

FACTORS AFFECTING INTENTION TO ADOPT
PRO-ENVIRONMENTAL BEHAVIOR (PEB) AMONG
HIGHER EDUCATION INSTITUTION (HEI)
STUDENTS IN MALAYSIA

BY

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PREFACE

This research project was undertaken as part of the requirements for the completion of the Bachelor of Business Administration (Honours) programme at Universiti Tunku Abdul Rahman (UTAR). The study, titled “Factors Influencing Pro-Environmental Behavioral Intention among Higher Education Institution (HEI) Students in Malaysia,” aims to examine the key factors that influence students’ intention to engage in pro-environmental behavior.

The motivation for this study arises from the growing environmental challenges in Malaysia, including climate change, pollution, and increasing waste generation. Despite continuous efforts by higher education institutions to promote sustainability through environmental education, awareness campaigns, and green campus initiatives, students’ engagement in pro-environmental behavior remains inconsistent in practice. Although many students show concern for environmental issues, this concern does not always lead to meaningful action in their daily behavior, highlighting a persistent intention–behavior gap. Therefore, this study seeks to examine the factors that shape pro-environmental behavioral intention among HEI students in Malaysia.

Guided by the Theory of Planned Behavior (TPB), this study extends the framework by incorporating environmental knowledge and environmental concern to provide a more comprehensive understanding of behavioral intention.

Throughout this research process, we have gained valuable experience in academic research, data analysis, and critical thinking, while also strengthening essential skills such as teamwork, communication, and problem-solving. It is hoped that the findings of this study will contribute to existing literature and provide useful insights for universities, policymakers, and other stakeholders in promoting sustainable behavior among students

ABSTRACT

This study examines the factors influencing pro-environmental behavioral intention among Higher Education Institution (HEI) students in Malaysia. It focuses on attitude, subjective norms, perceived behavioral control, environmental knowledge, and environmental concern. A quantitative approach was adopted, with data collected from 384 HEI students in Selangor, Perak, and Johor using structured questionnaires and non-probability sampling. The data were analyzed using SPSS through reliability and multiple regression analysis. The results show that subjective norms, environmental attitude, and environmental knowledge have significant positive effects on pro-environmental behavioral intention, highlighting the importance of social influence, personal evaluation, and knowledge. However, perceived behavioral control and environmental concern were found to be insignificant, indicating possible contextual constraints and a concern–behavior gap among students. Overall, the model explains a moderate level of variance, suggesting that other factors may also influence behavior. The findings provide practical implications for higher education institutions to enhance environmental education, strengthen peer influence, and improve support systems to promote sustainable behavior among students.

Keywords: Pro-environmental behavioral (PEB) intention, environmental \attitude, subjective norms, perceived behavioral control, environmental knowledge, environmental concern, Higher Education Institution (HEI) students

Subject Area: GE195-199 Environmentalism. Green movement

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LIST OF ABBREVIATIONS

DV	Dependent Variables
EA	Environmental Attitude
EC	Environmental Concern
EK	Environmental Knowledge
EPI	Environmental Performance Index
HEI	Higher Education Institution
IV	Independent Variables
PBC	Perceived Behavioral Control
PEB	Pro-Environmental Behavior
PEBI	Pro-Environmental Behavior Intention
SN	Subjective Norms
SPSS	Statistical Package for the Social Sciences
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
VIF	Variable Inflation Factor

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CHAPTER 1: RESEARCH OVERVIEW

1.0 Introduction

The primary objective of this study is to determine the factors that influence Malaysian Higher Education Institution (HEI) students' intentions to embrace pro-environmental behavior (PEB). A thorough summary of the research background and a thorough explanation of the issue statement are presented in Chapter 1. This chapter also covers the development of research questions, hypotheses, and objectives, as well as the study's importance in relation to the larger scholarly debate. Additionally, the structure of the following chapters is described. Lastly, it provides a thorough chapter structure and an overview of every chapter.

1.1 Research Background

One of the most significant problems facing humanity now is environmental sustainability (Zaidi & Azmi, 2022). In recent decades, human activity has been prompted by rapid technological development and globalization, leading to significant environmental and conservation issues such as pollution, deforestation, species extinction, climate change, and global warming (Junita et al., 2023). Human well-being has been directly impacted by environmental degradation, which is predicted to worsen in the future (Bilynets & Cvelbar, 2020). Climate change and global warming pose serious risks to our ecosystem, making them crucial to human survival (Aguilera et al., 2021). Human behavior has a significant impact on environmental quality, and it is alarming that these patterns have shifted despite the negative consequences of human activity on the environment, such as pollution, climate change, and the depletion of natural resources (Shafiei & Maleksaeidi, 2020).

Pollution has worsened global environmental degradation in recent decades, putting ecosystems, human health, and the economy at risk. According to Rhodes (2019)

and Seah et al. (2023), over half of the 464 million tonnes of waste produced annually because of the increase in plastic production from 2 million tonnes in 1950 to over 450 million tonnes in 2019 is improperly dumped in landfills or dumpsites. By 2050, water contamination from city wastewater is expected to exceed 380 billion m³ annually, putting freshwater in low- and middle-income countries at danger (European Investment Bank, 2022; Akbar et al., 2022). Developed countries produce 34% of the world's municipal solid waste, which already exceeds 2 billion tonnes yearly and could reach 3.4 billion tonnes by 2050, despite making up only 17% of the world's population (Kaza et al., 2018). About 30% of food and packaging is wasted due to inefficient recycling, which makes problems worse (Valavanidis, 2023). These interrelated issues highlight how urgently integrated strategies are needed to lessen environmental damage worldwide.

A well-known tool for assessing and contrasting 180 countries' environmental performance, the Environmental Performance Index (EPI) focuses on ecosystem vitality, environmental health, and climate change (Arcagriguez, 2024; Karahan et al., 2025). Malaysia's declining EPI scores show that the country's environmental problems have grown more serious in recent years. Malaysia ranked 68th in 2020 with a score of 47.9, but by 2022, it had fallen to 130th with a score of just 35 (Wendling et al., 2020; EPI, 2022). The nation still does not meet international sustainability standards, even with a little improvement in 2024, ranking 118th with a score of 41.2 (World Population Review, 2025). Electronic waste, or e-waste, is becoming more prevalent in Malaysia from both domestic and commercial sources. Malaysia produced approximately 2.62 million metric tons of e-waste between 2005 and 2023, enough to cover almost three-quarters of the Petronas Twin Towers. This amount is predicted to increase in tandem with the overall production of solid waste, which is anticipated to surpass 17 million tonnes by 2035 (Ibrahim et al., 2024; Palansamy, 2025). These metrics show that Malaysia still has a long way to go before achieving globally recognized sustainability targets in areas including ecosystem vitality, environmental health, and climate change mitigation.

Malaysia is also dealing with tighter environmental restrictions in a number of areas. Malaysia was the second-biggest importer of plastic waste and scrap worldwide in 2021 (Brown et al., 2023). Only an estimated 334,000 tonnes (24%)

of significant plastic resins were recycled annually in 2019, leaving 1.07 million tonnes lost. The unrecovered material value caused an economic loss of USD 1–1.1 billion (World Bank Group, 2021). Environmental stress is also indicated by water quality; of the 672 rivers examined in 2022 (Lokman et al., 2025), 22% (148) were slightly contaminated and 4% (29) were contaminated, primarily as a result of industrial effluents in Johor, Penang, and Selangor (Mokhtar, 2024). In 2021, the average daily amount of municipal solid waste (MSW) was 39,000 tonnes, or 1.17 kg per person. More than 83% of this waste was dumped in landfills, and by 2030, it is expected to reach 49,670 tonnes (Ahmed et al., 2023). Over 30% of all MSW is wasted by Malaysians, who discard 8.3 million tonnes of edible food annually, or 260 kg per person (International Trade Administration, 2024).

It is the responsibility of Malaysia's higher education sector to support sustainability. According to Zain et al. (2017), the Private Higher Educational Institutions Act (1996) defines "higher education" as encompassing both public and private institutions as well as community colleges, colleges or polytechnics, universities, university colleges, and university branches. According to Roos et al. (2020), since HEIs are closely linked to knowledge that encompasses a variety of aspects of life, they are thought to be useful platforms for encouraging the adoption of PEB among future generations. Universities have a big influence on how students behave by encouraging environmental awareness through coordinated environmental programs, green campus initiatives, and sustainability teaching (Qi et al., 2025). In keeping with international efforts toward sustainability, Malaysian HEIs are adopting green practices to achieve sustainable growth and cut greenhouse gas emissions by 40% per GDP by 2020 (Anthony Jnr, 2020). Furthermore, the role of universities in promoting sustainability through green campus efforts is further underscored by national plans like the Malaysian Green Technology Master Plan 2017–2030 (Mohd Muhiddin et al., 2023). Due to their large populations and expansive campus areas, universities are viewed as important institutions with the potential to spark sustainability (Isa, 2016). However, these operations have frequently disregarded environmental and social responsibilities (Larrán et al., 2016; Ceulemans et al., 2015).

Even though Malaysian HEIs have made significant attempts to integrate sustainable development objectives, there are still issues, such as the lack of integration across sustainability disciplines (Reza, 2016). Besides, while university sustainability performance is evaluated using international instruments like UI GreenMetric (Grindsted, 2011), and many Malaysian universities have implemented green campus initiatives, 17 out of 20 participated in UI GreenMetric 2021, their overall ranking is still very low when compared to nations like Canada, the United Kingdom, and the United States (Gomez & Yin Yin, 2019). A whole-of-university approach emphasizes how sustainability initiatives affect students' educational experiences and involve every member of the campus community. However, evidence indicates that students' sustainable behavior is still limited, with only 37% of Malaysian university students recycling on a regular basis and encountering obstacles like perceived inconvenience and lack of knowledge (Soomro et al., 2022). Low awareness of 3R programs also contributes to low recycling rates (Sudin et al., 2023). Students at HEIs are a crucial component of the university system, and their actions have a direct impact on the success of green campus programs and the attainment of sustainability objectives, thus it is crucial to concentrate on them.

Although sustainability programs have been implemented by Malaysian HEIs, student involvement and results are still low. For example, despite being aware of recycling campaigns and having received environmental education from an early age, 40% of 384 youths aged 15 to 30 in Kuala Lumpur and Putrajaya who participated in a government study titled "Youth Awareness in Environmental Care" cited time constraints and busyness as reasons for not recycling (Izzati Samdi et al., 2024). This demonstrates that knowledge is not always translating into proactive environmental behavior. Even though Malaysian HEIs have started a number of sustainability projects, there is still a lack of student involvement and behavioral results. According to Derahim et al. (2011), students at Universiti Kebangsaan Malaysia (UKM) engage in a variety of pro-environmental practices, such as conservation of energy and trash management but their general understanding of sustainability is mediocre, and they are ill-prepared to run programs because of isolated and small-scale initiatives. Recycling rates vary from 0.03% to 29.26% among universities like UTM, UM, UKM, and UPM, much below

the anticipated 20% national norm by 2025 (Na'im et al., 2022), and awareness of reduce, reuse, and recycle (3Rs) activities is still very low (Jamil et al., 2021). Although sustainability concepts are gradually embraced, comprehensive and methodical application is still lacking in Malaysian HEIs (Menon & Suresh, 2020; Ambariyanto & Utama, 2020). These restrictions demonstrate that students' intentions to participate in pro-environmental activities are still low, highlighting the importance of studying the variables that affect these intentions.

1.2 Significance of Study

While the intention to engage in PEB has been extensively studied using the Theory of Planned Behavior (TPB), most of the current research concentrates on the tourism industry (Sarmiento & Loureiro, 2021; Lin et al., 2022; Zhang et al., 2024a), the hotel industry (Martínez-Martínez et al., 2020), and workplace environments (Banwo & Du, 2019; Yuriev, 2020a). For example, Makoondlall-Chadee and Bokhoree (2024) focused on hotels, while Huo et al. (2025) examined rural tourists. Few studies, particularly in Malaysia, have looked into students' intentions to adopt PEB in HEIs. Most of the research in this field is still scarce in Malaysia, with a higher concentration of studies carried out in countries like China (Wang & Mangmeechai, 2021; Tang et al., 2023; Zhang et al., 2024b; Luo & Kim, 2025) and several Western countries (Shulman et al., 2022; Schulz et al., 2024). This group continues to be underrepresented in literature despite growing awareness of sustainability in education. HEI students' participation in PEB activities cannot be disregarded because they are future decision-makers and leaders who represent powerful drivers of environmental change (Correia et al., 2022). As a result, examining the intention to adopt PEB among Malaysian HEI students fills a significant research need and adds to a better understanding of PEB across all society segments.

Although the TPB and its primary components, attitude, perceived behavioral control, and subjective norms, have been examined in connection with the prediction of PEBI, the TPB model by itself is unable to fully account for people's

PEB, particularly when faced with significant environmental challenges (Rao, 2022; Leong, 2023; Peng, 2025; Soyalp, 2025; Zhao et al., 2022; Shalender & Sharma, 2021). Ajzen (1991) emphasized that additional variables have an independent impact on behavioral intentions when the TPB is expanded to include more variables. To put it another way, a range of behaviors can be explained by the TPB. According to Gansser and Reich (2023), TPB disregards the range of societal and personal factors that affect PEB. As a result, researchers recommend adding new constructions to improve the model (Wan et al., 2014; Paul et al., 2016). This study integrates environmental concern and environmental knowledge since these are important elements influencing the intention to adopt pro-environmental action (Ghosh & Prasad, 2024; Zeng et al., 2023). Environmental concern is essential to environmental research and a crucial factor in consumer decision-making (Liao et al., 2020). It also demonstrates a person's understanding of environmental issues and their readiness to engage in improvement-oriented initiatives (Heath & Gifford, 2002). Studies indicate that environmental concern can significantly boost pro-environmental attitudes and intentions when combined with the standard TPB components (Bamberg, 2003). Environmental knowledge is the understanding of the environment's fragility and the need to protect it (Farrukh et al., 2022). Based on other studies, environmental information supports the formation of intentions by strengthening perceived behavioral control and improving environmental attitudes (Chaihanchai & Anantachart, 2023).

From an organizational perspective, this study gives HEI administration valuable information about students' viewpoints and behavioral intents, enabling the creation of specialized tactics that boost the adoption of PEB. HEIs are important change agents and co-creators of sustainability. Growing students' environmental knowledge, skills, values, and awareness is the responsibility of HEIs (Žalėnienė & Pereira, 2021; Bertossi & Marangon, 2022). In order to protect the environment for future generations, university students should be encouraged to participate in PEBs since they would be the ones to bear the long-term consequences of today's environmental carelessness (Fang, 2021). As a result, this study highlights the crucial issue that will impact the students and helps management to pinpoint those components and make changes. Students who participate in this study are better able to comprehend the factors that affect their desire to practice PEB. By

recognizing the influence of attitudes, environmental concern, knowledge, and subjective norms, students can become more conscious of how their beliefs and aspirations translate into sustainable behaviors (Essiz et al., 2023; Lytras et al., 2022). Additionally, this study highlights how adopting PEB not only helps the environment but also equips students with the skills and mindset needed to thrive in a society that is becoming increasingly focused on sustainability (Sokienah, 2024).

Therefore, by providing a more thorough knowledge of the factors driving pro-environmental intentions, the expanded model seeks to advance the body of existing work. It is essential to identify the factors influencing Malaysian HEI students' intention to adopt PEB. The goal of this study is to find out how environmental attitude, environmental knowledge, environmental concern, perceived behavioral control, and subjective norms affect the intention to use PEB.

1.3 Problem Statement

According to Kikko and Ishigaki (2025), PEB is essential to maintaining environmental sustainability for both current and future generations. Positive environmental attitudes and real participation in sustainable actions continue to diverge, despite increased global awareness of environmental challenges. This phenomenon, also known as the intention-behavior gap or the “green gap,” implies that positive attitudes do not always result in action (Carducci et al., 2021; Juma-Michilena et al., 2023). Among college students, this discrepancy is especially apparent, who do not always exhibit significant pro-environmental intentions or behaviors while having high levels of environmental knowledge and concern (Balundè et al., 2020; Mkumbachi et al., 2020; Shen et al., 2024).

Education has long been seen as a vital tool for advancing sustainability through improving students' comprehension of environmental issues and fostering the knowledge and values required for pro-environmental conduct (Chwialkowska et al., 2025). Given that this level of education is a formative time when people acquire

their beliefs, attitudes, and behavioral intentions, HEIs are increasingly seen as crucial platforms for promoting environmental stewardship. Previous research also indicates that, in comparison to the general population, students' PEBIs are more significantly influenced by personal values (Song et al., 2022). To foster PEB, HEIs have put in place a variety of sustainability initiatives, such as student environmental organizations, green campus programs, and environmental education courses. Nevertheless, despite these efforts, it is still unknown how well these programs influence students' aspirations to behave in a pro-environmental manner, and the underlying mechanisms controlling this process are not well understood. Students' behavioral responses frequently contradict institutional efforts, even though campuses offer structured environments that encourage social contact, peer influence, and exposure to sustainable practices (Qi et al., 2025).

In the Malaysian context, this issue is particularly significant. Young people between the ages of 18 and 24 make up a sizable section of the population, underscoring their vital role in promoting environmental sustainability (Ahmad et al., 2025). As of 2024, there were more than 1.2 million students enrolled at Malaysian HEIs, and this figure is still rising (Ministry of Higher Education, 2025). Given that students have a significant impact on Malaysia's future sustainable development, this trend emphasizes how crucial it is to comprehend the PEBIs of this demographic. As future decision-makers and active participants in ongoing environmental activities, students in HEIs are essential to the advancement of sustainability. Accordingly, HEIs are crucial venues for encouraging environmental responsibility and bolstering students' aspirations to protect the environment (Mat et al., 2020). However, research indicates that students' participation in pro-environmental conduct is still low, despite its strategic significance. While the fact that many university students show concern for environmental issues and have positive views toward sustainability, these attitudes may not always convert into real behavioral engagement (Abdul-Rahman, 2020). This illustrates the ongoing intention-behavior gap, in which favorable attitudes and environmental knowledge may not always result in behavioral action (Dixit & Badgaiyan, 2016; Fielding et al., 2016).

Moreover, while larger factors impacting PEBIs are still largely unexplored, previous research has mostly concentrated on particular PEBs, including recycling (Hamrouni, 2024). Furthermore, since the majority of research on PEBIs has been done in developed nations, there is little empirical data on how these relationships function in developing country contexts, particularly among Malaysian HEI students (Chaplin & Wyton, 2014; Too & Bajracharya, 2015; Zwickle et al., 2014). With differences in cultural values, social norms, and contextual factors that affect how intentions are converted into real behavior, findings from various cultural contexts may not be fully generalized to other settings, even though they offer insightful information. Therefore, a context-specific study is necessary to provide a more comprehensive understanding of the factors impacting Malaysian HEI students' intentions to engage in pro-environmental conduct.

Regarding the growing global recognition of environmental sustainability, pro-environmental conduct among university students is still erratic and comparatively low. Conflicting findings have been found in earlier studies on the effect of age on PEB. While some claim that environmental concern decreases with age (Liere & Dunlap, 1980), others find that pro-environmental participation increases with age (Wiernik et al., 2013; Hughes et al., 2019). Despite these contradictions, research shows that university students (18–24 years old) frequently have comparatively lower pro-environmental intentions than older populations (Wallis et al., 2021; Surrasin, 2022; Quesada, 2025; Parzonko et al., 2021). Regardless of widespread promotion of sustainable practices like the 3Rs (reduce, reuse, and recycle) (Yusoff et al., 2024; Wu et al., 2021), empirical findings also show that only a small percentage of university students actively participate in sustainable practices, such as green consumption, environmentally friendly transportation, or recycling (Ágoston et al., 2024). When combined, these results show that there is still a gap between HEI students' real behavioral intentions and their level of environmental care. Hence, it is essential to investigate the main elements influencing students' intention to adopt PEB, particularly in the context of Malaysian HEIs.

The TPB, which emphasizes the functions of environmental attitude, perceived behavioral control, and subjective norms, has frequently been utilized in earlier studies to explain PEBIs. According to certain research, pro-environmental

intentions are strongly influenced by these three constructions (Yang et al., 2020; Wang et al., 2019a; Zheng et al., 2022; Kotyza, 2024). Other research, however, presents inconsistent or conflicting results. For example, Zarei et al. (2020) discovered a weak correlation between behavioral intention and subjective norms. Subjective norms have no significant impact, according to Blok et al. (2015) and Huo et al. (2025), whereas attitudes may also be a negligible predictor, according to Zhang et al. (2023). However, Klöckner (2013) and Yoon et al. (2013) argue that behavioral intention is more predicted by perceived behavioral control and subjective norms than by attitudes. This is further supported by Moghimehfar (2016), who emphasizes the comparatively greater influence of subjective standards and perceived behavioral control over attitudes. These discrepancies imply that PEBIs may not be entirely explained by TPB constructs alone, highlighting the necessity to take into account other explanatory factors.

Environmental concern and environmental knowledge are two of these additional characteristics that have drawn more scholarly attention. Environmental knowledge has garnered significant empirical attention and has long been seen as a crucial antecedent of PEB. Theoretically, pro-environmental attitudes should be more pronounced in those with greater environmental knowledge (Amoah & Addoah, 2021). Knowledgeable people are more likely to adopt sustainable behaviors and develop greater pro-environmental intentions, according to earlier research (Fielding & Head, 2012). Conversely, ignorance might lessen concern for environmental deterioration and lower emotional engagement (Shanmugavel & Balakrishnan, 2023). It has also been suggested that insufficient information can hinder pro-environmental action (Ünal et al., 2018; Wang et al., 2018a). Likewise, although the widespread belief that environmental information is crucial, its lack may lead to negative or apathetic attitudes about sustainability issues (Zheng et al., 2022; Yang et al., 2020; Passafaro, 2020; Zeng et al., 2023). Notably, students who have finished environmental courses may still show such apathetic attitudes (Arshad et al., 2020). Similarly, environmental concern is widely recognized as an important determinant of PEB. However, empirical evidence shows that its relationship with behavioral intention is often weak or inconsistent (Bamberg, 2003). Some scholars argue that general environmental concern does not directly translate into specific behaviors but instead exerts indirect effects through TPB

variables such as perceived behavioral control, attitude, and subjective norms (Ajzen, 1991; Bamberg, 2003). This suggests that the mechanism through which environmental concern influences behavioral intention remains unclear and warrants further investigation (Lau & Hashim, 2020).

Even so, empirical results are still unclear and fragmented in spite of these theoretical expectations (Amoah et al., 2018). According to some research, environmental knowledge greatly increases PEBI (Shanmugavel & Balakrishnan, 2023); meanwhile, other research reveals no meaningful connection between environmental knowledge and behavioral intention (Liu et al., 2020). Related knowledge-intention research also reveals similar discrepancies (Borusyak et al., 2021; Alam et al., 2022; Lau & Hashim, 2020). These conflicting results emphasize the need for more empirical research to elucidate how environmental knowledge influences PEBI.

Besides, based on current literature, few quantitative studies have investigated the combined effects of environmental knowledge and environmental concern within the TPB framework, particularly among students in Malaysian HEIs. It is still unclear whether university students are genuinely willing to translate their environmental concern and knowledge into genuine PEBIs or to make personal sacrifices for environmental preservation (Dardanoni & Guerriero, 2021; Zęková et al., 2023), even though the younger generation is widely acknowledged as a key driver of sustainability transitions (Meyer, 2016). Thereby, in order to fill the current study gap and gain a better understanding of the factors influencing PEBI among Malaysian HEI students, a more thorough analysis that incorporates environmental concern, environmental knowledge, and the fundamental TPB constructs is required.

1.4 Research Objectives

1.4.1 General Objective

The general goal of this study is to look at the variables influencing Malaysian Higher Education Institution (HEI) students' intentions to adopt pro-environmental behavior (PEB).

1.4.2 Specific Objectives

1. To investigate the impact of subjective norms on the intention to adopt Pro-Environmental Behavior (PEB) among Higher Education Institution (HEI) students in Malaysia.
2. To investigate the impact of perceived behavioral control on the intention to adopt Pro-Environmental Behavior (PEB) among Higher Education Institution (HEI) students in Malaysia.
3. To investigate the impact of environmental attitude on the intention to adopt Pro-Environmental Behavior (PEB) among Higher Education Institution (HEI) students in Malaysia.
4. To investigate the impact of environmental knowledge on the intention to adopt Pro-Environmental Behavior (PEB) among Higher Education Institution (HEI) students in Malaysia.
5. To investigate the impact of environmental concern on the intention to adopt Pro-Environmental Behavior (PEB) among Higher Education Institution (HEI) students in Malaysia.

1.5 Research Questions

1.5.1 General Research Question

What are the key indicators of Malaysian Higher Education Institution (HEI) students' intention to adopt pro-environmental behavior (PEB)?

1.5.2 Specific Research Questions

1. Is there a significant impact of subjective norms on the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia?
2. Is there a significant impact of perceived behavioral control on the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia?
3. Is there a significant impact of environmental attitude on the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia?
4. Is there a significant impact of environmental knowledge on the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia?
5. Is there a significant impact of environmental concern on the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia?

1.6 Hypotheses of the Study

H1: Subjective norms have a significant impact on the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.

H2: Perceived behavioral control has a significant impact on the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.

H3: Environmental attitude has a significant impact on the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.

H4: Environmental knowledge has a significant impact on the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.

H5: Environmental concern has a significant impact on the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.

1.7 Chapter Layout

Chapter 1: Introduction

This chapter introduces the study, establishes the general framework, and describes the research problem. Further, it clearly defines the investigation's focus by presenting the research objectives and hypotheses. This chapter further emphasizes the study's importance by highlighting its applicability and possible contributions. In order to give the following chapters a clear direction, the chapter ends with a summary.

Chapter 2: Literature Review

This chapter offers a comprehensive review of the literature on the subject. It establishes research hypotheses, offers a conceptual framework, critically evaluates the relevant literature, and analyzes the underlying theories.

Chapter 3: Research Methodology

This chapter provides the design and technique used for data collection and analysis. This covers methods for data collecting, sampling, and data processing.

Chapter 4: Research Results

This chapter gathers participant questionnaire responses in order to examine the proposed study paradigm. Several analyses will be performed to ensure the validity and reliability of the study. These include scale measurement, descriptive analysis, and inferential analysis. All data will be handled and analyzed using the Statistical Package for the Social Sciences (SPSS).

Chapter 5: Conclusion and Discussion

The final chapter of this study summarizes the statistical analyses, discusses the main conclusions, highlights the significance of the research, and outlines its limitations. Furthermore, recommendations for further research are given. This chapter covers all the concluding remarks and conclusions.

1.8 Chapter Summary

In summary, the purpose of this study is to look at the main factors that influence Malaysian students at HEI intention to engage in PEB. From the research backdrop to the chapter arrangement, this chapter lays the groundwork for the entire study. It also directs the transition to the following chapter, which will contain a conceptual framework, literature review, and a discussion of the variables.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

The chapter continues the examination of variables by providing a detailed overview of their nature through four different sections: theories that form the basis of the discussion, the existing body of research with explanations of the variables involved, how these variables relate using a conceptual framework, and hypotheses derived from the literature review.

2.1 Underlying Theories

2.1.1 Extended Theory of Planned Behavior (TPB)

Icek Ajzen introduced the TPB in 1985, is a widely recognized psychological model for predicting the relationship between intentions and behaviors (Ajzen, 1991). It expands upon Fishbein and Ajzen's 1975 Theory of Reasoned Action (TRA), which holds that an individual's behavioral intention is the most accurate indicator of actual conduct when there is complete volitional control (Ajzen & Fishbein, 1977). However, this assumption limits its explanatory power in situations where individuals face constraints beyond their control. In order to overcome this constraint, TPB adds perceived behavioral control while maintaining the fundamental concepts of attitude and subjective standards. Perceived behavioral control allows the model to account for circumstances in which volitional control is insufficient and represents how easy or difficult a behavior is thought to be (Ajzen, 1991; Lau & Hashim, 2020). Since this improvement, TPB has been widely applied to predict a range of individuals behaviors, especially those

involving conscious decision-making (Kotzya et al., 2024; Yuriev, 2020b; Sarmento & Loureiro, 2021).

The three primary motivational factors that determine behavioral intention, which in turn influence actual action, are attitude, subjective norms, and perceived behavioral control, according to the conventional TPB framework (Ajzen, 1991). An individual's attitude is their positive or negative evaluation of a conduct based on expected outcomes (Ajzen & Madden, 1986; Abrahamse et al., 2009; Liu et al., 2020a). Subjective norms are a representation of perceived social pressure to participate in or refrain from a behavior from significant individuals, such as friends, family, or teachers (Ajzen, 1991; Karimi et al., 2022; Karimi & Mohammadimehr, 2022). According to Ajzen (1985) and Fishbein & Ajzen (2010), perceived behavioral control is a measure of an individual's perception of how simple or hard an action is to perform, reflecting the availability of opportunities, resources, and talents.

TPB has been widely recognized as a robust framework for explaining pro-environmental intentions and behaviors (Wang et al., 2019b; Karimi & Saghaleini, 2021; Alzubaidi et al., 2021). Lucarelli et al. (2020) state that actions like recycling, green purchasing, energy conservation, and sustainable transportation are frequently motivated by behavioral goals defined by attitude, subjective norms, and perceived behavioral control. The significance of these three dimensions in forming pro-environmental intentions is constantly shown by empirical uses of TPB in environmental research. TPB has also been demonstrated to be useful in higher education for elucidating students' environmental preferences and assisting in the creation of interventions that encourage sustainable behavior (Phang & Ilham, 2023). The model's accuracy in forecasting both intention and actual behavior is further supported by meta-analytical data (Overstreet et al., 2013). As a result, TPB offers an appropriate theoretical framework for this research since it makes it easier to comprehend how Malaysian HEI students develop intentions to act in a pro-environmental manner and how these intentions materialize.

TPB has some limits when it comes to understanding PEB, despite its extensive use. Although its fundamental concepts are well-established, some academics contend that attitude and subjective standards might be too broad to adequately represent the complexity of behavioral choices made in the real world. Therefore, pro-environmental decision-making processes may not be adequately explained by depending only on the original TPB variables (Ajzen, 2011; Yuriev et al., 2020b). This emphasizes the necessity of expanding the framework in order to increase its capacity for explanation. TPB has been amenable to theoretical growth since its inception (Ajzen, 1991; Ajzen, 2011). According to Ajzen (1991), further variables can be included to the model as long as they are behavior-specific, conceptually independent, and able to increase explanatory power without overlapping with preexisting constructs. Because of this flexibility, additional factors that represent moral, affective, and knowledge-based influences on behavior have been added (Alzubaidi et al., 2021). Accordingly, the research expands the TPB framework by incorporating additional variables while maintaining the core relationships of the original model. These additional constructs must adhere to the compatibility principle, remain conceptually distinct from existing TPB variables, and function as causal determinants of behavioral intention (Ajzen, 1991; Oh & Hsu, 2001). Environmental concern and environmental knowledge are included in the model based on these criteria because they satisfy the theoretical requirements for TPB extension and have been used in previous PEB research (Chuang et al., 2018; Lau et al., 2020; Wu et al., 2022; Zhang et al., 2024b).

Environmental knowledge is essential for fostering pro-environmental intentions because it enables individuals to make responsible and informed actions (Liu et al., 2020b; Li et al., 2022). Similarly, it is generally recognized that environmental concern is a significant driver of pro-environmental activity and a strong predictor of behavioral intention. It shows how conscious people are of environmental problems and how motivated they are to take ecologically friendly acts (Lee et al., 2014; Polonsky et al., 2014; Felix et al., 2018). Since EC changes students' fundamental motivation for environmental engagement, it continues to be a

crucial component in describing their intentions toward sustainable conduct (Shanmugavel & Balakrishnan, 2023; Zhang et al., 2024b). EC offers a cognitive basis for the development of environmental intentions and actions, even though it may not always have a direct impact on behavior (Bamberg & Möser, 2007). Environmental concern and environmental knowledge together continue to be crucial concepts for comprehending HEI students' PEBIs.

This study attempts to improve the model's explanatory power in the setting of Malaysian HEIs by incorporating environmental concern and environmental knowledge into the TPB framework. Value-driven incentives and knowledge-based effects may not be well captured by the original TPB, despite its emphasis on rational decision-making through attitude, subjective standards, and perceived behavioral control. A more thorough and nuanced knowledge of the factors influencing PEBI among Malaysian HEI students is provided by the addition of environmental concern (value-based motivation) and environmental knowledge (cognitive awareness) to the original TPB constructs.

2.2 Literature Review

2.2.1 Intention to Adopt Pro-Environmental Behavior (PEB)

Ajzen (1991) defined intention as a person's deliberate motivation or propensity to try to carry out a particular behavior. Intention is a psychological state that represents people's objectives and behaviors and is the most direct predictor of actual behavior. The intricate process of developing an intention can be influenced by a person's beliefs, attitudes, social pressure, and self-efficacy (Conner & Norman, 2022). In the context of environmental behavior, pro-environmental intention is a collection of internal motivations for adopting PEB and refers to people's willingness to

do acts linked to environmental protection (Shen et al., 2024). Kurisu (2015) defined PEBI as consumers' desire to reduce their consumption's negative environmental effects. These objectives encourage people to make thoughtful decisions that support resource conservation, waste reduction, environmental protection, and the preservation of natural habitats. They are essential for guiding sustainable activities and encouraging individuals to reflect on their daily lives and interactions with the natural world (Kotzya et al., 2024). To achieve sustainability and lessen our detrimental impact on the environment, PEB promotion is essential. This is since a lot of environmental changes are caused by human activity (Abusafieh & Razem, 2017). While their absence may result in unfavorable changes, more pro-environmental measures may contribute to positive environmental improvements (Büchs et al., 2015; Dreijerink et al., 2021).

The term of PEB emerged as scholars began to take into account the escalating environmental issues in the 1960s (Omarova & Jo, 2022). An increase in interest in environmental studies across disciplines such as psychology, agriculture, social work, anthropology, and political science was sparked by this topic. They started applying scientific knowledge to environmental management studies and how altering human behavior could address these issues (Shafiei & Maleksaeidi, 2020; Kollmuss & Agyeman, 2002). Evaluating public concern for environmental well-being was the primary emphasis of early research (Li et al., 2019). As public interest in environmental studies has grown throughout time, scientists have been preoccupied with issues about the critical circumstances that result in the acceptability of a long-term eco-friendly behavior (Gifford & Nilsson, 2014). Researchers examined environment-specific behaviors across a variety of social groups, such as workers (Bissing-Olson et al., 2013; Ahmad et al., 2021a), customers (Runyan et al., 2012), and farmers (Walder & Kantelhardt, 2018). Environmentally responsible behavior (Su & Swanson, 2017; Cheung et al., 2019), sustainable behavior (Juvan & Dolnicar, 2014; Geiger et al., 2019), green behavior (Li et al., 2018b; Kim et al., 2019), ecological behavior (Otto & Pensini, 2017; Liu et al., 2019), and environmentally friendly behavior (Liobikienė et al., 2017; McCoy et al.,

2018) are some of the phrases used to describe PEB. In Ajzen's (1991) TPB, intention was formally included as a key motivator for action. TPB is the most direct predictor of conduct, and people are more likely to carry out an intention if it is stronger.

2.2.2 Subjective Norms (SN)

A subjective norm is an individual's impression of how other people see their behavior, which reflects the perceived social pressure from important persons or groups over whether or not to engage in a particular activity (Lau & Hashim, 2020; Zhang et al., 2024b). These social impacts often originate from salient references, such as friends, family, coworkers, or business partners, whose opinions have the capacity to profoundly influence an individual's objectives and actions (Verma & Chandra, 2018). Lee and Tanusia (2016) state that "even if expert advice is better informed, the personal opinions and actions of one's friends may have a more powerful influence over choices." According to Ulker-Demirel and Ciftci (2020), SN function as a form of social pressure in the context of the environment, encouraging people to conform their behavior to standards of social and environmental responsibility. If a person thinks the subjective standard is higher, they are more inclined to act. This also applies to eco-friendly activities. If a person knows that most powerful people think he should act in an ecologically responsible manner, he will feel under pressure to do so (Karimi et al., 2022).

SN function through normative ideas that are frequently driven by the fear of social rejection, regardless of these definitional viewpoints. Since they frequently compare themselves to their referent groups, people are likely to be impacted by their expectations and opinions (Yang et al., 2020). According to earlier research, subjective norms are crucial in encouraging individuals to conform to others' expectations, as they reflect the perceived social pressure from important referent groups when forming behavioral

intentions (Zhang et al., 2024b). In addition to directly impacting behavioral intentions, SN may also mediate or attenuate the impacts of other factors, increasing their influence on decision-making (Sun et al., 2020). Furthermore, when social expectations surrounding a specific activity are widely accepted, empirical evidence supports the notion that subjective norms are a strong predictor of behavioral intention (Nayanajith et al., 2020).

2.2.3 Perceived Behavioral Control (PBC)

A person's evaluation of how easy or difficult a certain behavior is to perform, along with their confidence in their capacity to do so while accounting for their skills, resources, and potential constraints, is known as PBC (Kotzya et al., 2024; Zheng et al., 2022). It is a person's assessment of their ability to carry out a certain task, influenced by both prior experiences and potential challenges (Ateş, 2020). PBC stresses a person's assessment of their capacity to complete the task at hand, much as Bandura's idea of self-efficacy in social cognitive theory (Yang et al., 2020). Accordingly, those who think sustainable behaviors are hard to embrace are less likely to do so, whereas people who think they're simple to incorporate into daily life are more likely to do so (Gansser & Reich, 2022).

In the context of the environment, PBC functions as a psychological construct that influences people's intentions and actions about eco-friendly practices (Al Mamun et al., 2018). Additionally, Ajzen distinguished between internal control variables, such as knowledge, information, and abilities, and external control elements, such as environmental opportunities or barriers that either support or impede behavior (Al Zaidi et al., 2023). Behavioral intentions are frequently reinforced by a greater sense of control because individuals who are more confident in their abilities are more likely to believe they can effectively contribute to environmental conservation. Conversely, when perceived control is limited, intentions and subsequent

actions frequently degrade. It is anticipated that greater PBC would increase the likelihood of adopting PEBs, as people who feel in control of their environmental activities are more likely to engage in sustainable practices (Raman et al., 2024). Accordingly, PBC is an indicator of an individual's capacity to identify and manage the elements that either facilitate or hinder their behavior (Verma & Chandra, 2018).

2.2.4 Environmental Attitude (EA)

Most people agree that attitude is a significant psychological concept that affects how people think and act. It describes a person's subjective and psychological inclination toward a particular human, thing, occasion, or idea that influences perception, feeling, and behavior (Albarracin et al., 2005). According to Fishbein and Ajzen (1975, p. 6), attitude is "a learned predisposition to respond in a consistent favorable or unfavorable manner to a given object," highlighting its intimate connection to behavioral intention and the capacity to foresee future intentions. To elaborate, Ajzen (1991) states that attitudes can also be defined as an individual's favorable or unfavorable assessment of engaging in a certain behavior, so establishing a closer connection between attitudes and behavioral outcomes. It represents a person's evaluation of an "object of thought," which could be concepts, people, or anything else that comes to mind (Mainieri et al., 1997; Bohner & Dickel, 2011). Additionally, attitudes can change in response to new knowledge or situations and are rather straightforward to change (Ajzen, 2005).

Environmental attitude is defined in the context of the environment as a person's concern for the environment and their evaluation of environmental issues (Gifford & Sussman, 2012), expressing common viewpoints and ideas about ecological issues (Tian et al., 2020). According to Milfont and Duckitt (2010), EA is psychological inclinations that show up as a degree of favoritism or disdain for the natural world. A positive environmental

mindset encourages responsibility for environmental protection and advancement (Hungerford & Volk, 1990; Sabzehei et al., 2016). An EA comprises a collection of values and sentiments about ecologically linked actions or issues (Sabzehei et al., 2016; Schultz, 2004). There are two ways to look at EA. The first is how one views the natural world in general or its constituent elements, such as soil and water. Attitudes toward eco-friendly behaviors, such recycling and energy saving, make up the second component. These attitudes are impacted by several human, cultural, and environmental factors (Rokicka, 2002). The term “pro-environmental attitude” in this context refers to a willingness to adopt PEB in order to achieve sustainability and save the environment. It has components related to cognitive, emotional, and behavioral tendencies and is comparatively stable (Lee et al., 2014). According to the TPB (Ajzen, 1991), a person’s propensity to worry about the environment is commonly referred to as pro-environmental attitude (Bamberg, 2003; Hawcroft & Milfont, 2010), and it should positively predict actual behaviors.

2.2.5 Environmental Knowledge (EK)

Environmental knowledge is the awareness and comprehension of environmental problems and their solutions (Zsóka et al., 2013; Amoah & Addoah, 2021). It is frequently defined as the ability to identify significant environmental indicators, concepts, and tactics that could be used to address environmental problems (Wang et al., 2014; Han, 2021). Understanding the reality, principles, and connections throughout the natural environment, as well as its major ecosystems (Fryxell & Lo, 2003; Ahmad et al., 2021b), is a larger definition of EK and is essential to sustainability (Sun et al., 2018). The ability to recognize and understand the degree of environmental systems’ health and to take appropriate action to maintain, restore, or improve their health is known as environmental literacy, according to Dresner et al. (2015). Another definition of EK is “realizing the importance of the environment” (Leonidou et al., 2010). A person cannot intentionally

protect the environment or act in a pro-environmental manner if they are unaware of environmental challenges (Gifford & Nilsson, 2014). Understanding environmental issues, environmental science, and environmental governance are all included in EK. Environmental knowledge is typically divided into two categories: daily and professional. Environmental information related to commonplace environmental pollution, including harmful noise, is referred to as daily EK. Professional environmental knowledge is usually found in specialized fields (such as industrial production, chemical pharmacy, and soil research), which are not well known to the general public. For example, a single forest species may be prone to diseases (Xie & Lu, 2022).

According to Martin & Simintiras (1995), Dodd et al. (2005), Janmaimool & Khajohnmanee (2019), Cai et al. (2022), and other scholars, EK can be further classified as either subjective or objective. According to Vicente-Molina et al. (2013), objective environmental knowledge is accurate environmental information that is stored in a person's long-term memory. Moreover, previous research in the literature indicates that subjective environmental information can more accurately predict PEBs than objective knowledge, which is why it is used in this study (Ellen, 1994; Huang et al., 2021). According to other theories, it is divided into three categories: action-related knowledge (knowing how to act), effectiveness knowledge (knowing which acts have the greatest impact), and systemic knowledge (understanding ecological systems) (Frick et al., 2004). Since adopting sustainable practices is frequently impeded by a lack of information about environmental issues, pro-environmental education is essential to fostering pro-environmental attitudes in students. Research indicates that knowledge of sustainability significantly influences behavioral intentions, highlighting the significance of including environmental education in curricula (Husban, 2025). According to Hopkinson et al. (2008), organizations can enable students to act as change agents and connect their actions with the principles of sustainable development by including sustainability topics into courses and campus events.

2.2.6 Environmental Concern (EC)

The degree to which people are conscious of and actively address environmental challenges is known as environmental concern (Dunlap et al., 2000; Schuitema, 2013; Zhang et al., 2024b). According to Alzubaidi et al. (2021), it is an emotive trait that represents a person's concerns, empathy, and preferences for the environment as well as a general attitude toward specific pro-environmental initiatives. Burgos Espinoza et al. (2024) claim that EC can also be seen as an individual's values, responsibilities, and position in the environment. In addition to increasing awareness, EC is a motivator that shapes attitudes and beliefs and encourages sustained behavior (Ghosh & Prasad, 2024). According to the widely accepted definition provided by Dunlap and Jones (2002), EC is a gauge of how well people comprehend environmental problems, endorse solutions, and show a desire to personally contribute. EC, as opposed to environmental value, more correctly captures people's emotional responses to environmental challenges by combining subjective values with knowledge of objective concerns (Fu et al., 2020).

Importantly, pro-environmental conduct is greatly influenced by EC (Zeng et al., 2023; Wang et al., 2021). Concern for the environment inspires people to embrace sustainable practices (Shanmugavel & Balakrishnan, 2023). Even while it might not always lead to action, Ajzen (1991) suggested that EC might indirectly influence behavioral intentions, particularly with regard to environmentally friendly products, in accordance with the idea of planned behavior. A meta-analysis by Klöckner et al. (2013) that consistently revealed a link between ecological activity and EC provides empirical evidence for this association. As a result, within the TPB paradigm, EC is viewed as a crucial antecedent that supports people's intents to engage in pro-environmental activities.

2.3 Proposed Conceptual Framework

Conceptual Framework Model

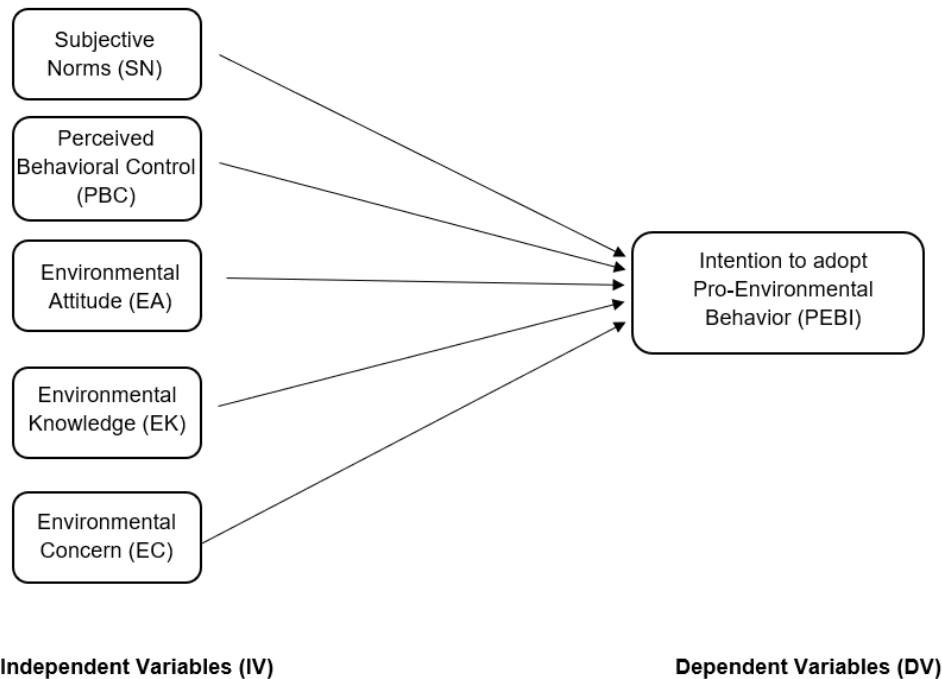


Figure 2.1. Developed for research.

The conceptual framework model for this investigation is displayed in Figure 2.1. This paradigm, which examines the desire to conduct pro-environmental action, is theoretically supported by the TPB. According to TPB, an individual's behavioral intention is influenced by three primary factors: environmental attitude (EA), subjective norms (SN), and perceived behavioral control (PBC). In this study, the traditional TPB model is expanded to include Environmental Knowledge (EK) and Environmental Concern (EC). When considered collectively, these components should provide a more comprehensive understanding of the elements impacting HEI students' intention to act in an ecologically sustainable manner. Consequently, the proposed conceptual framework illustrates the perceived factors that are expected to influence Malaysian students enrolled in HEIs to adopt PEB.

2.4 Hypothesis Development

2.4.1 The relationships between subjective norms and intention to adopt pro-environmental behavior

Since adopting sustainable practices is frequently impeded by a lack of information regarding environmental issues, pro-environmental education is essential to fostering pro-environmental attitudes in students. Research indicates that knowledge of sustainability significantly influences behavioral intentions, highlighting the significance of integrating environmental education into curricula (Husban, 2025). According to Hopkinson et al. (2008), organizations can enable students to take part as change agents and connect their actions with the principles of sustainable development by including sustainability themes into courses and campus events. For instance, Yadav and Pathak (2016) found that young customers' inclination to buy environmentally friendly products was significantly influenced by their subjective norms, while Si et al. (2020) discovered that the use of sustainable bikes was positively impacted by subjective norms. Similarly, Wang et al. (2019) discovered that peer pressure encourages students to save energy, while Khan et al. (2019) revealed that subjective norms are a strong predictor of household recycling intention. Similar results were found in the tourism industry, where Fan et al. (2023) found a positive relationship between subjective norms and travel behavior during the COVID-19 recuperation phase, while Wang et al. (2018b) found that subjective norms significantly influenced tourists' responsible environmental intentions. Maleknia et al. (2025) affirmed the importance of subjective standards as important motivators in creating sustainable lives by confirming that they had a positive and significant impact on PEBIs.

However, there are times when the relationship is unstable. Subjective norms were found to have little to no impact on pro-environmental intentions (Armitage & Conner, 2001). According to Huo et al. (2025), a

study carried out in rural areas revealed that social expectations had minimal impact on residents' inclination to participate in pro-environmental activities due to a lack of social pressure and a reliance on traditional norms that lessened their sensitivity to the opinions of others. Similarly, in certain contexts, energy-saving intentions were not predicted by subjective standards (Ru et al., 2018). This implies that when individuals do not perceive high societal expectations, they are less likely to be inspired to act in a pro-environmental manner. As a result, the following hypothesis was developed:

H1: Subjective norms have a significant impact on the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.

2.4.2 The relationships between perceived behavioral control and intention to adopt pro-environmental behavior

According to Scalco et al. (2017), students' perceived behavioral control reflects their beliefs about their capacity to engage in environmentally responsible activity. When students believe they have the abilities or resources necessary to carry out these practices, they are more inclined to generate greater intentions and participate in them (Aziz, 2020). People who can overcome challenges or discomforts also often exhibit stronger PEBIs (Ateş, 2020). Bamberg (2003) asserts that when it comes to PEBs, students' perceptions of behavioral control are particularly significant because many of these actions (such as recycling, reducing energy use, or choosing sustainable transportation) can be challenging to execute, making it more difficult to turn intentions into actions. As a result, Ajzen (1991) emphasizes that opportunities and resources, such as time, money, skills, knowledge, or social support, that represent the actual degree of control over one's behavior often influence behavior. People who believe they have more

influence over these resources are more likely to start and maintain pro-environmental activities, according to empirical research (Macovei, 2015).

Furthermore, previous studies indicate that perceived behavioral control is a major indicator of PEBI (Bamberg, 2003; Zaidi et al., 2023; Gumasing et al., 2023; Kotyza et al., 2024; Aziz et al., 2021). For example, Wang et al. (2019) found that people's propensity to engage in online recycling activities was significantly influenced by their impression of behavioral control. Similarly, Zheng et al. (2022) discovered a favorable correlation between tourists' perceptions of behavioral control and their PEBIs. However, several studies discovered weak links between perceived behavioral control and pro-environmental objectives. For instance, Li and Wu (2019) found that perceived behavioral control had no appreciable effect on people's pro-environmental intentions. The following hypotheses are put forth in light of these observations:

H2: Perceived behavioral control has a significant impact on the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.

2.4.3 The relationships between environmental attitude and intention to adopt pro-environmental behavior

Individuals who have positive environmental attitudes are more likely to develop strong intentions to take pro-environmental actions, according to numerous prior studies. For instance, Stedman (2002) found that participation in conservation activities was higher among people with favorable opinions regarding environmental protection. As the only variable consistently significant across studies on behavioral adoption (Hines et al., 1987; Dunlap et al., 2000; Bamberg & Möser, 2007) and environmental policy support (McCright et al., 2016), a meta-analysis showed that environmental attitude is a strong predictor of behavioral intentions.

Similarly, other researchs have demonstrated that people with strong environmental attitudes typically behave more ecologically friendly in a variety of situations (Kollmuss & Agyeman, 2002; Maiteny, 2002; Chen et al., 2011; Fielding & Head, 2011). Furthermore, Tan et al. (2017), Khan et al. (2019), and Rezaei et al. (2019) found that pro-environmental intentions, including adopting integrated pest management techniques and sustainable farming, are significantly influenced by attitude. According to the TPB, those who are more concerned about the environment should be more likely to take actions that preserve it (Hinds & Sparks, 2008; Andersson et al., 2005). Further studies support this, showing that relationships with nature influence future behavioral intentions (Baird et al., 2020), that pro-environmental attitudes positively influence PEBIs (Levine & Strube, 2012; Zarei et al., 2021), and that higher levels of environmental concern indicate a greater likelihood of adopting PEB (Ahmed et al., 2020; Babutsidze & Chai, 2018).

Nevertheless, not all research has found a significant relationship between environmental attitudes and intentions to engage in PEB. According to some research, attitude, for instance, only represents a person's favorable or unfavorable assessment of a conduct (Ajzen, 1991) and does not always translate into true purpose (Rebualos et al., 2024). Depending on the context or population under study, attitude may not be a major predictor of intention (Zhang et al., 2023). Consequently, the following theory will be developed:

H3: Environmental attitude has a significant impact on the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.

2.4.4 The relationships between environmental knowledge and intention to adopt pro-environmental behavior

The impact of environmental knowledge on the intention to undertake PEB has been extensively studied. According to several research studies, increased knowledge improves environmental consciousness and fortifies behavioral goals. For example, Amoah and Addoah (2021) predicted that an individual's concern for environmental issues would increase with their level of education. Well-informed individuals adopt eco-friendly practices in their daily lives and contribute significantly to environmental improvements through a range of eco-friendly practices (Kim et al. 2021). Furthermore, Vicente-Molina et al. (2013) discovered that students' pro-environmental intentions and behaviors are positively and significantly impacted by environmental knowledge in both developed and developing nations. In a similar vein, environmental knowledge and pro-environmental intentions and behaviors were found to be positively correlated by Yadav and Pathak (2016), Liu et al. (2021), and Wang et al. (2019). According to Levine and Strube (2012), PEBs are significantly predicted by broad ecological knowledge. Other studies have shown that people who are more aware of environmental issues and how to address them are more probable to take action to protect the environment (Kaiser & Fuhrer, 2003; Kollmuss & Agyeman, 2002; Mobley et al., 2010; Oğuz et al., 2010).

However, there is inconsistent evidence to support the relationship between environmental knowledge and the intention to take pro-environmental action. According to some research, there is no apparent relationship between environmental knowledge and the desire to engage in environmentally friendly behavior (Bartiaux, 2008). Di Martino et al. (2019) also noted that customers' motivation has shifted from knowledge to environmental attitudes, suggesting that knowledge alone no longer influences people's feelings about eco-friendly options. In a similar vein, Lee (2011) noticed that knowledge did not result in a willingness to spend extra for environmentally friendly apparel. Further research has shown that

environmental knowledge has no effect on green consumer behavior (Chekima et al. 2016; Leonidou & Skarmeas, 2017; Zarei & Maleki, 2018). Consequently, we have formulated the following hypothesis:

H4: Environmental knowledge has a significant impact on the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.

2.4.5 The relationships between environmental concern and intention to adopt pro-environmental behavior

People are more likely to have plans or intentions to do pro-environmental acts when they genuinely care about the environment (Li et al., 2022). This notion is supported by Fielding and Head's (2012) finding that those who were more worried about the environment were significantly more likely to engage in eco-friendly actions like recycling and energy conservation. Similarly, Kuhlemeier et al. (1999) discovered that consumers are prepared to give up material belongings in order to purchase eco-friendly products that promote environmental conservation. Numerous studies have found a favorable correlation between environmental concern and PEBI (Borusiak et al., 2021; Shanmugavel & Balakrishnan, 2023; Kotyza et al., 2024; Alam et al., 2022). For instance, Ghosh and Prasad (2024) discovered that people with higher levels of environmental concern were more likely to adopt innovations like solar home lighting systems, while Yadav and Pathak (2016) showed that environmental concern has a significant impact on consumers' intention to buy green products. Additionally, Han et al. (2018) discovered that environmental concerns have an impact on guests' desire to engage in green hotel activities, which in turn affects the relationship between perceived value and participation intention.

Previous research has generally consistently identified environmental concern as a key determinant of PEB because it provides valuable

information about people's intentions to adopt sustainable practices (De Groot & Steg, 2008; Lee et al., 2014; Polonsky et al., 2014; Vermeir & Verbeke, 2006; Azubaidi et al., 2021). Lau and Hashim (2020), however, discovered a negligible correlation between environmental concern and behavioral intention. Given these contradictory findings, it is crucial to look into this association more thoroughly. To bridge this gap, the current study focuses on Malaysian students enrolled in HEIs. In view of these findings, the following hypothesis is proposed:

H5: Environmental concern has a significant impact on the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.

2.5 Chapter Summary

A summary of the literature and journal articles on the variables is given in this chapter. This chapter additionally develops and outlines the underlying ideas and conceptual framework. The research methodologies will be covered in the upcoming chapter.

CHAPTER 3: METHODOLOGY

3.0 Introduction

The methods and strategies used in the investigation are explained in this chapter. It outlines the research design, data collection techniques, sampling strategy, research instrument, construct measurement, data processing, and data analysis techniques to ensure the reliability and validity of the findings. The purpose of this chapter is to give a brief, methodical summary of the research techniques used to answer the research questions and assess the hypotheses. Each part discusses the procedures for gathering, processing, and analyzing the data to guarantee that the link between variables is suitably examined. The chapter concludes with a summary of important methodological issues.

3.1 Research Design

Research design refers to the overall structure that links conceptual research problems with practical empirical studies. Its primary objective is to transform a research problem into analyzable data so that it can offer suitable and economical answers to research questions. According to Asenahabi (2019), there are three different kinds of study designs: quantitative, and qualitative, mixed methods. The goal of quantitative research is to gather numerical data through closed-ended questions and empirical observations (Kothari, 2004). It uses statistical and mathematical techniques to examine data, test hypotheses, and derive conclusions that can be applied to a larger population (Headley & Plano Clark, 2020). In contrast, qualitative research uses open-ended questions to provide non-numerical data to examine and assess the interpretations that individuals or groups make of human or social issues (Creswell & Creswell, 2017). Finally, to better comprehend the research problem, a mixed-methods research design weighs the benefits and drawbacks of both quantitative and qualitative methodologies (Asenahabi, 2019).

In order to examine the connection between the independent variables (EA, SN, PBC, EC, and EK) and the dependent variable (intention to adopt PEB), this study used a quantitative research approach. Since they allow researchers to find broad trends and examine correlations between factors among a sizable student population, quantitative data were selected (Ahmad et al., 2019). This method enables researchers to produce trustworthy conclusions by concentrating on characterizing particular traits and significant variations among variables. Thus, quantitative research offers a more methodical and impartial comprehension of the research issue. Surveys were employed to collect data since they are among the most widely used and effective quantitative techniques for documenting the characteristics, attitudes, actions, and opinions of a significant number of respondents. Specifically, a cross-sectional survey that collected data from many respondents at once was conducted. This method works well for looking at multiple aspects at once and offers a solid foundation for extrapolating the findings to a wider student body (Ghanad, 2023). This approach also makes it easier to generate hypotheses, permits the exploration of many outcomes and exposures, and presents few ethical challenges. The results can also be used as a basis for future study that is more thorough and in-depth (Wang & Cheng, 2020).

3.2 Data Collection Methods

Data collection refers to the systematic process of gathering, analyzing, and evaluating specific information for research purposes using established and approved methods. The data gathered is used to evaluate hypotheses (Mazhar et al., 2021). To bolster our findings regarding the study's research questions, both primary and secondary data will be gathered.

3.2.1 Primary Data

Primary data refers to original information that is collected directly from the source for the first time. It is original, fresh, and hasn't been altered or

published by anybody else. Questionnaires, interviews, conversations, and observations are common methods for obtaining primary data, depending on the goals of the study (Sileyew, 2019). A Google Form was used to disseminate a structured questionnaire to participants in order to collect primary data for this study. Questionnaires are thought to be particularly useful for gathering primary data because they allow researchers to select the sample, standardize questions, and efficiently collect data from a large number of people. This method works well for large-scale surveys since it can efficiently reach geographically dispersed respondents (Taherdoost, 2021). Each respondent answered the identical set of questions in a systematic order to minimize bias and ensure consistency. This approach provided a solid foundation for evaluating the study hypotheses by ensuring consistent and reliable results (Mazhar et al., 2021).

3.2.2 Secondary Data

Secondary data refers to information that has been previously gathered, created, or published by other sources for purposes different from the present study. These statistics, which are typically historical in character, were previously gathered for a variety of reasons by organizations, agencies, or academics. In general, using secondary data is quick, economical, and gives a study important context and background. Common sources include government documents, books, journal articles, the internet, institutional records, and statistical databases (Ajayi, 2023). Secondary data were also employed in this study to complement the literature review. To obtain pertinent data, databases such as Google Scholar, ScienceDirect, JSTOR, Emerald, and Taylor & Francis were utilized.

3.3 Sampling Design

The method of selecting research study participants from a larger population using predefined criteria is known as sampling design. The main objective of sampling is to create a representative subset of the population in order to make inferences about the total population (Rahman, 2023). For researchers, creating a sample framework is essential because it allows them to collect data effectively and affordably.

3.3.1 Target Population

Alvi (2016) states that the target group is a subset of the larger population being studied and is distinguished by particular characteristics that are directly related to the research question. Since this subset is defined using criteria that align with the objectives and requirements of the study, researchers can focus on population segments that are most crucial for addressing the research questions (Casteel & Bridier, 2021; Willie, 2022). Accurately defining the target group is crucial to research methodology because it allows for the employment of tailored procedures and sampling methodologies that enhance the validity, relevance, and application of the results (Willie, 2024). Students enrolled in HEIs in Malaysia make up the study's target population. According to the Ministry of Higher Education (MOHE), there were 1,251,552 students registered in HEIs in 2024 (Ministry of Higher Education, 2025). HEI students are particularly relevant to this research because they represent a younger demographic. Furthermore, their behaviors and environmental knowledge are crucial in shaping Malaysia's long-term sustainability environment because they are future leaders, professionals, and decision-makers. To ensure that it represents a representative distribution, the study also concentrates on states with significant student enrollment.

3.3.2 Sampling Frame and Sampling Location

A sampling frame is a list of members of the target population from whom a sample may be taken (Mooney & Garber, 2019). However, as the complete list of Malaysian HEI students' names was not available, a proper sampling frame could not be built for this study. The sampling location is the site of the investigation and data collection (Karon & Wejnert, 2012). This study focuses on three states with substantial HEI student enrollments. Together, these three states will enroll 567,831 students in 2024, or around 45.37% of all HEI students in Malaysia, according to Table 3.1. Selangor had the highest percentage at 399,259 students (31.90%), followed by Perak at 85,267 students (6.81%) and Johor at 83,305 students (6.66%), according to the MOHE (2025). Approximately half of the nation's HEIs are located in these three states, making them highly representative of the country's overall student population. Therefore, selecting Selangor, Perak, and Johor as the sampling locations provides an important and trustworthy basis for analyzing regional differences in university students' environmental beliefs.

Table 3.1:

Number of HEI Students in Three States

State of HEIs	Number of Students	Percentage
Selangor	399,259	$\frac{399,259}{1,251,552} \times 100 = 31.90\%$
Perak	85,267	$\frac{85,267}{1,251,552} \times 100 = 6.81\%$
Johor	83,305	$\frac{83,305}{1,251,552} \times 100 = 6.66\%$
Total	567,831	$\frac{567,831}{1,251,552} \times 100 = 45.37\%$

Note. Adopted from Ministry of Higher Education. (2025, July 10). *MoHE - 2024*. KPT - Kementerian Pendidikan Tinggi (KPT).

3.3.3 Sampling Elements

A sample element is the portion of the population that is employed as the respondent in a study. The study's sampling components are individual students who are presently enrolled in Malaysian HEIs. The focus is on students from HEIs in Selangor, Perak, and Johor, as these three states combined account for more than half of all HEI students in the country. HEI students who went to school in these three states will thus fill out the questionnaire. Data is collected via a survey and disseminated via Google Forms.

3.3.4 Sampling Technique

Probability sampling and non-probability sampling are the two primary sampling techniques. Since there is no complete demographic list of Malaysian students enrolled in HEIs, probability sampling approaches are impractical. This study employs convenience sampling, a form of non-probability sampling. Convenience sampling participants are selected according to research relevance and accessibility (Nyimbili & Nyimbili, 2024). This strategy is particularly popular among student researchers due to its simplicity and ease of usage when compared to other sampling strategies (Stratton, 2021; Taherdoost, 2016). Despite its limitations, which include potential sample bias and limited representativeness, this approach is suitable for exploratory research and provides relevant information regarding students' environmental beliefs and pro-environmental activities (Golzar et al., 2022). The survey will be distributed to Malaysian students through Facebook and WhatsApp groups associated with the university.

3.3.5 Sampling Size

The sample size is the number of respondents selected from the target population to represent the population being studied. According to this report, there were 1,251,552 students enrolled in HEIs in Malaysia in 2024. The study focuses on three states, Selangor, Perak, and Johor, which together have 567,831 students, or roughly 45.37% of all HEI students. A minimum sample size of 384 respondents is considered adequate for populations between 75,000 and 1,000,000, according to the Krejcie and Morgan (1970) table. This sample size was chosen to retain practicality and feasibility in terms of data collection while guaranteeing that the study's findings are statistically representative of the target population.

Determining Sample Size from a Given Population for Categorical Data

N	s	N	S	N	s
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Figure 3.1. Adopted from Krejcie, R., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30(3), 607-610.

3.4 Research Instrument

3.4.1 Questionnaire Design

The main research instrument used in this study was the questionnaire, which enables researchers to collect a lot of data from several individuals while guaranteeing uniform responses. Fixed alternative questions on the questionnaire give respondents a limited number of options, encouraging consistent and comparable responses. Sections A through G comprise the total of 37 questions. With a total of six questions, Section A collects demographic data such as gender, age, state, ethnicity, education level, and subject of study. Six questions in Section B are intended to measure HEI students' intention to adopt PEB. The independent variables, which comprise 25 questions that evaluate the elements influencing students' intention to adopt PEB, are the subject of Sections C through G. There are five questions on environmental attitude (EA) in Section C, five questions on subjective norms (SN) in Section D, five questions on perceived behavioral control (PBC) in Section E, four questions assessing environmental knowledge (EK) in Section F, and six questions on environmental concern (EC) in Section G. A five-point Likert scale is used for all of the "questions in Sections B through G, with 1 indicating "strongly disagree" and 5 representing "strongly agree." This method provides quantifiable data for research by allowing respondents to select the option that best captures their perspective.

3.4.2 Pilot Study

Before beginning a bigger inquiry, a pilot study is a small-scale feasibility study carried out to assess the viability of the research approach, tools, and procedures. The primary objective is to find and address any issues in order to avoid major flaws that could compromise the validity of a comprehensive

inquiry and lead to time and cost inefficiencies, rather than focusing on the core research themes (Lowe, 2019). Pilot studies are often used to assess the usefulness, clarity, and reliability of research instruments in order to ensure that the suggested processes are suitable for the intended context. One of the main goals of questionnaire-based research is to test reliability. Methodological guidelines include minimum sample sizes of 15 for the kappa agreement test, 22 for the intra-class correlation test, and 24 for Cronbach's alpha. Considering a 20% non-response rate, a minimum of 30 respondents is generally sufficient to evaluate the reliability of a questionnaire (Bujang et al., 2024). As a result, students from Malaysian HEIs received thirty sets of questionnaires as part of the pilot experiment. SPSS was used to conduct reliability tests on the collected data.

3.5 Constructs Measurement

3.5.1 Origin of Constructs

Table 3.2:

Questionnaire

Dependent Variable	Questions	Source	Adopted/ Adapted
Pro-environmental Behavior Intention (PEBI)	PEBI1: When possible I would ride a bicycle or take public transportation to work or school. PEBI2: I intend to buy products in refillable packages. PEBI3: When cooking I would use a lid to cover the pot or pan to avoid wasting energy. PEBI4: I would recycle used paper and plastic. PEBI5: I intend to use less air-conditioning. PEBI6: I would try to convince others of the importance of environmental protection.	(Yang et al., 2020)	Adopted

Independent Variables	Questions	Source	Adopted/Adapted
Environmental Attitude (EA)	EA1: I want to live as ecologically as possible. EA2: I am very concerned about environmental issues. EA3: I think about how I can reduce environmental damage when I go on holiday. EA4: I think about the environmental impact of services I use. EA5: When shopping, I consider the environmental impact of the things I buy.	(Árnadóttir et al., 2019)	Adapted
Subjective Norms (SN)	SN1: Most people who are important to me think I should engage in pro-environmental behavior. SN2: I feel social pressure to reduce my negative impact on the environment. SN3: People who matter to me approve when I act in an environmentally friendly way SN4: People I respect want me to behave sustainability. SN5: People around me think I should act in ways that protect the environment.	(Maleknia et al., 2025)	Adapted

Independent Variables	Questions	Source	Adopted/ Adapted
Perceived Behavioral Control (PBC)	PBC1: I find it easy for me to be friendly to the environment. PBC2: I have confidence in protecting the environment. PBC3: Thanks to my resourcefulness, I can always find ways to be environmentally friendly. PBC4: I have the knowledge and skills of environmental protection. PBC5: I think that I can adopt pro-environmental behavior.	(Zhang, 2025)	Adopted
Environmental Knowledge (EK)	EK1: I have a good understanding of the benefits of recycling and waste reduction. EK2: I am knowledgeable about the impacts of pollution on human health and the environment. EK3: I am familiar with the principles of sustainable development. EK4: Compared to the average person, I am more familiar with issues related to the environment.	(Lee et al., 2023)	Adopted

Independent Variables	Questions	Source	Adopted/ Adapted
Environmental Concern (EC)	EC1: I am concerned about the condition of the environment. EC2: Humans are damaging the environment. EC3: I would give up some economic goods for a cleaner environment. EC4: The condition of the natural environment is getting worse every year. EC5: I am concerned about natural resource shortage in the future. EC6: We all need to change our behavior to protect the natural environment.	(Alzubaidi et al., 2021)	Adapted

3.5.2 Scale of Measurements

The technique of utilizing a gauge or instrument to assign numbers to human characteristics or objects is known as a scale of measurement. It is a technique that gives performances or entities numbers based on predetermined criteria. Stanley Stevens, a psychologist, developed the scale of measurement, which comprised four scales: nominal, ordinal, interval, and ratio (Nwankwo, 2023).

3.5.2.1 Nominal Scale

By classifying occurrences or observations according to a shared or comparable qualitative characteristic, the nominal measuring scale qualitatively classifies them. The nominal scale employs numbers arbitrarily, in contrast to other scales that use them more quantitatively (Idika et al., 2023). “In nominal measurement, the variable consists of

named categories that have no mathematical properties,” according to Howitt and Cramer (2011, p. 46). This kind of evaluation may be found in the questionnaire’s Section A (Demographic profile), specifically in the questions on gender, field of study, ethnic group, and current state of study in Malaysia.

Examples of nominal scale from the questionnaire:

Gender:

☐ Male

☐ Female

State currently studying in Malaysia:

☐ Selangor

☐ Perak

☐ Johor

Field of Study:

☐ Business & Management

☐ Science

☐ Engineering & Technology

☐ Social Sciences

☐ Arts & Humanities

Ethnic Group:

☐ Chinese

☐ Malay

☐ Indian

☐ Others, please specify _____

3.5.2.2 Ordinal Scale

Ordinal scales are simply ordered categories with implicit comparisons made possible by the ordering (Tastle & Wierman, 2006). The results are expressed in terms of ordinal numbers when the function shows the hierarchy or rank (Yudhanegara, 2016). The questionnaire's Section A (Demographic profile) used ordinal scales to assess questions about age and educational attainment.

Examples of ordinal scale from the questionnaire:

Age:

- ☐ 18 to 21 years old
- ☐ 22 to 25 years old
- ☐ 26 years old and above

Education Level:

- ☐ Foundation
- ☐ Diploma
- ☐ Bachelor Degree
- ☐ Master degree
- ☐ PhD

3.5.2.3 Interval Scale

Interval scales share characteristics with nominal and ordinal scales, but they also have a set interval. Thus, researchers are able to observe how much a person or object differs from another in terms of characteristics (Aini et al. 2018). In surveys, the Likert scale is widely used to measure respondents' agreement with a statement (Hodge & Gillespie, 2003). It typically includes five fundamental measurements, where 1 stands for "Strongly Disagree", 2 for "Disagree", 3 for "Neutral", 4 for "Agree", and 5 for "Strongly Agree."

A 5-point Likert scale was used in this study to evaluate respondents' agreement or disagreement with the statements provided in Sections B through G of our questionnaire.

Examples of interval scale from the questionnaire:

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	When possible, I would ride a bicycle or take public transportation to work or school.	1	2	3	4	5
2	I intend to buy products in refillable packages.	1	2	3	4	5
3	When cooking I would use a lid to cover the pot or pan to avoid wasting energy.	1	2	3	4	5
4	I would recycle used paper and plastic.	1	2	3	4	5
5	I intend to use less air-conditioning.	1	2	3	4	5
6	I would try to convince others of the importance of environmental protection.	1	2	3	4	5

3.6 Data Processing

3.6.1 Data Checking

Data checking is a crucial phase in the data processing stage that guarantees the accuracy, comprehensiveness, and consistency of the responses obtained by surveys. To identify and eliminate any incorrect codes, missing information, inconsistent responses, or responses from participants who are not eligible such as incomplete submissions or responses from individuals who do not belong to the target demographic, a methodical review of the returned data is essential (Si-Prince, 2024). This process not only enhances the general quality and dependability of the dataset but also minimizes

potential sources of bias that could undermine the validity of additional analysis. Effective data validation finally strengthens the reliability and accuracy of the research findings by safeguarding the accuracy of the data.

3.6.2 Data Editing

Data editing, which involves identifying and correcting errors, inconsistencies, and omissions in the gathered data, is an essential stage in the research process. Ensuring the validity of research findings, data quality, and research credibility is crucial. Biased and inaccurate conclusions could result from inaccurate data. Therefore, updating the data is essential before examining it. When a researcher adds, subtracts, or changes variables, values, or cases, this is known as data editing. Examples include altering an irrational number, eliminating a few outliers, or choosing between various measurements (Leahey et al., 2003). The inaccuracies are removed to guarantee the accuracy and completeness of the data collection.

3.6.3 Data Coding

Data coding included providing every possible response option in the survey with a numerical value. In this study, all responses were coded systematically using SPSS, with the coding scheme presented in Table 3.3. By ensuring that the data was organized in a standard format, this procedure made analysis more effective and decreased the possibility of mistakes during the statistical testing phase.

Table 3.3:

Data Coding for Demographic Questions

Questions	Particular	Coding
1.	Gender	1= Male 2= Female
2.	Age	1= 18 to 21 years old 2= 22 to 25 years old 3= 26 years old and above
3.	State currently studying in Malaysia	1= Selangor 2= Perak 3= Johor
4.	Education Level	1= Foundation 2= Diploma 3= Bachelor Degree 4= Master Degree 5= PhD
5.	Field of Study	1= Business & Management 2= Science 3= Engineering & Technology 4= Social Science 5= Arts & Humanities
6.	Ethnic Group	1= Chinese 2= Malay 3= Indian 4= Others

Note. Developed for research

As indicated in Table 3.4, the answers to each item in Sections B through G of the questionnaire were coded.

Table 3.4:

Data Coding for Interval Scale Questions

Likert Scale	Coding
Strongly Disagree	1
Disagree	2
Neutral	3
Agree	4
Strongly Agree	5

Note. Developed for research

3.6.4 Data Transcribing

Transcription is the method of converting notes, audio, or video into a readable textual format for qualitative data analysis. Transcribing can be costly, time-consuming, and challenging; judgments and transcribing methods need to be transparent (Eftekhari, 2024). Data transcription in this study refers to the process of inputting audited data into statistical software (SPSS). To investigate the relationship between the data and the hypothesis, this study can perform a reliability analysis using SPSS.

3.7 Data Analysis

3.7.1 Descriptive Analysis

In the absence of experimental intervention, descriptive analysis is the direct observation of target behavior in natural or naturalistic situations to gather data on ongoing and potentially important environmental events. Descriptive analysis tends to be utilized as part of a comprehensive functional assessment of problem behavior before doing an experimental functional analysis (Sloman, 2010). The findings of the study will be displayed as a means, standard deviation, frequency, and percentage. Section A of our study displays the respondents' demographic data. Data in this area can be effectively presented using bar charts, pie charts, and histograms. While bar charts are helpful for grading data, pie charts are useful for expressing nominal scale data by breaking it up into 100% parts for greater comprehension (Bavdekar, 2015).

3.7.2 Reliability Analysis

A reliability study assesses the consistency and stability of an indicator tool across time. This method guarantees reliable and consistent data from the device (Kimberlin & Winterstein, 2008). The standard method for doing reliability testing is Cronbach's alpha coefficient. Figure 3.2 shows that α values of 0.91 and above indicate excellent reliability, 0.81 – 0.90 good reliability, 0.71 – 0.80 good and acceptable reliability, and 0.61 – 0.70 acceptable reliability, and still reliable, while values below 0.60 reflect non acceptable, and considered poor strength (Konting et al., 2009).

Cronbach's Alpha Range

Cronbach Alpha value	Interpretation
0.91 - 1.00	Excellent
0.81 - 0.90	Good
0.71 - 0.80	Good and Acceptable
0.61 - 0.70	Acceptable
0.01 - 0.60	Non acceptable

Figure 3.2. Adopted from Konting, M. M., Kamaruddin, N., & Man, N. A. (2009). Quality assurance in higher education institutions: Exist survey among Universiti Putra Malaysia graduating students. *International Education Studies*, 2(1), 25-31.

3.7.3 Inferential Analysis

According to Janczyk and Pfister (2023), inferential analysis is a method used to extrapolate the results of a random sample to the population from which it came. Using a collection of data, this kind of statistical analysis enables users to draw conclusions and judgments about the general population. This analysis is used to identify correlations between variables, test hypotheses, and make predictions (Dabas, 2024). This study's

questionnaires use an interval scale to determine the dependent variable (intention to adopt PEB) and independent variables (SN, PBC, EA, EK, and EC). Multiple regression analysis is employed because both the independent and dependent variables are measurements.

A common statistical method in both academic and practical marketing research is multiple regression analysis (Mason & Perreault Jr., 1991). This regression process describes the linear relationship between a dependent variable and multiple independent factors. This approach can be used to identify outliers and ascertain the relationship between predictor elements and a criteria value (Ge & Wu, 2020). The independent and dependent variables are shown in the following equation:

$$y = \beta_0 + \beta_1x_1 + \beta_2x_2 + \beta_3x_3 + \beta_4x_4 + \beta_5x_5 + \varepsilon$$

Where:

y represent the dependent variable, β_0 represent the y – intercept, β_n represent the coefficient of each independent variables, x_n represent the independent variables, ε represent the error term.

Where should this formula have been adapted into this research:

$$PEBI = \beta_0 + \beta_1SN + \beta_2PBC + \beta_3EA + \beta_4EK + \beta_5EC + \varepsilon$$

3.8 Chapter Summary

The research approach used in this study is described in this chapter. The research design, sampling strategy, data collection techniques, research instrument, construct measurement, data processing, and data analysis methodologies were all discussed. Cronbach's Alpha is used to evaluate the questionnaire's reliability and guarantee internal consistency. The suggested hypotheses were examined using multiple regression analysis and both descriptive and inferential statistical techniques. This chapter's approach guarantees that the study is carried out systematically and that the results are accurate and dependable.

CHAPTER 4: DATA ANALYSIS

4.0 Introduction

The research approach used in this study is described in depth in this chapter. Research design, sampling strategy, data collection techniques, research instrument, construct measurement, data processing, and data analysis techniques were all discussed. Cronbach's Alpha is used to evaluate the questionnaire's reliability in order to guarantee internal consistency. The suggested theories were examined using multiple regression analysis and both descriptive and inferential statistical techniques. This chapter's approach guarantees that the study is carried out carefully and that the results are accurate and dependable.

4.1 Descriptive Analysis

4.1.1 Respondents Demographic Profile

Table 4.1:

Gender Descriptive Analysis

Gender	Frequency	Percentage (%)	Cumulative Frequency	Cumulative Percentage (%)
Male	180	46.9	180	46.9
Female	204	53.1	384	100.0
Total	384	100.0		

Note. Data generated and retrieved from SPSS

Pie Chart of Descriptive Analysis for Gender

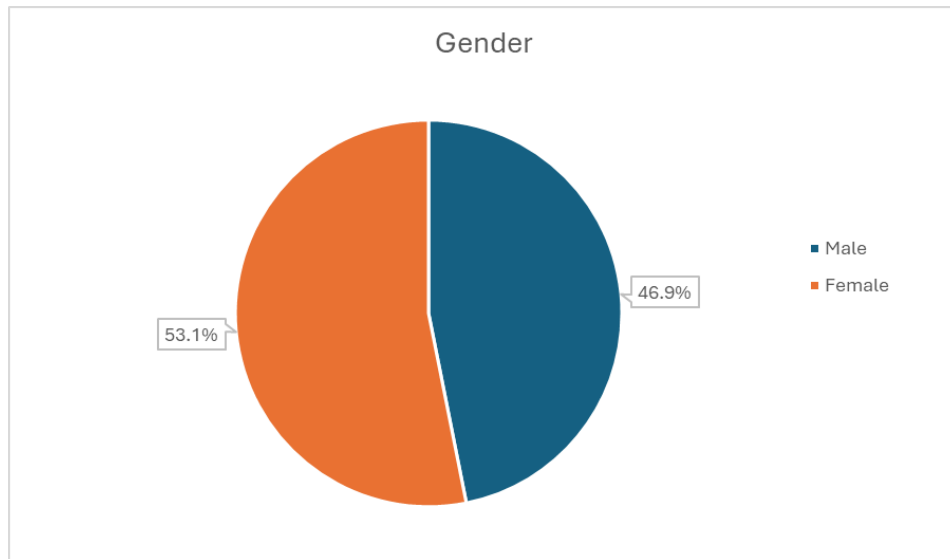


Figure 4.1. Data generated and retrieved from SPSS

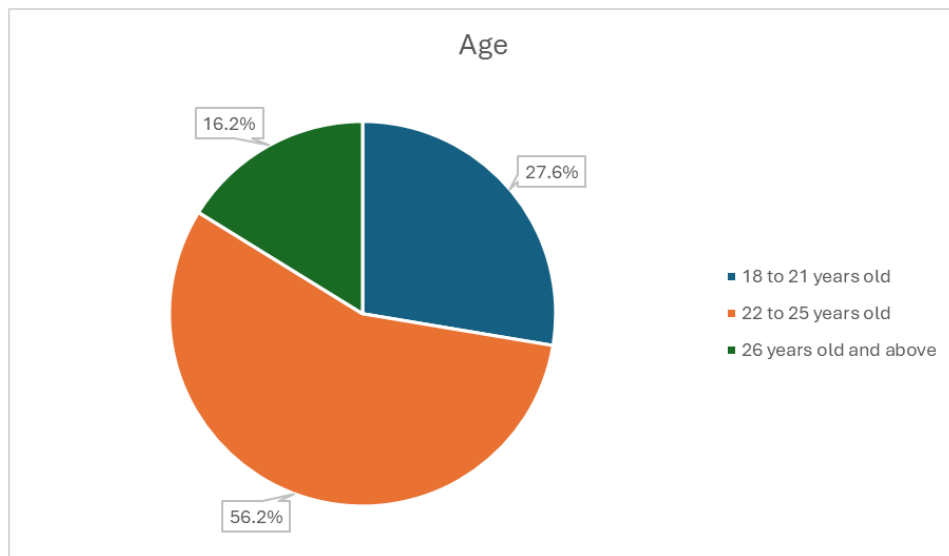
Table 4.1 and Figure 4.1's Gender section reveals that 204 female respondents, or 53.1% of the total, and 180 male respondents, or 46.9%, made up the majority of survey participants.

Table 4.2:

Age Descriptive Analysis

Age	Frequency	Percentage (%)	Cumulative Frequency	Cumulative Percentage (%)
18 to 21 years old	106	27.6	106	27.6
22 to 25 years old	216	56.2	322	83.9
26 years old and above	62	16.1	384	
Total	384	100.0		

Note. Data generated and retrieved from SPSS

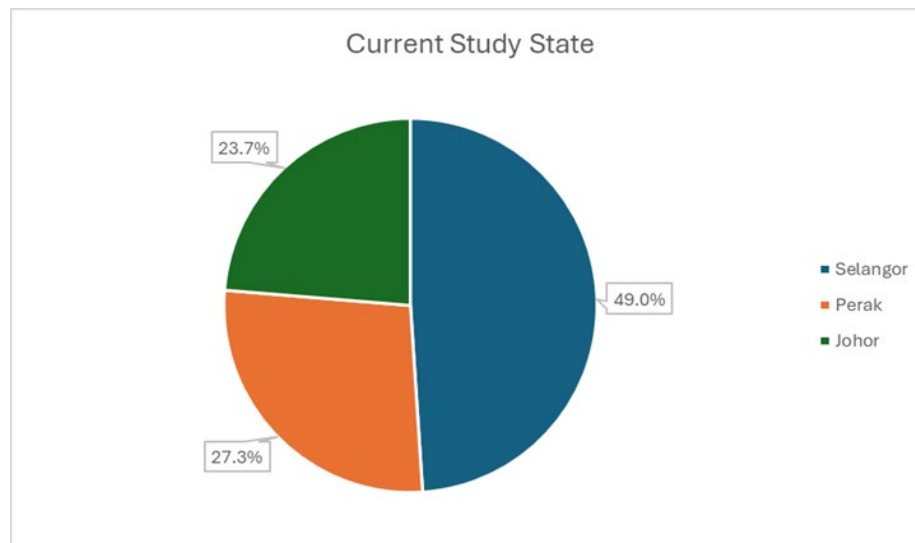
Pie Chart of Descriptive Analysis for Age*Figure 4.2.* Data generated and retrieved from SPSS

The ages of the respondents were divided into three categories, as shown in Table 4.2 and Figure 4.2. Of the 384 respondents, 27.6% (106 respondents) were between the ages of 18 and 21, 56.2% (216 respondents) were between the ages of 22 and 25, and 16.1% (62 respondents) were older than 26. The results show that the large of respondents are in the ages of 22 and 25, indicating that young adults make up the majority of the sample. Since people in this age range are usually enrolled in HEIs, this age distribution is suitable for the study. Thus, the sample offers pertinent information about the subject of the study.

Table 4.3:
Current Study State Descriptive Analysis

Current Study State	Frequency	Percentage (%)	Cumulative Frequency	Cumulative Percentage (%)
Selangor	188	49.0	188	49.0
Perak	105	27.3	293	76.3
Johor	91	23.7	384	100.0
Total	384	100.0		

Note. Data generated and retrieved from SPSS

Pie Chart of Descriptive Analysis for Current Study State*Figure 4.3. Data generated and retrieved from SPSS*

According to Table 4.3 and Figure 4.3, Selangor accounts for the largest percentage of respondents (188, or 49% of the total), followed by Perak (105, or 27.3%) and Johor (91, or 23.7%). The greater concentration of HEIs and students in the state may be reflected in the higher percentage of responders from Selangor. Selangor offers a pertinent background for analyzing factors impacting HEI students' intention to embrace PEB because it is one of Malaysia's most developed and densely inhabited states.

Table 4.4:

Educational Level Descriptive Analysis

Education Level	Frequency	Percentage (%)	Cumulative Frequency	Cumulative Percentage (%)
Foundation	97	25.3	97	25.3
Diploma	75	19.5	172	44.8
Bachelor's degree	157	40.9	329	85.7
Master's degree	36	9.4	365	95.1
PhD	19	4.9	384	100.0
Total	384	100.0		

Note. Data generated and retrieved from SPSS

Pie Chart of Descriptive Analysis for Educational Level

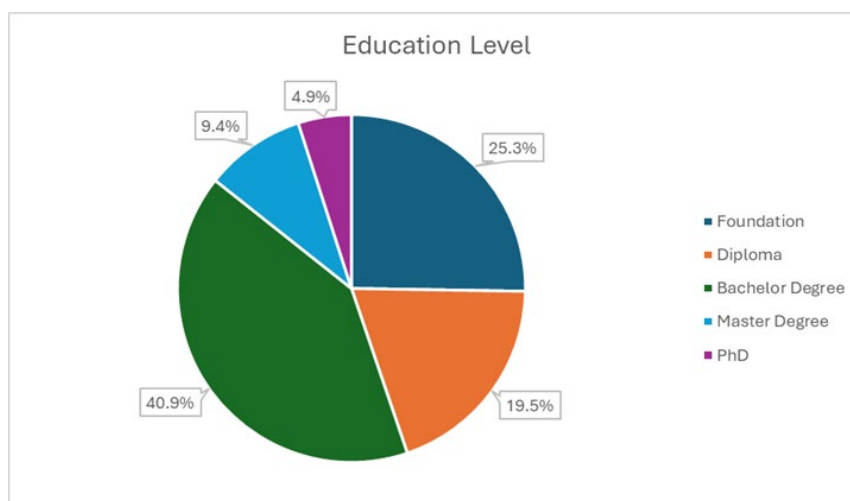


Figure 4.4. Data generated and retrieved from SPSS

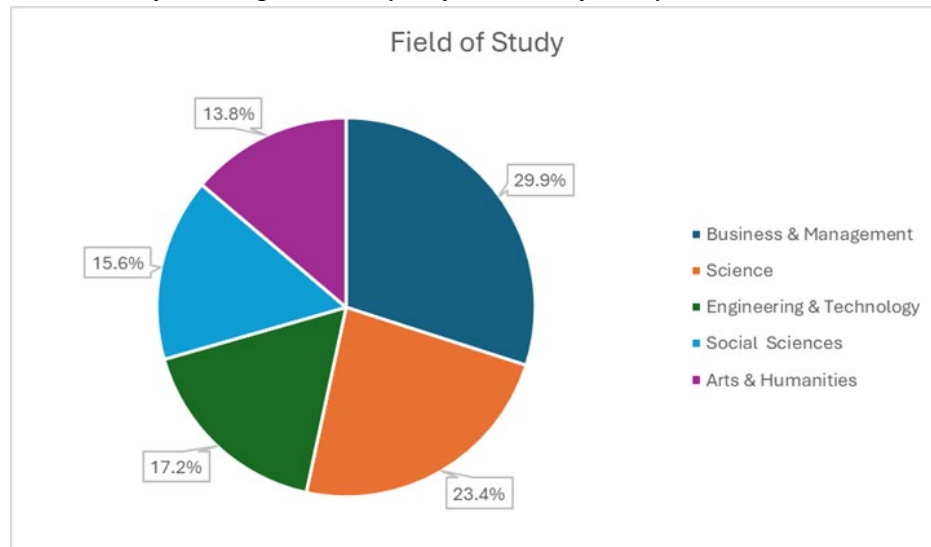
Table 4.4 and Figure 4.4 show that 157 respondents, or 40.9% of all, hold a bachelor's degree. Next in line are 97 responders, or 25.3%, who have foundation qualifications. 75 respondents, or 19.5%, have a diploma; 36 respondents, or 9.4%, have a master's degree; and 19 respondents, or 4.9%, have a PhD, which is the lowest percentage. The bulk of respondents appear to be undergraduate students in HEIs, based on the high percentage of bachelor's degree holders.

Table 4.5:

Field of Study Descriptive Analysis

Field of Study	Frequency	Percentage (%)	Cumulative Frequency	Cumulative Percentage (%)
Business & Management	115	29.9	115	29.9
Science	90	23.4	205	53.4
Engineering & Technology	66	17.2	271	70.6
Social Sciences	60	15.6	331	86.2
Arts & Humanities	53	13.8	384	100.0
Total	384	100.0		

Note. Data generated and retrieved from SPSS

Pie Chart of Descriptive Analysis for Field of Study*Figure 4.5.* Data generated and retrieved from SPSS

The allocation of respondents according to their subject of study is shown in Table 4.5 and Figure 4.5. With 115 respondents (29.9%), business and management account for the bulk of responses. Science comes in second with 90 respondents (23.4%), and engineering and technology with 66 respondents (17.2%). 60 respondents (15.6%) are in the social sciences, and 53 respondents (13.8%) are in the arts and humanities. The distribution demonstrates that responses are drawn from a wide variety of academic fields, with business and management accounting for a disproportionately large portion. This diversity is advantageous to the study because it allows for a more comprehensive knowledge of the factors influencing the desire to adopt PEB across different academic disciplines in Malaysian HEIs.

Table 4.6:
Ethnic Group Descriptive Analysis

Ethnic Group	Frequency	Percentage (%)	Cumulative Frequency	Cumulative Percentage (%)
Chinese	179	46.6	179	46.6
Malay	157	40.9	336	87.5
Indian	48	12.5	384	100.0
Total	384	100.0		

Note. Data generated and retrieved from SPSS

Pie Chart of Descriptive Analysis for Ethnic Group

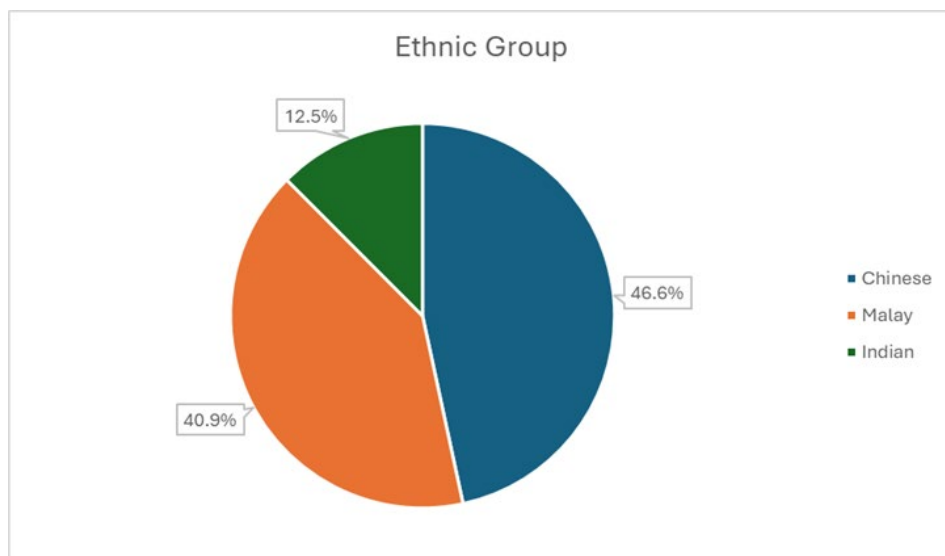


Figure 4.6. Data generated and retrieved from SPSS

Table 4.6 and Figure 4.6 display the ethnic makeup of the respondents. With 179 responses, or 46.6%, Chinese respondents made up the largest group. A total of 157 responders, or 40.9%, were Malay. With 48 responses, or 12.5%, Indian responders were the fewest, nonetheless.

4.1.2 Central Tendencies Measurement of Constructs

Table 4.7:

Central Tendencies Measurement of Constructs

Variables	Sample sizes, N	Mean	Standard Deviation
Intention to Adopt Pro-Environmental Behavior	384	3.9905	0.64761
Environmental Attitude Average	384	3.9781	0.76226
Subjectives Norms Average	384	3.9187	0.82814
Perceived Behavioral Control Average	384	4.1281	0.66752
Environmental Knowledge Average	384	4.2083	0.57005
Environmental Concern Average	384	4.2405	0.54761

Note. Data generated and retrieved from SPSS

Following the SPSS analysis, Table 4.7 displays the descriptive statistics for the six variables analyzed in this study: five independent variables (EA, SN, PBC, EK, and EC) and one dependent variable (intention to adopt PEB).

Environmental concern had the greatest mean score of 4.2405 with a standard deviation of 0.54761, according to the results. Environmental knowledge came next, with a mean score of 4.2083 and a standard deviation of 0.57005, suggesting that respondents are generally quite knowledgeable and concerned about the environment. With a mean of 4.1281 and a standard deviation of 0.66752, perceived behavioral control came in third, indicating that respondents believe they can act in an environmentally friendly manner. Subjective norms had a mean score of 3.9187 with a standard deviation of 0.82814, indicating somewhat favorable opinions and societal pressure to undertake PEB, whereas environmental attitude had a mean score of 3.9781 with a standard deviation of 0.76226. Furthermore, HEI students in Malaysia often show a positive intention to engage in PEBs, as indicated by

the dependent variable, intention to adopt PEB, which had an average value of 3.9905 with a standard deviation of 0.64761. Overall, the findings indicate that respondents had a high level of environmental awareness and care, which may influence their desire to engage in PEB.

4.2 Scale Measurement

4.2.1 Reliability Analysis

Table 4.8:

Cronbach's Alpha Reliability Analysis

Type of the variable	Variables	Number of Items	Cronbach's Alpha	Reliability Test
Independent Variable	Subjective Norms	5	0.855	Good
	Perceived Behavioral Control	5	0.837	Good
	Environmental Attitude	5	0.849	Good
	Environmental Knowledge	4	0.681	Acceptable
	Environmental Concern	6	0.765	Good and Acceptable
Dependent Variable	Intention to Adopt Pro-Environmental Behavior	6	0.723	Good and Acceptable

Note. Data generated and retrieved from SPSS

The reliability analysis in Table 4.8 displays the Cronbach's alpha values for each variable used in this study. The dependent variable, intention to adopt PEB, shows a Cronbach's alpha value of 0.723, which is within the range of 0.71 to 0.80 and indicates good and acceptable reliability. Environmental concern having an alpha value of 0.765 for the independent variables, which is also regarded as good and acceptable. Environmental knowledge records a value of 0.681, indicating acceptable reliability as it

falls within the range of 0.61 to 0.70. However, because their Cronbach's alpha values are over 0.81, subjective norms (0.855), environmental attitude (0.849), and Perceived behavioral control (0.837) show good reliability. Overall, all variables show acceptable to good reliability because the minimum Cronbach's alpha value of 0.60 is exceeded. They are therefore thought to be trustworthy and suitable for more investigation in this study.

4.2.2 Multicollinearity Analysis

Multicollinearity occurs when a large number of factors in the regression model have a significant connection with both the dependent variable and each other (Young, 2017). In multiple linear regression using more than two independent variables, multicollinearity can be determined using the VIF and tolerance values. VIF values of more than 10.0 and Tolerance values of less than 0.10 indicate a serious multicollinearity problem (Wondola et al., 2020).

Table 4.9:

Tolerance value and Variable Inflation Factor (VIF)

Independent Variables	Collinearity Statistics	
	Tolerance	VIF
Subjective Norms	0.411	2.431
Perceived Behavioral Control	0.388	2.578
Environmental Attitude	0.350	2.854
Environmental Knowledge	0.415	2.409
Environmental Concern	0.432	2.313

Note. Data generated and retrieved from SPSS

Based on the results, subjective norms has a tolerance value of 0.411 and a VIF value of 2.431, while perceived behavioral control records a tolerance value of 0.388 and a VIF value of 2.578. Environmental attitude shows a tolerance value of 0.350 with a VIF value of 2.854. Meanwhile,

environmental knowledge and environmental concern have tolerance values of 0.415 and 0.432, with VIF values of 2.409 and 2.313 respectively. The results show that there is no multicollinearity problem among the independent variables in this study because all tolerance values are above 0.10 and all VIF values are below 10.0.

4.3 Inferential Analysis

4.3.1 Multiple Regression Analysis

Table 4.10:

Coefficient Range Table

Coefficient Range	Strength
± 0.91 to ± 1.00	Very Strong
± 0.71 to ± 0.90	High
± 0.41 to ± 0.70	Moderate
± 0.21 to ± 0.40	Small but definite relationship
± 0.00 to ± 0.20	Slight, almost negligible

Note. Adopted from Hair, J. F. Jr. Money, A.H., Samouel, Philip, & Page, Mike (2007). *Research Methods for Business*, John Wiley and Sons, Inc.

Table 4.11:

Model Summary

Model	R	R Square	Adjusted Square	R Std. Error of the Estimate
1	0.790a	0.624	0.549	0.39946
a. Predictors: (Constant), Concern Average, Norms Average, Control Average, Knowledge Average, Attitude Average				
b. Dependent Variable: Intention Average				

Note. Data generated and retrieved from SPSS

R value

The R-value shows the relationship coefficient between the independent and dependent variables. The R value for this study is 0.790. The dependent variable, intention to adopt PEB, and the independent factors, EA, SN, PBC, EK, and EC, are correlated with this value. Strong and positive relationships between the independent and dependent variables are shown by the R value of 0.790. The value can be viewed as having a good correlation because it is between ± 0.71 and ± 0.90 . This implies that students' intention to embrace PEB is substantially correlated with the sum of the independent variables.

R Square

The R square value indicates the proportion of the dependent variable's variance that the independent variables in the model can explain. The R square value in this investigation is 0.624. This shows that the independent factors of EA, SN, PBC, EK, and EC account for 62.4% of the variance in the dependent variable, intention to adopt PEB. Nevertheless, the variables in this study do not account for the remaining 37.6% (100% - 62.4%) of the variance. This suggests that HEI students' intention to engage in pro-environmental conduct may be influenced by other factors that have not been included in the current research. However, a R square value of 62.4% shows that the model has significant explanatory power, indicating that the chosen independent variables are crucial in predicting Malaysian students' intention to adopt PEB.

Table 4.12:

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig
1	Regression	100.314	5	20.063	125.732	0.000a
	Residual	60.317	378	0.160		
	Total	160.632	383			

a. Predictors: (Constant), Concern Average, Norms Average, Control Average, Knowledge Average, Attitude Average

b. Dependent Variable: Intention Average

Note. Data generated and retrieved from SPSS

The regression model's F-statistic is 125.732, with $p < 0.001$, according to the ANOVA findings shown in the table. The model is statistically significant because the p-value is smaller than the alpha value of 0.05. This suggests that the variance in the data is substantially explained by the regression model. The significant F-value indicates that a significant percentage of the variance in the dependent variable, intention to adopt PEB, can be explained by the independent variables, which include EA, SN, PBC, EK, and EC. As a result, the results validate both the study's alternate hypothesis and the suggested research model.

Table 4.13:

Coefficients

Model		Unstandardized Coefficients Beta	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	0.777	0.172		4.509	0.000
	Subjective Norms	0.186	0.038	0.238	4.483	0.000
	Perceived Behavioral Control	0.084	0.049	0.087	1.711	0.088
	Environmental Attitude	0.360	0.045	0.423	7.951	0.000
	Environmental Knowledge	0.130	0.056	0.114	2.340	0.020
	Environmental Concern	0.037	0.057	0.032	0.661	0.509

a. Dependent Variable: Intention to adopt pro-environmental behavior

Note. Data generated and retrieved from SPSS

H1: There is a significant relationship between subjective norms and the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.

The results show that students' intentions to adopt PEB is greatly influenced by subjective norms. The link is statistically significant when the p-value is less than 0.001, which is below the 0.05 significance level. H1 is therefore supported.

H2: There is a significant relationship between perceived behavioral control and the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.

The findings show that the intention to adopt PEB is not significantly correlated with perceived behavioral control. Perceived behavioral control had a p-value of 0.088, which is higher than the significance level of 0.05.

Thus, in this study, intention is not significantly influenced by perceived behavioral control. H2 is therefore not supported.

H3: There is a significant relationship between environmental attitude and the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.

The results show that the intention to adopt PEB in this study is significantly correlated with environmental attitude. The environmental attitude p-value was less than 0.001 ($p < 0.001$), which is below the 0.05 significance limit. As a result, students' intentions to adopt PEB are greatly influenced by their environmental attitudes. H3 is therefore supported.

H4: There is a significant relationship between environmental knowledge and the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.

Analysis of the data shows that environmental knowledge significantly affects students' intention to adopt PEB. The p-value for this variable is 0.020, which falls below the 0.05 significance threshold. This indicates that students who possess higher levels of environmental knowledge are more likely to intend to engage in PEB. Consequently, H4 is supported.

H5: There is a significant relationship between environmental concern and the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.

Analysis of the data shows that environmental knowledge significantly affects students' intention to adopt PEB. This variable's p-value is 0.020, which is less than the significance level of 0.05. This suggests that students who are more knowledgeable about the environment are more likely to plan to act in an environmentally friendly manner. Consequently, H4 is supported.

Regression Equation

$$y = a + b_1 (x_1) + b_2 (x_2) + b_3 (x_3) + b_4 (x_4) + b_5 (x_5)$$

y = Dependent variable (Intention to Adopt Pro-environmental Behavior)

a = Constant value

x₁ = Independent variable 1 (Subjective Norms)

x₂ = Independent variable 2 (Perceived Behavioral Control)

x₃ = Independent variable 3 (Environmental Attitude)

x₄ = Independent variable 4 (Environmental Knowledge)

x₅ = Independent variable 5 (Environmental Concern)

Intention to adopt PEB = 0.777 + 0.186 (Subjective Norms) + 0.084 (Perceived Behavioral Control) + 0.360 (Environmental Attitude) + 0.130 (Environmental Knowledge) + 0.037 (Environmental Concern)

Highest Contribution

The strongest predictor of the dependent variable is environmental attitude, which has the highest standardized beta value (0.423) when compared to the other predictor variables. After adjusting for the effects of the other variables in the model, this shows that environmental attitude makes the most distinct contribution to explaining variance in the dependent variable.

Second-Highest Contribution

The second-largest contributor, subjective norms, has a standardized beta value of 0.238. This demonstrates that, after controlling for the other variables in the model, subjective norms provide the second-largest unique contribution to explaining the variance in the dependent variable.

Third-Highest Contribution

With a standardized beta of 0.114, environmental knowledge has the third-largest effect on the dependent variable. After taking into account the impact of the other factors in the model, its effect is significantly smaller than that of the higher-ranked predictors, even if it still helps explain students' intention to embrace pro-environmental action.

Fourth-Highest Contribution

The contribution of perceived behavioral control is ranked fourth, with a normalized beta of 0.087. This implies that perceived behavioral control contributes very little to explaining the variance in the dependent variable after the other variables in the model are taken into consideration.

Lowest Contribution

Among all the independent factors in this study, environmental concern has the lowest standardized beta value (0.032), suggesting that it has the least impact on students' desire to adopt pro-environmental activity. This suggests that, in comparison to the other predictors in the model, environmental concern contributes very little to explaining the variance in the dependent variable when the effects of the other factors are controlled.

4.4 Chapter Summary

This chapter used SPSS to provide the study's data analysis and conclusions. Descriptive analysis, reliability analysis, multicollinearity analysis, and inferential analysis were among the analyses. The central tendency measurement of the constructs and the demographic characteristics of the respondents were summarized using descriptive analysis. The measuring items' internal consistency was assessed using reliability analysis, and the links between the independent variables were investigated using multicollinearity analysis. To ascertain the connection between independent and dependent variables, multiple regression analysis was also carried out. The study's main conclusions, limitations, and suggestions for additional research will all be covered in more detail in the following chapter.

CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATIONS

5.0 Introduction

The statistical analysis from the previous chapter will be reviewed in this chapter, along with the main research findings, practical consequences, limits, and suggestions for additional research. This chapter also provides a summary of the full research project. By detailing and summarizing the findings, it will clearly communicate the study's key conclusions and offer guidance for additional research in relevant domains.

5.1 Discussions of Major Findings

Table 5.1:

Summary of SPSS Hypotheses Testing

Hypothesis	Value	Result
H1: Subjective norms have a significant impact on the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.	P-Value = 0.000 ($P < 0.05$)	Supported
H2: Perceived behavioral control has a significant impact on the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.	P-Value = 0.088 ($P > 0.05$)	Not Supported

H3: Environmental attitude has a significant impact on the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.	P-Value = 0.000 ($P < 0.05$)	Supported
H4: Environmental knowledge has a significant impact on the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.	P-Value = 0.020 ($P < 0.05$)	Supported
H5: Environmental Concern has a significant impact on the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.	P-Value = 0.509 ($P > 0.05$)	Not Supported

Note. Developed for research

5.1.1 Subjective Norms (SN)

H1: There is a significant relationship between SN and the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.

According to H1, students' intentions to adopt PEB are significantly influenced by subjective norms. SN have a considerable impact on students' intention, as evidenced by the p-value of 0.000, which is below the significance level of 0.05. H1 is therefore supported.

This study implies that social pressure or expectations from important individuals in their lives, such as friends, family, and peers, have a major impact on students' intentions to act in a pro-environmental manner. According to Setiawan et al. (2020), people are more likely to create intentions to engage in actions that are favored by their reference groups.

Students are more likely to absorb these normative standards when they strongly identify with social groupings, such as communities or peers who care about the environment (Capasso et al., 2025). Pro-environmental intentions are strengthened and adherence to group principles is encouraged by this sense of belonging (Bamberg et al., 2023). As these norms gain prominence, people's motivation to engage in ecologically responsible activities increases, demonstrating the impact of group identification on individual decision-making (Maleknia et al., 2025).

In addition, research by Jalaludin (2025) shows that public figure campaigns can successfully motivate students to adopt environmentally friendly behaviors. This conclusion is also supported by earlier research. For instance, Wang et al. (2022) discovered that regulatory encouragement and social support can motivate university students to adopt ecologically responsible practices. Correia et al. (2022) found that students' pro-environmental intentions are positively impacted by SN. This is in line with recent research showing a robust correlation between pro-environmental intention and SN (Savari et al., 2023; Sun et al., 2022; Zhang et al., 2022). This outcome generally aligns with the TPB, which asserts that subjective criteria are a major determinant of behavioral intention (Ajzen, 2011). Students' desire to act in an environmentally responsible manner is greatly increased as social expectations gain prominence.

5.1.2 Perceived Behavioral Control (PBC)

H2: There is a significant relationship between PBC and the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.

H2 states that the intention of HEI students to embrace pro-environmental conduct is significantly correlated with PBC. Nevertheless, the multiple regression analysis's findings show that this link is not significant because

the p-value (0.088) is higher than the significance level of 0.05. H2 is therefore not supported.

PBC is influenced by the availability of resources such as time, money, knowledge, and facilitating conditions. According to this study, there is no significant correlation between PBC and PEBI. This could be explained by students' perceptions of pro-environmental acts as costly or inconvenient, especially considering academic time restrictions that make them less inclined to engage in time-consuming behaviors (Fatih Sudin et al., 2023). Besides, although students may typically believe that they can do pro-environmental acts, when external and contextual restrictions are present, this perceived control does not always convert into intention (Kotzya et al., 2024). These obstacles include unclear institutional guidelines, insufficient public transportation systems, inadequate energy-saving infrastructure, and restricted access to recycling facilities. Consistent participation in PEBs is further discouraged by elements like financial limits, time constraints, distance to facilities, and the complexity of necessary measures (Matiuk & Liobikienė, 2021). Even among those with favorable environmental attitudes, these situational constraints lessen the impact of PBC on behavioral intention (Bosnjak et al., 2020). This suggests that PBC alone is inadequate when environmental actions are limited by institutional and structural constraints, as there is a discrepancy between perceived control and actual opportunity structures (Phang & Ilham, 2023; Maulana et al., 2025). As a result, PBC's ability to predict intention is diminished. This result is consistent with earlier research demonstrating that while students appreciate environmental conservation, they frequently find it difficult to put these ideals into practice because of practical limitations (Gifford, 2011; Landers, 2024). When external impediments are present, PBC may specifically have a greater impact on actual behavior than on intention, reflecting the well-known intention-behavior gap defined by structural, resource, and financial constraints (Maria et al., 2025).

In addition, this study implies that when structural support is inadequate, social and normative influences may have a greater impact on behavioral

intention. In a similar vein, Krettenauer et al. (2020) discovered that when normative influences and external support systems are more prevalent, PBC typically has less impact. Contextual obstacles like scarce institutional resources and infrastructure limitations, which limit students' opportunities to act despite their willingness, might be blamed for this diminished influence (Chen & Erfanian, 2026). In this sense, the extent to which PBC translates into behavioral intention is highly dependent on the availability of university infrastructure and supportive regulatory frameworks. When supporting conditions such as waste segregation systems, energy-efficient infrastructure, accessible green spaces, and organized environmental initiatives are insufficient or absent, students have fewer practical opportunities to participate in PEB (Maulana et al., 2025). This suggests that students' PEB is influenced by institutional structures and environmental support networks in addition to their own sense of control. Therefore, when environmental measures are heavily limited by university policies and available infrastructure, the impact of PBC on behavioral intention may be diminished (Chwialkowska et al., 2020; Qi et al., 2025). This offers a reasonable justification for PBC's non-significant impact in this investigation. Overall, the non-significant correlation between PBC and PEBI suggests that students' behavioral intention cannot be driven solely by perceived capacity, especially when institutional and structural limitations restrict the viability of action.

5.1.3 Environmental Attitude (EA)

H3: There is a significant relationship between environmental attitude and the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.

According to H3, students' intention to embrace PEB is significantly correlated with their attitude toward the environment. Subjective norms have a considerable impact on students' intention, as indicated by the p-

value of 0.000, which is smaller than the statistically significant alpha value of 0.05. H3 is thus supported.

According to Milfont and Duckitt (2010), attitude plays a significant role in environmental environments where people develop attitudes about the natural world. The outcome is consistent with the central idea of the TPB, which maintains that an individual's behavioral intention is significantly influenced by their attitude toward an activity. According to Ajzen (1991), people are more likely to take part in activities that they feel advantageous. Pro-environmental participation is strongly predicted by good EA, and people with optimistic views are more inclined to act. Studies have repeatedly shown that attitude toward the environment positively affects behavioral intention along with turn and actual conduct, providing empirical support for this link. For example, Levine and Strube (2012) discovered that EA has a considerable impact on pro-environmental intention, which subsequently influences undergraduate students' eco-friendly conduct. In a similar vein, Smith and McSweeney (2007) demonstrated that intentions toward pro-social, pro-environmental, and altruistic activities are influenced by positive sentiments.

Pro-environmental attitudes and behavioral intentions are positively correlated, according to studies published in 2020 and 2021 (Baird et al., 2020; Zarei et al., 2020). This correlation is further substantiated by another research (Taufique & Vaithianathan, 2018; Fang et al., 2018). Furthermore, attitude plays a crucial role in identifying how conduct affects the environment and reflects people's views of the human-environment relationship (Janmaimool & Khajohnmanee, 2019). In certain circumstances such as energy conservation, while favorable attitudes result in stronger behavioral intentions, attitude has also been found to be the biggest predictor (Martinsson et al., 2011; Cotton et al., 2016). Therefore, encouraging university students to have favorable environmental views is crucial for bolstering their intention to participate in pro-environmental activity, which may be improved by effective communication techniques.

5.1.4 Environmental Knowledge (EK)

H4: There is a significant relationship between environmental knowledge and the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.

According to H4, students' intention to engage in PEB is significantly correlated with EK. The p-value of 0.020, which is smaller than the significance alpha value of 0.05, indicates that students' intentions are significantly influenced by subjective standards. Thus, H4 is supported.

According to Wang et al. (2014) and Zsóka et al. (2013), environmental knowledge is the understanding of environmental issues, challenges, and possible solutions that enables people to take appropriate action. According to Leonidou et al. (2010), it also entails "realizing the importance of the environment". Without this knowledge, people cannot consciously protect the environment or behave in an environmentally friendly way (Gifford & Nilsson, 2014). Numerous studies have shown that those with greater EK are more probable to adopt pro-environmental attitudes and behaviors (Liu et al., 2021; Wang et al., 2019). For example, Vicente-Molina et al (2013) showed that students' pro-environmental intentions and behaviors in both developed and developing nations are positively and significantly impacted by EK. Furthermore, Yadav and Pathak (2016) showed that students' pro-environmental intentions are positively impacted by EK.

Knowledge in society also makes it possible for people to gain a deeper comprehension of environmental problems and to place a higher value on environmental preservation. The function of understanding as a predictor of ecological behavior is also supported by previous research. Levine and Strube (2012) and Fielding and Head (2012) found that knowledge was a significant direct predictor of ecological behavior. Knowledge of environmental and climate change issues is associated with increased environmental concern, attitudes, and a desire to reduce energy use,

according to Steg et al. (2015) examination of the factors influencing energy-saving behavior. Using the data generated by their study, Moghimehfar and Halpenny (2016) proposed that knowledge had a direct and favorable effect on intention, a direct but negative impact on limitations, and a positive impact on motives. Therefore, these results highlight how important environmental information is in influencing the intention to engage in environmentally friendly activity.

5.1.5 Environmental Concern (EC)

H5: There is a significant relationship between environmental concern and the intention to adopt pro-environmental behavior (PEB) among higher education institution (HEI) students in Malaysia.

According to H5, students' intentions to engage in PEB are significantly correlated with EC. However, this association is not statistically significant, according to the multiple regression analysis. EC has a p-value of 0.509, which is higher than the significance level of 0.05. Consequently, H5 is not supported. This finding aligns with Lau and Hashim (2020), who also reported no significant direct association between EC and PEBI, representing an inconsistent result compared to prior studies that found positive relationships (Shulman et al., 2022; Chwialkowska et al., 2020; Gansser & Reich, 2023).

The global increase in EC is often seen as a positive indicator of pro-environmental orientation, based on the premise that higher concern leads to stronger behavioral intention. Nevertheless, this assumption is not always supported by empirical data. According to earlier research, people's behavior does not necessarily reflect their stated concerns about the environment (Kollmuss & Agyeman, 2002; Gifford, 2011). High levels of EC do not result in comparable behavioral results; this discrepancy is commonly known as the "concern-behavior gap" (Kollmuss & Agyeman,

2002; Zeng et al., 2023). One explanation for this gap is psychological barriers, which are internal factors that hinder individuals from translating EC into PEB (Lorenzoni et al., 2007; Gifford, 2011). Students, who are in a transitional stage of life where EC does not always result in strong behavioral commitment, are especially vulnerable to these obstacles (Sammalisto et al., 2016).

Specifically, the relationship between students' EC and their behavioral intention is weakened by mistrust. Students may be reluctant to engage in PEB even when they care about the environment if they believe that others are not making sufficient effort. This fear of free riding lowers motivation because people can think their efforts are meaningless in the absence of group involvement (Tam & Chan, 2017). Also, people frequently base their expectations on their preconceived notions about human nature due to the lack of information regarding other people's involvement in environmental problems. Engagement in PEB is also decreased when such trust is poor (Sønderskov, 2009). Such suspicion further undermines the conversion of EC into behavioral intention in student situations where peer influence and social comparison are powerful.

The idea of external control is another crucial argument for why EC may not strongly translate into PEB among students. Since environmental issues are often perceived as large-scale and complex, students may feel that their individual actions have a limited impact on environmental outcomes (Weber & Stern, 2011). Empirical studies further show that individuals who perceive low control over environmental outcomes or experience feelings of helplessness are less likely to engage in PEB (Aitken et al., 2011; Doherty & Webler, 2016). This aligns with the locus of control theory, which suggests that individuals with a more external orientation are less likely to adopt PEBs (Tam & Chan, 2017). In this sense, students may perceive environmental protection as a collective responsibility that requires systemic and societal action, rather than individual effort alone. The perceived influence of any one person diminishes when the situation is seen as a societal challenge involving numerous individuals, which lowers

emotions of personal control over results. As a result, people who care about the environment could nevertheless be reluctant to take action since they do not think they have any power over the environment. Previous research has revealed this perceived lack of control as a psychological obstacle (Lorenzoni et al., 2007). According to research, people who question the efficacy of their acts are less likely to participate in PEB (Antonetti & Maklan, 2014). According to research, people who question the efficacy of their acts are less likely to participate in PEB (Antonetti & Maklan, 2014). According to Hines et al. (1987), pro-environmental activity is also less common among those who generally think that external factors control life outcomes. In general, it is anticipated that the relationship between behavioral engagement and EC will be weakened by a greater belief in external control.

The limited correlation between EC and PEBI may also be caused by cognitive limits in addition to psychological restrictions. Wachholz et al. (2014) found that although most HEI students express concern about climate change, they often hold misconceptions about its causes and consequences. If students think that their individual efforts are insufficient to address global EC, these beliefs may cause them to become less motivated to behave in a pro-environmental manner. The lack of prompt and obvious feedback further impedes the conversion of EC into behavioral intentions because the benefits of pro-environmental acts are frequently intangible or delayed (Yu & Yu, 2017). Taken together, these psychological and cognitive elements contribute to the explanation of why behavioral intention among Malaysian HEI students is not strongly predicted by EC alone. Even though students may show concern for environmental issues, their lack of consciousness of environmental repercussions and suspicion of others make it difficult to put their concerns into practice.

5.2 Implications of the Study

5.2.1 Practical Implications

The results of the study offer legislators, HEIs, and environmental stakeholders with innovative, useful advice for promoting PEB among Malaysian students. The significant influence of subjective norms highlights the significant role that social identity, peer influence, and supportive institutions play in influencing students' PEB. If students feel they are part of a pro-environment community, they are more likely to adopt sustainable behaviors as social norms. Therefore, Malaysian HEIs should purposefully cultivate a strong sense of collective environmental identity through peer-led projects, eco-groups, sustainability ambassador programs, inter-dormitory competitions, and public appreciation of environmentally concerned student organizations. By presenting sustainability as a shared group value and a sign of belonging, institutions can raise normative pressures, boost students' preparedness to adopt PEB, and ensure that behavioral intentions result in consistent pro-environmental activities (Chen & Erfanian, 2026). In addition, the strong association between environmental attitude and intention suggests that prosocial principles are a significant driver of students' environmental engagement. Therefore, instead of simply conducting awareness campaigns, HEIs should actively integrate sustainability into value-based education by integrating environmental ethics into academic programs, experiential education, and community engagement activities. By educating students on the long-term individual and societal benefits, such as increased employment opportunities, more self-efficacy, and a stronger sense of social responsibility, institutions may foster a deeper commitment to sustainability. Furthermore, the significance of environmental awareness indicates that informed students are more likely to have intentions to adopt PEB. Universities and policymakers should enhance the dissemination of knowledge through targeted educational programs, digital tools, and

interactive campaigns that clearly convey concrete steps and real-world environmental consequences. Behavioral intention can be further reinforced by customizing communication tactics to highlight the efficacy of specific acts and their observable results.

On the other hand, the non-significant results for environmental concern and perceived behavioral control suggest that structural provision and general awareness are insufficient to affect behavioral intention. This demonstrates a potential intention-behavior gap, where students may be concerned about environmental issues but not motivated to act. Therefore, rather than relying solely on infrastructure or awareness messaging, corporations should encourage value internalization, social impact, and engagement-driven approaches. All factors considered, this study emphasizes the significance of a comprehensive and well-coordinated strategy that integrates social norms, prosocial principles, and knowledge expansion. By moving from solely informational or resource-based initiatives to more socially anchored and value-driven strategies, HEIs and policymakers can more successfully translate environmental awareness into meaningful behavioral intentions. Students in Malaysia will benefit from this by becoming more ecologically conscious and sustainable.

5.2.2 Theoretical Implications

The present research advances the theory of Icek Ajzen's 1985 TPB and its extensions. This study identifies significant shortcomings that call for additional theoretical development while examining its application in explaining Malaysian HEI students' intentions to embrace PEB. The results of this study show that not all factors consistently predict behavioral intention, despite TPB's claim that attitudes, subjective norms, and perceived behavioral control impact behavior. Students' intention to adopt PEB was found to be highly influenced by environmental attitude and subjective norms, but not by perceived behavioral control. By adding other

factors related to PEB, such as environmental knowledge and concern, this study expanded the TPB framework. However, environmental concern was also shown to be negligible, indicating that in this situation, some psychological and affective components might not successfully translate into behavioral intention.

All of these results point to a TPB boundary condition and raise the possibility that the model may not adequately explain pro-environmental intentions. The difference between intentions and conduct observed in both correlational and experimental research is known as the intention-behavior gap (Sheeran, 2002; Godin & Conner, 2008; Rhodes & de Bruijn, 2013), helps to explain this limitation. The existence of the intention-behavior gap and the necessity of adding more variables to increase its explanatory power are further supported by earlier research demonstrating that TPB is more successful in predicting intention than actual conduct (Gomes et al., 2018).

Since it defies the generally accepted notion in earlier research that greater environmental concern results in more PEB, the weak correlation between environmental concern and PEBI is especially interesting. Comparing different situations makes this disparity more noticeable. Strong regulations, advanced infrastructure, and active involvement in waste management systems make it easier for environmental concerns to be converted into PEBs in places like Taiwan and Japan (Rasnan et al., 2016). On the contrary, while environmental concern is present among Malaysian students, it does not always result in action. This discrepancy can be attributed to contextual factors like inadequate infrastructure, poor enforcement, and implementation difficulties in Malaysia (Adibah Zulkifli & Lim, 2025), as well as mistrust of environmental initiatives, restricted access to facilities (Ganesan & Lajis, 2025), and delayed behavioral responses (Yu & Yu, 2017). On the contrary, while environmental concern is present among Malaysian students, it does not always result in action. This discrepancy can be attributed to contextual factors like inadequate infrastructure, poor enforcement, and implementation difficulties in Malaysia (Adibah Zulkifli & Lim, 2025), as well as mistrust of environmental initiatives, restricted

access to facilities (Ganesan & Lajis, 2025), and delayed behavioral responses (Yu & Yu, 2017). On the contrary, while environmental concern is present among Malaysian students, it does not always result in action. This discrepancy can be attributed to contextual factors like inadequate infrastructure, poor enforcement, and implementation difficulties in Malaysia (Adibah Zulkifli & Lim, 2025), as well as mistrust of environmental initiatives, restricted access to facilities (Ganesan & Lajis, 2025), and delayed behavioral responses (Yu & Yu, 2017).

From a theoretical standpoint, this study advances the TPB model by showing that adding environmental concerns does not always improve the model's capacity to explain various situations. The results cast doubt on the notion that environmental concern directly influences PEB and instead imply that it may play a more indirect and context-dependent function. This emphasizes how crucial it is to apply behavioral theories like TPB with a more context-specific approach, especially in developing nations like Malaysia whose structural and behavioral dynamics may be different from those seen in more industrialized nations.

5.3 Limitations of the Study

This study has several limitations that should be taken into consideration when evaluating the results. First, since the questionnaire was self-reported, response bias might have happened. When it comes to socially valued PEB, such as recycling or energy saving, respondents may tend to give positive answers. Participants may exaggerate their engagement in eco-friendly behaviors because the study focuses on the intention to adopt PEB, even if their actual conduct does not fully reflect these claims. In survey-based research, this tendency is challenging to manage and may have an impact on data accuracy. Due to time limitations or lack of interest, some respondents might have filled out the questionnaire quickly without giving their answers much thought, which could result in inconsistent or random responses. Survey-based research frequently exhibits this kind of behavior, which

could lower the overall validity and trustworthiness of the findings. Furthermore, despite the study's comparatively high R-square value of 0.624, the model still has 37.6% of unexplained variation. This indicates that the selected independent factors account for 62.4% of the variation in the desire to engage in PEB. The remaining unexplained variance, however, raises the possibility that the model is not entirely complete because there may be more significant factors influencing students' inclination to adopt PEB that were not considered in this study. Furthermore, this study collected data from Malaysian students enrolled in HEIs using convenience sampling. Although this approach saves time and is effective, it may limit the sample's representativeness and lessen the findings' generalizability. The sample might be skewed in favor of student demographics that are easier to reach or more eager to take part. The ethnic distribution of respondents is unbalanced, including more Chinese participants ($n = 179$) than Malays ($n = 157$) and Indians ($n = 48$), even though Malays make up the majority population in Malaysia. Such an imbalance implies that sampling bias may be introduced and that the sample may not accurately reflect the true demographic composition, especially when it comes to ethnic variations in PEB. The results cannot be completely extrapolated to all HEI students in Malaysia or to other communities, despite efforts to gather a varied sample in terms of background and demographics. Therefore, it is important to exercise caution when extrapolating the results of the study from the sample that is being studied.

5.4 Recommendations for Future Research

Future studies might think about using a mixed-method approach that combines online questionnaires with a few semi-structured interviews. While surveys can be used to collect data from a larger sample, a subset of respondents may be deliberately selected for interviews in order to gain a deeper knowledge of their attitudes and motives for pro-environmental action. This method gives researchers a deeper understanding of the research subject by allowing them to supplement quantitative findings with qualitative observations. Future studies should look at other psychological and contextual factors that could affect students' intention to

adopt PEB in order to provide a more complete knowledge of the factors influencing PEB. Incorporating a wider range of variables may help to capture influences that are not fully addressed in this study and improve the explanatory power (R^2) of the model. This implies that further mediating or moderating factors that affect the relationship between concern and behavior should be investigated in future research. These factors include mistrust of environmental initiatives, delayed behavioral responses, infrastructure availability, and situational or psychological constraints that may prevent concern from being translated into actual pro-environmental action. Lastly, it is advised that future studies use quota sampling approaches to ensure that the sample more closely reflects the demographic composition of the population. For example, respondents may be chosen according to predetermined percentages of Malaysian ethnic groups, such as ensuring a greater representation of Malay students in accordance with their majority status, followed by Chinese and Indian students. This strategy would improve the sample's representativeness and lessen sampling bias, making it possible to more confidently generalize the results to Malaysia's larger population of HEI students.

5.5 Conclusion

In summary, the aim of this study was to examine the ways in which various factors influence the intentions of Malaysian HEI students to adopt PEB. Among the independent factors analyzed are subjective norms, perceived behavioral control, environmental attitude, environmental knowledge, and environmental concern. The findings demonstrate that while perceived behavioral control and environmental concern were shown to be insignificant, students' intention to participate in PEB is significantly influenced by subjective norms, environmental attitude, and environmental knowledge. Given the limitations of the study, recommendations for additional research have been made. These results can be used as a guide for politicians and HEIs to create initiatives, policies, and programs that encourage students to behave sustainably and cultivate a more ecologically conscious campus culture.

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Appendices

Appendix 1: Survey Questionnaire



**UNIVERSITI TUNKU ABDUL RAHMAN
TEH HONG PIOW FACULTY OF BUSINESS AND FINANCE
UNDERGRADUATE FINAL YEAR PROJECT [FYP]**

**TOPIC: Factors Affecting Intention to Adopt Pro-Environmental Behavior (PEB)
among Higher Education Institution (HEI) Students in Malaysia**

Dear respondents,

We are students of from Teh Hong Piow Faculty of Business and Finance from Universiti Tunku Abdul Rahman (UTAR). The purpose of this study is to evaluate the impacts of subjective norms, environmental attitude, perceived behavioral control, environmental concern and environmental knowledge on intention to adopt pro-environmental behavior among HEI students in Malaysia. This study can help policymakers, educators, and institutions better understand the factors influencing students' pro-environmental intentions and provide useful insights to design more effective environmental awareness campaigns, education programs, and policies.

There are **SEVEN** (7) sections in this questionnaire. Section A is on demographics. Sections B, C, D, E, F, and G cover all of the variables in this study. Please read the instructions carefully before answering the questions. Please answer **ALL** questions in **ALL** sections. Completion of this questionnaire will take you approximately 15 to 20 minutes.

Your participation in this study is entirely voluntary. There will be no disadvantage if you decide not to complete the attached anonymous questionnaire. You can withdraw at any time without any penalty. You can refuse to answer any question at any time if you feel uncomfortable.

The information collected from you will be kept strictly private and confidential. All responses and findings will be used solely for academic purposes.

Your assistance in completing this questionnaire is very much appreciated. Thank you for your participation. If you have any questions regarding this questionnaire, you may contact us at xuanng0826@utar.my / wanqin4992@utar.my.

If you decide to complete this attached anonymous questionnaire, this will be taken as you voluntarily agree and formal consent to participate in this study. Thank you very much for your cooperation and willingness to participate in this study.

Yours sincerely,
Ng Xuan
Tee Wan Qin

PERSONAL DATA PROTECTION NOTICE

Please be informed that in accordance with Personal Data Protection Act 2010 (“PDPA”) which came into force on 15 November 2013, Universiti Tunku Abdul Rahman (“UTAR”) is hereby bound to make notice and require consent in relation to collection, recording, storage, usage and retention of personal information.

1. Personal data refers to any information which may directly or indirectly identify a person which could include sensitive personal data and expression of opinion. Among others it includes: Name, identity card, place of birth, address, education history, employment history, medical history, blood type, race, religion, photo, personal information and associated research data.

2. The purposes for which your personal data may be used are inclusive but not limited to:

- a) For assessment of any application to UTAR
- b) For processing any benefits and services
- c) For communication purposes
- d) For advertorial and news
- e) For general administration and record purposes
- f) For enhancing the value of education
- g) For educational and related purposes consequential to UTAR
- h) For replying any responds to complaints and enquiries
- i) For the purpose of our corporate governance
- j) For the purposes of conducting research/ collaboration

3. Your personal data may be transferred and/or disclosed to third party and/or UTAR collaborative partners including but not limited to the respective and appointed outsourcing agents for purpose of fulfilling our obligations to you in respect of the purposes and all such other purposes that are related to the purposes and also in providing integrated services, maintaining and storing records. Your data may be shared when required by laws and when disclosure is necessary to comply with applicable laws.

4. Any personal information retained by UTAR shall be destroyed and/or deleted in accordance with our retention policy applicable for us in the event such information is no longer required.

5. UTAR is committed in ensuring the confidentiality, protection, security and accuracy of your personal information made available to us and it has been our ongoing strict policy to ensure that your personal information is accurate, complete, not misleading and updated. UTAR would also ensure that your personal data shall not be used for political and commercial purposes.

Consent:

1. By submitting or providing your personal data to UTAR, you had consented and agreed for your personal data to be used in accordance to the terms and conditions in the Notice and our relevant policy.

2. If you do not consent or subsequently withdraw your consent to the processing and disclosure of your personal data, UTAR will not be able to fulfill our obligations or to contact you or to assist you in respect of the purposes and/or for any other purposes related to the purpose.

3. You may access and update your personal data by writing to us at xuanng0826@1utar.my/ wanqin4992@1utar.my.

Acknowledgment of Notice

- ☐ I have been notified and that I hereby understood, consented and agreed per UTAR above notice.
- ☐ I disagree, my personal data will not be processed.

Section A: Demographic Profile

Please select one option for each of the following questions:

1. Gender:
 - ☐ Male
 - ☐ Female
2. Age:
 - ☐ 18 to 21 years old
 - ☐ 22 to 25 years old
 - ☐ 26 years old and above
3. State currently studying in Malaysia:
 - ☐ Selangor
 - ☐ Perak
 - ☐ Johor
4. Education Level
 - ☐ Foundation
 - ☐ Diploma
 - ☐ Bachelor Degree
 - ☐ Master degree
 - ☐ PhD
5. Field of Study:
 - ☐ Business & Management
 - ☐ Science
 - ☐ Engineering & Technology
 - ☐ Social Sciences
 - ☐ Arts & Humanities
6. Ethnic Group:
 - ☐ Chinese
 - ☐ Malay
 - ☐ Indian
 - ☐ Others, please specify _____

Section B: Intention to Adopt Pro-Environmental Behavior

Based on your personal experience and lifestyle as a higher education student in Malaysia, please select the option that best reflects your level of agreement with the following statements regarding your intention to adopt pro-environmental behavior.

Level of agreement:

1- Strongly Disagree;

2- Disagree;

3- Neutral;

4- Agree;

5 - Strongly Agree

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	When possible, I would ride a bicycle or take public transportation to work or school.	1	2	3	4	5
2	I intend to buy products in refillable packages.	1	2	3	4	5
3	When cooking, I would use a lid to cover the pot or pan to avoid wasting energy.	1	2	3	4	5
4	I would recycle used paper and plastic.	1	2	3	4	5
5	I intend to use less air-conditioning.	1	2	3	4	5
6	I would try to convince others of the importance of environmental protection.	1	2	3	4	5

Section C: Environmental Attitude

Based on your personal experience and lifestyle as a higher education student in Malaysia, please select the option that best reflects your level of agreement with the following statements.

Level of agreement:

- 1- Strongly Disagree;**
- 2- Disagree;**
- 3- Neutral;**
- 4- Agree;**
- 5 - Strongly Agree**

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I want to live as ecologically as possible.	1	2	3	4	5
2	I am very concerned about environmental issues.	1	2	3	4	5
3	I think about how I can reduce environmental damage when I go on holiday.	1	2	3	4	5
4	I think about the environmental impact of services I use.	1	2	3	4	5
5	When shopping, I consider the environmental impact of the things I buy.	1	2	3	4	5

Section D: Subjective Norms

Based on your personal experience and lifestyle as a higher education student in Malaysia, please select the option that best reflects your level of agreement with the following statements.

Level of agreement:

1- Strongly Disagree;

2- Disagree;

3- Neutral;

4- Agree;

5 - Strongly Agree

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Most people who are important to me think I should engage in pro-environmental behavior.	1	2	3	4	5
2	I feel social pressure to reduce my negative impact on the environment.	1	2	3	4	5
3	People who matter to me approve when I act in an environmentally friendly way.	1	2	3	4	5
4	People I respect want me to behave sustainability.	1	2	3	4	5
5	People around me think I should act in ways that protect the environment.	1	2	3	4	5

Section E: Perceived Behavioral Control

Based on your personal experience and lifestyle as a higher education student in Malaysia, please select the option that best reflects your level of agreement with the following statements.

Level of agreement:

1- Strongly Disagree;

2- Disagree;

3- Neutral;

4- Agree;

5 - Strongly Agree

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I find it easy for me to be friendly to the environment.	1	2	3	4	5
2	I have confidence in protecting the environment.	1	2	3	4	5
3	Thanks to my resourcefulness, I can always find ways to be environmentally friendly.	1	2	3	4	5
4	I have the knowledge and skills of environmental protection.	1	2	3	4	5
5	I think that I can adopt pro-environmental behavior.	1	2	3	4	5

Section F: Environmental Knowledge

Based on your personal experience and lifestyle as a higher education student in Malaysia, please select the option that best reflects your level of agreement with the following statements.

Level of agreement:

1- Strongly Disagree;

2- Disagree;

3- Neutral;

4- Agree;

5 - Strongly Agree

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I have a good understanding of the benefits of recycling and waste reduction.	1	2	3	4	5
2	I am knowledgeable about the impacts of pollution on human health and the environment.	1	2	3	4	5
3	I am familiar with the principles of sustainable development.	1	2	3	4	5
4	Compared to the average person, I am more familiar with issues related to the environment.	1	2	3	4	5

Section G: Environmental Concern

Based on your personal experience and lifestyle as a higher education student in Malaysia, please select the option that best reflects your level of agreement with the following statements.

Level of agreement:

- 1- Strongly Disagree;**
- 2- Disagree;**
- 3- Neutral;**
- 4- Agree;**
- 5 - Strongly Agree**

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I am concerned about the condition of the environment.	1	2	3	4	5
2	Humans are damaging the environment.	1	2	3	4	5
3	I would give up some economic goods for a cleaner environment.	1	2	3	4	5
4	The condition of the natural environment is getting worse every year.	1	2	3	4	5
5	I am concerned about natural resource shortage in the future.	1	2	3	4	5
6	We all need to change our behavior to protect the natural environment.	1	2	3	4	5

Appendix 2: Descriptive Analysis

Demographic Profile: Gender

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	180	46.9	46.9	46.9
	Female	204	53.1	53.1	100.0
	Total	384	100.0	100.0	

Demographic Profile: Age

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18 to 21 years old	106	27.6	27.6	27.6
	22 to 25 years old	216	56.2	56.2	83.9
	26 years old and above	62	16.1	16.1	100.0
	Total	384	100.0	100.0	

Demographic Profile: Current Study State

Current study state

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Selangor	188	49.0	49.0	49.0
	Perak	105	27.3	27.3	76.3
	Johor	91	23.7	23.7	100.0
	Total	384	100.0	100.0	

Demographic Profile: Education Level

Education level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Foundation	97	25.3	25.3	25.3
	Diploma	75	19.5	19.5	44.8
	Bachelor Degree	157	40.9	40.9	85.7
	Master Degree	36	9.4	9.4	95.1
	PhD	19	4.9	4.9	100.0
	Total	384	100.0	100.0	

Demographic Profile: Field of Study

		Field of study			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Business & Management	115	29.9	29.9	29.9
	Science	90	23.4	23.4	53.4
	Engineering & Technology	66	17.2	17.2	70.6
	Social Sciences	60	15.6	15.6	86.2
	Arts & Humanities	53	13.8	13.8	100.0
	Total	384	100.0	100.0	

Demographic Profile: Ethnic Group

		Ethnic group			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Chinese	179	46.6	46.6	46.6
	Malay	157	40.9	40.9	87.5
	Indian	48	12.5	12.5	100.0
	Total	384	100.0	100.0	

Appendix 3: Reliability Test Analysis Result for Full Test

Dependent Variable: Intention to Adopt Pro-Environmental Behavior

Scale: Reliability Analysis for Intention to Adopt Pro-Environmental Behavior

Case Processing Summary

		N	%
Cases	Valid	384	100.0

a. Listwise deletion based on all variables in the procedure.

Case Processing Summary

		N	%
Cases	Excluded ^a	0	.0
	Total	384	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.723	6

Independent Variable: Subjective Norms

Scale: Reliability Analysis for Subjective Norms

Case Processing Summary

		N	%
Cases	Valid	384	100.0
	Excluded ^a	0	.0
	Total	384	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.855	5

Independent Variable: Perceived Behavioral Control

Scale: Reliability Analysis for Perceived Behavioral Control

Case Processing Summary

		N	%
Cases	Valid	384	100.0
	Excluded ^a	0	.0
	Total	384	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.837	5

Independent Variable: Environmental Attitude

Scale: Reliability Analysis for Environmental Attitude

Case Processing Summary

		N	%
Cases	Valid	384	100.0
	Excluded ^a	0	.0
	Total	384	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.849	5

Independent Variable: Environmental Knowledge

Scale: Reliability Analysis for Environmental Knowledge

Case Processing Summary

		N	%
Cases	Valid	384	100.0
	Excluded ^a	0	.0
	Total	384	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.681	4

Independent Variable: Environmental Concern

Scale: Reliability Analysis for Environmental Concern

Case Processing Summary

		N	%
Cases	Valid	384	100.0
	Excluded ^a	0	.0
	Total	384	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.765	6

Appendix 4: Multiple Linear Regression Analysis

Regression

[DataSet1] E:\F-Batch32-BA12-2301162_FYP.sav

Variables Entered/Removed^b

Model	Variables Entered	Variables Removed	Method
1	Concern Average, Norms Average, Control Average, Knowledge Average, Attitude Average ^a	.	Enter

a. All requested variables entered.

b. Dependent Variable: Intention Average

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.790 ^a	.624	.620	.39946

a. Predictors: (Constant), Concern Average, Norms Average, Control Average, Knowledge Average, Attitude Average

b. Dependent Variable: Intention Average

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	100.314	5	20.063	125.732	.000 ^a
	Residual	60.317	378	.160		
	Total	160.632	383			

a. Predictors: (Constant), Concern Average, Norms Average, Control Average, Knowledge Average, Attitude Average

b. Dependent Variable: Intention Average

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.777	.172		4.509	.000		
	Attitude Average	.360	.045	.423	7.951	.000	.350	2.854
	Norms Average	.186	.038	.238	4.843	.000	.411	2.431
	Control Average	.084	.049	.087	1.711	.088	.388	2.578
	Knowledge Average	.130	.056	.114	2.340	.020	.415	2.409
	Concern Average	.037	.057	.032	.661	.509	.432	2.313

a. Dependent Variable: Intention Average

Casewise Diagnostics^a

Case Number	Std. Residual	Intention Average	Predicted Value	Residual
139	-3.600	2.00	3.4379	-1.43790
144	-6.582	1.67	4.2960	-2.62934
160	-3.565	1.83	3.2574	-1.42407
257	-3.223	3.17	4.4540	-1.28737
341	-3.065	3.17	4.3910	-1.22433

a. Dependent Variable: Intention Average

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.2912	4.7639	3.9905	.51178	384
Residual	-2.62934	1.16090	.00000	.39685	384
Std. Predicted Value	-3.320	1.511	.000	1.000	384
Std. Residual	-6.582	2.906	.000	.993	384

a. Dependent Variable: Intention Average