendency bias (Budiyanto Nur & Ismail Ghoffar, 2025). Instrument validity and reliability were confirmed through two-stage testing: a pilot test (n=32) yielding Cronbach's alpha of 0.877 for the sustainable behavior scale and 0.912 for the TPB scale, and main data confirmation (n=163) yielding alpha values of 0.754 and 0.823, respectively, with all item correlations significant at $p<0.01$. An additional seven-item perception survey assessed student responses regarding the six UI GreenMetric indicators. Data were analyzed using IBM SPSS Statistics through descriptive statistics, classical assumption tests, and multiple linear regression with both dimension-level models and an aggregate model for hypothesis testing. All participants provided informed consent before participation, and data were collected anonymously to ensure confidentiality.

RESULT AND DISCUSSION

Respondent Characteristics. A total of 163 active UNS students participated in this study, drawn from 13 faculties and the Graduate School. The Faculty of Mathematics and Natural Sciences contributed the largest proportion (30%), followed by the Graduate School (12%) and the Vocational School (10%). The sample was predominantly female (56%) and concentrated in the 20-24 age group (58%), consistent with the typical demographic profile of active undergraduate students. The majority of participants were in Semester 5-6 (36%), indicating mid-program students with sufficient campus experience to evaluate Green Campus programs. Table 2 presents the complete demographic distribution.

Table 1. Demography of Respondents

Demographics	Freq	(%)	Demographics	Freq	(%)
Faculty			**Gender**		
Faculty of Mathematics and Natural Sciences	49	30	Male	71	44
Graduate School	19	12	Female	92	56
Vocational School	17	10	**Age**		
Faculty of Agriculture	16	10	< 20	53	33
Faculty of Economics and Business	13	8	20-24	94	58
Faculty of Engineering	12	7	25-29	13	8
Faculty of Education and Educational Sciences	9	6	30-39	1	1
Faculty of Psychology	6	4	>40	2	1
Faculty of Animal Science	5	3	**Semester**		
Faculty of Law	5	3	Semester 1-2	50	31
Faculty of Information Technology and Data Science	5	3	Semester 3-4	31	19

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Faculty of Cultural Studies	4	2	Semester 5-6	59	36
Faculty of Medicine	3	2	Semester 7-8	15	9
Total	163	100	>Semester 8	8	5

Source: Primary Data Processed, 2026

Descriptive Statistics. Table 2 presents the descriptive statistics for all study variables. Mean scores per item were calculated to enable valid comparison across variables with different item counts. Normality of all variables was assessed through skewness and kurtosis values, all falling within the acceptable range of ±2 (George & Mallery, 2010), confirming that the data distributions were sufficiently normal for multiple regression analysis.

All four sustainable behavior dimensions fell in the High category (2,51–3,25), with mean scores ranging from 3,04 (Frugal) to 3,17 (Pro-Ecological). Among TPB constructs, Attitude scored in the Very High category (M=3,32), while Subjective Norm (M=3,01) and Perceived Behavioral Control (M=3,19) both fell in the High category. These patterns indicate that students exhibit a favorable orientation toward sustainability, with attitude consistently being the strongest self-reported disposition, consistent with TPB theory, which positions attitude as the most proximal psychological antecedent of behavioral intention (Ajzen, 1991). The relatively lower mean for Subjective Norm (M=3,01) suggests that perceived social pressure is weaker than personal motivational factors, a pattern that foreshadows the regression results below.

Table 2. Descriptive Statistics

Variable	Items	Mean	SD	Mean Category
Sustainable Behavior				
Pro-Ecological Behavior	5	3,17	0,46	High
Frugal Behavior	5	3,04	0,41	High
Altruistic Behavior	5	3,12	0,45	High
Equitable Behavior	4	3,13	0,34	High
Theory of Planned Behavior				
Attitude	5	3,32	0,48	Very High
Subjective Norm	4	3,01	0,51	High
Perceived Behavioral Control	4	3,19	0,42	High

Category based on (Azwar, 2016): Low (X < M-1SD), Moderate (M-1SD ≤ X < M+1SD), High (X ≥ M+1SD). Scale intervals: 1.00-1.75 Very Low, 1.76-2.50 Low, 2.51-3.25 High, 3.26-4.00 Very High

Regression Analysis of the Aggregate TPB Model. Before regression analysis, classical assumption tests were conducted. VIF values for all predictors were well below 10, confirming the absence of problematic multicollinearity (Ghozali, 2016). Scatterplots of standardized residuals showed no systematic pattern of heteroscedasticity. Skewness and kurtosis of regression residuals fell within ±2 (George & Mallery, 2010), confirming residual normality. Classical assumptions were therefore fully met.

Table 3 presents the results of the aggregate multiple regression analysis examining the influence of attitude, subjective norm, and perceived behavioral control on overall sustainable behavior. The model was statistically significant ($F=60.291$, $p<0,001$), with the three TPB constructs collectively explaining 53.2% of variance in sustainable behavior ($R^2=0,532$, Adj. $R^2=0,523$).

Attitude ($\beta=0.395$, $t=5.522$, $p<0.001$) emerged as the strongest significant predictor of students' sustainable behavior. Students who evaluate environmentally responsible behaviors as personally

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valuable are more likely to enact them, a pattern consistent with evidence that sustainability attitudes among university students are positively associated with behavioral engagement across HEI contexts (Khattak et al., 2022; Mohammadi et al., 2023). However, the attitude–behavior gap cautions that high attitude scores do not guarantee behavioral execution when structural barriers are present (Kollmuss & Agyeman, 2002; Farjam et al., 2019).

Subjective Norm (β=0.099, t=1.450, p=0.149) did not significantly predict overall sustainable behavior. This finding is consistent with TPB studies on college students' green behavior where SN has similarly shown weak predictive power relative to attitude and PBC (Sousa et al., 2022). Theoretically, norm effects are stronger when behaviors are socially visible and communally performed (Barbera & Ajzen, 2020), conditions that are not characteristic of the individually executed, infrastructure-dependent sustainable behaviors predominant in the UNS campus context.

Perceived Behavioral Control (β=0.346, t=4.752, p<0.001) also significantly predicted students' sustainable behavior. PBC encompasses both self-efficacy and controllability as determinants of behavioral intention (Ajzen, 2020) and is particularly salient in campus sustainability contexts where infrastructure constraints have been empirically identified as primary barriers to behavioral enactment (Horhota et al., 2014). At UNS, where lack of facilities was the top reported barrier (Q5=31%), this dynamic is directly reflected in the regression outcome.

Table 3. Aggregate Multiple Linear Regression Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	Constanta (C)	1.273	0.140		9.115	<0.001
	Attitude	0.254	0.046	0.395	5.522	<0.001
	Subjective Norm	0.060	0.042	0.099	1.450	0.149
	Perceived Behavioral Control	0.257	0.054	0.346	4.752	<0.001
	R^2	0.532				
	Adj. R^2	0.523				
	Prob (F-statistic)	60.291				<0.001
Dependent Variable: Sustainable Behavior						

Source: Primary Data Processed, 2026

Dimensional Analysis: TPB Predictive Variation Across Sustainable Behavior Dimensions. Table 4 presents regression results across the four SB dimensions. The range of R^2 values, from 0,490 (altruistic) to 0,063 (equitable), reveals that TPB's explanatory power varies substantially by dimension. This constitutes the central empirical contribution of the study, since most prior research reports a single aggregate model and thereby masks dimensional heterogeneity (Kothe et al., 2019; Tamar et al., 2021).

For pro-ecological behavior (R^2 = 0.472), both attitude (β = 0.295, p < 0.001) and PBC (β = 0.385, p < 0.001) were significant predictors, while subjective norm was not. The stronger relative contribution of PBC over attitude is interpretable given the nature of pro-ecological behaviors: actions such as waste sorting and energy conservation are directly contingent on the availability and convenience of campus facilities, a pattern empirically documented in campus sustainability contexts where inconvenience and infrastructure constraints emerge as primary behavioral barriers (Horhota et al., 2014).

Altruistic behavior showed the strongest model fit (R^2=0,490), with all three predictors reaching significance: attitude (β=0,369, p<0,001), PBC (β=0,302, p<0,001), and uniquely, subjective

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norm (β=0,146, p<0,05). The significance of subjective norm exclusively for altruistic behavior is theoretically coherent: altruistic acts are by definition other-directed and socially visible, activating the social pressure mechanism that TPB predicts (Barbera & Ajzen, 2020; White et al., 2023).

For frugal behavior (R^2=0,185), only attitude was a significant predictor (β=0,346, p<0,001). The distinctively low model fit for this dimension highlights a crucial theoretical boundary of the Theory of Planned Behavior in a campus setting. Neither subjective norm nor PBC reached significance, consistent with evidence that frugal behavior is governed more by personal economic constraints and habits than by social pressure or perceived feasibility (Stern, 2000; Suárez et al., 2020). By connecting this statistical data to the insights of supporting literature, this study argues that frugality must be redefined in future green campus models as an 'economic-habitual mechanism' supported by structural enforcement (such as automatic timed faucets or centralized power-saving regulations), rather than merely a 'planned socio-psychological choice'.

Furthermore, when examining equitable behavior (R^2=0,063), it was the only dimension for which the model failed to reach a practically meaningful explanatory threshold, despite marginal F-significance (F=3.549, p<0,05). None of the three TPB predictors reached individual significance. This near-zero predictive capacity represents a major conceptual finding. It demonstrates that when students practice fairness, they do not calculate personal benefits or social pressures. Instead, expanding upon the moral extension frameworks of Kothe et al. (2019), equity-oriented sustainable behavior operates through mechanisms outside TPB's framework and is governed almost exclusively by internal moral imperatives and core human values. Therefore, improving equitable sustainability requires a deep curriculum transformation focused on ethics and environmental justice, rather than standard promotional campaigns.

Table 4. Multiple Regression Four Dimensions of Sustainable Behavior Results

	Pro-Ecological	Frugal	Altruistic	Equitable
Attitude (β)	0,295***	0,346***	0,369***	0,098
Subjective Norm (β)	0,114	-0,014	0,146*	0,019
PBC (β)	0,385***	0,130	0,302***	0,166
R^2	0,472	0,185	0,490	0,063
Adj. R^2	0,462	0,169	0,481	0,045
F	47.290***	12.002***	50.961***	3.549*

Note. β = standardized regression coefficient. *p<0.05; ***p<0.001. Independent variables: Attitude, Subjective Norm, Perceived Behavioral Control.
Source: Primary Data Processed, 2026

Student Perceptions of Green Campus Program. Student assessment of the Green Campus program showed a predominantly moderate-to-positive distribution, with 40% rating it as Good and 9% as Very Good, while 32% rated it as Sufficient and 17% as Poor, with 2% reporting unfamiliarity with the program (Q1). The concentration of responses in the Good and Sufficient categories indicates general awareness of the program, though the substantial Poor ratings suggest that UNS's 6th national ranking has not translated uniformly into felt student experience.

Energy and Climate Change (EC) was identified as the most impactful element on daily campus life (Q2=42%), consistent with its strong institutional performance (#3 nationally). In contrast, Waste (WS) emerged as the top priority for development (Q3=34%), despite UNS ranking 4th nationally on this indicator, suggesting that strong institutional achievement in waste management has not been internalized as felt experience by students. Setting and Infrastructure (SI) appeared as both the second most impactful element (Q2=26%) and the second priority for

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improvement (Q3=23%), indicating a persistent perception gap between physical campus conditions and student expectations.

Campus policy was identified as the most influential factor shaping student environmental behavior (Q4=35%), followed by peers (29%), while 20% reported no influential party, indicating that social norms supporting sustainable behavior remain underdeveloped in the campus environment. Lack of facilities was the primary barrier identified (Q5=31%), followed by an unsupportive social environment (25%), with these two external barriers cumulatively comprising 56% of responses. Students' self-reported lack of facilities as the primary barrier reflects diminished perceived behavioral controllability when physical infrastructure is insufficient, consistent with the TPB premise that PBC is partly determined by actual control conditions in the environment (Horhota et al., 2014; Ajzen, 2020), and directly corroborating the regression finding that PBC is a significant predictor of pro-ecological behavior.

Regarding specific behaviors, bringing a personal tumbler was the most frequently practiced sustainable behavior (Q6=58%), reflecting a low-barrier, individually executable action with minimal infrastructure dependence. Sustainable transportation was identified as both the least practiced (Q6=6%) and the most difficult behavior (Q7=44%), a high-barrier, infrastructure-dependent behavior where perceived behavioral control is most constrained, consistent with TR's poor national GreenMetric ranking (#31).

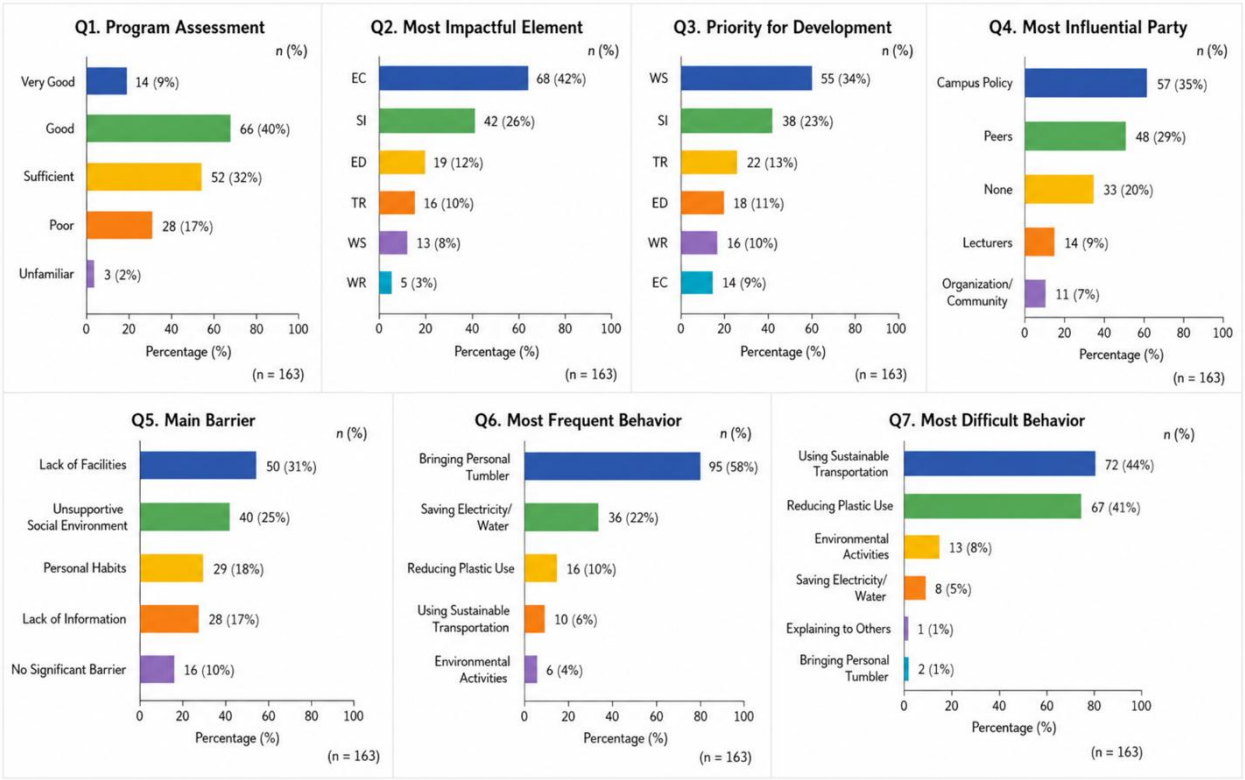

Figure 2. Student Perceptions of Green Campus Program

Institutional Achievement and Student Behavior Gap. Figure 2 integrates GreenMetric performance data with student perception responses to map the structural divergence between institutional achievement and student lived experience. Patterns vary systematically by indicator

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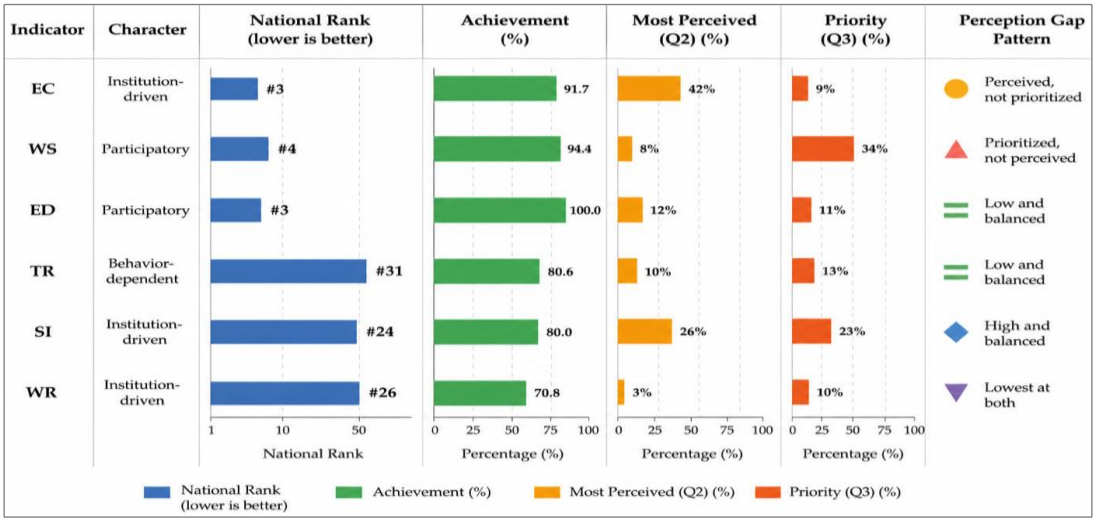
character, confirming that the institution-driven versus behavior-dependent classification has diagnostic value.

Energy and Climate (EC) exhibits the sharpest inverse between institutional performance and student prioritization. Despite ranking #3 nationally with 91.7% achievement, EC is identified as a priority by only 9% of students (Q3) while perceived as most impactful by 42% (Q2). This perceived, not prioritized pattern indicates that students recognize EC as the campus's strongest current achievement and therefore assign it lower urgency. Communication and maintenance remain warranted, but resource allocation urgency is lower relative to other indicators.

Waste (WS) presents the mirror-image pattern. Despite UNS ranking #4 nationally in waste management with 94.4% achievement, only 8% of students perceive it as impactful on their daily lives (Q2), while 34% identify it as the top priority for improvement (Q3). This Prioritized, not perceived pattern reveals a critical communication and visibility gap: high institutional performance is not reaching students as lived experience. This finding is consistent with evidence that participatory sustainability achievements require active communication strategies embedded in student routines (Weiss et al., 2021).

Transportation (TR) presents the most analytically convergent pattern in the dataset. Institutionally, TR ranks #31 nationally, the weakest of all six indicators at 80.6%. Behaviorally, sustainable transportation is the most difficult behavior to practice (Q7, 44%). In the regression analysis, PBC is a significant aggregate predictor, and lack of facilities is the top reported barrier (Q5, 31%). TR thus represents the intersection of institutional underperformance, behavioral constraint, and psychological uncontrollability, the highest-priority intervention target for any evidence-based Green Campus strategy.

Education and Research (ED) and Setting and Infrastructure (SI) show balanced low-to-moderate perception scores, reflecting neither acute gaps nor particularly salient achievements in student experience. Water (WR) shows the lowest perception scores on both Q2 (3%) and Q3 (10%) despite ranking #26 nationally, suggesting that water-related sustainability remains largely invisible in students' daily experience.



Note. Most Perceived (Q2) = percentage selecting indicator as most impactful on daily campus life. Priority (Q3) = percentage selecting indicator as most needing improvement.
Source: Primary Data Processed, 2026; GreenMetric Ranking Data: UI GreenMetric 2025

Figure 3. Gap between Institutional Achievement and Student Perceptions per GreenMetric Indicator

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CONCLUSION

In direct alignment with the two objectives of this study, two main conclusions and their practical implications can be drawn. First, regarding the socio-psychological determinants of sustainable behavior (Objective 1), sustainable behavior among university students is not a psychologically homogeneous construct. Attitude and perceived behavioral control consistently predict pro-ecological and altruistic behaviors but fail to adequately explain frugal and equitable behaviors, indicating that distinct psychological mechanisms drive different sustainability dimensions. The consistently high attitude scores further suggest that students are already positively disposed toward sustainability, implying that the primary barriers to behavioral engagement lie less in motivation than in contextual and institutional conditions. Accordingly, universities should continue strengthening environmental education, sustainability co-curricular activities, and experiential learning to maintain positive attitudes while complementing these efforts with educational approaches that foster distributive fairness, environmental justice, and moral value development to support equitable behavior.

Second, regarding the institutional implementation of Green Campus (Objective 2), the findings reveal a structural gap between institutional performance and students' lived experiences. Although UNS demonstrates strong institutional performance in waste management and energy initiatives, these achievements are not yet fully reflected in students' everyday campus experiences. In contrast, sustainable transportation remains the weakest aspect, simultaneously representing the lowest institutional performance, the greatest perceived behavioral difficulty, and the strongest constraint on perceived behavioral control. These findings indicate that transportation infrastructure offers the greatest leverage for simultaneously improving student sustainable behavior and institutional sustainability performance. Therefore, campus management should prioritize the optimization of sustainable transportation systems, including the revitalization of campus shuttle services, continuous maintenance of bicycle lanes, and policies that encourage sustainable mobility. At the same time, waste management initiatives require greater visibility through participatory communication and routine-based engagement strategies so that existing institutional achievements become more recognizable and meaningful in students' daily campus life.

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PUBLISHING KSI
• ISSN 2720 - 9644 (print)
• ISSN 2721 - 0877 (online)
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