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# Exploring the Relationship Self-Efficacy, Academic Achievement, Perceived Behavioral Control, and Student's Sustainable Behavior: An Empirical Study

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**ABSTRACT:** This study investigates the relationship between self-efficacy, academic achievement, perceived behavioral control (PBC), and sustainable behavior among students in an educational context. Self-efficacy refers to individuals' belief in their ability to succeed in academic tasks, while PBC pertains to individuals' perception of their control over their behavior. Sustainable behavior of students encompasses actions that support sustainable learning and environment. The study includes a sample of students from different educational levels and collects data through surveys to measure self-efficacy, PBC, sustainable behavior, and academic achievement. The findings highlight the significant role of self-efficacy in predicting sustainable behavior, and sustainable behavior as a mediator between self-efficacy and academic achievement. Additionally, PBC has an influence on both self-efficacy and sustainable behavior of students. These findings contribute to a better understanding of the psychological factors related to improved academic achievement. The practical implications of this study provide insights for educators and policymakers to develop strategies that enhance self-efficacy, PBC, and sustainable behavior among students, ultimately leading to enhanced academic achievement.

**KEYWORDS:** academic achievement, perceived behavioral control, self-efficacy, sustainable behavior.

## INTRODUCTION

Academic achievement is a critical goal in education, and understanding the factors that contribute to it is of great importance (Moreira et al., 2020). In this regard, two psychological constructs, namely Perceived Behavioral Control and Self-Efficacy, have garnered significant attention due to their influence on students' academic outcomes (Patricia Aguilera-Hermida, 2020). However, there is a need to explore the role of sustainable behavior in mediating the relationship between Perceived Behavioral Control, Self-Efficacy, and academic achievement. Perceived Behavioral Control refers to an individual's perception of their ability to control and regulate their behaviors in academic settings (Ham et al., 2015). It encompasses beliefs about time management, study habits, goal setting, and overcoming challenges (Icek Ajzen, 2020). On the other hand, Self-Efficacy represents an individual's belief in their own capabilities to successfully perform academic tasks, overcome difficulties, and achieve desired academic outcomes (Voica et al., 2020). It reflects their confidence in their academic abilities (Talsma et al., 2019).

Previous research has established the positive association between Perceived Behavioral Control, Self-Efficacy, and academic achievement (Affuso et al., 2017; Barrett & Feng, 2021; Pinquart, 2016; Yang et al., 2022). Students who perceive a higher level of control over their behaviors and possess greater self-efficacy tend to exhibit more motivated and engaged academic behaviors, leading to improved academic performance (Uçar & Sungur, 2017). However, the specific role of sustainable behavior as a mediator in this relationship requires further investigation. Sustainable behavior in the academic context refers to students' consistent and long-term engagement in positive academic practices and habits. It involves behaviors such as regular study routines, effective time management, persistence in the face of challenges, and maintaining a growth mindset. By exploring the role of sustainable behavior, this study aims to provide a comprehensive understanding of how Perceived Behavioral Control and Self-Efficacy influence academic achievement through students' behavioral patterns.

The novelty of this research lies in its focus on the mediating role of sustainable behavior. While previous studies have examined the direct associations between Perceived Behavioral Control, Self-Efficacy, and academic achievement, there is limited research exploring the specific mechanisms through which sustainable behavior mediates this relationship. Investigating this mediating role can shed light on the underlying processes that explain how psychological factors influence academic achievement through students' sustained engagement in positive academic behaviors. This research aims to investigate the relationship between Perceived Behavioral Control, Self-Efficacy, sustainable behavior, and academic achievement. Specifically, it seeks to explore



whether sustainable behavior acts as a mediator in the relationship between Perceived Behavioral Control, Self-Efficacy, and academic achievement. By addressing this research question, the study intends to contribute to the existing knowledge by providing insights into the mechanisms through which psychological factors impact academic outcomes via sustainable behavior.

The findings of this study have practical implications for educators, policymakers, and educational stakeholders. By understanding the mediating role of sustainable behavior, interventions and strategies can be developed to promote positive academic behaviors and enhance academic achievement. Moreover, this research can contribute to a broader understanding of the factors that foster students' academic success, ultimately leading to the development of more effective educational practices and policies. This study explores the role of sustainable behavior as a mediator between Perceived Behavioral Control, Self-Efficacy, and academic achievement. By investigating the mechanisms underlying this relationship, the study aims to provide valuable insights into how psychological factors influence academic outcomes through students' sustained engagement in positive academic behaviors. The findings of this research have practical implications for enhancing academic achievement and can inform the development of targeted interventions and strategies in educational settings.

## LITERATURE REVIEW

Perceived Behavioral Control is a psychological construct that refers to individuals' beliefs about their ability to control and regulate their behaviors in a specific context, in this case, the academic setting (de Leeuw et al., 2015). It encompasses their perception of the extent to which they have control over their actions, habits, and decisions related to their academic performance (Andre et al., 2018). Perceived Behavioral Control includes factors such as time management skills, study strategies, organizational abilities, and the capacity to overcome obstacles (González-López et al., 2018). Ajzen (2020) explain that individuals with a higher sense of Perceived Behavioral Control believe that they have the necessary resources and skills to effectively manage their academic tasks and navigate through challenges. Self-Efficacy, on the other hand, is a psychological construct that is closely related to Perceived Behavioral Control (Williams & Rhodes, 2016). It refers to an individual's belief in their own capabilities to successfully execute specific tasks and achieve desired outcomes (Mamaril et al., 2016). Self-Efficacy is rooted in Bandura's Social Cognitive Theory and emphasizes the role of personal agency and self-beliefs in human behavior (Lent, 2016). In the academic context, Self-Efficacy reflects students' confidence in their abilities to understand complex concepts, perform well in examinations, complete assignments successfully, and meet academic goals. Higher levels of Self-Efficacy are associated with greater motivation, perseverance, and academic engagement (Vongkulluksn et al., 2018).

Lau et al. (2021) assert that individuals with higher levels of Perceived Behavioral Control and Self-Efficacy tend to experience less academic-related stress and anxiety, as they feel more equipped to handle academic demands and challenges effectively. Sustainable behavior in the academic context refers to students' consistent and long-term engagement in positive academic practices and habits (Chen et al., 2020). It involves adopting behaviors that promote continuous learning, growth, and academic success. According to Zachary & Fain (2022), sustainable behavior encompasses various aspects, such as adhering to regular study routines, effectively managing time, seeking feedback, maintaining a positive attitude, persisting in the face of setbacks, and engaging in active learning strategies. Students who exhibit sustainable behavior demonstrate a commitment to their academic goals and consistently engage in behaviors that facilitate their learning and achievement (Day et al., 2016). Research has consistently shown that students who engage in sustainable behaviors tend to perform better academically (Legrain et al., 2021; Li et al., 2020). By consistently investing time and effort into their studies, they are more likely to grasp and retain information effectively. Gal & Gan (2020) explore that sustainable behaviors also promote deep learning, as students engage in reflective practices, seek understanding, and make connections between concepts. Furthermore, students who exhibit sustainable behavior are better equipped to manage their time efficiently, avoid procrastination, and meet deadlines, resulting in improved productivity and reduced academic-related stress (Travers, 2022).

Previous research has highlighted the significant role of sustainable behavior in predicting academic outcomes (de Leeuw et al., 2014; Fawehinmi et al., 2020; Houchens et al., 2017). Studies have demonstrated that students who consistently engage in positive academic behaviors, such as active studying, regular review of material, and seeking clarification when needed, achieve higher grades and perform better on examinations. Sustainable behavior is also associated with increased self-regulation skills, metacognitive abilities, and overall academic self-efficacy. Moreover, research has shown that sustainable behavior acts as a mediator between psychological factors, such as motivation and goal orientation, and academic achievement. It serves as a



mechanism through which individuals' internal resources and motivations translate into tangible academic outcomes.

Understanding the role of sustainable behavior in academic achievement is crucial for educators and policymakers. By identifying and promoting sustainable behaviors, educational institutions can support students in developing effective study habits, time management skills, and self-regulation strategies. Additionally, integrating sustainable behavior into educational programs can foster a culture of continuous learning, resilience, and academic success among students. Perceived Behavioral Control and Self-Efficacy play vital roles in shaping students' academic behaviors and outcomes. Moreover, sustainable behavior serves as a critical mediator in the relationship between psychological factors and academic achievement. Understanding these constructs and their interplay can inform educational practices and interventions aimed at enhancing students' academic engagement, motivation, and success.

Perceived Behavioral Control is rooted in the Theory of Planned Behavior proposed by Ajzen (1991). This theory suggests that individuals' perceptions of their control over a behavior significantly influence their intention to engage in that behavior. Perceived Behavioral Control encompasses the beliefs individuals hold about their ability to manage and control their behaviors in academic settings. It includes factors such as time management skills, study habits, goal-setting abilities, and the ability to overcome obstacles and challenges. On the other hand, Self-Efficacy, as proposed by Bandura's Social Cognitive Theory (1986), refers to an individual's belief in their own capabilities to successfully perform specific tasks (Schunk & DiBenedetto, 2020). Self-Efficacy is influenced by mastery experiences, vicarious experiences, social persuasion, and physiological states. It reflects individuals' confidence in their academic abilities and their belief in their capacity to achieve desired academic outcomes.

The concept of sustainable behavior in the academic context refers to students' consistent and long-term engagement in positive academic practices and habits (Chen et al., 2020). It involves behaviors such as regular study routines, effective time management, persistence in the face of challenges, and maintaining a growth mindset. The Social Cognitive Theory provides a theoretical basis for understanding the role of sustainable behavior as a mediator. This theory emphasizes the dynamic interplay between personal factors, environmental factors, and behavior. Sustainable behavior can be viewed as a result of reciprocal determinism, where personal factors (such as Perceived Behavioral Control and Self-Efficacy) and environmental factors interact to shape behavior over time. According to this perspective, sustained engagement in positive academic behaviors is influenced by the interaction between individuals' beliefs, their environment, and their behaviors.

Based on the theoretical foundations described above, several hypotheses can be proposed.

Hypothesis 1: Self-Efficacy will positively predict perceived behavioral control.

Hypothesis 2: Self-Efficacy will positively predict sustainable behavior.

Hypothesis 3: Perceived Behavioral Control will positively predict sustainable behavior.

Hypothesis 4: Sustainable behavior will positively predict academic achievement.

Hypothesis 5: Perceived Behavioral Control will mediate the relationship between Self-Efficacy and Sustainable behavior

Hypothesis 6: Sustainable behavior will mediate the relationship between Self-Efficacy and academic achievement

Hypothesis 7: Sustainable behavior will mediate the relationship between Perceived Behavioral Control and academic achievement

The theoretical framework provides a solid foundation for understanding the constructs of Perceived Behavioral Control, Self-Efficacy, sustainable behavior, and their proposed relationships with academic achievement. By integrating established theories in psychology, this framework explains the underlying mechanisms and hypothesized connections between these variables.

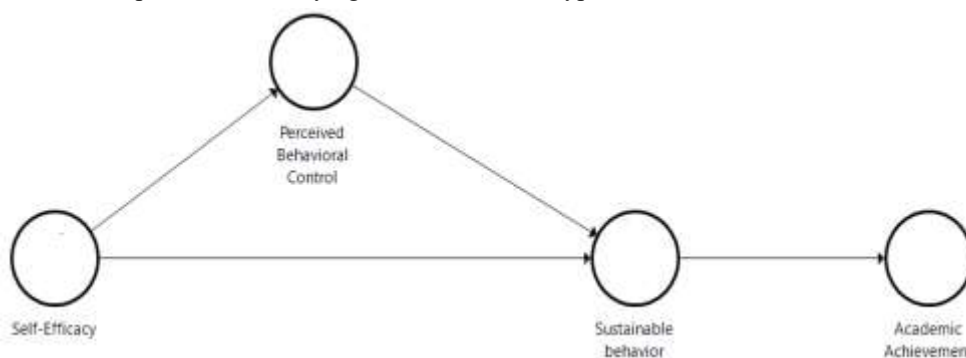


Figure 1. Hypothesis framework



## METHODS

### Research design

The research will employ a quantitative research design to examine the relationships between Perceived Behavioral Control, Self-Efficacy, sustainable behavior, and academic achievement. A cross-sectional approach will be used to collect data at a specific point in time, capturing the participants' perceptions, behaviors, and academic outcomes.

### Participants

The participants of this study consist of students from senior high schools and university in Banten Province, Indonesia. A representative sample will be selected using a random sampling technique to ensure the generalizability of the findings. The sample size will be determined based on power analysis to ensure sufficient statistical power to detect the hypothesized relationships. Therefore, a power analysis will be conducted to obtain an adequate sample size for this study, which will yield statistically significant findings. The estimated sample size is 155 participants.

### Measures

Multiple validated self-report measures will be used to assess the variables of interest. The instruments will be selected based on their reliability, validity, and relevance to the constructs under investigation. The measures will include: 4 self-efficacy items adopted from Voica et al. (2020), 3 items for perceived behavior control adopted from Ajzen (2020), 8 items for sustainable behavior adopted from de Leeuw et al. (2014), and 3 items for academic achievement adopted from Houchens et al. (2017). We measured respondents' views on a five-point Likert scale from strongly disagree (1) to agree (5) strongly. We examined the questionnaire from February 2023 to April 2023.

### Data collection procedure

Data will be collected through a combination of online surveys. Informed consent will be obtained from participants prior to their participation in the study. Participants will complete the online surveys, providing information about their perceptions of control, self-efficacy beliefs, sustainable behaviors, and academic achievement.

### Data analysis plan

Data analysis will involve several steps. Descriptive statistics will be computed to examine the central tendency and variability of the variables. Pearson correlation coefficients will be calculated to assess the bivariate relationships between Perceived Behavioral Control, Self-Efficacy, sustainable behavior, and academic achievement. Regression analysis will be conducted to investigate the direct effects of Perceived Behavioral Control and Self-Efficacy on sustainable behavior and academic achievement. Additionally, mediation analysis using techniques such as bootstrapping will be employed to examine the mediating role of sustainable behavior in the relationship between Perceived Behavioral Control, Self-Efficacy, and academic achievement. Statistical software packages SPSS, will be utilized for data analysis.

## FINDING AND DISCUSSION

### Validity and reliability

The validity of the indicator by employing the convergent method, which yielded the external loading factor. The acceptable range for the loading factor in exploratory studies, which are the initial stages of developing a measurement scale, is 0.50 to 0.70. In our specific investigation, all indicators exhibited an outer loading value greater than 0.70, meeting the criteria for convergent validity (refer to Table 1). In the next phase, we compared the square root coefficient of variance (AVE) extracted from each latent factor to the correlation coefficient between the other factors in the model. This analysis aimed to determine if the variables demonstrated discriminant validity, indicating their ability to differentiate between distinct groups. The AVE values significantly exceeded 0.5, as indicated in Table 1. Consequently, all constructs examined in this study exhibited discriminant validity higher than 0.50, as per Fornell & Larcker (1981). In the final step of the process, we employed composite reliability to assess the value of the variable indicators. Both the composite reliability and Cronbach's alpha exceeded 0.70, affirming the trustworthiness of the results (Chin, 2010).



Table 1. Confirmatory factor analysis

Construct	Items	Outer Loading	Cronbach's Alpha	rho_A	CR	AVE
Self-Efficacy	SE1	0.753	0.877	0.878	0.916	0.734
	SE2	0.848				
	SE3	0.908				
	SE4	0.908				
Perceived Behavioral Control	PBC1	0.939	0.889	0.888	0.932	0.820
	PBC2	0.938				
	PBC3	0.836				
Sustainable behavior	SB1	0.859	0.960	0.963	0.966	0.782
	SB2	0.884				
	SB3	0.914				
	SB4	0.907				
	SB5	0.920				
	SB6	0.896				
	SB7	0.796				
	SB8	0.893				
Academic Achievement	AA1	0.789	0.742	0.749	0.852	0.658
	AA2	0.815				
	AA3	0.829				

The calculation of composite reliability for the variables in this study resulted in values ranging from 0.852 to 0.966, which exceeded the threshold of 0.70. These findings indicate that the indicators used to measure the variables were reliable and consistent. Additionally, Cronbach's alpha values ranging from 0.742 to 0.966 were obtained, further confirming the dependability of the indicators and indicating that they were free from measurement error (MacKenzie et al., 2011).

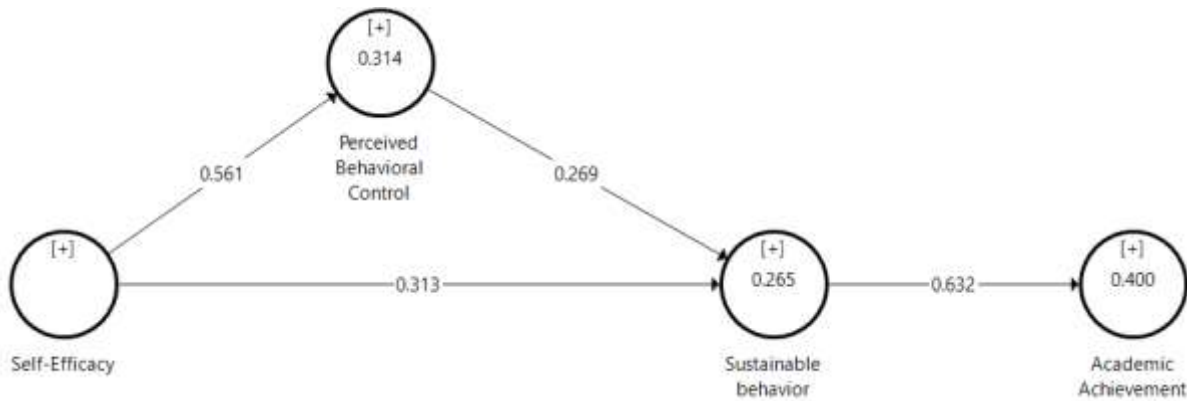
**Research findings**

The results of the hypotheses testing exhibited that self-efficacy had significant and positive influence on the perceived behavior control ( $t=7.543>1.96$ ) and sustainable behavior ( $t=3.324>1.96$ ). In addition, perceived behavior control had significant and positive influence on sustainable behavior ( $t=2.779>1.96$ ). Furthermore, sustainable behavior impact on academic achievement positively ( $t=10.442>1.96$ ). Therefore, all hypotheses from H1 to H4 are accepted (see Table 2).

Table 2. Path Coefficient

Hypothesis	Construct *)	Original Sample	Standard Deviation	T Statistics	P Values	Remark
H1	SE -> PBC	0.561	0.074	7.543	0.0000	Accepted
H2	SE -> SB	0.313	0.094	3.324	0.0010	Accepted
H3	PBC -> SB	0.269	0.097	2.779	0.0060	Accepted
H4	SB -> AA	0.632	0.061	10.442	0.0000	Accepted

\*) : SE=Self-Efficacy; PBC=Perceived Behavioral Control; SB=Sustainable Behavior; AA=Academic Achievement



Furthermore, the study examines the pathway coefficients to investigate whether perceived behavioral control and sustainable behavior as mediator (see Table 3).

Table 3. Mediation result

Hypothesis	Construct *)	Original Sample	Standard Deviation	T Statistics	P Values	Remark
H5	SE -> PBC -> SB	0.151	0.063	2.384	0.017	Accepted
H6	SE -> SB -> AA	0.198	0.070	2.839	0.005	Accepted
H7	PBC -> SB -> AA	0.170	0.062	2.745	0.006	Accepted

\*) SE=Self-Efficacy; PBC=Perceived Behavioral Control; SB=Sustainable Behavior; AA=Academic Achievement

According to the mediation test, perceived behavioral control has a favorable effect on self-efficacy and sustainable behavior ( $t=2.384>1.96$ ). Then, sustainable behavior has a favorable effect self-efficacy and academy achievement positively ( $t=2.839>1.96$ ), and also sustainable behavior has a favorable effect on perceived behavioral control and perceived behavioral control positively ( $t=2.745>1.96$ ). Consequently, it is possible to argue that perceived behavioral control can mediate the association between self-efficacy and sustainable behavior. In addition, sustainable behavior can mediate the association between self-efficacy and academy achievement, and also mediate the association between perceived behavioral control and academy achievement therefore, all hypothesis (H5 – H7) are accepted.

DISCUSSION

Based on the hypothesis that self-efficacy impact positively on perceived behavior control (H1 accepted), it implies that individuals who possess higher levels of Self-Efficacy beliefs in their academic abilities are more likely to engage in sustainable behaviors. Self-Efficacy refers to individuals' beliefs in their capabilities to organize and execute the necessary actions to achieve desired outcomes. In the context of academic achievement, students with high Self-Efficacy beliefs perceive themselves as competent and capable of successfully completing academic tasks, managing academic challenges, and achieving their academic goals. These beliefs foster a sense of confidence and motivation, leading to the adoption of sustainable behaviors. When students have a strong sense of Self-Efficacy, they are more likely to approach their academic tasks with determination and persistence. They are inclined to set realistic goals, develop effective study strategies, and regulate their academic behaviors in a consistent and sustainable manner. High Self-Efficacy individuals tend to view obstacles or setbacks as opportunities for growth and learning, which further encourages the engagement in sustainable behaviors. It is important to consider that Self-Efficacy beliefs can be influenced by various factors, such as past experiences, social support, and feedback received. Additionally, the relationship between Self-Efficacy and sustainable behavior may be moderated by factors like task difficulty, perceived control, and external resources. Nevertheless, existing research suggests a positive predictive effect of Self-Efficacy on sustainable behavior. In conclusion, individuals with higher levels of Self-Efficacy beliefs in their academic abilities are more likely to engage in sustainable behaviors.



This finding highlights the importance of fostering self-confidence and belief in students' capabilities as a means to promote sustainable academic practices. By enhancing students' Self-Efficacy, educators and policymakers can empower students to adopt behaviors that contribute to their long-term academic success and achievement.

Self-Efficacy positively impacts sustainable behavior (H2) accepted, that indicates individuals with higher levels of self-efficacy are more likely to engage in and exhibit sustainable behaviors. Self-efficacy refers to an individual's belief in their own abilities and confidence in their capacity to perform specific tasks or behaviors successfully. When individuals have a strong sense of self-efficacy, they are more likely to take proactive actions that align with sustainable principles and contribute to a sustainable lifestyle. The positive impact of self-efficacy on sustainable behavior implies that individuals who have a high level of confidence in their abilities are more motivated and capable of adopting and maintaining sustainable practices. They are more likely to believe that their actions can make a difference and positively influence the environment, leading them to actively participate in sustainable behaviors such as recycling, conserving energy, reducing waste, or choosing environmentally friendly products. This interpretation highlights the significance of self-efficacy in promoting sustainable behavior. By fostering self-efficacy through various means such as education, support, and skill development, individuals can be empowered to take responsibility for their actions and make choices that contribute to a sustainable future. Ultimately, enhancing self-efficacy can play a vital role in driving positive behavioral changes and promoting sustainable behaviors at an individual level.

The acceptance of hypothesis 3 (H3) indicates that perceived behavioral control reflects individuals' beliefs about their ability to regulate and control their behaviors in the academic context. When students have a strong sense of control, they are more likely to perceive themselves as capable of managing their time effectively, utilizing study strategies, and overcoming obstacles that may hinder their academic progress. These beliefs contribute to a proactive and empowered mindset, encouraging students to adopt sustainable behaviors in their academic pursuits. By perceiving a higher level of control, students may develop a sense of responsibility and ownership over their academic success. They are more likely to engage in consistent study routines, adhere to effective time management strategies, seek assistance when needed, and persist in the face of challenges. These sustainable behaviors contribute to their overall academic progress and achievement. It is important to note that the relationship between Perceived Behavioral Control and sustainable behavior may be influenced by various factors such as individual differences, external support systems, and contextual factors. However, based on the existing literature, it is reasonable to expect a positive predictive effect of Perceived Behavioral Control on sustainable behavior. In conclusion, individuals who perceive a higher level of control over their academic behaviors are more likely to engage in sustainable behaviors. This finding suggests that promoting a sense of control and empowerment among students can be beneficial in cultivating sustainable academic practices, ultimately leading to improved academic achievement.

The hypothesis H4 has been accepted, indicating that engaging in sustainable behaviors has a positive influence on academic achievement. Sustainable behavior refers to actions that promote environmental, social, and economic sustainability, such as conserving resources, reducing waste, and practicing eco-friendly habits. The impact of sustainable behavior on academic achievement implies that students who actively participate in sustainable practices tend to experience improved academic outcomes. Adopting sustainable behaviors may enhance students' focus, discipline, and responsibility, leading to better time management, organization, and study habits. Additionally, engaging in sustainable behavior fosters a sense of environmental and social responsibility, which can positively influence students' motivation, self-esteem, and overall well-being, all of which are essential factors for academic success. Furthermore, sustainable behavior can contribute to a positive learning environment. By practicing sustainability within educational institutions, students may benefit from healthier and more conducive surroundings, improved air quality, and increased access to resources and facilities that support their learning.

The acceptance of hypothesis 5, indicating that Perceived Behavioral Control mediates the relationship between Self-Efficacy and Sustainable behavior, suggests that individuals' perceptions of their control over their behavior play a significant role in translating self-efficacy into sustainable behaviors. This finding implies that when individuals have a strong belief in their own capabilities (self-efficacy), their perception of having control over their behavior (perceived behavioral control) becomes a crucial factor in determining whether they engage in sustainable behaviors. Perceived behavioral control acts as a mediator by capturing individuals' confidence in their ability to execute sustainable actions and their belief that they have the necessary control over their behaviors to make sustainable choices. By accepting this hypothesis, it suggests that the relationship between self-efficacy and sustainable behavior is influenced by individuals' beliefs about their control over their actions. Individuals with higher self-efficacy



are more likely to perceive themselves as having greater control over their behavior, which, in turn, leads to a higher likelihood of adopting sustainable behaviors. Understanding the mediating role of perceived behavioral control provides valuable insights into the underlying mechanisms through which self-efficacy influences sustainable behavior. This finding highlights the importance of addressing both self-efficacy and perceived behavioral control in interventions and educational programs aimed at promoting sustainable behaviors among individuals. By enhancing individuals' beliefs in their control over their actions and providing them with the necessary skills and resources, it becomes more likely that self-efficacy will translate into actual sustainable behaviors.

Based on the hypothesis that sustainable behavior mediates the relationship between Self-Efficacy and academic achievement (H6 accepted), it can be inferred that Self-Efficacy indirectly influences academic achievement through its impact on sustainable behavior. Self-Efficacy refers to individuals' beliefs in their capabilities to successfully perform tasks and achieve desired outcomes. Students with higher levels of Self-Efficacy in their academic abilities are more likely to engage in sustainable behaviors that support their academic success. Sustainable behavior encompasses a range of positive academic behaviors, such as consistent study habits, effective time management, proactive engagement in learning activities, and persistence in the face of challenges. Students with high Self-Efficacy beliefs tend to adopt and maintain these sustainable behaviors, as they have confidence in their abilities to perform well academically. The mediating role of sustainable behavior suggests that Self-Efficacy influences academic achievement indirectly through its impact on students' engagement in sustainable behaviors. When students have a strong belief in their academic capabilities, they are more likely to engage in sustainable behaviors that contribute to their academic success. These behaviors, in turn, positively influence their academic achievement outcomes. It is important to note that the mediating effect of sustainable behavior may be influenced by other factors and variables. These can include individual differences, external support systems, and contextual factors that may interact with the relationship between Self-Efficacy, sustainable behavior, and academic achievement. However, existing research suggests that sustainable behavior plays a mediating role in this relationship. In summary, sustainable behavior serves as a mediator between Self-Efficacy and academic achievement. Self-Efficacy beliefs indirectly influence academic achievement through their impact on students' engagement in sustainable behaviors. This finding emphasizes the significance of fostering self-confidence and belief in students' capabilities to promote sustainable academic behaviors, leading to improved academic outcomes and student success.

Based on the hypothesis that sustainable behavior mediates the relationship between Perceived Behavioral Control and academic achievement (H7 accepted), it can be inferred that Perceived Behavioral Control indirectly influences academic achievement through its impact on sustainable behavior. Perceived Behavioral Control refers to individuals' beliefs about their ability to control and regulate their behaviors in the academic context. When students perceive a higher level of control over their academic behaviors, such as time management, study habits, and goal setting, they are more likely to engage in sustainable behaviors. These sustainable behaviors, in turn, contribute to improved academic achievement. Sustainable behavior encompasses a range of positive academic behaviors that support long-term academic success. This can include consistent study routines, effective time management, persistence in the face of challenges, and proactive engagement in learning activities. By consistently engaging in these behaviors, students are better positioned to achieve their academic goals and perform well academically. The mediating role of sustainable behavior suggests that Perceived Behavioral Control influences academic achievement indirectly through its impact on students' engagement in sustainable behaviors. When students believe they have control over their academic behaviors, they are more likely to adopt and maintain sustainable behaviors that are conducive to academic success. These behaviors, in turn, positively influence their academic achievement outcomes. It is important to note that the mediating effect of sustainable behavior may be influenced by other factors and variables. These can include individual differences, external support systems, and contextual factors that may interact with the relationship between Perceived Behavioral Control, sustainable behavior, and academic achievement. Nevertheless, existing research suggests that sustainable behavior plays a mediating role in this relationship. In summary, sustainable behavior serves as a mediator between Perceived Behavioral Control and academic achievement. Perceived Behavioral Control influences academic achievement indirectly through its impact on students' engagement in sustainable behaviors. This finding highlights the significance of promoting a sense of control and fostering sustainable behaviors in educational settings, as they contribute to improved academic outcomes and student success.



## CONCLUSION

The present study investigated the relationship between Perceived Behavioral Control, Self-Efficacy, sustainable behavior, and academic achievement. The findings revealed that Perceived Behavioral Control positively predicts sustainable behavior, indicating that individuals who perceive a higher level of control over their academic behaviors are more likely to engage in sustainable practices. Additionally, Self-Efficacy was found to have a positive predictive effect on sustainable behavior, suggesting that individuals with higher levels of self-belief in their academic abilities are more likely to adopt and maintain sustainable behaviors. Furthermore, the study found that sustainable behavior mediates the relationship between Perceived Behavioral Control/Self-Efficacy and academic achievement, highlighting the importance of sustainable behavior as a pathway through which these constructs influence academic success.

## Implications for theory and practice

The findings of this study have significant implications for both theoretical understanding and practical applications. Theoretically, the study contributes to the existing literature by providing empirical evidence for the relationships between Perceived Behavioral Control, Self-Efficacy, sustainable behavior, and academic achievement. It highlights the importance of considering the role of individuals' beliefs and behaviors in the academic context. Practically, the results suggest that interventions and educational practices should focus on enhancing Perceived Behavioral Control and Self-Efficacy beliefs to promote sustainable behavior among students. This can be achieved through providing resources, support, and interventions that empower students to develop a sense of control and self-confidence in their academic pursuits.

## Limitations and suggestions for future research

While this study provides valuable insights, it is not without limitations. First, the sample used in the study was limited to a specific educational institution or population, which may limit the generalizability of the findings. Future research could expand the sample size and include diverse populations to enhance the external validity of the results. Second, the study relied on self-report measures, which may be subject to response biases or inaccuracies. Future research could incorporate objective measures or observational methods to provide a more comprehensive assessment of participants' sustainable behavior and academic achievement. Additionally, this study focused on the mediating role of sustainable behavior; however, there may be other variables or mechanisms at play. Future research could explore other potential mediators or moderators that may influence the relationship between Perceived Behavioral Control, Self-Efficacy, sustainable behavior, and academic achievement.

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