Group 5

FACTORS AFFECTING PRO-ENVIRONMENTAL BEHAVIOUR AMONG UNDERGRADUATE STUDENTS IN UTAR

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A research project submitted in partial fulfillment of the requirement for the degree of

BACHELOR OF BUSINESS ADMINISTRATION (HONS)

UNIVERSITI TUNKU ABDUL RAHMAN
FACULTY OF BUSINESS AND FINANCE

DEPARTMENT OF BUSINESS

AUGUST 2018

DECLARATION

We hereby declare that:

(1) This undergraduate research project is the end result of our own work and that due acknowledgement has been given in the references to ALL sources of information be they printed, electronic, or personal.

(2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.

(3) Equal contribution has been made by each group member in completing the research project.

(4) The word count of this research report is 20722.

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ACKNOWLEDGEMENT

First and foremost, we would like to express sincere thanks to Universiti Tunku Abdul Rahman (UTAR) for giving us the opportunity to involve in the final year project. We had gained lots of benefits including learning, communication, teamwork and self-development. With the guidance and contribution from numerous parties, we have successfully completed our final year project.

Apart of that, special thanks to our FYP supervisor, Dr. Teoh Sok Yee, who provided countless hours of guidance, advice, concern, information, support and precious advice in completing this final year project. We are grateful for her assistance and time spent during and outside consultation hours. Without her guidance and persistent support, we are unable to complete our research project in a proper and smooth manner.

In addition, we would like to the express appreciation to Dr. Alex Choong Yuen Onn and Dr. Ng Lee Peng. Although they are not our FYP supervisor, they still provide us useful and constructive suggestion that able to help us through the difficulties and problems.

Besides, our sincerest appreciation is extended to all the respondents who were willing to spend their valuable time and efforts to complete the questionnaire. Without their collaboration and contributions in filling our questionnaire, it would have been impossible to collect so many questionnaires in such a short period.

Therefore, we truly appreciate the efforts of the respondents who were being so kind to provide us with such quality and precise data in assisting this research. Furthermore, the support from family members and friends are also integral as it gives us the motivation and commitment in completing this research project. In a nutshell, the commitment and encouragement from all the members is highly appreciated as this research will not be so successful without the help of the members.

DEDICATION

This research project is dedicated to all individual who have been contributed to this research whether directly or indirectly.

Firstly, we would like to dedicate this research project to our beloved supervisor, Dr. Teoh Sok Yee, who contributed her precious time and effort in guiding us. Without her guidance and full support, we would not be able to complete this research project on time.

Secondly, we would like to dedicate this research project to our family members, friends and classmates whom have supported us unconditionally throughout the process. They have been providing us with umpteenth encouragement and motivation in completing this research project.

Last but not least, we would like to dedicate this research project to Universiti Tunku Abdul Rahman (UTAR) which have provided us with sufficient facilities and resources to conduct this research project. Without the help of all these parties, this research project will not be a success.

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LIST OF ABBREVIATIONS

BES	Built Environmental Society
CFC	Chlorofluorocarbon
CO2	Carbon Dioxide
CSR	Corporate Social Responsibility
ENGOs	Environmental non-governmental organizations
EPI	Environmental Performance Index
GPS	Green Power Society
NAM	Norm- Activation Model
NASA	National Aeronautics and Space Administration
PBC	Perceived Behavioural Control
PEB	Pro-Environmental Behaviour
PPM	Parts per Million
SAS	Statistical Analysis System
THE	Times Higher Education
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
UKM	Universiti Kebangsaan Malaysia
UM	Universiti Malaya
UMS	Universiti Malaysia Sabah
UPSI	Universiti Pendidikan Sultan Idris
USM	University Science Malaysia
UTAR	Universiti Tunku Abdul Rahman
VBN	Value-Belief Norms
WWF	World Wide Fund

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PREFACE

It is compulsory to carry out this research project in order to accomplish our study which is Bachelor of Business Administration (Hons). The topic of this research project is "To examine the Factors affecting Pro-Environmental Behaviour among Undergraduate Students in UTAR". This topic is conducted to raise awareness of undergraduate students in UTAR regarding the importance of the mother-nature.

In this era of globalization, many people tend to neglect their roles and responsibilities to take care of the environment. It is of the utmost importance for every parties such as government, community, business cooperation and educational institutions to play their part in maintaining the balance of the ecology. This research will provide a better understanding of pro-environmental behaviour among undergraduate students in UTAR.

This research project take personal, social and environmental factors into consideration to explain the significance influence of these antecedent towards the pro-environmental behaviour In short, this research project will provide the public with clear information and data for a cleaner and healthier environment.

ABSTRACT

While pro-environmental behaviour among undergraduate students has been widely investigated in developed countries, it is often overlooked among undergraduate graduates, especially in private universities, in Malaysia. However, undergraduate students are the future leader, decision-makers and intellectuals of the economic, social and political that could perform a positive attitude, taking responsibility and participate in the protection of a sustainable environment. Hence, this study aimed at examining the influence of personal norms, social norms, social media, environmental knowledge and environmental attitudes on pro-environmental behaviour among UTAR undergraduate students. Structured self-administered questionnaires were distributed to UTAR undergraduate students using the simple random sampling technique. Usable responses were received from 382 UTAR undergraduate students, giving a response rate of 96%. Pearson Correlation Coefficient and Multiple Linear Regression Analysis were performed using the Statistical Analysis System (SAS) version 7.1. The results indicate that personal norms and social media have the significant influence on pro-environmental behaviour whereas social norms, environmental knowledge and environmental attitudes show insignificant influence on pro-environmental behaviour. Integrating internal and external factors in explaining pro-environmental behaviour among undergraduate students will enrich the existing literature.

Keywords: Pro-Environmental Behaviour, Personal Norms, Social Norms, Social Media, Environmental Knowledge, Environmental Attitudes

CHAPTER 1: INTRODUCTION

1.0 Introduction

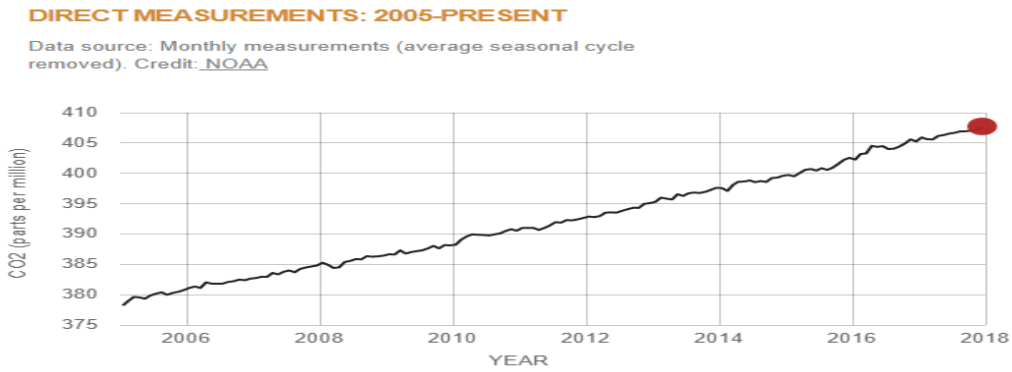
Chapter one provides an overall view of the research background regarding the research topic include the detailed elucidation of the problem statement. Moreover, it also includes the research objectives, research questions, hypotheses test, significance of this study, chapter layout and ultimately the conclusion of this study.

1.1 Research Background

In this era of globalization, many people have realized that the society cannot continue with the present path of being unethically involved in the environmental issues such as water pollution, deforestation, industrial waste and natural disaster (Siti, Nurita and Azlina, 2010). According to Steg and Vlek (2009), human practices are one of the most crucial actions that lead to environmental problems such as climate change, global warming, environmental noise, loss of biodiversity, and environmental quality that may pose a threat to the environmental sustainability.

Climate change is caused by the patterns of human activity and it will bring a severe impact on everyone's life in the society as well as the environment (Hargreaves, 2011). Adedeji, Reuben and Olatoye (2014) pointed out that climate change is indeed one of the main challenges that will affect not only the environment but to the societies as well. For example, carbon dioxide (CO2) is a significant heat-trapping gas which is released by human activities such as burning fossil fuels, deforestation and natural process like respiration. Figure 1.1 shows the measurement of the CO2 from the year 2005 to the year 2017.

Figure 1.1: Measurements of carbon dioxide from the year 2005 to the year 2017



Source: (NASA, 2018)

The measurement for CO2 showed a significant increase of 29.41 ppm from 378.21 ppm (2005) to 407.62 ppm (2017). NASA pointed out that the parts per million of the CO2 may continue to increase in 2018 (NASA, 2018). Shahbazi and Nasab (2016) stated that human actions such as the burning of oil, coal and gas as well as deforestation are the central reason of the increased in CO2. Besides, burning fossil fuels will transform the carbon to CO2 during the process and it is vital to note that the three primary sectors that use fossil fuels are electricity/heat, industry and transportation.

Adedeji et al., (2014), explained that with the ever-changing weather patterns, it could harm the food production, rising of sea level, increase the risk of natural disasters, and these negative effects of climate change are unprecedented in scale. Moreover, Adedeji et al., (2014) pointed out that climate change may bring more negative impacts on poor people and poor countries as they have a high dependency on natural resources in their daily activities. These groups of people will be more vulnerable as compared to those who are wealthier because they have a lower dependency on natural resources in their daily activities. Other than that, global climate change may cause health impacts to mankind such as temperature-related illness, extreme weather-related illness, air-pollution-related illness, water and food bore diseases and effect of food and water shortages (Adedeji et al., 2014). Hence, it is argued that human activities are one of the contributors to these kinds of infectious diseases other

than the inevitable climate change (Adedeji et al., 2014). According to the Swiss Re Economic Research, the numbers of catastrophic events are expected to increase in the coming years (Organisation for Economic Co-operation and Development, 2018).

Hence, the pro-environmental behaviour (PEB) is important as understanding because human behaviour is the main factor to the environmental problems and these problems should be solved by the human itself by changing their perception and perspective of its action towards the mother earth. Krajhanzl (2010) defines PEB as the knowledge of environmental science or ecology that will be judged according to the impact on the environment. Moreover, the PEB is a behaviour that generally judged in the context of a tribute to the healthy environment or as a protective way of environmental behaviour. Elgaaied (2012) and Staats, Harland and Wilke (2004) considered PEB as one of the pro-social behaviour that is more beneficial to others. PEB is generally future-oriented and benefits directly to the person who performs the behaviour. According to Turaga, Howarth and Borsuk (2010), PEB of an individual is one of the integration challenges in the route to sustainable development.

1.2 Problem Statement

In these modern societies, many people tend to place a high value on economic prosperity rather than to promote PEB which is one of the most vital issues in today's world (Gatersleben, Murtagh and Abrahamse, 2014). Osman, Isa, Othman and Jaganathan (2015) pointed out that human behaviour has hardly changed even with the consequences of human actions towards the environment which include climate change, pollution as well as another diminishing of natural resources. Kollmuss and Agyeman (2002) also argued that the current views of behaviour that intentionally try to reduce the adverse impact of one's actions will not completely solve the problems of environmental in today's world. Hence, government, society and organization should play their own role in recognizing all the environmental issues and search for a solution to environmental problems. Government intervention in terms of regulating

the limit of emission and the use of toxic materials while organization can contribute more in promoting the environment rather than being profit-oriented (Stegall, 2006).

Hence, promoting, understanding and measuring of environmental performance are of the utmost importance around the world. The Environmental Performance Index (EPI) has been used to analyze the countries' performance on high-significance environmental concerns in two different areas which is the protection of environmental condition to assist in the economic growth and prosperity of a country, and the ecosystem vitality which categorize under strain from industrialization and development activities (Environmental Performance Index, 2018). There are ten different indicators to determine the EPI of a country which include air quality, water quality, heavy metals, biodiversity and habitat, forests, fisheries, climate and energy, air pollution, water resources and agriculture. Among all these indicators, air quality is one of the primary environmental pressures to the public's health. According to World Bank (2016) and Institute for Health Metrics and Evaluation (2016), the illnesses from air pollutants contributed two-thirds of average life lost to environmentally related deaths and disabilities. Air pollution problems are extremely serious in urbanizing and industrialization countries such as China and India (Environmental Performance Index, 2018).

Table 1.1: The 2018 EPI Rankings for Asia Countries

Asia Ranking	World Ranking	Country	Score
1	20	Japan	74.69
2	23	Taiwan	72.84
3	49	Singapore	64.23
4	53	Brunei Darussalam	63.57
5	60	South Korea	62.30
6	70	Sri Lanka	60.61
7	75	Malaysia	59.22
8	82	Philippines	57.65
9	83	Mongolia	57.51
10	111	Maldives	52.14
11	120	China	50.74
12	121	Thailand	49.88
13	122	Micronesia	49.80
14	125	Timor-Leste	49.54
15	131	Bhutan	47.22

16	132	Vietnam	46.96
17	133	Indonesia	46.92
18	138	Myanmar	45.32
19	150	Cambodia	43.23
20	153	Laos	42.94
21	164	Papua New Guinea	39.35
22	168	Afghanistan	37.74
23	169	Pakistan	37.50
24	176	Nepal	31.44
25	177	India	30.57
26	179	Bangladesh	29.56

In terms of the environmental performance (Table 1.1), Malaysia has been ranked as number 7 in Asia and 75 in the World Ranking. Besides, Japan, Taiwan and Singapore are the top 3 countries in Asia that have the highest score in which are 74.69, 72.84 and 64.23 respectively. However, Nepal, India and Bangladesh are the countries in Asia that have the lowest score in terms of the environmental performance which are 31.44, 30.57 and 29.56 respectively. From the table above, it can be seen that Malaysia is in the moderate score range with the score of 59.22.

In the context of Malaysia, environmental problems have a lengthy history as environmental effluence and ecological degradation has been a serious problem to the economy and quality of life. For example, there were cases like landslides at Gua Tempurung and North-South Highway, flood in Segamat, Johor and haze in Kuala Lumpur which had cause the loss of human loss, destruction of crops, loss of livestock, damage to property and worsening of health. The negligence of human actions toward the environment may cause a more severe damage and irreversible harm to the environmental condition (Osman et al., 2015).

The root of the causes of environmental issues is related to human activities and this has been a major and serious issue in Malaysia for the past few decades. Due to the modernization of the world, it is undeniable that continuous urbanization of the world especially in Malaysia will increase the risk of pollution (Saleem, 2005). A survey had been done by World Wide Fund organization (2018) on environmental issues in Malaysia. The result indicated that pollution is one of the most severe environmental

issues in Malaysia followed by deforestation, waste management, loss of biodiversity and climate change.

Hence, a change of human behaviour is needed for environmental protection and restoration efforts in which it is not only depending on the systems that are being implemented by the regulatory bodies but also on the day-to-day choices made by every individual (Bronfman, Cisternas, Lopez-Vazquez, Maza and Oyanedel, 2015). To overcome the problem, understanding of PEB is important among individuals participation.

Hence, it is debated that universities can play an integral part in educating individuals on environmental problems (Khalil, Husin, Mahat and Nasir, 2011). Universities are hubs of innovation and ideas of development. It is an ideal place to instil the concepts of sustainable development which enable to create public consciousness of how sustainability can be incorporated into daily life. Environmental education can influence the environmental behaviour of an individual to perform positive attitude, taking responsibility and participate in the protection of a more sustainable environment (Heyl, Moyano Díaz and Cifuentes, 2013). Through the establishment of sustainable development in campus, it gives higher education institutions the chance to use their campuses to educate the public at a larger scale (Abd Razak, Goh Abdullah, Mohd Nor, Usman and Che-Ani, 2011). Lozano (2006) pointed out that universities are the most likely of these societal domains to protect the environment as university students are "the future leader, decision-makers and intellectuals of the social, political, economic and academic sectors are created, formed and shaped within the world's higher education institutions".

However, it is argued that there is a lack of commitment and concerns by Malaysian undergraduate students in participating in environmental activities. The level of knowledges, attitudes, skills and participation of Malaysian undergraduate students towards PEB are still very low (Ahmad, Rahim, Pawanteh and Ahmad, 2012).

Despite the limited empirical studies in the realm of PEB in Malaysian universities, some related studies are evident in the Malaysian public universities. For example, Hussin and Kunjuraman (2015) have conducted a study on "eco-campus" at Universiti Malaysia Sabah (UMS) whereas Basri, Zawawi, Zain, Mohamad and Kasa (2016) focused their study at Universiti Kebangsaan Malaysia (UKM) regarding PEB. Besides, Mohd Isa (2016) also conducted a study at Universiti Pendidikan Sultan Idris (UPSI) about campus sustainability among undergraduate students. However, limited studies have focused on PEB among Malaysian private universities. Although private university receive limited attention in their PEB involvement as compared to the public university in Malaysia, nonetheless, private university's involvement in PEB activities cannot be overlooked because private universities comprises about 42% of the total number of tertiary education sector in Malaysia (Teng, 2016).

Therefore, this study aims to examine PEB among undergraduate students in Universiti Tunku Abdul Rahman (UTAR). UTAR had been ranked as the top 100 universities in the Times Higher Education (THE) Asia University Rankings 2018 and ranked as the second university after Universiti Malaya (UM) in Malaysia. This study mainly focused on Kampar campus because Kampar campus is the main campus of UTAR. Some green practices such as Going Green Campaign, Public Relation Campaign, talks on Green Initiatives had been done to promote a greener environment in Kampar campus (UTAR, 2018). Other events had also organized by Built Environment Society (BES), Kampar District Council and the Green Power Society (GPS) aims to create awareness among the public to care for the environment. These initiatives have increased the interest of the UTAR undergraduate students to act pro-environmentally (The Star Online, 2017).

Hence, it is crucial to identify factors that affect undergraduate's PEB. Researchers have categorized the motivation that drives an individual to PEB. PEB can be generally explained by personal, social and environmental factors (Gatersleben, Murtahg and Abrahamse, 2012; Liao, Ho and Yang 2016; Fu, Zhang, Xiong and Bai, 2018).

Personal factor such as personal norms has been regarded as the good predictors of behaviour that may affect a wider range of behaviour such as values and beliefs (Gatersleben, Murtahg and Abrahamse, 2014; Onel (2017). Bleys, Defloor, Ootegem and Verhofstadt (2018) pinpointed that different individuals may engage themselves in different types of PEB. Onel (2017) found a positive relationship between personal norms and PEB. However, other researcher reported different results. Johnson (2016) indicated that personal norms had a negative relationship with PEB. However, Johnson mentioned that personal norms will be a stronger predictor to influence PEB when social norms are being internalized to become personal norms.

In the context of social factors, Liao, Ho and Yang (2016) argued that social media have a positive relationship with PEB. However, Vigrass (2015) found that there is no relationship between social media and PEB. Besides, Vesely and Klockner (2017) showed that social norms positively affect the PEB but the result from Dercks (2015) and Abusafieh and Razem (2017) found a negative relationship between them.

As for environmental factors, Fu et al., (2018) stated that the environmental attitudes show a negative relationship towards PEB, while Osman, Jusoh, Amlus and Khotob (2014), discovered a positive relationship between environmental attitudes and PEB. Besides**,** Cheam and Ong (2018) highlighted a positive relationship between environmental knowledge and PEB. However, Pan, Chou, Morrison, Huang and Lin (2018) found a negative relationship between environmental knowledge and PEB.

Thus, it comes to us that a study on personal, social and environmental factors on PEB CSR driver in private university is crucial. However, studies on these factors from the undergraduate students' perspective have received less attention in the past within the private universities context. Most of these studies focus only on the undergraduate students in public universities. This is thus the gap to be filled up in the present study.

1.3 Research Objectives

1.3.1 General Objective

The general objective is to examine the pro-environmental behaviour of undergraduate students and identify the factors that influence pro-environmental behaviour.

1.3.2 Specific Objectives

1) To identify the types of pro-environmental behaviour engaged by UTAR undergraduate students.
2) To examine the key determinants for UTAR undergraduate students to promote pro-environmental behaviour.

1.4 Research Questions

1) What are the pro-environmental behaviour engaged by UTAR students?
2) What are the key determinants for UTAR undergraduate students to promote pro-environmental behaviour?

1.5 Hypotheses of the Study

H1(a): Undergraduate students will be more concern on environmental issues.
H1(b): Undergraduate students will be more likely to engage in green purchase behaviour.
H1(c): Undergraduate students will be more likely to engage in recycling.
H1(d): Undergraduate students will be more likely to engage in energy conservation.

H1(e): Undergraduate students will be more likely to engage in environmentally friendly modes of transportation.

H2: Personal norms has a positive and significant influence on pro-environmental behaviour.

H3: Social norms has a positive and significant influence on pro-environmental behaviour.

H4: Social media has a positive and significant influence on pro-environmental behaviour.

H5: Environmental knowledge has a positive and significant influence on pro-environmental behaviour.

H6: Environmental attitudes has a positive and significant influence on pro-environmental behaviour.

1.6 Significance of the study

Past studies on PEB in Malaysia have focused on public universities and only limited empirical studies have been conducted on private universities. Thus, there is limited knowledge and information on PEB among undergraduate students in the private university context. This study aims to contribute to the existing in several ways.

First, this study would enhance the corpus of knowledge in PEB literature. We would be able to identify the key factors that will affect PEB. By including the personal, social and environmental motivation, we are able to explain the PEB clearly, especially among the undergraduate students in private university.

Second, after having completed this study one would have a clearer understanding of the motives behind the PEB among the UTAR undergraduate students. Based on the findings, it can assist UTAR to devise appropriate policies to promote PEB in both Kampar and Sungai Long campus.

Next, by understanding PEB among undergraduate students and factors associated with the PEB, appropriate guidelines and initiatives can be drafted for UTAR to implement the "green campus". Through the establishment of sustainable development on campus, it gives higher education institutions the chance to use their campuses to educate the public on PEB.

Lastly, the findings of this study may also be of interest to the government for future green campus implementation in Malaysian universities and colleges. The government can set the overall objectives by establishing a cap-and-trade scheme (environmental tax scheme) to delegate the task of environmental protection to education sectors.

1.7 Chapter Layout

This study has five sections which are the introduction, literature review, research methodology, research results, discussion and conclusion.

Chapter 1: Introduction

Chapter one is the introduction to this research proposal, which include the overview of this research study and the other components in this study. These components include research background, problem statement, research objectives, research questions, hypotheses of the study, significance of the study, chapter layout and conclusion.

Chapter 2: Literature Review

Chapter two involves the discussion and evaluation of other journals about the past studies that are related to the factors that affect the PEB among university students. Besides, it also includes a review of the literature, review of relevant theoretical models, proposed conceptual framework, together with hypotheses development as well as conclusion.

Chapter 3: Research Methodology

Chapter three explains on the methods used in completing this study. This section includes the introduction, research design, data collection methods, sampling design, research instrument, constructs measurement, data processing, data analysis and conclusion.

Chapter 4: Research Results

Chapter four presents the pattern and analysis of the results. By using sample data from respondents, scale measurement will be conducted to evaluate the outcomes of reliability test and inferential analysis is used to evaluate the generation of conclusion. This part includes the introduction, descriptive analysis, scale measurement, inferential analyses and conclusion.

Chapter 5: Discussion and Conclusion

Chapter five provides a discussion and summary of the results generated from the previous chapter. However, this part includes the introduction, summary of statistical analyses, discussion of major findings, the implication of the study, limitations of the study, recommendations for upcoming study and conclusion.

1.8 Conclusion

To recapitulate, environmental problems are indeed one of the crucial issues that have been faced by everyone in today's world due to the urbanization and industrialization of modernizing the world. The government, public and individual has been neglected to play their own parts in sustainable development. Besides, universities are higher institutions that have great influence on the public in taking up the PEB practices. However, the action of an individual is solely depending on the behaviour to perform PEB. Education indeed plays a crucial role in shaping their mindset to protect the environment but many people choose not to take up their responsibility to participate in PEB practices. This may be due to the personal factors, social factors and environmental factors that hinder the public to perform PEB practices. In a nutshell,

the main emphasis of this study is to identify the types of PEB undertaken by UTAR undergraduate students as well as to examine the key drivers of PEB in the university (UTAR). In order to know more about the key drivers that affect the PEB among university students, there will be a further discussion on the review of other journals in the next chapter regarding PEB.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

In this chapter, the literature review of both the dependent variable and independent variables are necessary for the research proposal. In the previous chapter, it has discussed the problems of PEB among university students. In order to solve this problem, it is require to examine the factors affecting PEB among undergraduate students. In this review, it will pinpoint on the areas such as the definition of PEB and the factors affecting it which include social factors (social media and social norms), personal factor (personal norms) and environmental factors (environmental knowledge and environmental attitudes). However, this research proposal will evaluate the relationship between PEB and the factors affecting it. This chapter will present the theoretical model and conceptual framework on factors related to PEB. Ultimately, chapter 2 will cover the hypotheses formed to examine the relationship between the determinants and PEB among undergraduate students.

2.1 Literature Review

2.1.1 Pro-environmental behaviour (PEB)

According to Ture and Ganesh (2014), there are three essential considerations that can be highlighted when it comes to PEB. Firstly, is about how the way of PEB are defined, second is the source of the motivation for PEB and third will be the measurement issues.

Stern (2000) explained PEB as the impact towards the environment or the intention behind the behaviour. Impact-oriented behavioural research is mainly concerned with the quantity of impact on the environment while the

intention-oriented are concerned about the motivation. The impact-oriented can be defined as the recommendation to determine and target behaviours that can make a huge difference to the environment while the intention-oriented is to determine on people's beliefs, motives and to understand and change the target behaviours (Stern, 2000).

Second essential considerations are the motivational source of PEB. Two prominent models can be used to explain PEB, namely Theory of Planned Behavior (TPB) (Ajzen, 1991) and the Value-Belief Norms (VBN) (Stern and Dietz, 1994).

The third important consideration for PEB is the measurement issues. According to Fryxell and Lo (2003), PEB is based on its visibility to other people in an organization and the explanatory power of variable may vary with the types of PEB.

Stern (2000) clarified several types of environmental behaviour which include environmental activism, non-activist behaviour in the public sphere, private-sphere environmentalism and other environmentally significant behaviours. Environmental activism can be defined as the active involvement of activists in environmental organizations, and demonstrations whereas the non-activist behaviour in the public sphere can be explained as the involvement of pro-environmental activities such as signing petitions or voting for a green party that involved individuals' civic engagement. Moreover, private-sphere environmentalism emphases on personal behaviours in which they take the consideration of the environment in their daily activities such as purchase, consume and dispose of products. The last type of environmental behaviour is other environmentally significant behaviours in which the behaviours that influence the actions of an organization to which individuals belong.

Sawitri, Hadiyanto and Hadi (2014) pointed out that PEB is a special type of behaviour that is directed toward and performed with the intent of promoting the welfare of an individual, group or organization. However, the harmful impact of human lifestyles that are being practiced in this modern society on the environment has broadened the focus of applied environmental psychology to pro-environmental behavioural change. Environmental psychology look at the behaviour that inhibits sustainable, environmental-health, as well as the nature-enhancing choices.

2.1.2 Role of Universities in Creating Pro-Environmental Behaviour (PEB)

Zou, Zhao, Mason and Li (2015) argued that the university in sustainable development is to facilitate the moral and cultural changes which are necessary for a sustainable society. In order to promote sustainable society, university has the responsibility to engage themselves with social and political issues as well as to foster environmental justice.

According to Lozano (2006), universities are the backbone of Malaysia's sustainable and responsible development because universities play an important role in producing the future leaders to maintain the balance of the ecosystem. Lukman, Lozano, Vamberger and Krajnc (2013) and Wright (2007) explained that educational institutions especially universities have been taking the environmental initiatives to study on undergraduate students' perception towards the environment in two aspects which are curricular in environmental education and co-curricular activities. However, Fu et al., (2018) explained the variation of perceptions that may influence the PEB on university campuses.

According to Carey (2013), universities comprise of different types of stakeholders such as students, faculty, administrative staff and government, however most of the studies on pro-environmental topics on campus usually focus on students or faculty members. For instance, student engagement should be the main tool to create an environment that is meaningful between students and staffs in university. The involvement of faculty members is indeed vital in encouraging the undergraduate students to participate in pro-environmental activities. (Carey, 2013).

2.1.3 Personal Factor

2.1.3.1 Personal norms

Norms can be defined as an expectation held by an individual about how one should act in a particular social situation. An internalized social norms are termed as personal norms which it may gain strength from personal conscience rather than from others' expectations (Ture and Ganesh, 2014). According to Stern (2000), personal norms is the last and immediate predictor of PEB, while Onel (2017) defines personal norms as one of the successful predicting factors of different environmental behaviour, it can be constructed as individuals' internal expectations of how they should act based on their inner values.

Personal norms make an individual to have moral obligation to behave in a certain environmental friendly way that may help them to develop the willingness to act accordingly. Higher levels of personal norms could possibly lead to a greater intention to act in an eco-sensitive way (Onel, 2017).

According to Patel (2015), personal norms can be explained as an internalized moral rules in regard to the perception of correctness or incorrectness of a certain target behaviour. It can be categorized into two subtypes which include introjected and integrated. Introjected personal norms can be defined as the

personal norms that is enforced by guilt and pride whereas integrated personal norms is defined as the deeply internalized and no requirement for guilt and pride to influence an individual's behaviour. Personal norms arises from shared expectations in a social interaction in which they can influence behaviour regardless of any social mediated sanctions or outside reinforcement. Therefore, personal norms will guide behaviour due to the self-expectations and it will be integrated into an individual's self-concept when this norms have been internalized (Patel, 2015).

Onwezen, Antonides and Bartels (2013) pinpointed that Norm-Activation Model (NAM) is frequently used to explain the personal norms to predict an individual's behaviour. While NAM states that these norms can be determined by two factors which include the awareness that performing a particular behaviour has some consequences, and the feeling of obligation for performing the precise behaviour. De Groot and Steg (2009) highlighted that an individual must be conscious of the consequences of a behaviour before being responsible for it. Turaga et al. (2010) explained that different people have different values and general norms, so the activation of personal norms would generate different intensities of moral obligation even though it is in the same action situation, In other words, the higher the importance of norms and values that are relevant to a specific action to an individual, the stronger the feeling of moral obligation to act.

It is noted that many studies had examined the relationship between personal norms and PEB (Doran and Larsen, 2015; Onwezen et al., 2013; Hidayah and Agustin, 2017). Doran and Larsen (2015) investigated the positive relationship between personal norms and pro- environmental behaviour. Onwezen et al., (2013) shown that the compliance with personal norms is related to the feelings of pride and guilt towards PEB. They pointed out that it is solely depending on an individual to feel a moral obligation to perform pro-environmental activities but not the influence of others. While in the context

of the university, Hidayah and Agustin (2017) explained that the involvement of an individual to participate in pro-environmental activities are solely depending on an individual's obligation (personal norms) to perform the PEB. University act as an intermediary to assist the community in producing the "future leaders" that help to maintain the ecosystem of the world.

2.1.4 Social Factors

2.1.4.1 Social Norms

Terrier and Marfaing (2015) define social norms as a set of "rules and norms that are understood by members of a group, and that guide or constraint human behaviour without any enforcement of laws". Social norms are a strong force that will influence an individual behaviour towards certain actions (Abusafieh and Razem, 2017). While the focus theory of normative conducted by Kallgren, Reno and Cialdini (2012) proposed that social norms can be distinguished into two types which include injunctive norms and descriptive norms. Injunctive norms refer to what most people approve in a given culture, and it guides behaviour through public pressure that is related to the possible evaluation of certain types of behaviours which often being conveyed through rewards and punishments. While, descriptive norms refer to the most general observed behaviour in a given situation.

Huber, Viscusi and Bell (2017) pointed out that social norms are indeed one of the crucial drivers that have a strong influence on promoting PEB. Injunctive social norms are proven to influence behaviour through social expectations reflecting what is suitable or unsuitable. While descriptive social norms provide details about what appears to be the most appropriate behaviour based on the opinion of what other people does. Besides, social norms in an environmental context have relation with the theory of planned

behaviour (TPB). TPB is used to explain the behaviour of an individual in performing the PEB (Doran and Larsen, 2015).

Besides, within the category of descriptive norms, an additional difference can be made by two subtypes of the descriptive norms which are descriptive subjective norms and descriptive local norms. Descriptive subjective norms is to focus on the social influence of individuals that are perceived to be integral to the individual such as friends, family members or relatives while descriptive local norms is to focus on the social influence of those who share the same social physical setting such as neighbors or colleagues (Kormos, Glifford and Brown (2015).

The changes in social norms can be referred to as the changes in beliefs or behaviour, and changes to one that does not necessarily link to changes in other. Lubchenco, Cerny-Chipman, Reimer and Levin (2016) argued that a clearer and more accurate definition is needed to better articulate the use of social norms and normative social beliefs in explaining PEB.

Thogersen (2006) and Kormos et al., (2015) explained the relationship between social normative beliefs and PEB, the uses of persuasive communication strategies of social norms information have gained lots of acceptance as a means of encouraging and explaining PEB.

Ajzen (1991) had pinpointed the approaches of attitudes, social norms and perceived behavioural control in shaping the human behaviour. The more people engage themselves in PEB the more individual will follow the group's behaviour either by unwritten cultural rules or by policies to perform PEB activities.

Collado, Staats and Sancho (2017) pointed that parents modestly usually have a great influence on their children's personal norms and this relationship

between parents' and children's pro-environmental practices may open the eyes of other social agents to influence youngsters' environmentalism. Moreover, peers can also influence on youngsters' personal norms and their behaviours through several ways. Youngsters may also adjust their personal norms and behaviours to that of their close social group because they want to be recognized into the group.

While Kinzig, Ehrlich, Alston, Arrow, Barrett, Buchman, Daily, Levin, Levin, Oppenheimer, Ostrom and Saari (2013) justified that university students or undergraduate students tend to be more pro-environmental due to the strong influences of friends, family members and university staff. However, Gifford and Nilsson (2014) explained that students from rural areas are tend to have more positive orientations to engage in PEB than students from urban areas.

2.1.4.2 Social Media

Mass media can be defined as a medium of communication to communicate and interact with people around the globe with different languages without any boundaries (Garyan , 2012). Schramm (1964) explained that mass media alone or together with other institutions can play a number of important roles in the society. The mass media act as a speedy information tool to provide information to the society within the expected time frame. Other than that, mass media also act as a tool to guide people for the development of the country and can be classified into three types such as printed, electronic and new media (Muhammadali, 2011).

Ahmad and Lateh (2016) described that media is a basis of information and it plays an integral role in gathering and spreading the information to the general public, government officials, relief organization and environment groups. Media is also a main source of information because society tends to be

dependent on media to get more information regarding the environmental issues such as disasters, climate changes and global warming. The citizens' PEB can be influenced by the mass media and is considered as a major source of social that can be applied by the government or other institutions to address on the environmental problems (Castillo and Egea, 2015).

Social media is an internet-based application that builds on the ideological and technological foundation of Web 2.0 for users to create and exchange of contents (Hopkins, 2017). According to Dewing (2010), Taprial and Kanwar (2012), explained that all the internet-based and mobile services applications that enabled interaction between the users and allow them to take part in online transactions, create or exchange user-created content, or join online communities can be classified as social media. For example, the types of internet services that associated with social media can be in the form of social network sites such as Facebook, Friendster, Google Plus, blogs, wikis, status-update services, virtual world content, media-sharing sites, Q and A sites and etc. Leonardi, Huysman and Steinfield (2013) justified that social media is a tool that can be used by the organizations for internal communication within the organization and to communicate with the external parties through various platforms. According to Hopkins (2017), social media is a central part of the internet, and it is undeniable that most researchers focus their study on social media rather than the internet.

A study was done by Zhang (2018) reported that the use of social media has apositive relationship with the environmental activism and environmental consumerism. Jagodic (2016) also emphasized that social media can lead to better outcomes and higher impact on consumer environmental behaviour.

In the recent year, the usage of internet and social media has risen dramatically. According to Ors (2012), social media can be used as an instrument to increase the environmental concerns among young adults'

especially undergraduate students. Currently, there are different types of internet sites and social networks that help to deal with environmental issues such as Facebook, Instagram, YouTube and Twitter. Social Media also provides environment's information to users and acts as a platform for the users to share their thoughts and ideas about the environmental issues (Ors, 2012). For instance, environmental non-governmental organizations (ENGOs) foster the visibility, increase awareness and disseminate the relevant information and resources through different types of social media such as Facebook, Youtube and Twitter (Ballew, Omoto and Winter, 2015). According to Glowinski and Kerber (2015), social media is an essential platform to influence people to concern about the environment's problems and activities. Hencem, it is important to understand how social media could help in influencing the behaviour of an individual to engage in environmental activities (Fernandez, Wippoo, Piccolo, Meili, Maynard and Alani, n.d.).

Vigrass (2015) explained social media as a medium of communication for youngsters nowadays. Due to the advancement of technology, most of the undergraduate students are depending on social media platforms to obtain information regarding environmental problems which include climate change, global warming, water pollution and air pollution.

According to Buzov (2014) social media is indeed a strong tool to motivate an individual especially undergraduate students to participate in environmental campaigns and engaged themselves in promoting PEB. Besides, these platforms help undergraduate students to enhance their knowledge and awareness of the environment (Buzov, 2014). The involvement of university in campus sustainability is indeed vital as it helps to increase the awareness about environmental issues among undergraduate students and university staffs. Social media would encourage undergraduate students to involve themselves in campus sustainability as it is the most influential platforms nowadays (Carpenter, Takahashi, Cunningham and Lertpratchya, 2016).

2.1.5 Environmental Factors

2.1.5.1 Environmental Knowledge

Environmental knowledge is the concepts, relationship and the fact of the general knowledge that concern about its major ecosystems and the natural environment (Fryxell and Lo, 2003). It can also be defined as how much understanding of an individual towards the action of the public that affects the ecosystem (Gambro and Switzky, 1996). Environmental knowledge is the information that helps people to understand and sustain the environment which include human actions toward the environment that may impact the mother-nature (Mostafa, 2006). Due to the continuous impact of productions, development and urbanization of a country, environmentalism has become a popular issue concerned by the public (Bayaah Ahmad, Juhdi and Awadz, 2010; Brown, 2003). The fact that natural resources on earth have its limits and the fact that environment can be easily destroyed had been concerned by the people during the 1960s to 1990s (Krause, 1993).

According to Schahn and Holzer (1990), there are two types of knowledge to examine on environmental practices, namely abstract knowledge and concrete knowledge. Abstract knowledge is the knowledge that related to the issues, problems, causes and solutions concerning to environment, while concrete knowledge is the knowledge that comprises of factual knowledge (Booi, 2011). However, abstract knowledge is the one that is most effective for the environment as compared to the concrete knowledge. Tanner and Kast (2003) clarified that knowledge from the abstract is directly related to the purchases of green food while concrete knowledge was not a determinant of the purchases of green food. Rolston and Di Benedetto (1994) also decline the use of concrete knowledge in the study of environmental behaviour which comprise of factual knowledge only.

According to Bradley et al. (1999), undergraduate students are encouraged to attend environmental courses held by the university in order to improve on students' environmental knowledge. They found that students with the high score in environmental knowledge are more concerned with engaging themselves in environmental activities. According to Gifford and Nilsson (2014) studied about environmental knowledge on business and non-business students, it is vital for business students to understand on the environmental knowledge so that proper changes can be made to tackle on environmental issues. Gifford and Nilsson's studies had proven that business students do exhibit more environmental concern and orientation than those who are non-business students to engage in the PEB. However, Lateh and Ahmad (2011) found that undergraduate students in University Science Malaysia (USM) have the basic knowledge of the environment regarding the landslide that occurred in Penang but this knowledge does not mean the students have PEB in the sense that they will not involve themselves in activities that harm the environment. Based on the result from Idros (2006), undergraduate students from University Science Malaysia (USM) did not have a high environmental factual knowledge even they had a better understanding on the environmental concepts. Besides, Idros (2006) emphasized that it is essential for undergraduate students to understand the importance of environmental knowledge towards the PEB as they are the future leaders that help to maintain the balance of the ecosystem.

2.1.5.2 Environmental Attitudes

The term attitude has been defined as favourable or unfavourable evaluations and reactions to objects, people, situations, or any other aspects of the world (Ugulu, Sahin and Baslar, 2013). Attitudes obviously affect the behaviour which is derived from life experiences and education. (Ugulu, Sahin and Baslar, 2013). For instance, attitude is an enduring mixture of motivational,

emotional, perceptual and cognitive processes with respect to some aspect of our mother nature (Eilam and Trop, 2012). According to Heberlein (2004), attitudes are based on values, vertical and horizontal structure and tend from general to specific. Attitudes are the judgments that people make about the behaviour they like or dislike. The person that has optimistic attitudes towards the behaviour will have the greater behavioural intention (Fang, Ng, Wang and Hsu, 2017). Positive attitudes towards a specific PEB could positively influence the intention to promote PEB (Fang, Ng, Wang and Hsu, 2017).

According to Tan (2011), some of the environmental sociologists referred environment attitudes as environmental concern. The terms of environmental attitudes and environmental concern have been used correspondently in several studies while some of the other studies have differentiated them. Environmental concern is a post-material attitudes according to the notion. It has been stated that developing countries such as Malaysia will express lower concern about environmental problems as in compared to other advanced countries (Bronfman, Cisternas, Lopez.V, Mazza and Oyanedel, 2015).

Environmental attitudes provide a good understanding of the set of beliefs, interests, and guidelines that encourage environmentalism or pro-environmental practices (Fernandez-Manzanal, Rodriguez Barreiro and Carrasquer, 2007). According to Heyl, Moyano Díaz and Cifuentes (2013), many university students have an interest in global problems such as climate change, air pollution and global warming, however they do not involve themselves in pro-environmental activities. Heyl, Moyano Díaz and Cifuentes, (2013) argued the relations between environmental attitudes and PEB are not always linear. Environmental attitudes are recognized as a strong predictor of PEB but the gap between environmental attitudes and PEB still exist.

Environmental attitudes of an individual especially undergraduate students are very developed but their behaviours are influenced by the economic concerns

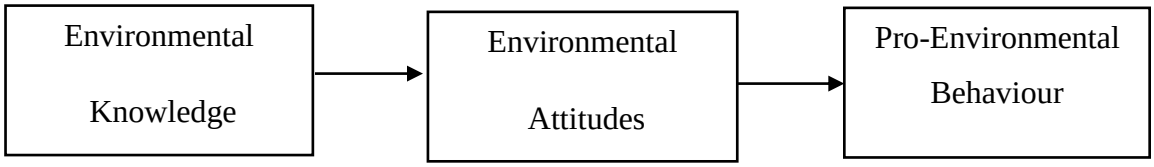
(Muderrisoglu and Altanlar, 2010). Besides, undergraduate students are of the age at which they can rationalize the environmental dilemma and take action to protect the ecology of the world. Other than that, a higher learning institution provides a platform for an individual to learn and communicate regarding environmental issues and to be a foundation for activism behaviour (Thapa, 1999).

2.2 Review of Relevant Theoretical Models

2.2.1 Early model of pro-environmental behavior

According to Kollmuss and Agyeman (2002), the early models of PEB is considered as the oldest and simplest models of PEB that were constructed on a simple linear progression of environmental knowledge that leads to environmental attitudes and in turn lead to PEB. This model presumed that by educating people regarding environmental concerns would automatically result in a more PEB.

Figure 2.1: Early models of pro-environmental behaviour



Source: Kollmuss and J.Agyeman (2002).

These early models of PEB were soon proven to be wrong as many researchers have proven that the increase in knowledge and awareness did not lead to the engagement of PEB of an individual. Owens (2000), pointed out that most of the parties including government have the assumption of an increase in environmental knowledge will lead to higher engagement of PEB. Besides, Rajecki (1982) said that there is a discrepancy between

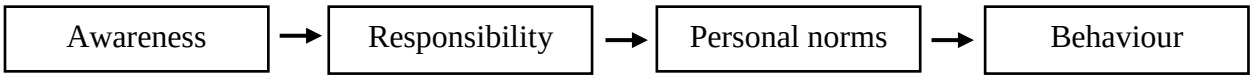
environmental knowledge and environmental attitudes towards the PEB of an individual.

2.2.2 Other relevant theoretical models

Other than that, there are few other theoretical approaches in explaining PEB which include Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TPB), Norm Activation Model (NAM) and etc. According to Fishbein and Ajzen (1975), TRA is a model that attempts to foretell the behaviour by understanding the key drivers such as behavioural intention, attitudes towards behaviour and subjective norms. The fundamental concept of TRA explained that the behaviour of an individual is determined by the factors within an individual's control in which a person may choose to perform the certain actions. It is of the utmost importance to understand that the TRA only emphases on the factors that related to single behaviour rather than a group of behaviours. Ajzen (1991) came up with another model named TPB which is an extension model of the TRA. The differences between these models are that TPB focuses on "perceived" in addition to "actual" control over the behaviour. The overview of the perceived behavioural control (PBC) was to allow the prediction of behaviours that are not voluntarily by an individual. So, it can be said that a person's behaviour is influenced by the confidence level to perform a certain behaviour (Reid, Sutton, Hunter, 2010).

The norm activation model (NAM) which was originally developed by Schwartz (1977) as cited by Onwezen, Antonides and Bartels (2013) to elucidate NAM as a context of altruistic behaviour. Personal norms form the fundamental of this model and it can be explained as the feelings of moral obligations but not as intentions and these norms are used in NAM to predict an individual's behaviour.

Figure 2.2: Norm Activation Model

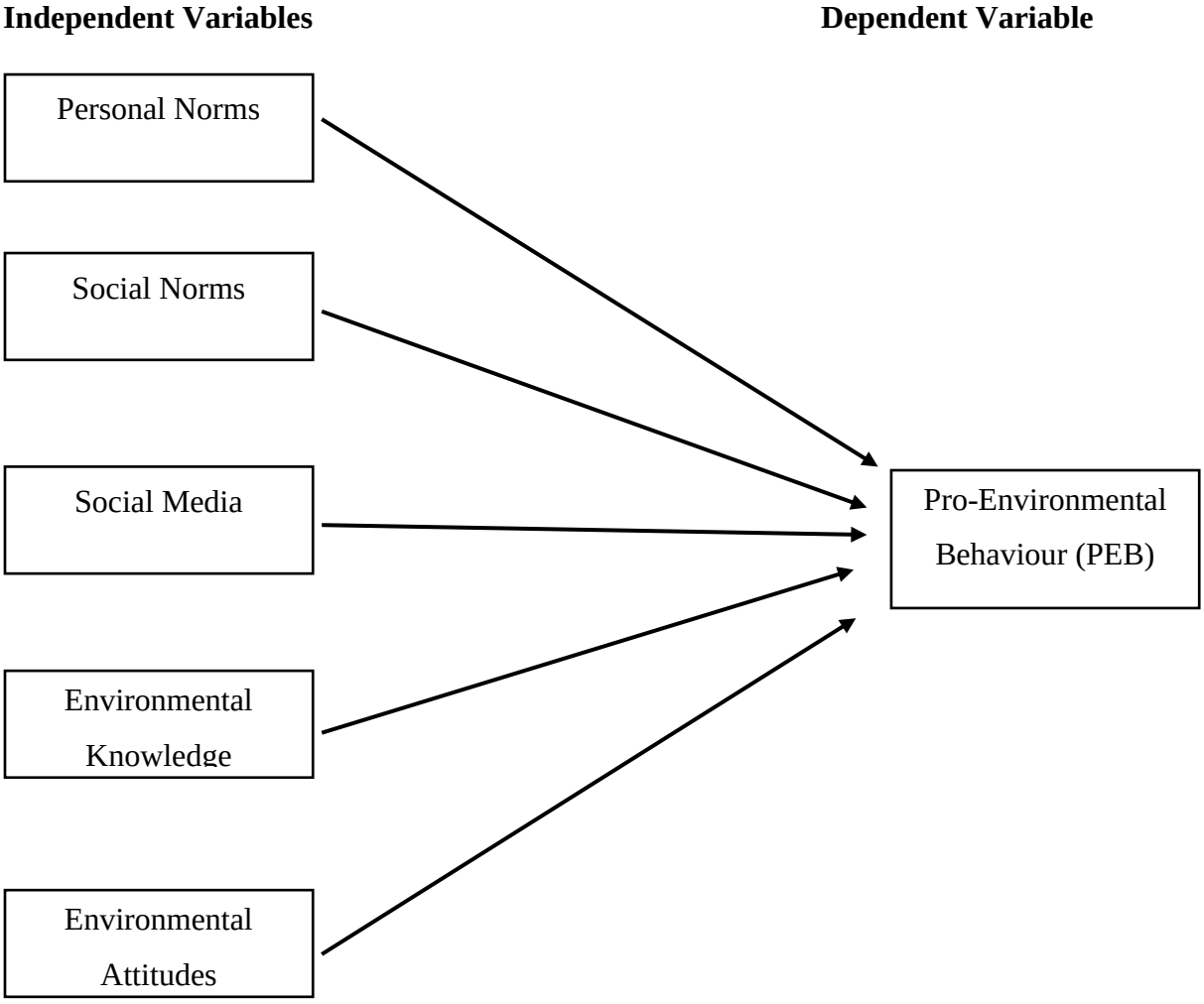


Source: M.C, Onwezen, G. Antonides, J. Bartels (2013).

De Groot and Steg (2009), explained that the norm activation model (NAM) serve as a basic model to explore the relationship between awareness, responsibility and personal norms towards an individual behaviour. However, many studies have combined the NAM and theory of planned behaviour (TPB) to explain PEB because it is one of the most influential theories of all. The theory of planned behaviour (TPB) stated that the intentions are being determined by the attitudes, subjective norms and perceived behavioural control (PBC), which in turn reflect on the behaviour of an individual. However, Staats, Harland and Wilke (2004) emphasized that personal norms within the TPB show the increase of variance in explaining the intention and behaviour of an individual towards a certain action.

2.3 Proposed Theoretical / Conceptual Framework

Figure 2.3 Proposed Conceptual Framework



Based on the past theoretical models that had mentioned earlier, a conceptual framework model is proposed and illustrated in Figure 2.3, regarding the relationship between independent variables and dependent variable among undergraduate students in UTAR. This conceptual framework consists of five independent variables which are personal norms, social norms, social media, environmental knowledge and environmental attitudes, and the dependent variable of PEB. From the literature review, it is explained that the independent variables (Personal norms, Social norms, Social media, Environmental Knowledge and Environmental Attitudes) will affect the

dependent variable (Pro-Environmental Behaviour). The purpose of this proposed framework is to examine whether there is a significant relationship between the independent variables and dependent variable. This model will help us to develop hypotheses to test the relationship between the independent variables and dependent variable.

2.4 Hypotheses Development

2.4.1 Types of Pro-Environmental Behaviour (Environmental Concern, Green Purchase Behaviour, Recycling, Energy Conservation & Environmentally Friendly Modes of Transportation).

According to Chaplin and Wyton (2014), environmental concern of an individual is one of the objective to achieve environmental sustainability. Environmental concern is solely depends on the motives of an individual whether to be ethically involved in environmental practices or just to neglect on their responsibilities. While Larson, Stedman, Cooper and Decker (2015), pointed out social and structural factors will influence on the environmental concern of an individual to act pro-environmentally. Other than that, environmental concern also depend on the intent and behaviour of an individual. People tend to be more participative when the action can benefit them as well as the level of importance of that action. Besides, undergraduate students tend to be more participative in campus sustainability as it is a mandatory criterion and scoring merit that is encouraged by the university (Er et al., 2017).

H1(a): Undergraduate students will be more likely to engage in environmental concern.

Green purchase can be defined as the purchase of environmentally friendly products and avoid buying products that may detriment to the environment. The green product is a product that will satisfy consumers' needs without harming the environment. These products are environmental superior which has a low environmental impact such as organic products, energy-efficient light bulbs, eco-friendly washing machine and etc (Joshi and Rahman, 2015). Ferraz, Buhamra, Laroche and Veloso (2017) indicated that attitudes are the most vital predictors of the willingness to pay more for green products, especially for undergraduate students. Besides, Ferraz et al (2017) also explained that the greater the knowledge of an undergraduate about the environmental issues, the greater the tendency for undergraduate students to purchase green products.

H1(b): Undergraduate students will be more likely to engage in green purchase behaviour.

According to Hussin and Kunjuraman (2015), the involvement of undergraduate students in PEB has become a common practice in Malaysia. For instance, Universiti Malaysia Sabah (UMS) has come up with eco-campus sustainability strategies to encourage undergraduate students to participate in environmental activities. Besides, Basri et al., (2016) also discussed on campus sustainability in Universiti Kebangsaan Malaysia (UKM) context. These researchers have concluded that undergraduate students are more likely to perform pro-environmental activities if the university encourages them to do so. According to Wilcox (2014) undergraduate students tend to be more involved in recycling behaviour.

H1(c): Undergraduate students will be more likely to engage in recycling.

Energy conservation can be defined as the reduction of energy usage by reducing the service demand (Alias, Hashim, Farzana and Mariam, 2013). Recently, energy conservation has attracted any attention to the society as it

brings financial benefits such as cost-savings and non-financial benefits such as promoting environmental preservation to the public. A study has been conducted by Ho (2013) about the energy consumption of undergraduate students in Universiti Tunku Abdul Rahman (UTAR), Kampar Campus in collaboration with Earth Hour campaign. This approach is indeed one of the most useful way to increase on individuals' participation in saving energy (Ho, 2013). Moreover, Petersen, Frantz, Shammin, Yanisch, Tincknell and Myers (2015) had identified the involvement of college and university students in energy conservation is solely depending on an individual's behaviour towards a specific action.

H1(d): Undergraduate students will be more likely to engage in energy conservation.

Environmentally friendly modes of transportation play a significant part in promoting PEB as it helps to reduce the gas emission from automobiles (Borhan, Syamsunur, Akhir, Mat Yazid, Ismail and Rahmat, 2014). Besides, Thi and Tu (2016) highlighted that the mode choice behaviour among undergraduate students will influence their travel patterns. Undergraduate students are commonly more persuaded to use public transport or non-motorized travel modes (such as walk or cycle) (Santos, Maoh, Potoglou and Brunn, 2013). A study conducted by Maneesh, Selvaraj, Shamanth, Sunil and Burris (2007) found that travel time, travel cost and convenience are the key aspects that influence the mode travel choice among university students. Therefore, the hypothesis H1 is proposed as follows:

H1(e): Undergraduate students will be more likely to engage in environmental friendly modes of transportation.

2.4.2 Personal norms and pro-environmental behaviour.

According to Gifford and Nilsson (2014), personal norms refer to an individual's feelings of moral responsibility toward a certain action that influence both intentions and actual PEB. Thus, personal norms are followed by some internal reasons which are consistent with internal values, the ethical concept of good or bad by an individual towards a behaviour.

Jansson and Dorrepaal (2015) pinpointed the role of personal norms in explaining PEB. Collado et al. (2017) argued that personal norms have a positive relationship with PEB, and it is often seen as a good predictor of an individual's behaviour. In the context of university, it is found that undergraduate students tend to act pro-environmentally as they are attached to the feelings of morally obliged to take on the responsibility to protect the environment as they are being considered as the future leaders of the world that help to maintain the balance of the ecology (Willuweit, 2009; Lozano, 2006).

In a nutshell, personal norms are indeed an important factor that affects the PEB of an individual. Therefore, hypothesis (H2) is proposed as follows:

H2: Personal norms has a positive and significant influence on pro-environmental behaviour.

Social norms and pro-environmental behaviour.

Social norms as common behaviour and beliefs that support conformity to certain behaviours (Farrow, Grolleau and Ibanez, 2017). The encouragement from friends and families are indeed vital to influence an individual to act pro-environmentally (Truelove and Gillis, 2018).

According to Thomas and Sharp (2013), a successful environmental initiative can be achieved by using social norms context to influence others in performing the pro-social behaviour. Terrier and Marfaing (2015) identify two types of social norms, namely injunctive norms and descriptive norms that can encourage individuals to act pro-environmentally. Abusafieh and Razem (2017) argued that the more people involve in a specific behaviour, the more the individual will follow to suit the group's behaviour by following social norms. Hence, social influence is vital for the activation of social norms within an individual because they will act pro-environmentally if they see other people doing it.

Kinzig et al., (2013) clarified that social norms are not just enforced in a localized neighbourhood but through a more distant geographic connection that is sustained through social media networks and face-to-face visits. Besides, the social norms of the academy have evolved to serve as an integral role in explaining PEB and it serves as a motivator tool for an individual especially undergraduate students to engage themselves in pro-environmental activities (Kinzig et al., 2013).

Vesely and Klockner (2017) had identify the positive relationship between social norms and PEB. Yu and Yu (2017) stated that social norms play a significant role in predicting undergraduate PEB. They tend to perform environmental activities if they see their friends or faculty staff in doing so.
Therefore, social norms are another factor that affects the PEB of an individual. So hypothesis H3 is proposed as follows:

H3: Social norms has a positive and significant influence on pro-environmental behaviour.

Social media and pro-environmental behaviour.

Ballew, Omoto and Winter (2015) stated that social media are a set of communication tools that are gradually gaining attention from the public to improve on the environmental concern and facilitate sustainable behaviours. Social media plays a significant role in creating an opportunity for the communicator to interact with the public without any boundaries (Ford, 2010).

Due to the advancement of technology, the Internet has successfully transformed and changed the mindset of the society in practising PEB (Sogari, Pucci, Aquilani and Zanni, 2017). According to Zhang and Skoric (2018), many researchers have adopted social media as one of the antecedents of PEB. The community function of the social media is to build and nurture the participation of society as well as to increase the involvement of an individual to perform pro-environmental activities.

Besides, Moreland and Melsop (2014) found that social media that can be strategically used to influence pro-environmental activities. Liao et al. (2016) identified the positive relationship between social media and PEB. Therefore, hypothesis H4 is proposed as follows:

H4: Social media has a positive and significant influence on pro-environmental behavior

Environmental knowledge and pro-environmental behaviour.

Norshariani (2016) found that environmental knowledge is a basis for understanding the impact of human behaviour towards the environment, and confirmed that environmental knowledge is indeed vital in resolving environmental problems.

Halkos, Gkargkavouzi and Matsiori (2018) suggest that PEB and environmental knowledge are connected but not in a direct way to influence the action of an individual. Siti, Nurita and Azlina (2010) demonstrated environmental knowledge as one's ability to identify environmental problems, causes and the consequences that may lead to a specific action towards the environment. Besides, Halkos et al., (2018) said that environmental knowledge is indeed a necessary pre-condition for environmental action. However, there is some environmental action such as reducing waste and saving of energy can be carried out as a matter of habit of an individual that does not require any environmental knowledge.

Besides, Latif et al., (2013) also found the positive relationship between environmental knowledge and PEB. Fu et al., (2018) highlighted environmental knowledge as factual knowledge on environmental topics, definitions and policies. Moreover, these researchers had proven that the increase in environmental knowledge leads to the increase to act PEB. Therefore, hypothesis H5 is proposed as follows:

H5: Environmental knowledge has a positive and significant influence on pro-environmental behaviour

Environmental attitudes and pro- environmental behaviour.

According to Osman, Jusoh, Amlus and Khotob (2014), environmental attitudes are considered as an indicator and component to predict an individuals' environmental behaviour. While a study on environmental issues has revealed that the level and disposition of information can influence an individual's environmental attitudes to act pro-environmentally. Osman et al., (2014) found a strong positive relationship between environmental attitudes and PEB. Quinn and Burbach (2008) explained that general environmental attitudes have an indirect effect on PEB.

Johnson and Cincera (2015) found that young adults tend to be more dependent on environmental attitudes to perform the pro-social behaviour. Tan (2011) stated that it is vital to differentiate between general attitudes towards the environment and attitude towards a precise type of environmental behaviour as it is the major reason that leads to the behavioural gap. However, they found that specific attitude is a stronger antecedent in explaining PEB compared to general attitude.

Chen, Peterson, Hull, Lu, Hong and Liu (2012) found a positive relationship between environmental attitudes and PEB. Besides that, Kose et al., (2011), explained that environmental attitudes provide a good understanding of the set of beliefs and values that may influence an individual's pro-environmental action. Moreover, these researchers justified the importance of environmental attitudes toward undergraduate students to act pro-environmentally. Therefore, hypothesis H6 is proposed as follows:

H6: Environmental attitudes has a positive and significant influence on pro-environmental behaviour

2.5 Conclusion

Overview on the literature on the independent variables (Personal norms, Social norms, Social Media, Environmental Knowledge and Environmental Attitudes) and the dependent variable (Pro-Environmental Behaviour-PEB) are provided in this chapter. A comprehensive review of relevant literature on this proposed theoretical framework and hypotheses development are critically explained and identified. Research methodology regarding the way this research is conducted, data collection techniques and data analysis method will be discussed in the following chapter.

CHAPTER 3: RESEARCH METHODOLOGY

3.0 Introduction

The main objective of this study is to examine the PEB among undergraduate in UTAR and the factors that affecting their PEB. This study is carried out in term of research design, data collection methods, sampling design, operational definitions of constructs, measurement scales and methods of data analysis. In this study, quantitative research design has been used. Primary data will be collected from target respondents through questionnaires and simple random sampling method is applied to draw the sample.

3.1 Research Design

Research designed can be defined as "a detailed proposal that created to solve the problem of the research" (Zikmund, Babin, Carr, and Griffin, 2013). There are two types of research design namely qualitative research and quantitative research.

According to Zikmund et al. (2013), quantitative research is those research that involves numerical measurement and analysis and is a technique used by the researcher to obtain the results from the survey without relating it to numerical measurement. In short, qualitative research is a technique used to explore the inner meaning and new insights of the research or the relationship between the cause-and-effect.

Quantitative research is used in the study. The question that designed in the questionnaires is fixed-alternative. The reason to use quantitative research is that this method gave a more specific information for the study.

3.2. Data Collection Methods

Data collection can be said to be a significant part for various types of this study. The level of accuracy of the data collected will at the end impact the outcomes of the outcomes. The data collection methods can be classified into two types of sources which are primary and secondary data (Sekaran and Bougie, 2010). Both the methods were used in this study.

3.2.1 Primary Data

Data that is unknown and collected by researchers for a certain purpose to solve issues, the data are obtained at the first time is defined as the primary data (Sekaran and Bougie, 2013; Malhotra, 2004). There are few techniques listed in primary data which are questionnaires, statistics, surveys as well as government documents

In the collection of primary data, questionnaires were distributed to the targeted respondents for the purpose of gathering information related to the research topic. Questionnaires are more reliable than other methods because it is a written format in the form of alternatives which can be answered by the respondents (Zikmund et al., 2013). Moreover, the answer from the questionnaires will be kept in a fully private and confidential form. In the questionnaires, a series of questions related to this research topic was asked of the targeted respondents. The reason questionnaires were used in this study is that this is a low cost and low time-consuming methods for gathering the data from the interviewers (Zikmund et al., 2013).

3.2.2 Secondary Data

According to Sekaran and Bougie (2010), secondary data is the sources that already existed or data that has been collected previously for research purposes. Some of the secondary data which include research reports, newspaper, academic and professional paper, textbook, thesis, and so on. Secondary data is an inexpensive and faster method to obtain from as compared to the ways obtained from primary data.

In this study, most of the secondary data obtained from the online database such as Science Direct, SAGE Journal, Utar Engine, Google scholar, Emerald Management eJournal Collection and so on.

The secondary data is significant to use in the literature review, developed proposed theoretical framework and questionnaire because the information can be obtained from online journals, articles, and thesis which are related to the research topic (Sekaran, 2010).

3.3 Sampling Design

3.3.1 Target Population

Target population refers to all the respondents who meet the particular criterion especially for a research investigation (Alvi, 2016). The researchers have to ensure that respondents are from the right target population to make sure the results of the data are accurate and relevant to this study. The main objective of this study is to determine the factors that affecting PEB among undergraduate students in UTAR. Therefore, the relevant target population will be the undergraduate students in UTAR.

3.3.2 Sampling Frame and Sampling Location

A sampling frame is the list of all the people in the appropriate population. According to Hamed Taherdoost (2016), the sampling frame must be representative of the population. Therefore, the sampling frame for this study is undergraduate students from the different faculty of UTAR.

Furthermore, the sampling location is where this study being conducted. The target respondents in this study are undergraduate students in UTAR. Thus, the sampling location that selected is University Tunku Abdul Rahman (UTAR), Kampar Campus.

3.3.3 Sampling Elements

In sampling elements, every group of members has the equal chance to be selected as our respondents in the study sample (Sekaran and Bougie, 2010). In this study, the target respondents are the undergraduate students of Universiti Tunku Abdul Rahman (UTAR) in Kampar, Perak who are pursuing the Bachelor's Degree. The participants for this study should be from different gender, race, ages, religion, years of study and faculty.

3.3.4 Sampling Technique

According to Zikmund et al (2013), sampling designs can be classified into two types of sampling which are probability and nonprobability sampling. Every member of the population has a known or nonzero chance of being selected as sample subject can be regarded as probability sampling. However, the non-probability sampling is the member in the population is unknown or predetermined chance of being chosen as a sample subject. Both of the

sampling designs have different types of sampling strategies itself (Sekaran and Bougie, 2010).

Simple random sampling has been selected for this study. Zikmund et al (2013) stated that simple random sampling is all the element in the population are known and each of them has the same or equal chance of being chosen as the sample subject. Sekaran and Bougie (2010) also emphasized that this sampling technique has the least bias and offers high generalizability of the findings. Asmum, Khalili and Zain (2012) had also applied a simple random sampling technique to gather their data from the undergraduate UiTM Shah Alam students. Besides, a research was done by A.Jalil, Yee, Abdul Asis and Yunas (2016) also selected a simple random method to collect the data from their targeted respondents who studying in UUM. Hence, simple random sampling is used to obtain the sufficient volume and reliable data from targeted respondents, thus this method is beneficial to conduct the pilot study, full study and for generating hypothesis and the efficiency of facilitating the data collection.

3.3.5 Sampling Size

Based on Krejcie and Morgan (1970), they simplified the decision of size by providing a table to ensure of a good decision model. The table of Determining Sample Size of Known Population is used by to determine the sampling size for this study. The total number of UTAR undergraduate students was 10810 (Table 2). Therefore, 375 minimum respondents are required in this study. To avoid low response rate problems, 400 questionnaires will be distributed to the targeted respondents. Usable responses were received from 382 UTAR undergraduate students, giving a response rate of 96%.

Table 3.1: Population of undergraduate students in UTAR, Kampar

Faculty	Undergraduate students
Faculty of Science (FSc)	1380
Faculty of Engineering and Green Technology (FEGT)	690
Faculty Business and Finance (FBF)	5290
Faculty of Arts and Social Science (FAS)	2070
Faculty of Information and Communication Technology (FICT)	1150
Institute of Chinese Studies (ICS)	230
Total	10810

3.4 Research Instrument

3.4.1 Questionnaire

In this study, the questionnaire is designed to collect the primary data from the targeted respondents. According to Wilkinson and Birmingham (2003), the questionnaire is the favored tool of many of those engaged in research and it is an inexpensive and effective way to obtain the large quantities of data from a variety of respondents. The survey questionnaire used in this study is fixed-alternative questions, where the respondents are requested to make the choices to their viewpoint among a set of alternatives (Sekaran and Bougie, 2013).

In this study, the survey questionnaire has a cover layout and consists of three sections. Section A is constructed to obtain the personal background details. There have six demographic questions in this study, namely gender, age group, ethnicity, religion, current year of study and faculty. Section B comprises thirty-three questions which are related to the factors (personal norms, social norms, environmental knowledge, environmental attitudes and social media) that affecting the PEB. In Section C, eleven questions are constructed to measure the types of PEB that have been undertaken by the respondents.

In this study, respondents are asked to answer to all the questionnaire items using a five-point Likert scale. According to Johns (2010), Five-point Likert

Scale could strike a compromise between the conflicting of offering enough choice and making things manageable for respondents. Babakus and Mangold (1996) also are argued that Five Likert Scale would reduce the frustration level of respondent patients, thus it could increase the quality and response rates of the responses from the targeted respondents. In addition, Muderrisoglu and Altanlar (2011) are used Five-point Likert Scale in analyzing attitudes and behaviours of undergraduate toward environmental issues.

3.4.2 Pre-Test

Before distributed the questionnaire to the university students, the questionnaire has been reviewed by Universiti Tunku Abdul Rahman's Lecturer.

3.4.3 Pilot Test

According to Zikmund (2003), the pilot test is known as a pre-measured or small-scale trial designed to estimate and measure the statistical variability of data that obtained from the small scale of the targeted respondents before conduct the full-scale study. A pilot test should be carried out in this study because it can measure the reliability and accuracy of the questionnaire. Through the pilot test, it also can increase the quality of the questionnaire, thus adjustment also can be made in the questionnaire in order to obtain a good result in the full study.

In this study, the pilot study was conducted on 5 June 2018. A total of 30 sets of questionnaires are distributed to the undergraduate students from different faculties (FBF, FAS, Fsc, FEGT, FICT, and ICS) at UTAR, Kampar Campus.

The library and canteens of UTAR are selected as the targeted place to collect the primary data from the undergraduate students. All the collected data are processed through the Statistical Analysis System (SAS) software in order to check and measure the questionnaires' reliability.

3.5 Constructs Measurement (Scale and Operational Definitions)

Construct measurement is an important concern for strategic management researchers (Boyd, Bergh, Ireland and Ketchen, 2013). In this study, construct measurement as the important part of the element to keep the validity of the findings.

3.5.1 Origin of Construct

Table 3.2: Summary of Measures used for Present Study

Variables	Adapted from	Items	Five Point Likert Scale
Personal Norms	Onwezen , Antonides and Bartels (2013) Hynes and Wilson (2016)	7 Items	(Strongly Disagree (1) to Strongly Agree (5)
Social Norms	Yu and Yu (2017) Vassanadumrongdee and Kittipongvises (2017)	5 Items	Strongly Disagree (1) to Strongly Agree (5)
Social Media	Jimenez-Castillo and Ortega-Egea (2015)	6 Items	Strongly Disagree (1) to Strongly Agree (5)
Environmental Knowledge	Siti, Nurita and Azlina (2010)	7 Items	Strongly Disagree (1) to Strongly Agree (5)
Environmental Attitudes	Ogunjinmi, Onadeko and Adewumi (2012)	6 Items	Strongly Disagree (1) to Strongly Agree (5)
Pro-Environmental Behaviour (PEB)	Heyl, Moyano Díaz and Cifuentes (2013) Blankenberg and Alhusen (2018)	11 Items	Never (1) to Very Often (5)

3.5.2 Scale of measurement

According to Sekaran and Bougie (2013), measurement is the assignment of numbers or other symbols to characteristics of the object according to a pre-specified set of rules. The scale of measurement was used to measure the variables by categorizing and quantifying the variables. There are four basic categories of scale measurement in the construct measurement which are nominal scale, ordinal scale, internal scale and ratio scale.

3.5.2.1 Nominal Scale

Based on Sekaran and Bougie (2013), a nominal scale is one that allows the researcher to assign subjects to certain groups or categories. A nominal scale assigns a value to an object for identification or classification purposes. The value can be but does not have to be a number because no quantities are being represented. Nominal scale categorizes data into distinct sets in which no ranking is implied. In this study, the nominal scale has been applied to indicate gender as below.

Example of nominal scale:

1. Your gender:

( ) Male **( ) Female**

3.5.2.2 Ratio Scale

Ratio scale represents the highest form of measurement in that they have all the properties of interval scales with the additional attribute of representing absolute quantities. Ratio scale provides an iconic measurement (Sekaran and

Bougie, 2016). In this study, the ratio scale has been applied to indicate age as below.

Example of ratio scale:

2. Your age:

( ) 18-21 ( ) 22-25 ( ) 26-30

3.5.2.3 Interval Scale

According to Sekaran and Bougie (2016), interval scale is an ordered scale in which the difference between measurements is a meaningful quantity but does not involve a true zero point. Interval has nominal and ordinal properties but they also capture the information about differences in quantities of a concept. Although Interval scale captures relative quantities in the form of distances between observations it is not iconic which mean that it does not exactly represent some phenomenon. The origin or starting point may be any arbitrary number. In this study, interval scale has been applied to indicate the question as below.

Example of interval scale:

	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1. It is important to me whether the products I buy are environmentally friendly.	1	2	3	4	5

3.5.3 Questionnaires designing

The questionnaire consists of three parts which are part A, part B, and Part C. Part A is related to demographic variables. The targeted respondents' personal information was being collected in Part A. There is a total of 6 questions in

this part A. Under this part, gender, ethnicity, religion and faculty are measured by the nominal scale, whereas ages and year of study are measured by ratio scale.

In part B, the independent variable which are the factors affecting PEB consists of thirty-three questions. In this part, interval scale is used as the scale of measurement and the Likert Scale is applied to measure the all independent variables. The respondents are required to choose from the range of 1-5 to represent their perception. For instance, 1 represent (Strongly Disagree), 2 represent (Disagree), 3 represent (Neutral), 4 represent (Agree), 5 represent (Strongly Agree).

The dependent variable in part C which is the PEB consists of eleven questions. Interval scale was used as the scale of measurement and the Likert scale was used as the method of summated ratings to measure the dependent variable. The scale of "Never", "Not Very Often", "Quite Often", "Very Often" and "Always" were being used as the format of Likert Scale. Besides that, we also use the SAS software to interpret the reliability of the questionnaires in this study.

3.6 Data Processing

Data processing is a process that converts primary data into information. According to Kveder and Galico (2008), checking, editing, coding and transcribing are the main four steps for data processing. As an example, data processing will be applied to the questionnaires that collected from the target respondents that distributed to them. Meanwhile, data processing need much concentration and carefulness while perform it to avoid any uncertainty or error to occur. In short, data processing is a process of changing the collected data into information through the computer. Statistical Analysis System (SAS) Enterprise Guide was used for data process in the study.

3.6.1 Data Checking

Data checking is the initial step in data processing. This step will be done in this study to make sure all the questionnaires are valid. The errors in the questionnaires collected from the targeted respondents involve missing data, omission data and inconsistent responses can be reduced to the minimum through data checking. All these errors can be detected while having a pilot test. To improve the reliability of the test researchers can make changes and amendment on the questionnaires. Therefore, it is the responsibility of the researchers to make sure all the collected data from the questionnaires were answered in a complete and correct way (Sekaran and Bougie, 2009). In short, data checking is the process of getting a more consistent and more precise data of the study (Zikmund et al., 2013).

3.6.2. Data Editing

The second step of data processing is data editing. Data editing is a process of checking, adjust or edit the missing answer or inconsistent responses from the targeted respondents. This process helps to reduce missing, omission or ambiguous answers. If there are any incomplete responses given by the respondents, the consistency of the data can be improved through the edit on the missing data by the researchers according to the answering pattern of the respondents. In another word, data need to be the edit to make sure the consistency of the results especially those responses involved open-ended (Sekaran and Bougie, 2009).

3.6.3. Data Coding

The third step of data processing is data coding. Data coding is when the researchers apply numerical codes to the responses of the targeted responses from the questionnaires collected and continue to the process of entering those data into Statistical Analysis System (SAS) Enterprise Guide. In short, data coding is when all the data edited was classified into numerical numbers or any others symbols (Sekaran and Bougie, 2009). The code range for the responses was coded from 1 to 5. Any missing data were coded 99.

In section A of the questionnaire, the label for each question is coded as below:

Q1	Gender	- "Male" = 1 - "Female"=2
Q2	Age	- "18-21" = 1 - "22-25" = 2 - "26-30" = 3
Q3	Ethnic	- "Malay" = 1 - "Chinese" = 2 - "India" = 3 - "Others" = 4
Q4	Religion	- "Islam" = 1 - "Buddhism" = 2 - "Christianity" = 3 - "Hinduism" = 4 - "Taoism" = 5 - "No religion" = 6 - "Others" =7
Q5	Current year of study	- "Year 1" = 1 - "Year 2" = 2 - "Year 3" = 3 - "Others" = 4
Q6	Faculty	- "Faculty of Business and Finance (FBF)" = 1 - "Faculty of Science (FSc)" = 2 - "Faculty of Information and Communication Technology (FICT)" = 3 - "Faculty of Engineering and

		Green Technology (FEGT)" = 4 - "Faculty of Arts and Social Science (FAS)" = 5 - "Institute of Chinese Studies (ICS)" =6

In section B, of the questionnaire, the label for each question is coded with 5-point Likert scale as below:

- "Strongly Disagree (SD)" was coded as 1
- "Disagree (D)" was coded as 2
- "Neutral (N)" was coded as 3
- "Agree (A)" was coded as 4
- "Strongly Agree (SA) was coded as 5

3.6.4 Data Transcribing

Data transcribing is the final step in data processing. Data transcribing is the process of converting all the raw data into useful information. The data was analyzed through Statistical Analysis System (SAS) Enterprise Guide software Version 7.1 in this study.

3.7 Data Analysis

Data analysis is the process of assessing data using systematic and logical reasoning to look at every element of the data provided. The goal of data analysis is to find actionable insights that can notify the decision making. Statistical Analysis System (SAS) Enterprise Guide is the computer software that used by the researchers to analyze data. The questionnaire data are checked, coded and keyed into SAS 7.1 computer software program after completing data collection process. There are

several types of statistical approaches provided by SAS such as descriptive analysis, Pearson' Correlation, Multiple Linear Regression Analysis, and reliability test that will be used in this study.

3.7.1 Descriptive Analysis

Descriptive statistic consists of methods for organizing and summarizing information. Besides, it also includes the construction of charts, graphs, tables, and calculation of descriptive measures such as averages, variance, and the percentage (Loeb, Dynarski, McFarland, Morris, Reardon and Reber, 2017). Descriptive analysis is the transformation of raw data into a form that easier for the researcher to understand. It generates descriptive information by interpreting, rearranging, ordering and manipulating data (Zikmund, 2003).

Descriptive statistics are used to describe the results obtained from the questionnaire using pie charts, tables, graphs and bar chart. The study is to know the factors that affecting PEB among undergraduate students in UTAR.

The total sample size for our pilot study is 30 respondents which consist of 4 male and 26 female. Most of the respondents are Chinese with the total number of 26, Indian 3 and Malay with only 1. In this study, descriptive analysis tool will be applied on Part A which consisted of the personal details data obtained from the targeted respondents. Pie chart and bar chart are used to shows the frequency distribution. The reason for using the pie chart is because the presentation of the chart can show data in clear and easier for the reader to understand all the detail of the questionnaire.

3.7.2 Scale Measurement

3.7.2.1 Reliability Test

Reliability is the degree to which measures are free from random error. Reliability is an indicator of a measure's internal consistency and stability in order to yield consistent results (Sekaran and Bougie, 2013). Cronbach's Coefficient Alpha was the most popular test used by the researchers to measure the reliability test. The reliability coefficient was calculated based on Cronbach's coefficient alpha by using SAS Enterprise Guide in this study.

The test is to indicate how well is the items in questionnaires are related with each other positively. The symbol for the Coefficient alpha is "α".

The Rule of Thumb of Cronbach Coefficient Alpha

Coefficient alpha (α) value	**Level of Reliability**
Below 0.60	Poor reliability
0.60-0.70	Fair reliability
0.70-0.80	Good reliability
0.80-0.95	Excellent reliability

Based on the table above, the coefficient alpha value which is below 0.60 is considered poor reliability whereas when the coefficient alpha is within 0.60 to 0.70 is considered as fair reliability. For the good reliability, the range for the coefficient alpha is within 0.70 to 0.80. Lastly, if the coefficient alpha value is range from 0.80 to 0.95 mean that the reliability is excellent reliability (Zikmund, Babin, Carr and Griffin, 2010).

Reliability Test of Questionnaire for Pilot Test

Variables	Coefficient Alpha Value	Level of Reliability
Personal Norms	0.720546	Good reliability
Social Norms	0.753180	Good reliability
Social Media	0.817687	Excellent reliability
Environmental Knowledge	0.891781	Excellent reliability
Environmental Attitudes	0.677760	Fair reliability
Pro-Environmental Behaviour	0.823027	Excellent reliability

Based on the table above, the result of the pilot test of this study shows that personal norms have a coefficient alpha value of 0.720546. The coefficient alpha value of environmental knowledge is 0.891781 while the coefficient alpha value for environmental attitudes is only 0.677760. Furthermore, the coefficient alpha value for social media is 0.817687 and 0.753180 for social norms. Moreover, the coefficient alpha value of the dependent variable which is PEB is 0.823027. The overall reliability result is high, which is acceptable.

3.7.3 Inferential Analysis

Inferential Analysis is the technique used which allow us to conclude the properties of the population from the sample. Pearson's Correlation Coefficient and Multiple Linear Regression were used to study the relationship between the dependent variable which is PEB and independent variables which are the personal norms, social norms, environmental knowledge, environmental attitudes and social media.

3.7.3.1 Pearson Correlation Coefficient Analysis

Pearson Correlation Coefficient analysis is used for the purpose of testing the directions and strength between the dependent variable and independent variables (Sekaran and Bougie, 2003). The result from the Pearson Correlation

Coefficient Analysis can be a positive correlation or a negative correlation (Sekaran and Bougie, 2003). If the result showing 1.0 means that the relationship is perfect positive correlated while the relationship is perfect negative correlated when the result showing a -1.0. When the result is less than 0.5, it has a weak correlation. Meanwhile, the result of 0.8 which showed a strong correlation between the dependent variable and independent variables.

Table 3.3: The Rules of Thumb about Correlation Coefficient Size

Coefficient Range	**Strength of Association**
±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

Source: Hair, J. F. Jr., Money, A. H., Samouel, P., and Page, M. (2007).

3.7.3.2 Multiple Linear Regression Analysis

Multiple Linear Regression Analysis is used for the purpose of investigating the relationship between two or more independent variables on a single interval-scaled dependent variable (Zikmund et al., 2013). The square of multiple-r (R-square / R^2) is generated to explain the level of effect of each variable on the dependent variable. The variation in the dependent variable was attributed to change in a single independent variable. The multiple regression equations are:

$$Yi = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_nX_n + e_i$$

Key:

Y = dependent variable

b_0 = constant

b_n = the regression coefficient associated with the independent variable, X

X_n = the independent variables, where n = 1, 2, 3……

e_i = an error term (for purpose of computation, the ε is assumed to be 0)

3.8 Conclusion

In conclusion, Chapter 3 discuss on the research methodology used which include research and sampling designs which were clearly justified, constructs measurements and research instrument as well as data collection and analysis methods in conducting this study. In order to get a better result in research reliability, Cronbach's Alpha statistic was used. Other than that, all the hypotheses in this study were tested through Pearson Correlation Coefficient analysis to determine the correlation between the independent variables and dependent variable. In the next chapter, all the results that are generated from the SAS software will be explained in detailed.

CHAPTER 4: RESEARCH RESULTS

4.0 Introduction

In this chapter, descriptive statistics relating to the respondents' demographic profile is provided. The inferential analysis is performed by Pearson's Correlation Coefficient and Multiple Linear using Statistical Analysis System (SAS) version 7. The results of the survey are interpreted followed by the summary of the chapter.

4.1 Descriptive Analysis

Descriptive analysis will be used to interpret the demographic data of target respondents which this data can obtain from Section A of the questionnaire. All the data are presented in the table and pie chart.

4.1.1 Respondent Demographic Profile

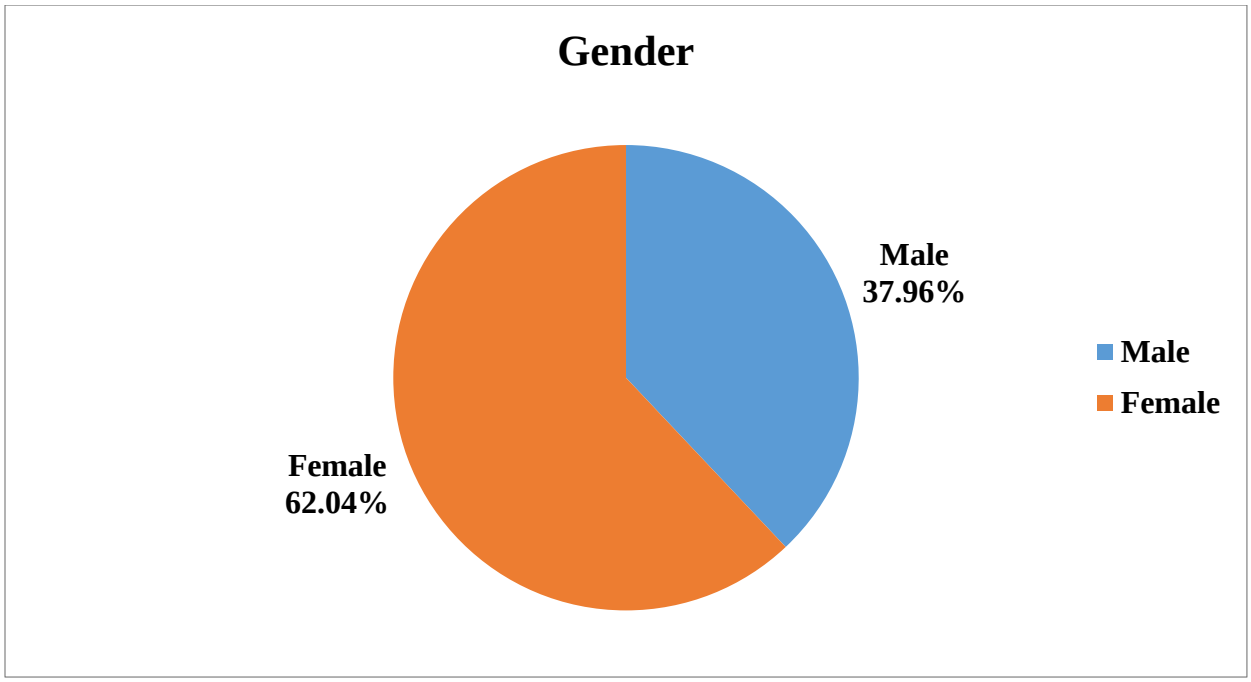
There are six demographic questions namely gender, age, ethnicity, religion, year of study and faculty.

4.1.1.1 Gender

Table 4.1: Descriptive analysis for Gender

Gender	Frequency	Percentage (%)	Cumulative Frequency	Cumulative percentage (%)
Male	145	37.96	145	37.96
Female	237	62.04	382	100

Figure 4.1: Descriptive analysis for Gender



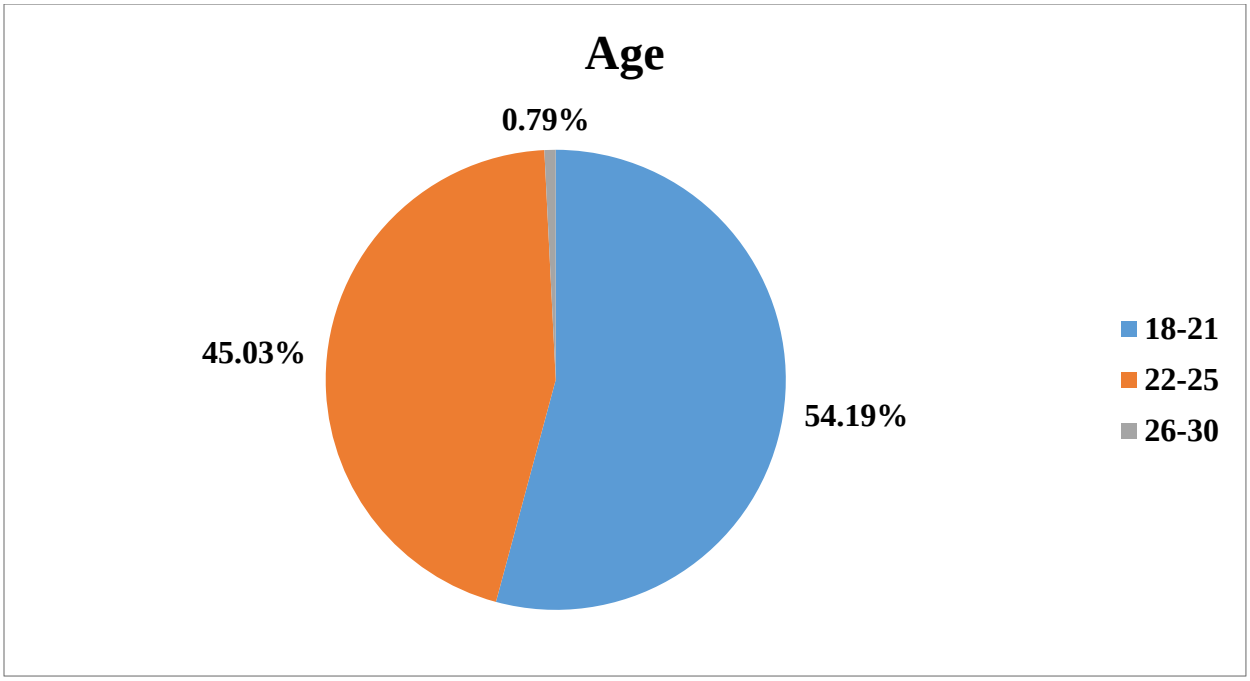
Based on the result that shown in Table 4.1 and Figure 4.1, there are 382 respondents who take part in this study Most of the respondents are female (62.04%) while only 37.96% are male.

4.1.1.2 Age

Table 4.2: Descriptive analysis for Age

Age	Frequency	Percentage (%)	Cumulative Frequency	Cumulative percentage (%)
18-21	207	54.19	207	54.19
22-25	172	45.03	379	99.21
26-30	3	0.79	382	100

Figure 4.2: Descriptive analysis for Age



This study survey has categorized the respondents into three different age groups. Table 4.2 and Figure 4.2 illustrates that more than 50% are between 18 and 21 years old. This is followed by 45.03% are between of 22 and 25 years old and only 0.79% are between 26 and 30 years old.

4.1.1.3 Ethnicity

Table 4.3: Descriptive analysis for Ethnicity

Ethnicity	Frequency	Percentage (%)	Cumulative Frequency	Cumulative percentage (%)
Malay	3	0.79	3	0.79
Chinese	346	90.58	349	91.36
Indian	32	8.38	381	99.74
Others	1	0.26	382	100

Figure 4.3: Descriptive analysis for Ethnicity

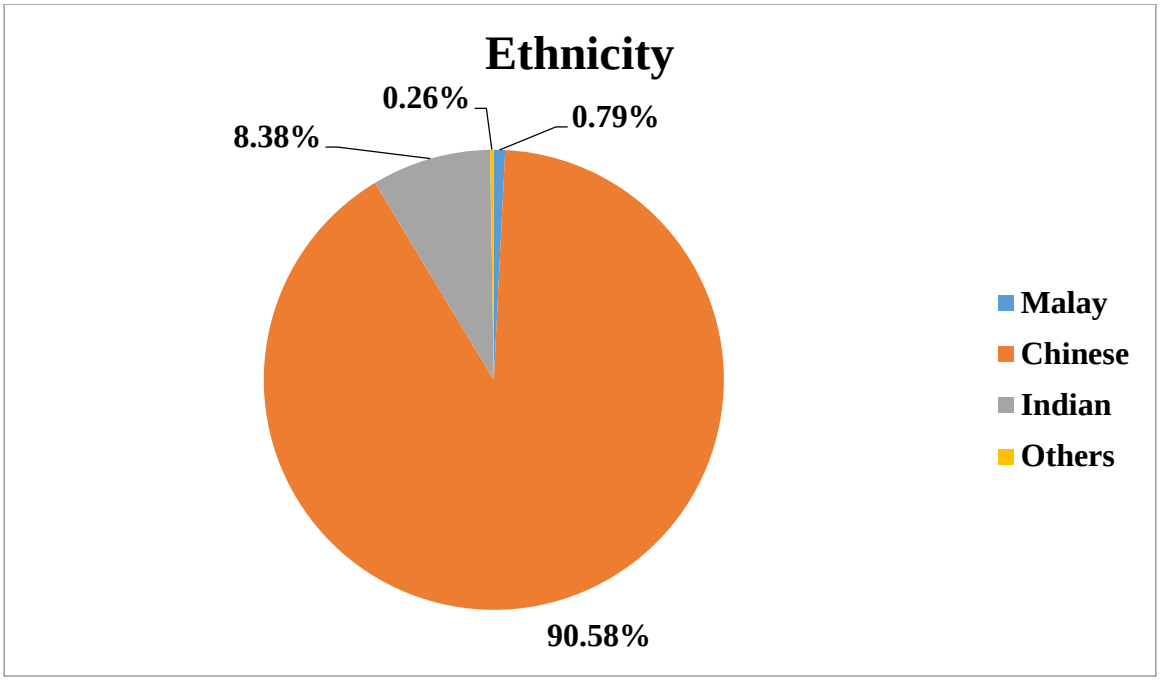


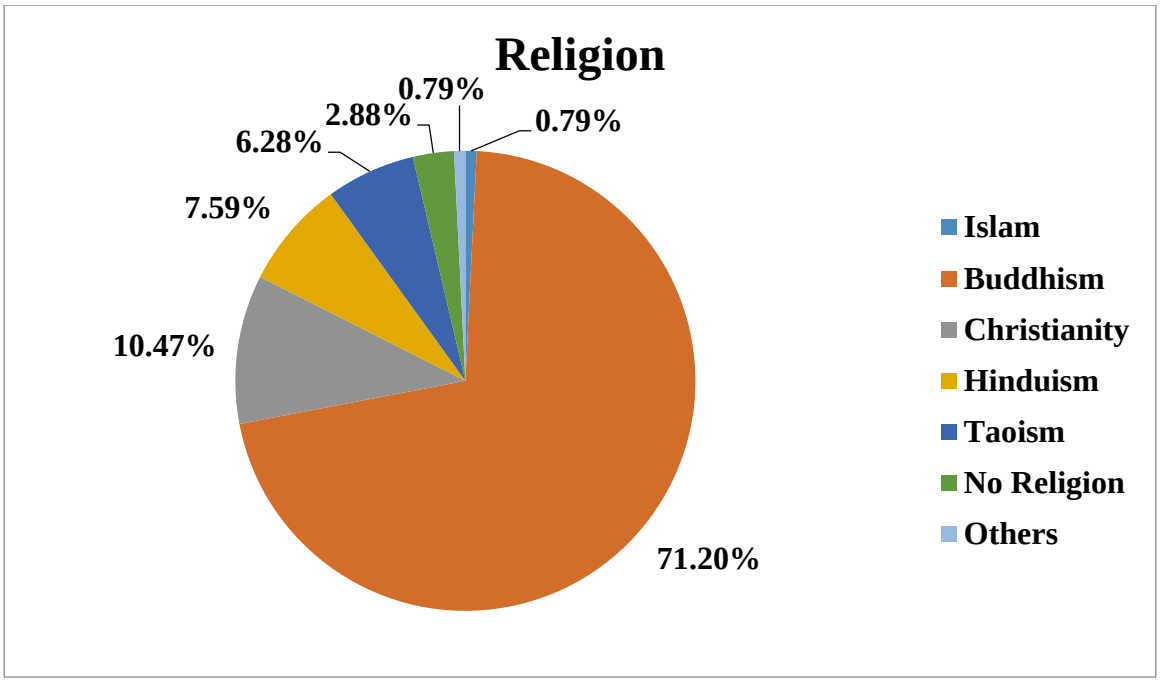
Figure 4.3 and Table 4.3 shows that majority of the respondents are Chinese (90.58%), followed by Indian (8.38%) and Malay (0.26%).

4.1.1.4 Religion

Table 4.4: Descriptive analysis for Religion

Religion	Frequency	Percentage (%)	Cumulative Frequency	Cumulative percentage (%)
Islam	3	0.79	3	0.79
Buddhism	272	71.20	275	71.99
Christianity	40	10.47	315	82.46
Hinduism	29	7.59	344	90.05
Taoism	24	6.28	368	96.34
No Religion	11	2.88	379	99.21
Others	3	0.79	382	100

Figure 4.4: Descriptive analysis for Religion



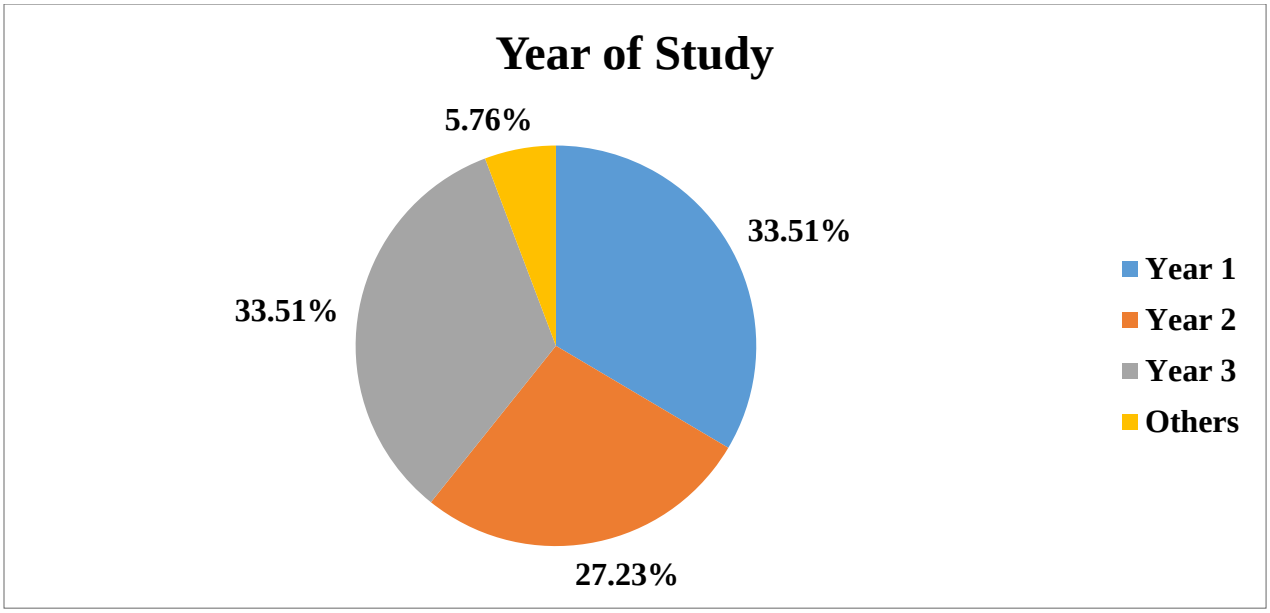
Based on Table 4.4 and Figure 4.4, most of the respondents are Buddhism (71.20%). This is followed by Christianity (10.47%), Hinduism (7.59%) and Taoism (6.28%). 0.79% of the respondents indicate that they have "no religion".

4.1.1.5 Year of Study

Table 4.5: Descriptive analysis for Year of Study

Year of Study	Frequency	Percentage (%)	Cumulative Frequency	Cumulative percentage (%)
Year 1	128	33.51	128	33.51
Year 2	104	27.23	232	60.73
Year 3	128	33.51	360	94.24
Others	22	5.76	382	100

Figure 4.5: Descriptive analysis for Year of Study



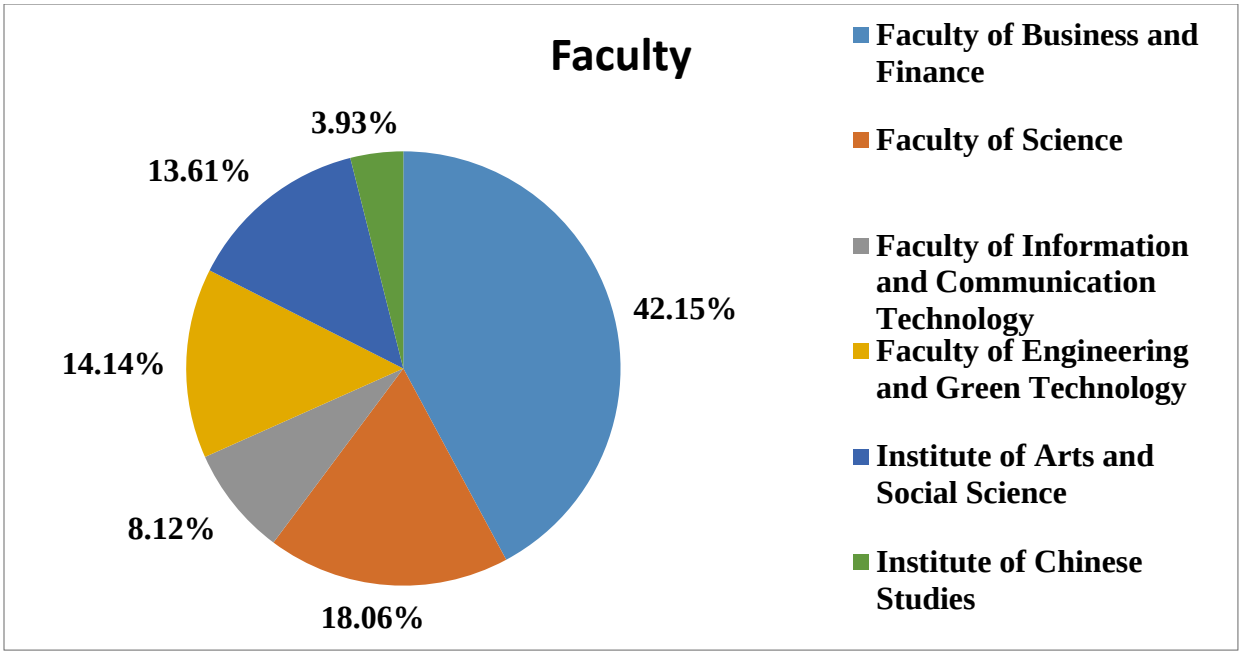
The Table 4.5 and Figure 4.5 shows that 33.51% of the respondents are first-year students, followed by third-years students (33.51%), second-year students (27.23%) and others (5.76%).

4.1.1.6 Faculty

Table 4.6: Descriptive analysis for Faculty

Faculty	Frequency	Percentage (%)	Cumulative Frequency	Cumulative percentage (%)
Faculty of Business and Finance	161	42.15	161	42.15
Faculty of Science	69	18.06	230	60.21
Faculty of Information and Communication Technology	31	8.12	261	68.32
Faculty of Engineering and Green Technology	54	14.14	315	82.46
Faculty of Arts and Social Science	52	13.61	367	96.07
Institute of Chinese Studies	15	3.93	382	100

Figure 4.6: Descriptive analysis for Faculty



Based on Table 4.6 and Figure 4.6, above, the majority of the respondents are from the Faculty of Business and Finance 42.15%. This is followed by Faculty of Science (18.06%), Faculty of Engineering and Green Technology (14.14%), Faculty of Arts and Social Science (13.61%), Faculty of Information and Communication Technology (13.61%) and Institute of Chinese Studies (3.93%).

4.1.2 Central Tendencies Measurement of Constructs

Central tendencies show all the mean and standard deviation of all of the questions in the questionnaires that prepared by using the SAS Enterprise Guide 7. 1. The use of frequency analysis is to produce frequency tables and charts in which data belongs to the frequencies of phenomena occurrence and variability of the set is provided. Moreover, the mean and standard deviation of sample distribution are able to get from the frequency analysis performed.

4.1.2.1 Personal Norms

Table 4.7: Central Tendencies Measurement of Personal Norms

Question	Statement	Sample Size, N	Mean	Standard Deviation	Mean Ranking	Standard Deviation Ranking
PN 1	It is important to me whether the products I buy are environmentally friendly.	382	3.58901	0.77099	7	2
PN 2	Environment protection is important to me when making purchases.	382	3.60471	0.75870	6	3
PN 3	If I can choose between environmentally friendly and conventional I will prefer to buy environmentally friendly products.	382	3.83508	0.84588	5	1
PN 4	I feel a moral obligation to protect the environment.	382	3.98429	0.68333	3	5
PN 5	I feel that I should protect the environment.	382	4.16754	0.63427	2	7
PN 6	I feel that it is important for people in general to protect the environment.	382	4.31675	0.64126	1	6
PN 7	I feel an obligation to behave in an environmentally-friendly way.	382	3.95288	0.71935	4	4

Based on Table 4.7, the highest average score (mean) is the PN 6 with the value of 4.31675 and standard deviation of 0.64126. PN 5 has the second highest mean score of 4.16754 and standard deviation of 0.63427 whereas PN 4 has the third highest of mean 3.98429 with the standard deviation of

0.68333. PN7 has the fourth highest mean score of 3.95288 and standard deviation of 0.71935 as in compared to PN3 with the mean score of 3.83508 and standard deviation of 0.84588 respectively. While, the average score mean of 3.60471 and standard deviation of 0.75870 and PN 1 has the lowest mean score and standard deviation of 3.58901 and 0.77099.

4.1.2.2 Social Norms

Table 4.8: Central Tendencies Measurement of Social Norms

Question	Statement	Sample Size, N	Mean	Standard Deviation	Mean Ranking	Standard Deviation Ranking
SN 1	My faculty expect me to do environment practices.	382	3.27749	0.92015	3	1
SN 2	My classmates/ course-mates expect me to do environment practices.	382	2.97120	0.80791	5	4
SN 3	My family members expect me to do environment practices.	382	3.34031	0.81932	2	3
SN 4	My friends expect me to do environment practices.	382	3.11780	0.82561	4	2
SN 5	I will do so if I see others doing environmental practices.	382	3.85340	0.77998	1	5

Based on Table 4.8, SN 5 has the highest mean 3.85340 and standard deviation (0.77998), followed by SN 3 (the mean and standard deviation are 3.34031 and 0.81932 respectively), SN 1 (the mean is 3.27749 and standard deviation is 0.92015), SN4 with the mean value of 3.11780 and the standard deviation of 0.82561 and SN2 scored the lowest mean score and standard deviation (2.97120 and 0.80791 respectively).

4.1.2.3 Social Media

Table 4.9: Central Tendencies Measurement of Social Media

Question	Statement	Sample Size, N	Mean	Standard Deviation	Mean Ranking	Standard Deviation Ranking
SM 1	I always concern about environmental campaigns launched online through social media.	382	3.38743	0.83660	3	6
SM 2	I always read the news from social media (e.g. facebook, youtube and so on).	382	3.63874	0.86965	1	4
SM 3	I always watch the advertisements on social media (e.g. youtube, facebook and etc).	382	3.36387	0.91706	4	1
SM 4	I always read the comments and opinion of the leader through social network (e.g. singers, sportsmen, celebrities and etc).	382	3.30366	0.89439	5	3
SM 5	I always read the comments and opinion of close people through social network (e.g. facebook, twitter and so on).	382	3.44764	0.84253	2	5
SM 6	I always watch live shows and events through social media (e.g. facebook live).	382	3.04450	0.90818	6	2

Table 4.9 reveals the central tendencies measurement of social media. From the data above, it can be seen that SM 2 having the highest mean value of 3.63874. SM 5 is the second highest mean (3.44764) whereby SM 1 is the third highest mean (3.38743). Then, followed by SM 3 which has the value of

3.36387 and SM 4 with the value of 3.30366. While, the lowest mean value has been recorded by SM 6 with the value of 3.04450.

For standard deviation, SM 3 has the highest standard deviation of 0.91706. Followed by, SM 6 (0.90818), SM 4 (0.89439), SM 2 (0.86965) and SM 5 (0.84253) respectively. Lastly, SM 1 is recorded the lowest standard deviation value of 0.83660.

4.1.2.4 Environmental Knowledge

Table 4.10: Central Tendencies Measurement of Environmental Knowledge

Question	Statement	Sample Size, N	Mean	Standard Deviation	Mean Ranking	Standard Deviation Ranking
EK 1	All the living things is important to maintain the balance of ecosystem.	382	4.34817	0.70375	4	4
EK 2	The condition of our environment will affect our health.	382	4.53403	0.63795	1	7
EK 3	Destruction of forests will cause biological imbalances.	382	4.47120	0.66242	2	6
EK 4	A country will run short of its natural resources.	382	4.30105	0.75708	5	3
EK 5	Natural resources should be preserved for future generation.	382	4.40052	0.70193	3	5
EK 6	Using public transport can help to reduce air pollution.	382	4.18063	0.82694	6	1
EK 7	Vehicles improperly maintained will cause pollution.	382	4.15969	0.75861	7	2

Table 4.10 shows the central tendencies measurement of environmental knowledge. Based on the results, EK 2 has the highest mean value of 4.53403. While, EK 3 has been recorded as the second highest with the mean value of 4.47120. After that followed by EK 5, EK 1, EK 4 and EK 6 with the value of

4.40052, 4.34817, 4.30105 and 4.18063 respectively. The lowest mean value goes to EK 7 with the mean scoring of 4.15969.

By referring to the standard deviation, EK 6 has the highest value of 0.82694. While, EK 7, EK4, EK 1, EK 5 and EK 3 have the scores of 0.75861, 0.75708, 0.70375, 0.70193 and 0.66242 respectively. Lastly, EK 2 has the lowest standard deviation value of 0.63795.

4.1.2.4 Environmental Attitudes

Table 4.11: Central Tendencies Measurement of Environmental Attitudes

Question	Statement	Sample Size, N	Mean	Standard Deviation	Mean Ranking	Standard Deviation Ranking
EA 1	The earth is like a spaceship with very limited room and resources.	382	4.06021	0.82865	3	3
EA 2	The balance of nature is very delicate and easily upset.	382	3.89791	0.76508	6	6
EA 3	The earth has plenty of natural resources if we learn how to develop it.	382	4.10209	0.77191	2	5
EA 4	Humans have the right to modify the natural environment to suit their needs.	382	3.45288	1.04825	8	1
EA 5	When humans interfere with nature it often produces disastrous consequences.	382	3.81152	0.76063	7	7
EA 6	Plants and animals have as much right as humans to exist.	382	3.95026	0.83565	5	2
EA 7	Humans must live in harmony with nature in order to survive.	382	4.28272	0.67085	1	8
EA 8	Humans are severely abusing the environment.	382	4.00000	0.78369	4	4

The Table 4.11 shows the central tendencies measurement of environmental attitudes. Based on the results, EA 7 is achieved the highest mean with the value of 4.28272 and standard deviation of 0.67085. The second highest mean is EA 3 which has the value of 4.10209 and standard deviation of 0.77191 whereas EA 1 is recorded the third highest mean with the value of 4.06021 and the standard deviation of 0.82865. After that, followed by EA 8 (the mean and the standard deviation are 4.00000 and 0.78369), EA 6 (the mean and standard deviation are 3.95026 and 0.83565), EA 2 (the mean and standard deviation are 3.89791 and 0.76508) and EA 5 (the mean and standard deviation are 3.81152 and 0.76063) respectively. However, EA 4 has the lowest mean with the value of 3.45288 and standard deviation of 1.04825.

4.1.2.6 Pro-Environmental Behaviour

Table 4.12: Central Tendencies Measurement of Pro-Environmental Behaviour

Question	Statement	Sample Size, N	Mean	Standard Deviation	Mean Ranking	Standard Deviation Ranking
PEB 1	I take part in activities that care for the environment.	382	2.66492	0.84043	11	10
PEB 2	I talk about the importance of the environment with others.	382	2.77487	0.90004	10	8
PEB 3	I consume drinks that come in returnable bottle.	382	3.13613	0.92632	7	7
PEB 4	I buy organic products.	382	2.82984	0.94180	9	6
PEB 5	I avoid using products that pollute the environment.	382	3.22775	0.87722	6	9
PEB 6	I use recycled or certified paper.	382	3.28534	0.97191	5	4
PEB 7	I contribute to the recycling campaigns.	382	3.03665	1.06912	8	3
PEB 8	I recycle paper, glass and cans.	382	3.64660	0.97109	3	5
PEB 9	I turn off the light when I leave the room.	382	4.39005	0.78517	1	11

PEB 10	I use public transports (e.g. bus and train.	382	3.39005	1.08543	4	1
PEB 11	I walk or cycle for short journey less than 1 km.	382	3.74084	1.08115	2	2

Table 4.12 shows the results of central tendencies measurement of pro-environmental behaviour. PEB 9 is achieved the highest mean with the value of 4.39005 whereas the second highest mean is recorded by PEB 11 with the value of 3.74084. The third highest mean (3.64660) is PEB 8, then followed by PEB 10 (3.39005), PEB 6 (3.28534), PEB 5 (3.22775), PEB 3 (3.13613), PEB 7 (3.03665), PEB 4 (2.82984) and PEB 2 (2.77487) respectively. However, PEB 1 has the lowest mean with the value of 2.66492.

For standard deviation, PEB 10 has the highest value of standard deviation which is 1.08543. The second highest ranking in standard deviation is PEB 11 with 1.08115 whereas PEB 7 is the third highest standard deviation with the value of 1.06912. After that, followed by PEB 6 (0.97191), PEB 8 (0.97109), PEB 4 (0.94180), PEB 3 (0.92632), PEB 2 (0.9004), PEB 5 (0.87722) and PEB 1 (0.84043) respectively. Lastly, the lowest standard deviation is PEB 9 which has the value of 0.78517.

4.1.2.7 Types of Pro-Environmental Behaviour

Table 4.13: Central Tendencies Measurement of Types of Pro-Environmental Behaviour

Types of PEB	Mean	Standard Deviation
Environmental Concern	2.71990	0.76596
Green Purchase Behaviour	3.06457	0.70817
Recycling	3.32286	0.80383
Energy Conservation	4.39005	0.78517
Environmentally Friendly Modes of Transportation	3.56545	0.89452

Table 4.13 shows the results of central tendencies measurement of types of pro-environmental behaviour. There are five types of PEB are examined. The mean score for energy conservation (Mean = 4.39005) are the highest compare to others type. The mean score for environmentally friendly modes of transportation (Mean = 3.56545), recycling (Mean = 3.32286), and green purchase behaviour (Mean = 3.06457) are relatively low but still above the mid-point of the rating scale. While, environmental concern (Mean = 2.71990) is below the mid-point of the rating scale.

4.2 Scale Measurement (Reliability Test)

Table below shows the results of the reliability test for independent variables and dependent variable for this study.

Table 4.14: Cronbach's Alpha Reliability Analysis

No	Variables	Topics	Number of Items	Cronbach's Alpha	Reliability Level
1	Independent Variable	Personal Norms	7	0.8227	Very Good
2	Independent Variable	Social Norms	5	0.7485	Good
3	Independent Variable	Social Media	6	0.7841	Good
4	Independent Variable	Environmental Knowledge	7	0.8128	Very Good
5	Independent Variable	Environmental Attitudes	8	0.7182	Good
6	Dependent Variable	Pro-Environmental Behaviour	11	0.8094	Very Good

Form the result above, the independent variables such as personal norms (0.8227) and environmental knowledge (0.8128) are considered as excellent reliability because the cronbach's alpha value fall within the range of 0.8 to 0.95. The cronbach's alpha value for the social norms (0.7485), environmental attitudes (0.7182) and social media (0.7841) are above 0.7, indicating good reliability. The cronbach's alpha for PEB is more than 0.8 indicating excellent reliability. In general, all the independent variables and dependent variable recorded the high cronbach's alpha value, therefore all the items have remained in this study.

4.3 Inferential Analysis

The purpose of the inferential analysis is to examine the individual variables and the relationship between the dependent variable and independent variable. Pearson's Correlation Coefficient and Multiple Linear Regression Analysis was applied in this study to test and evaluate all the hypothesis formed in this study.

4.3.1 Pearson Coefficient Analysis

The results of the Pearson Correlation Coefficient for this study as shown on the table below:

Table 4.15: Correlation between Each Independent Variable with Pro-Environmental Behaviour

PEB	Personal Norms	Social Norms	Social Media	Environmental Knowledge	Environmental Attitudes
Pearson Correlation	0.4364	0.2302	0.3490	0.1586	0.3036
P-value	<.0001	<.0001	<.0001	<.0001	<.0001
N	382	382	382	382	382

4.3.1.1 Correlation between Personal Norms and Pro-Environmental Behaviour

Based on the Table 4.15, personal norms is 0.4364 correlated with PEB. With positive value of the correlation coefficient, it indicates that the relationship between personal norms and PEB are interrelated.

According to Rules of Thumb of Pearson Correlation, it considered as moderate strength of correlation coefficient since 0.4364 is fall under the range of ± 0.41 to ± 0.70. Hence, there is a moderate relationship between personal norms and PEB.

Since p-value is <.0001 which is less than alpha value of 0.01, there is a significant relationship between personal norms and PEB.

4.3.1.2 Correlation between Social Norms and Pro-Environmental Behaviour

Based on Table 4.15, social norms is 0.2302 correlated with PEB. With positive value of the correlation coefficient, it indicates that the relationship between social norms and PEB are interrelated.

According to Rules of Thumb of Pearson Correlation, it considered as small but definite strength of correlation coefficient since 0.2302 is fall under the range of ± 0.21 to ± 0.40. Hence, there is a small but definite relationship between social norms and PEB.

Since p-value (<.0001) is less than alpha value (0.01), there is a significant relationship between social norms and PEB.

4.3.1.3 Correlation between Social Media and Pro-Environmental Behaviour

Based on the table above, social media is 0.3490 correlated with PEB. With positive value of the correlation coefficient, it shows that the relationship between social media and PEB are interrelated.

According to Rules of Thumb of Pearson Correlation, it considered as small but definite strength of correlation coefficient since 0.3490 is fall under the range of ± 0.21 to ± 0.40. Hence, there is a small but definite relationship between social media and PEB.

Since p-value (<.0001) is less than alpha value (0.01), there is a significant relationship between social media and PEB.

4.3.1.4 Correlation between Environmental Knowledge and Pro-Environmental Behaviour

Based on the table above, environmental knowledge is 0.1586 correlated with PEB. With positive value of the correlation coefficient, it shows that the relationship between environmental knowledge and PEB are interrelated.

According to Rules of Thumb of Pearson Correlation, it considered as slight, almost negligible strength of correlation coefficient since 0.1586 is fall under the range of ± 0.01 to ± 0.20. Hence, there is a slight and almost negligible relationship between environmental knowledge and PEB.

Since p-value (<.0001) is less than alpha value (0.01), there is a significant relationship between environmental knowledge and PEB.

4.3.1.5 Correlation between Environmental Attitudes and Pro-Environmental Behaviour

Based on the table above, environmental attitudes is 0.3036 correlated with PEB. With positive value of the correlation coefficient, it shows that the relationship between environmental attitudes and PEB are interrelated.

According to Rules of Thumb of Pearson Correlation, it considered as small but definite relationship strength of correlation coefficient since 0.3036 is fall under the range of ± 0.21 to ± 0.40. Hence, there is a small but definite relationship between environmental attitudes and PEB.
Since p-value (<.0001) is less than alpha value (0.01), there is a significant relationship between environmental attitudes and PEB.

4.3.2 Multiple Regression Analysis

Multiple regressions are used to test on one or more than one independent variable to predict the variance of the dependent variable (Sekaran and Bougie, 2010).

Hypotheses 1(a)

H_0: Undergraduate students will be less concern on environmental issues

H_1: Undergraduate students will be more concern on environmental issues.

Hypotheses 1(b)

H_0: Undergraduate students will be less likely to engage in green purchase behaviour

H_1: Undergraduate students will be more likely to engage in green purchase behaviour.

Hypotheses 1(c)

H_0: Undergraduate students will be less likely to engage in recycling

H_1: Undergraduate students will be more likely to engage in recycling.

Hypotheses 1(d)

H_0: Undergraduate students will be less likely to engage in energy conservation

H_1: Undergraduate students will be more likely to engage in energy conservation.

Hypotheses 1(e)

H0: Undergraduate students will be less likely to engage in environmentally friendly modes of transportation

H1: Undergraduate students will be more likely to engage in environmentally friendly modes of transportation.

Table 4.16: Analysis of Variance

Analysis of Variance					
Source	**DF**	**Sum of Square**	**Mean Square**	**F-value**	**Pr>F**
Model	5	32.71070	6.54214	28.34	<.0001
Error	376	86.78696	0.23082		
Corrected Total	381	119.49766			

1. Predictor: (Constant): Personal norms, Social norms, Social media, Environmental knowledge, Environmental attitudes

2. Dependent variable: Pro-environmental Behaviour

   Based on the Table 4.16, the p-value is <.0001 which is less than alpha value of 0.01. This showed that the F-statistic is significant with the value of 28.34. The model for this study was a well said explainer in explaining the relationship between the Independent Variables (Personal norms, social norms, social media, environmental knowledge and environmental attitudes) and Dependent Variable (Pro-environmental behavior). The outcome of the result showed that the data alternative hypothesis was supported by the data.

Table 4.17: Model Summary

Root MSE	0.48043	R-Square	0.2737
Dependent Mean	3.28391	Adj R-Square	0.2641
Coeff Var	14.62991		

The percentage of the independent variable indicated that the R-square can interpret the variation in dependent variable. Based on the outcome of this study, all the dimensions of the independent variable have 27.37% of the variation in PEB. The remaining 72.63% did not explain in this study which showed that this is significant in interpreting pro-environmental behavior that have not been consider in this study.

Table 4.18: Parameter Estimate

Parameter Estimates					
Variables	**Parameter Estimate**	**Standard Error**	**t value**	**Pr> |t|**	**Decision**
Personal Norms -> PEB	0.41117	0.27390	7.06	<.0001	H2: Supported
Social Norms -> PEB	0.03998	0.04523	0.88	0.3773	H3: Not Supported
Social Media -> PEB	0.22219	0.04384	5.07	<.0001	H4: Supported
Environmental Knowledge -> PEB	-0.09611	0.06344	-1.52	0.1306	H5: Not Supported
Environmental Attitudes -> PEB	0.12281	0.06873	1.79	0.0747	H6: Not Supported

Regression Equation: $Y = a + b1X1 + b2X2 + b3X3 + b4X4$

Y= Pro-environmental Behavior

X1 = Personal Norms

X2 = Social Norms

X3 = Social Media

X4 = Environmental Knowledge

X5 = Environmental Attitudes

Based on the Table 4.18,

Hypotheses 2

H_0: Personal norms does not has a positive and significant influence on pro-environmental behaviour.

H_1: Personal norms has a positive and significant influence on pro-environmental behaviour.

The p-value for personal norms is <.001 which is less than the alpha value of 0.01. Hence, personal norms is significant to predict dependent variable for this study. H_0 is rejected.

Hypotheses 3

H_0: Social norms does not has a positive and significant influence on pro-environmental behaviour.

H_1: Social norms has a positive and significant influence on pro-environmental behaviour.

The p-value for social norms is 0.3773 which is more than the alpha value of 0.01. Hence, social norms is not significant to predict pro-environmental behaviour for this study. H_0 is accepted.

Hypotheses 4

H_0: Social media does not has a positive and significant influence on pro-environmental behaviour.

H_1: Social media has a positive and significant influence on pro-environmental behaviour.

The p-value for social media is <.0001 which is less than the alpha value of 0.01.Hence, social media is significantly related to pro-environmental behaviour. H_0 is rejected.

Hypotheses 5

H_0: Environmental knowledge does not has a positive and significant influence on pro-environmental behaviour.

H_1: Environmental knowledge has a positive and significant influence on pro-environmental behaviour.

The p-value for environmental knowledge is 0.1306 which is more than the alpha value of 0.01. Hence, environmental knowledge is not significant to predict pro-environmental behaviour for this study. H_0 is accepted.

Hypotheses 6

H_0: Environmental attitudes does not has a positive and significant influence on pro-environmental behaviour.

H_1: Environmental attitudes has a positive and significant influence on pro-environmental behaviour.

The p-value for environmental attitudes is 0.0747 which is more than the alpha value of 0.01. Hence, environmental attitudes is not significant to predict pro-environmental behaviour for this study. H_0 is accepted.

Out of the five hypotheses, two are significant, and the remaining three are insignificant. Results of parameter estimates reveal that Personal Norms and Social Media are significantly related to the dependent variable (Pro-environmental Behavior), while Social Norms, Environmental Knowledge and Environmental Attitudes are insignificant.

Table 4.19: Ranking of the Parameter Estimates of Independent Variables

Independent Variables	Parameter Estimates	Ranking
Personal Norms	0.41117	1
Social Norms	0.03998	4
Social Media	0.22219	2
Environmental Knowledge	-0.09611	5
Environmental Attitudes	0.12281	3

Highest Contribution

Personal norms has the highest contribution to the variance of Pro-Environmental Behavior as the value of the parameter estimate of this independence variable was 0.41117, which is the highest when compare with other independence variables. This showed that personal norms has the highest contribution to explain the variation in pro-environmental behavior which has interpreted by other variable in the model.

Second Highest Contribution

Social media is the second highest contribution to the variation of pro-environmental behavior due to the value of parameter estimates, 0.22219 ranked number 2 as compare to others independent variables. It showed that social media make the second highest contribution to express the variation in

pro-environmental behavior, when the variance interpreted by all other independent variables in the model is controlled for.

Third Highest Contribution

Environmental attitudes is the third highest contribution to the variation of pro-environmental behavior when compared with others independent variable. This is because the value of parameter estimate for environmental attitudes is 0.12281 and it is indicated as the third highest contribution to explain the variation in pro-environmental behavior when the variance clarified by other independent variable.

Fourth Highest Contribution

Social norms is the fourth highest contribution to the variation of pro-environmental behavior as compare to others independent variables. The parameter estimate for social norms is 0.03998 which ranked as fourth highest contribution to justify the variation in pro-environmental behavior.

The lowest Contribution

When compare with others independent variables, Environmental knowledge had the lowest contribution in this study to predict the variation of pro-environmental behavior due to the negative parameter estimate of -0.09611, which is the lowest value when compared to others four independent variables.

4.4 Conclusion

In this study, SAS software is used by the researchers to exposit and summarizes the data collected from the targeted respondents. In this chapter, researchers will analyze the demographic profile of respondents, reliability of the research questionnaire, central tendencies for each of the question. In addition, researchers also examine the relationship between the dependent variable and independent variables through the

inferential analysis. Based on the results generated, only two independent variables which are personal norms and social media have the significant relationship with the dependent variable (PEB). However, social norms, environmental knowledge and environmental attitudes show no relationship with the dependent variable (PEB). On the following chapter, further discussion and conclusion will be carried out in this study.

CHAPTER 5: DISCUSSION AND CONCLUSION

5.0 Introduction

In this chapter, more detailed interpretations on the research finding will be conducted. This chapter start with an introduction, then followed by the discussions of major findings, implications of the study, limitations of the studies and recommendations for future research. A final conclusion is comprised to summarize this study.

5.1 Summary of Statistical Analyses

The summary of the results are shown in Table 5.1: Summary of the statistical findings (Dependent variables).

Table 5.1: Summary of the Statistical Findings (Dependent Variables)

Dependent Variables	Mean and Standard Deviation		Ranking
Environmental Concern	2.71190	0.76596	Fifth
Green Purchase Behaviour	3.06457	0.70817	Fourth
Recycling	3.32286	0.80383	Third
Energy Conservation	4.39005	0.78517	First
Environmentally Friendly Modes of Transportation	3.56545	0.89452	Second

This study has identified the PEB practices using five dimensions, namely environmental concern, green purchase behaviour, recycling, energy conservation and environmentally friendly modes of transportation. Table 5.1 reveals that undergraduate students in UTAR are more likely to engage in energy conservation,

followed by environmentally friendly modes of transportation, recycling and responsible consumption of products. While environmental concern is found to be the least engagement among undergraduate students in UTAR.

Table 5.2: Summary of the Statistical Findings (Independent Variables)

Independent Variables	Result (p-value)	Result (t-value)	Remarks
Personal Norms	<0.0001	7.06	Significant
Social Norms	0.3773	0.88	Not Significant
Social Media	<0.0001	5.07	Significant
Environmental Knowledge	0.1306	-1.52	Not Significant
Environmental Attitudes	0.0747	1.79	Not Significant

Based on Table 5.2, it is found that personal norms and social media have significant influence on PEB whereas social norms, environmental knowledge and environmental attitudes do not have significant influence on PEB. From the result, it can be said that personal norms and social media are indeed a stronger predictor in measuring on individual's PEB while social norms, environmental knowledge and environmental attitudes are found to be the weaker predictor on PEB.

5.2 Discussions of Major Findings

The general objective of this study is to examine the PEB of undergraduate students and identify the factors that influence the PEB. Detailed discussions of the major findings in this study would be provided in the following section.

5.2.1 What are the pro-environmental behaviour engaged by UTAR students?

Types of Pro-Environmental Behaviour (Environmental Concern, Green Purchase Behaviour, Recycling, Energy Conservation & Environmentally Friendly Modes of Transportation).

The outcome from this study showed that undergraduate students in UTAR tend to have high involvement in energy conservation. The result from this study is supported by Er, Asmaa, Luthfi, Erna, Noraine, Nurul, Siti, Siti, Siti and Alam (2017), stated that most of the undergraduate students in UKM are actively involved in energy conservation.

The results of this study show that UTAR undergraduate students are also involving in environmentally friendly modes of transportation after energy conservation. This result is being further supported by Borhan et al., (2014), stated that a better understanding of environmentally friendly modes of transport such as public transport that will help in reducing the emission of chlorofluorocarbon (CFC) that may harm the environment is of the utmost importance for undergraduate students. It has been found that most of the undergraduate students will use public transport as it is the most convenient and cost saving ways of going to the campus (Hussin and Kunjuraman, 2015).

It is also found that UTAR undergraduate students are less frequent in involving in recycling. Basri et al., (2016) found that 92% of the undergraduate students agreed that by recycling, it can help to reduce the problem of solid-waste disposal but only 38% of the students that took part in the recycling activities. Many students failed to demonstrate the recycling practice even though they have been provided with the recycling facilities at the university.

Green purchase behaviour is also found to be lacking among undergraduate students in UTAR. This is because the lack of initiatives from the university management regarding green purchase. Besides, undergraduate students usually will not buy organic products as it is highly priced as in compared to other non-organic products. Habits of undergraduate students are also another factor that lead to the lack of involvement of to consume green purchase products (Joshi and Rahman, 2015).

Environmental concern is found to be the least engagement among undergraduate students in UTAR as the lack of encouragement from the university. University should encourage its students to involve in environmental activities by organizing environmental campaign and environmental seminar (Lee, Kim, Kim and Choi, 2014).

5.2.2 What are the key determinants for UTAR undergraduate students to promote pro-environmental behaviour?

Personal norms and PEB.

The outcome of this study showed that there is a positive and significant influence between personal norms and PEB towards undergraduate students in UTAR. Onel (2017) defines personal norms as one of the successful predicting factors of different environmental behaviours, it can be constructed as individuals' internal expectations of how they should act based on their inner values.

The result from this study is in sync with the result of Onel (2017) stated that personal norms have a positive and significant influence on PEB. This is because the compliance with personal norms is related to the feelings of pride and guilt towards PEB. Onwezen et al., (2013) pointed out that it is solely

depending on an individual to feel a moral obligation to perform pro-environmental activities but not the influence of others (Onwezen et al., 2013).

Social media and PEB.

The outcome of this result showed a positive and significant influence between social media and PEB among undergraduate students in UTAR. Vigrass (2015) explained social media as a medium of communication for youngsters nowadays and it can lead to a better outcomes and higher impact on individual's environmental behaviour.

The outcome from this study is being supported by Liao, Ho and Yang (2016) who stated that social media have a positive and significant influence on PEB. Due to the advancement of technology, social media is indeed an important and useful tool in encouraging undergraduate students to participate in campus sustainability as it is the most influential platform nowadays (Carpenter et al., 2016).

Social norms and PEB.

The outcome of this study showed that social norms does not exert any significant influence on PEB among undergraduate students in UTAR. This result is consistent with Dercks (2015) and Abusafieh and Razem (2017). This may be due to the fact that undergraduate students tend not to actively participate in PEB even with the social influence from family members, friends, teachers and government. This is because the friends and family around them did not actively participate in PEB, in turn, resulting in the less involvement of undergraduate students in promoting PEB (Palupi and Saqitri, 2018).

Environmental knowledge and PEB.

The outcome of this study showed that there is no significant influence between environmental knowledge and PEB among undergraduate students in

UTAR. The result is supported by Pan et al. (2018). The lack of environmental knowledge or confusion created by conflicting information may act as the barriers for PEB, and the direct repeated information about the causes of climate change will not lead to the PEB of an individual (Blankenberg and Alhusen, 2018). Hence, even there is an increase in environmental knowledge among undergraduate students in the university, it does not usually lead to behavioural changes to act pro-environmentally (Latif et al., 2013).

Environmental attitudes and PEB.

Environmental attitudes do not exert any significant influence with PEB. The outcome from this result is consistent with Fu et al. (2018). According to Fielding and Hornsey (2016), environmental attitudes are very subjective in explaining PEB as it is solely depending on what an individual behave and react towards the situations. Different people may have the different opinion in seeing environmental issues. Hence, it is argued that undergraduate students from the different background may have different environmental attitudes towards the environment (Heyl, Moyano Díaz and Cifuentes, 2013). In addition, Kharat, Murthy, Kamble and Kharat (2017) also reported that people who have lack of interest, lack of efficacy, lack of information and lack of encouragement will affect the significance of environmental attitudes and PEB involvement.

5.3 Implications of the Study

5.3.1 Managerial Implications

The findings from this study showed the importance of PEB towards the environment and the community. It is everyone's responsibility to take good care of the environment as one of the main reason that lead to the destruction

of the ecosystem is human actions. These may be due to the different perceptions and opinions of individual towards the environment.

In this study, the result shows that undergraduate students in UTAR are more likely to engage in energy conservation, followed by environmentally friendly modes of transportation, recycling, green purchase behaviour and the environmental concern. It is found that the environmental concern has received less attention among undergraduate students. Hence, UTAR could introduce incentives such as environmental campaign and environmental talks in encouraging undergraduate students to actively involved in PEB.

The results from this study reveal that personal norms has a significant influence with PEB. According to Gifford and Nilsson (2014), personal norms is found to be an important factor and significantly related to PEB, this may due to the religion, childhood experience, felt responsibility and personality of an individual to act pro-environmental. Hence, school and parents can work together to encourage undergraduate students to be more responsible in the participation of PEB.

Furthermore, the result from this study shows that social media is significantly related to PEB. Hence, the government and UTAR may use social media such as Facebook to raise awareness among undergraduate students as it is considered the fastest and easiest way to deliver a positive environmental messages.

It is also found that social norms does not influence undergraduate students to involve in PEB. As such, government can play its role in influencing the values and social norms by implementing more environmental rules and regulations especially to the corporation, educational institutions and the community as well.

Besides, it is also found that environmental knowledge is insignificantly related to PEB. As such, educational institutions can play their part in educating students about the importance of PEB. In addition, parents can inject more environmental knowledge on their children since they are young so that they will be aware and participate in environmental activities.

Lastly, the result from this study show that the environmental attitudes is not significantly related to PEB. According to Shamuganathan and Karpudewan (2015), higher education studies of environmental attitudes is indeed important for undergraduate students as they are the future leader of the world that helps in maintaining the balance of the ecosystem. Hence, the universities can take extra steps in boosting their students to participate in environmental activities by frequently organizing environmental events and campaigns.

5.4 Limitations of the Study

There are some limitations in this study. First, the scope of this study mainly focused on UTAR undergraduate students from Kampar campus because Kampar campus is the main campus and has started to involve in promoting environmental campaign. This study only focuses on the PEB among undergraduate students in UTAR Kampar campus but neglected the roles and responsibilities of other parties such as the government, community and corporation. The role from these parties are equally important in maintaining a cleaner and healthier environment.

Second, the objective of this study is to examine the direct relationship between personal norms, social norms, social media, environmental knowledge, environmental attitudes and PEB because there is a lack of studies on PEB among undergraduate students in private universities. However, this study is mainly focused on independent variables and dependent variable without considering the possible intervening effects

of other factors. This might not give a strong and concrete evidence in explaining the relationship between the independent variables and dependent variable.

Finally, self-administered survey has been used in this study and the targeted respondents (i.e. UTAR undergraduate students) from UTAR Campus can be reached by using this method. However, this method is not able to clarify doubts and ensure that the respondents really understood the questions properly.

5.5 Recommendations for Future Research

There are several recommendations available for future researchers so that improvement can be made regarding this topic. First, to have a complete picture of PEB, future research should also be conducted in other private or public universities for comparison purposes, since different universities have different resource availabilities that would influence their environmental practices.

Second, the conceptual model of this study is to examine the direct relationship between independent variables and dependent variable. Hence, if future researchers wish to examine any change of PEB among undergraduate students over time, they could consider intervening variables such as mediator and moderator as it will further support and justify the antecedents in explaining PEB.

In addition, this study employs a survey method to obtain the information from the respondents. In order to get more in-depth information about undergraduate students' perception of environmental problems and their PEB, future researchers can conduct face-to-face personal interviews with undergraduate students. Face-to-face personal interviews allow the respondent to clarify some of the items on the questionnaire that require clearer explanations from the researchers.

5.6 Conclusion

The main objective of this study is to examine the PEB of undergraduate students and identify the factors that influence the PEB. Based on the result from the study, H2 and H4 are accepted and supported by the data while H3, H5 and H6 are rejected. This can be concluded that the independent variables (personal norms and social media) have a significant influence toward the dependent variable (PEB) while other independent variables (social norms, environmental knowledge and environmental attitudes) do not have significant influence toward the dependent variable (PEB). This study has been proven that these independent variables (personal norms, social norms, social media, environmental knowledge and environmental attitudes) are able to the influence on the PEB of an individual. This research project is served as future reference for future study regarding PEB.

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APPENDIX 1.1: PERMISSION LETTER

UNIVERSITI TUNKU ABDUL RAHMAN
Wholly Owned by UTAR Education Foundation (Company No. 578227-M)

5th June 2018

To Whom It May Concern

Dear Sir/Madam,

Permission to Conduct Survey

This is to confirm that the following students are currently pursuing their *Bachelor of Business Administration (Hons)* program at the Faculty of Business and Finance, Universiti Tunku Abdul Rahman (UTAR) Perak Campus.

I would be most grateful if you could assist them by allowing them to conduct their research at your institution. All information collected will be kept confidential and used only for academic purposes.

The students are as follows:

Name of Student	Student ID
Chee Zhen Fei	15ABB07802
Ho Kien Ming	15ABB07806
Leow Chun Leong	15ABB07910
Wong Jian Siang	15ABB07807

If you need further verification, please do not hesitate to contact me.

Thank you.

Yours sincerely,

Dr Choong Yuen Onn
Head of Department,
Faculty of Business and Finance
Email: choongyo@utar.edu.my

Dr Teoh Sok Yee
Supervisor,
Faculty of Business and Finance
Email: teohsy@utar.edu.my

Kampar Campus : Jalan Universiti, Bandar Barat, 31900 Kampar, Perak Darul Ridzuan, Malaysia
Tel: (605) 468 8888 Fax: (605) 466 1313
Sungai Long Campus : Jalan Sungai Long, Bandar Sungai Long, Cheras, 43000 Kajang, Selangor Darul Ehsan, Malaysia
Tel: (603) 9086 0288 Fax: (603) 9019 8868
Postal Address: PO Box 11348, 50744 Kuala Lumpur, Malaysia
Website: www.utar.edu.my

APPENDIX 1.2: SURVEY QUESTIONNAIRE

UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY OF BUSINESS AND FINANCE

BACHELOR OF BUSINESS ADMINISTRATION (HONS)

UNDERGRADUATE RESEARCH PROJECT:

FACTORS AFFECTING PRO-ENVIRONMENTAL BEHAVIOUR AMONG UNDERGRADUATE STUDENTS IN UTAR

Dear Respondents,

We are final year students from Universiti Tunku Abdul Rahman (UTAR), pursuing Bachelor of Business Administration and currently conducting our final year research project. The aim of the research questionnaire is to study the factors that affecting pro-environmental behaviour (PEB) among undergraduate students in UTAR.

Instructions:

This questionnaire consist of three sections which are Section A, Section B and Section C. Please answer all the questions. It should take around 15 minutes to complete this survey. All the answers will be kept **strictly private and confidential**. Thank you for your kind co-operation.

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.

Acknowledgment of Notice

[ ] I have been notified by you and that I hereby understood, consented and agreed per UTAR notice (refer to Appendix I).

[ ] I disagree, my personal data will not be processed.

If you have any enquiries, please do not hesitate to contact:

Chee Zhen Fei	017-8478600
Ho Kien Ming	017-3460939
Leow Chun Leong	016-5458930
Wong Jian Siang	012-5912567

Section A: Demographic information

We would like to obtain some information about your personal detail so that we can better understand your pro-environmental behaviour. Please tick (√) only ONE answer for each question.

1. Your gender:

   ( ) Male ( ) Female

2. Your age:

   ( ) 18-21 ( ) 22-25 ( ) 26-30

3. Your ethnicity:

   ( ) Malay
   ( ) Chinese
   ( ) Indian
   ( ) Others, please state: _____

4. Your religion:

   ( ) Islam
   ( ) Buddhism
   ( ) Christianity
   ( ) Hinduism
   ( ) Taoism
   ( ) No religion
   ( ) Others, please state: _____

5. Your current year of study:

   ( ) Year 1 ( ) Year 2 ( ) Year 3 ( ) others, please state: _____

6. Please tick your faculty:

   ( ) Faculty of Business and Finance (FBF)
   ( ) Faculty of Science (FSc)
   ( ) Faculty of Information and Communication Technology (FICT)
   ( ) Faculty of Engineering and Green Technology (FEGT)
   ( ) Faculty of Arts and Social Science (FAS)
   ( ) Institute of Chinese Studies (ICS)

Section B: Factors affecting pro-environmental behaviour

This section is seeking your opinion regarding the factors affecting pro-environmental behaviour. Please indicate the extent to which you agree or disagree with each of the following statements. Please ***circle*** the most appropriate option for each statement.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. It is important to me whether the products I buy are environmentally friendly.	1	2	3	4	5
2. Environment protection is important to me when making purchases.	1	2	3	4	5
3. If I can choose between environmentally friendly and conventional I will prefer to buy environmentally friendly	1	2	3	4	5

products.					
4. I feel a moral obligation to protect the environment.	1	2	3	4	5
5. I feel that I should protect the environment.	1	2	3	4	5
6. I feel that it is important for people in general to protect the environment.	1	2	3	4	5
7. I feel an obligation to behave in an environmentally-friendly way.	1	2	3	4	5
8. My faculty expect me to do environment practices.	1	2	3	4	5
9. My classmates/ course-mates expect me to do environment practices.	1	2	3	4	5
10. My family members expect me to do environment practices.	1	2	3	4	5
11. My friends expect me to do environment practices.	1	2	3	4	5
12. I will do so if I see others doing environmental practices.	1	2	3	4	5
13. All the living things is important to maintain the balance of ecosystem.	1	2	3	4	5
14. The condition of our environment will affect our health.	1	2	3	4	5
15. Destruction of forests will cause biological imbalances.	1	2	3	4	5
16. A country will run short of its natural resources.	1	2	3	4	5
17. Natural resources should be preserved for future generation.	1	2	3	4	5

18. Using public transport can help to reduce air pollution.	1	2	3	4	5
19. Vehicles improperly maintained will cause pollution.	1	2	3	4	5
20. The earth is like a spaceship with very limited room and resources.	1	2	3	4	5
21. The balance of nature is very delicate and easily upset.	1	2	3	4	5
22. The earth has plenty of natural resources if we learn how to develop it.	1	2	3	4	5
23. Humans have the right to modify the natural environment to suit their needs.	1	2	3	4	5
24. When humans interfere with nature it often produces disastrous consequences.	1	2	3	4	5
25. Plants and animals have as much right as humans to exist	1	2	3	4	5
26. Humans must live in harmony with nature in order to survive.	1	2	3	4	5
27. Humans are severely abusing the environment.	1	2	3	4	5
28. I always concern about environmental campaigns launched online through social media.	1	2	3	4	5
29. I always read the news from social media (e.g. facebook, youtube and so on).	1	2	3	4	5

30. I always watch the advertisements on social media (e.g. youtube, facebook and etc).	1	2	3	4	5
31. I always read the comments and opinion of the leader through social network (e.g. singers, sportsmen, celebrities and etc).	1	2	3	4	5
32. I always read the comments and opinion of close people through social network (e.g. facebook, twitter and so on).	1	2	3	4	5
33. I always watch live shows and events through social media (e.g. facebook live).	1	2	3	4	5

Section C: Dependent Variables

This following questions represent Pro-Environmental Behaviour (PEB). Please ***circle*** the most appropriate option for each statement.

	Never	Not Very Often	Quite Often	Very Often	Always
1. I take part in activities that care for the environment.	1	2	3	4	5
2. I talk about the importance of the environment with others.	1	2	3	4	5
3. I consume drinks that come in returnable bottle.	1	2	3	4	5
4. I buy organic products.	1	2	3	4	5
5. I avoid using products that pollute the environment.	1	2	3	4	5
6. I use recycled or certified paper.	1	2	3	4	5
7. I contribute to the recycling campaigns.	1	2	3	4	5
8. I recycle paper, glass and cans.	1	2	3	4	5
9. I turn off the light when I leave the room.	1	2	3	4	5
10. I use public transports (e.g. bus and train.	1	2	3	4	5
11. I walk or cycle for short journey less than 1 km.	1	2	3	4	5

PERSONAL DATA PROTECTION STATEMENT

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.

Notice:

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

- For assessment of any application to UTAR
- For processing any benefits and services
- For communication purposes
- For advertorial and news
- For general administration and record purposes
- For enhancing the value of education
- For educational and related purposes consequential to UTAR
- For the purpose of our corporate governance
- For consideration as a guarantor for UTAR staff/ student applying for his/her scholarship/ study loan

2. 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.

3. 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.

4. 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 this form you hereby authorise and consent to us processing (including disclosing) your personal data and any updates of your information, for the purposes and/or for any other purposes related to the purpose.

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 edmund8123@gmail.com.

Thank you for your time, opinion and comments.

~ The End ~

APPENDIX 1.3: TABLE FOR DETERMINING SAMPLE SIZE FROM A GIVEN POPULATION

TABLE 1
Table for Determining Sample Size from a Given Population

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

Note.—*N* is population size.
S is sample size.

APPENDIX 1.4: RELIABILITY TEST ANALYSIS RESULTS FOR PILOT TEST

Pro-Environmental Behaviour

Pro-Environmental Behaviour Reliability Test Analysis

The CORR Procedure

11 Variables:	PEB1	PEB2	PEB3	PEB4	PEB5	PEB6	PEB7	PEB8	PEB9	PEB10	PEB11

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
PEB1	30	2.33333	0.84418	70.00000	1.00000	5.00000
PEB2	30	2.40000	0.77013	72.00000	1.00000	4.00000
PEB3	30	2.56667	1.00630	77.00000	1.00000	5.00000
PEB4	30	2.56667	0.89763	77.00000	1.00000	5.00000
PEB5	30	2.90000	1.02889	87.00000	1.00000	5.00000
PEB6	30	3.06667	0.94443	92.00000	2.00000	5.00000
PEB7	30	2.76667	1.07265	83.00000	1.00000	5.00000
PEB8	30	3.13333	1.13664	94.00000	1.00000	5.00000
PEB9	30	4.06667	1.08066	122.00000	2.00000	5.00000
PEB10	30	3.20000	0.96132	96.00000	2.00000	5.00000
PEB11	30	3.46667	1.16658	104.00000	1.00000	5.00000

Cronbach Coefficient Alpha

Variables	Alpha
Raw	0.823027
Standardized	0.824620

Cronbach Coefficient Alpha with Deleted Variable

Deleted Variable	Raw Variables: Correlation with Total	Raw Variables: Alpha	Standardized Variables: Correlation with Total	Standardized Variables: Alpha
PEB1	0.525227	0.806617	0.556460	0.804510
PEB2	0.447771	0.813063	0.464542	0.812966
PEB3	0.300983	0.825833	0.320791	0.825742
PEB4	0.388499	0.817293	0.412303	0.817672

Personal Norms

Personal Norms Reliability Test Analysis

The CORR Procedure

7 Variables:	PN1	PN2	PN3	PN4	PN5	PN6	PN7

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
PN1	30	3.40000	0.93218	102.00000	1.00000	5.00000
PN2	30	3.63333	0.92786	109.00000	2.00000	5.00000
PN3	30	3.76667	0.81720	113.00000	2.00000	5.00000
PN4	30	3.90000	0.80301	117.00000	1.00000	5.00000
PN5	30	4.03333	0.76489	121.00000	1.00000	5.00000
PN6	30	4.13333	0.73030	124.00000	2.00000	5.00000
PN7	30	4.03333	0.71840	121.00000	3.00000	5.00000

Cronbach Coefficient Alpha

Variables	Alpha
Raw	0.720546
Standardized	0.719199

Cronbach Coefficient Alpha with Deleted Variable

Deleted Variable	Raw Variables: Correlation with Total	Raw Variables: Alpha	Standardized Variables: Correlation with Total	Standardized Variables: Alpha
PN1	0.432812	0.689326	0.420401	0.689154
PN2	0.535216	0.659870	0.528253	0.662104
PN3	0.320761	0.714657	0.310535	0.715378
PN4	0.544974	0.660308	0.545286	0.657710
PN5	0.589804	0.651182	0.583880	0.647632
PN6	0.200780	0.736880	0.215076	0.737107
PN7	0.415110	0.692760	0.426774	0.687592

Environmental Knowledge

Environmental Knowledge Reliability Test Analysis

The CORR Procedure

7 Variables: EK1 EK2 EK3 EK4 EK5 EK6 EK7

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
EK1	30	4.30000	0.65126	129.00000	3.00000	5.00000
EK2	30	4.23333	0.77385	127.00000	2.00000	5.00000
EK3	30	4.20000	0.71438	126.00000	3.00000	5.00000
EK4	30	4.16667	0.79148	125.00000	2.00000	5.00000
EK5	30	4.26667	0.63968	128.00000	3.00000	5.00000
EK6	30	4.16667	0.83391	125.00000	2.00000	5.00000
EK7	30	4.00000	0.83045	120.00000	1.00000	5.00000

Cronbach Coefficient Alpha

Variables	Alpha
Raw	0.891781
Standardized	0.897685

Cronbach Coefficient Alpha with Deleted Variable

Deleted Variable	Raw Variables: Correlation with Total	Raw Variables: Alpha	Standardized Variables: Correlation with Total	Standardized Variables: Alpha
EK1	0.816410	0.863421	0.828198	0.867492
EK2	0.882732	0.851150	0.889812	0.859939
EK3	0.754700	0.868462	0.763970	0.875200
EK4	0.786205	0.863535	0.793930	0.871625
EK5	0.657130	0.880304	0.667298	0.886488
EK6	0.650928	0.881610	0.645364	0.888998
EK7	0.368644	0.916473	0.353694	0.920609

Environmental Attitude

Environmental Attitude Reliability Test Analysis

The CORR Procedure

8 Variables: EA1 EA2 EA3 EA4 EA5 EA6 EA7 EA8

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
EA1	30	3.60000	1.00344	108.00000	1.00000	5.00000
EA2	30	3.90000	0.84486	117.00000	2.00000	5.00000
EA3	30	4.16667	0.74664	125.00000	2.00000	5.00000
EA4	30	3.20000	1.27035	96.00000	1.00000	5.00000
EA5	30	3.53333	0.93710	106.00000	1.00000	5.00000
EA6	30	4.03333	1.09807	121.00000	1.00000	5.00000
EA7	30	4.33333	0.60648	130.00000	3.00000	5.00000
EA8	30	4.00000	0.74278	120.00000	3.00000	5.00000

Cronbach Coefficient Alpha

Variables	Alpha
Raw	0.677760
Standardized	0.733270

Cronbach Coefficient Alpha with Deleted Variable

Deleted Variable	Raw Variables: Correlation with Total	Raw Variables: Alpha	Standardized Variables: Correlation with Total	Standardized Variables: Alpha
EA1	0.316918	0.661226	0.394481	0.712383
EA2	0.698745	0.571605	0.765420	0.633895
EA3	0.213615	0.678430	0.256535	0.738666
EA4	-.122591	0.795444	-.141879	0.806478
EA5	0.474476	0.621403	0.419852	0.707382
EA6	0.657014	0.561067	0.619409	0.666194
EA7	0.474602	0.637516	0.499964	0.691248

Social Norms

Social Norms Reliability Test Analysis

The CORR Procedure

5 Variables:	SN1	SN2	SN3	SN4	SN5

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
SN1	30	3.20000	0.88668	96.00000	1.00000	5.00000
SN2	30	2.83333	0.91287	85.00000	1.00000	5.00000
SN3	30	3.13333	0.97320	94.00000	1.00000	5.00000
SN4	30	2.90000	0.84486	87.00000	1.00000	5.00000
SN5	30	3.63333	1.06620	109.00000	1.00000	5.00000

Cronbach Coefficient Alpha

Variables	Alpha
Raw	0.753180
Standardized	0.762908

Cronbach Coefficient Alpha with Deleted Variable

Deleted Variable	Raw Variables: Correlation with Total	Raw Variables: Alpha	Standardized Variables: Correlation with Total	Standardized Variables: Alpha
SN1	0.499855	0.716190	0.512324	0.726782
SN2	0.640229	0.665381	0.648124	0.677670
SN3	0.516610	0.710313	0.522074	0.723372
SN4	0.632923	0.672817	0.640418	0.680552
SN5	0.354594	0.776673	0.350598	0.780811

Pearson Correlation Coefficients, N = 30
Prob > |r| under H0: Rho=0

	SN1	SN2	SN3	SN4	SN5
	1.00000	0.59642	0.32768	0.44189	0.15319

Social Media

Social Media Reliability Test Analysis

The CORR Procedure

6 Variables:	SM1	SM2	SM3	SM4	SM5	SM6

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
SM1	30	3.26667	0.82768	98.00000	2.00000	5.00000
SM2	30	3.76667	0.72793	113.00000	3.00000	5.00000
SM3	30	3.23333	1.00630	97.00000	1.00000	5.00000
SM4	30	3.53333	1.00801	106.00000	1.00000	5.00000
SM5	30	3.73333	0.82768	112.00000	2.00000	5.00000
SM6	30	3.16667	1.01992	95.00000	1.00000	5.00000

Cronbach Coefficient Alpha

Variables	Alpha
Raw	0.817687
Standardized	0.809647

Cronbach Coefficient Alpha with Deleted Variable

Deleted Variable	Raw Variables: Correlation with Total	Raw Variables: Alpha	Standardized Variables: Correlation with Total	Standardized Variables: Alpha
SM1	0.393595	0.824970	0.387880	0.818719
SM2	0.331588	0.832973	0.331615	0.830141
SM3	0.632753	0.777406	0.636605	0.764606
SM4	0.771335	0.742174	0.755582	0.736549
SM5	0.683299	0.769171	0.669028	0.757103
SM6	0.683743	0.764709	0.670230	0.756823

Pearson Correlation Coefficients, N = 30
Prob > |r| under H0: Rho=0

APPENDIX 1.5 : RELIABILITY TEST ANALYSIS RESULTS FOR FULL TEST

Pro-Environmental Behaviour

Pro-Environmental Behaviour Reliability Test Analysis Result

The CORR Procedure

11 Variables: PEB1 PEB2 PEB3 PEB4 PEB5 PEB6 PEB7 PEB8 PEB9 PEB10 PEB11

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
PEB1	382	2.66492	0.84043	1018	1.00000	5.00000
PEB2	382	2.77487	0.90004	1060	1.00000	5.00000
PEB3	382	3.13613	0.92632	1198	1.00000	5.00000
PEB4	382	2.82984	0.94180	1081	1.00000	5.00000
PEB5	382	3.22775	0.87722	1233	1.00000	5.00000
PEB6	382	3.28534	0.97191	1255	1.00000	5.00000
PEB7	382	3.03665	1.06912	1160	1.00000	5.00000
PEB8	382	3.64660	0.97109	1393	1.00000	5.00000
PEB9	382	4.39005	0.78517	1677	2.00000	5.00000
PEB10	382	3.39005	1.08543	1295	1.00000	5.00000
PEB11	382	3.74084	1.08115	1429	1.00000	5.00000

Cronbach Coefficient Alpha

Variables	Alpha
Raw	0.809422
Standardized	0.811798

Cronbach Coefficient Alpha with Deleted Variable

Deleted Variable	Raw Variables		Standardized Variables	
	Correlation with Total	Alpha	Correlation with Total	Alpha
PEB1	0.536999	0.788832	0.539658	0.790284
PEB2	0.569318	0.785010	0.570997	0.787139
PEB3	0.523212	0.789191	0.528301	0.791416
PEB4	0.508596	0.790531	0.511719	0.793063

Personal Norms

Personal Norms Reliability Test Analysis Result

The CORR Procedure

7 Variables: PN1 PN2 PN3 PN4 PN5 PN6 PN7

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
PN1	382	3.58901	0.77099	1371	1.00000	5.00000
PN2	382	3.60471	0.75870	1377	1.00000	5.00000
PN3	382	3.83508	0.84588	1465	1.00000	5.00000
PN4	382	3.98429	0.68333	1522	1.00000	5.00000
PN5	382	4.16754	0.63427	1592	1.00000	5.00000
PN6	382	4.31675	0.64126	1649	1.00000	5.00000
PN7	382	3.95288	0.71935	1510	1.00000	5.00000

Cronbach Coefficient Alpha

Variables	Alpha
Raw	0.822735
Standardized	0.829146

Cronbach Coefficient Alpha with Deleted Variable

Deleted Variable	Raw Variables		Standardized Variables	
	Correlation with Total	Alpha	Correlation with Total	Alpha
PN1	0.512464	0.808522	0.501393	0.817897
PN2	0.564359	0.799279	0.552726	0.809714
PN3	0.499622	0.813452	0.498611	0.818336
PN4	0.648939	0.785871	0.659607	0.792144
PN5	0.669216	0.784614	0.681751	0.788412
PN6	0.572895	0.798713	0.585112	0.804467
PN7	0.537383	0.803587	0.549232	0.810277

Environmental Knowledge

Environmental Knowledge Reliability Test Analysis Result

The CORR Procedure

7 Variables: EK1 EK2 EK3 EK4 EK5 EK6 EK7

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
EK1	382	4.34817	0.70375	1661	1.00000	5.00000
EK2	382	4.53403	0.63795	1732	1.00000	5.00000
EK3	382	4.47120	0.66242	1708	2.00000	5.00000
EK4	382	4.30105	0.75708	1643	1.00000	5.00000
EK5	382	4.40052	0.70193	1681	1.00000	5.00000
EK6	382	4.18063	0.82694	1597	1.00000	5.00000
EK7	382	4.15969	0.75861	1589	1.00000	5.00000

Cronbach Coefficient Alpha

Variables	Alpha
Raw	0.812807
Standardized	0.820418

Cronbach Coefficient Alpha with Deleted Variable

Deleted Variable	Raw Variables: Correlation with Total	Raw Variables: Alpha	Standardized Variables: Correlation with Total	Standardized Variables: Alpha
EK1	0.498680	0.796745	0.510951	0.804911
EK2	0.673133	0.769781	0.684273	0.775260
EK3	0.665040	0.769903	0.676082	0.776707
EK4	0.555073	0.787306	0.565120	0.795859
EK5	0.622529	0.775750	0.628040	0.785101
EK6	0.399151	0.818523	0.392818	0.823988
EK7	0.497515	0.797732	0.484251	0.809301

Environmental Attitude

Environmental Attitude Reliability Test Analysis Result

The CORR Procedure

8 Variables: EA1 EA2 EA3 EA4 EA5 EA6 EA7 EA8

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
EA1	382	4.06021	0.82865	1551	1.00000	5.00000
EA2	382	3.89791	0.76508	1489	1.00000	5.00000
EA3	382	4.10209	0.77191	1567	1.00000	5.00000
EA4	382	3.45288	1.04825	1319	1.00000	5.00000
EA5	382	3.81152	0.76063	1456	1.00000	5.00000
EA6	382	3.95026	0.83565	1509	1.00000	5.00000
EA7	382	4.28272	0.67085	1636	1.00000	5.00000
EA8	382	4.00000	0.78369	1528	1.00000	5.00000

Cronbach Coefficient Alpha

Variables	Alpha
Raw	0.718188
Standardized	0.735693

Cronbach Coefficient Alpha with Deleted Variable

Deleted Variable	Raw Variables: Correlation with Total	Raw Variables: Alpha	Standardized Variables: Correlation with Total	Standardized Variables: Alpha
EA1	0.398831	0.692448	0.410274	0.712357
EA2	0.512828	0.669690	0.520450	0.690336
EA3	0.428291	0.686592	0.424628	0.709544
EA4	0.192346	0.750531	0.194972	0.752602
EA5	0.481176	0.676245	0.479754	0.698586
EA6	0.454826	0.680350	0.470433	0.700456
EA7	0.483511	0.679046	0.488307	0.696863

Social Norms

Social Norms Reliability Test Analysis Result

The CORR Procedure

5 Variables:	SN1	SN2	SN3	SN4	SN5

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
SN1	382	3.27749	0.92015	1252	1.00000	5.00000
SN2	382	2.97120	0.80791	1135	1.00000	5.00000
SN3	382	3.34031	0.81932	1276	1.00000	5.00000
SN4	382	3.11780	0.82561	1191	1.00000	5.00000
SN5	382	3.85340	0.77998	1472	1.00000	5.00000

Cronbach Coefficient Alpha

Variables	Alpha
Raw	0.748451
Standardized	0.747612

Cronbach Coefficient Alpha with Deleted Variable

Deleted Variable	Raw Variables		Standardized Variables	
	Correlation with Total	Alpha	Correlation with Total	Alpha
SN1	0.473184	0.721807	0.471937	0.717656
SN2	0.624678	0.663160	0.622117	0.661253
SN3	0.587495	0.676558	0.586441	0.675066
SN4	0.698015	0.633137	0.699645	0.630325
SN5	0.221817	0.797305	0.221835	0.801866

Pearson Correlation Coefficients, N = 382
Prob > |r| under H0: Rho=0

	SN1	SN2	SN3	SN4	SN5
	1.00000	0.43445	0.37226	0.42673	0.15557

Social Media

Social Media Reliability Test Analysis Result

The CORR Procedure

6 Variables:	SM1	SM2	SM3	SM4	SM5	SM6

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
SM1	382	3.38743	0.83660	1294	1.00000	5.00000
SM2	382	3.63874	0.86965	1390	1.00000	5.00000
SM3	382	3.36387	0.91706	1285	1.00000	5.00000
SM4	382	3.30366	0.89439	1262	1.00000	5.00000
SM5	382	3.44764	0.84253	1317	1.00000	5.00000
SM6	382	3.04450	0.90818	1163	1.00000	5.00000

Cronbach Coefficient Alpha

Variables	Alpha
Raw	0.784108
Standardized	0.783951

Cronbach Coefficient Alpha with Deleted Variable

Deleted Variable	Raw Variables		Standardized Variables	
	Correlation with Total	Alpha	Correlation with Total	Alpha
SM1	0.422313	0.776833	0.421584	0.777870
SM2	0.526301	0.753132	0.527976	0.752504
SM3	0.550804	0.747103	0.549854	0.747132
SM4	0.607259	0.732693	0.608935	0.732353
SM5	0.597771	0.736276	0.595137	0.735840
SM6	0.496285	0.760823	0.495740	0.760322

Pearson Correlation Coefficients, N = 382
Prob > |r| under H0: Rho=0

APPENDIX 1.6: MULTIPLE LINEAR REGRESSION RESULTS

Multiple Linear Regression Results

The REG Procedure
Model: Linear_Regression_Model
Dependent Variable: PEBAVG PEBAVG

Number of Observations Read	382
Number of Observations Used	382

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	32.71070	6.54214	28.34	<.0001
Error	376	86.78696	0.23082		
Corrected Total	381	119.49766			

Root MSE	0.48043	R-Square	0.2737
Dependent Mean	3.28391	Adj R-Sq	0.2641
Coeff Var	14.62991		

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	Intercept	1	0.72447	0.27390	2.64	0.0085
PNAVG	PNAVG	1	0.41117	0.05822	7.06	<.0001
SNAVG	SNAVG	1	0.03998	0.04523	0.88	0.3773
EKAVG	EKAVG	1	-0.09611	0.06344	-1.52	0.1306
EAAVG	EAAVG	1	0.12281	0.06873	1.79	0.0747
SMAVG	SMAVG	1	0.22219	0.04384	5.07	<.0001

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APPENDIX 1.7: PEARSON CORRELATION ANALYSIS RESULTS

Pearson Correlation Analysis of All the variables with Pro-Environmental Behaviour

The CORR Procedure

5 With Variables:	PNAVG SNAVG EKAVG EAAVG SMAVG
1 Variables:	PEBAVG

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum	Label
PNAVG	382	3.92147	0.50497	1498	1.28571	5.00000	PNAVG
SNAVG	382	3.31204	0.58737	1265	1.40000	5.00000	SNAVG
EKAVG	382	4.34218	0.49667	1659	1.42857	5.00000	EKAVG
EAAVG	382	3.94470	0.47243	1507	1.37500	5.00000	EAAVG
SMAVG	382	3.36431	0.60929	1285	1.00000	5.00000	SMAVG
PEBAVG	382	3.28391	0.56004	1254	1.90909	4.90909	PEBAVG

Pearson Correlation Coefficients, N = 382
Prob > |r| under H0: Rho=0

	PEBAVG
PNAVG	0.43642
PNAVG	<.0001
SNAVG	0.23018
SNAVG	<.0001
EKAVG	0.15863
EKAVG	0.0019
EAAVG	0.30356
EAAVG	<.0001
SMAVG	0.34897
SMAVG	<.0001

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