ENVIRONMENTAL BEHAVIOUR AMONG UNIVERSITY STUDENTS: THE APPLICATION OF THEORY OF PLANNED BEHAVIOUR MODEL

By

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ABSTRACT

This study was conducted to examine the environmental behaviour specifically recycling behaviour of undergraduate business students in three Public Institutions of Higher Learning, namely; Universiti Malaya, Universiti Putra Malaysia and Universiti Utara Malaysia. Specifically, this study applies the Theory of Planned Behaviour, an approach to understand the relationship of attitude towards recycling, subjective norm, perceived behaviour control, behavioural intention and recycling behaviour. A total of 500 sets of questionnaire had been distributed but only 370 questionnaires (74 percent) could be used for coding, analyzing and hypotheses testing. Data for all the study variables were collected through self-administered survey questionnaires and analyse using SPSS version 20.0. A total of five hypotheses were formulated and the results showed that only four hypotheses are supported. The results indicated that: (1) attitude towards recycling is significantly (β = .355) related to behavioural intention. (2) Subjective norm is significantly (β = .216) related to behavioural intention. (3) Perceived behavior control is not related (β = .061) to behavioural intention. (4) Behavioural intention is significantly (β = .569) related to recycling behaviour. (5) Behavioural intention partially mediates the relationship between attitude towards recycling, and subjective norm with recycling behaviour. Perceived behaviour control was dropped in hierarchical analysis due to insignificant finding in step 1 of regression analysis. This study also found that the recycling behaviour of undergraduate business students from Universiti Putra Malaysia is better than Universiti Malaya and Universiti Utara Malaysia. Theoretical, practical and policy implications of the study as well as suggestions for future studies were discussed.

Keywords: Attitude towards recycling, Subjective norm, Perceived behaviour control, Behavioural intention, Recycling behaviour.

ABSTRAK

Kajian ini dijalankan dengan tujuan untuk mengkaji tingkah laku persekitaran khususnya tingkahlaku mengitar semula di kalangan pelajar jurusan perniagaan di tiga buah Institusi Pengajian Tinggi Awam iaitu Universiti Malaya, Universiti Putra Malaysia dan Universiti Utara Malaysia. Secara spesifik, kajian ini mengaplikasikan *Theory of Planned Behaviour*, iaitu satu pendekatan untuk memahami hubungan sikap terhadap kitar semula, norma subjektif, sifat tanggapan mengawal tingkahlaku, niat untuk bertingkahlaku dan tingkahlaku untuk mengitar semula. Sejumlah 500 set borang soal selidik telah diedarkan namun hanya 370 (74 peratus) borang soal selidik sahaja yang boleh dikumpul untuk pengekodan, analisis dan ujian hipotesis. Data dari pembolehubah kajian ini diperolehi melalui tinjauan pentadbiran kendiri (*self-administered survey*) dan dianalisis menggunakan SPSS versi 20.0. Sejumlah lima hipotesis telah diformulasi dan hasil kajian menunjukkan hanya empat hipotesis disokong. Hasil kajian menunjukkan (1) sikap terhadap kitar semula mempunyai hubungan yang signifikan (β = .355) ke atas niat untuk bertingkahlaku, (2) norma subjektif mempunyai hubungan yang signifikan (β = .216) ke atas niat untuk bertingkahlaku, (3) sifat tanggapan mengawal tingkah laku tidak ada hubungan (β = .061) ke atas niat untuk bertingkahlaku, (4) niat untuk bertingkahlaku mempunyai hubungan yang signifikan (β = .569) ke atas tingkahlaku untuk mengitar semula, (5) niat untuk bertingkah laku menjadi pengantara separa (*partially mediates*) di antara sikap terhadap kitar semula dan norma subjektif dan tingkahlaku untuk mengitar semula. Sifat tanggapan mengawal tingkahlaku telah digugurkan dalam analisis regresi berbilang berhierarki (*hierarchical multiple regression)* disebabkan hubungan yang tidak signifikan dalam peringkat 1 analisis regresi (*regression analysis).* Hasil kajian ini juga menunjukkan tingkahlaku untuk mengitar semula di kalangan pelajar jurusan perniagaan daripada Universiti Putra Malaysia adalah lebih baik daripada pelajar dari Universiti Malaya dan Universiti Utara Malaysia. Implikasi teoritikal, praktikal dan polisi serta cadangan untuk kajian masa hadapan juga dibincangkan.

Kata kunci: Sikap terhadap kitar semula, Norma subjektif, Sifat tanggapan mengawal tingkah laku, Niat untuk bertingkahlaku, Tingkahlaku untuk mengitar semula.

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CHAPTER ONE

INTRODUCTION

1.0 Introduction

Wasteful consumption is the root cause of much of environmental quality degradation through pollution and over-exploitation of resources (Hassan, 1998) and this is the result of the accumulative action of individuals (The National Environment Education and Training Foundation (NEETF)/Roper Report, (1999). One of major environmental problems faced by most municipalities in Malaysia is solid waste (World Bank, 1992) and the amount of waste generated continues to increase in response to rapid increased in population and accelerated urbanisation and industrialisation processes. These activities are increasingly causing more damage and are due to the human actions which cause irreversible harm on the environmental condition (Oskamp, 2002). It has been almost 40 years since the first Earth Day and the birth of the environmental movement, but despite widespread support for the environmental cause and increased awareness of the problems (Schultz, 2001), human behaviour has hardly changed even with the information about the consequences of human actions, such as climate change, pollution, or diminishing natural resources (Gardener & Stern, 1996; Wolfe, 2001). In other words, the root causes of environmental problems are related to human activities (Aini, Fakhru'l-Razi, Laily & Jariah, 2003). Therefore, it requires a fundamental change in human activities, which is a shift from reckless to responsible consumption of resources (Gardener & Stern, 1996).

In the Holy Al-Quran, about 750 verses (12.5%) from 6,666 verses, implicitly or explicitly discuss the problems that the world is facing today such as global warming, climate change and green conservation. In verse 56 of al-A'raf, Allah said *'do not mischief on the earth, after it hath been set in order but call on Him (Allah) with fear and longing (in your hearth): for the mercy of God is (always) near to those who do good'* (www.alquranic.com). In another verse 41 of Ar-Rum, Allah Say "*mischief has appeared on land and sea because of (the need) that the hands of men have earned, that (Allah) may give them a taste of their deeds: in order that they may truly back (from Evil)*" (www.alquranic.com). In other words, the environmental problems which we are experiencing globally are indisputably function of human behaviour. Islam forbids the use of environmental resources irresponsibly and as a responsible human being, we are responsible for and have a duty towards nature and towards the world as a whole.

1.1 Background of the Study

Presently, the world population is approaching 6.5 billion and the need for each of us to make environmentally sustainable choices is critical. We are depleting our natural resources and generating waste at a per capita rate unprecedented in human history. As our population and economy continue to grow, humans are searching for ways that more people can survive on less; less water, less energy and less waste. Furthermore, the environmental concern about global warming that we are facing today started since the 1960s as scientists began to track the increase of temperature (Bernstein, Bosch, Canziani, Chen, Christ, ... Davidson, 2007). Greenhouse gases such as carbon dioxide, methane, and nitrous oxide are released into the air when fossil fuels are burnt (such as, by cars, power plants), and waste materials decompose in

landfills. These gases accumulated in the atmosphere and prevent the sun's energy from exiting the Earth's stratosphere. Consequently, the trapped energy will create warmer ocean waters, contributing to more storms and melting permafrost, tundra and ice caps (Bernstein *et al.*, 2007). As a result, the sea levels around the world are rising, and temperature changes are contributing to shorter, warmer winters and longer, hotter summers.

This would contribute to health risks (e.g. asthma) that are associated with pollution. In fact, cases of asthma have increased once air pollution and climate changed (Moorman, Rudd, Johnson, King, Minor, Bailey, ... Akinbami, 2007). In order to reduce this risk, it is best to avoid air pollution by recycling (Moorman *et al.*, 2007). Most of the behavioural researchers have taken on the challenge of creating pro-environmental behaviours. While some researchers create and evaluate the efficacy of behavioural interventions in order to change environmentally related behaviours (Baker & Ozaki, 2008; Manaktola & Jauhari, 2007; Reid, Sutton & Hunter, 2009), others investigate who is most likely to take part in pro-environmental behaviours and under what conditions (Barr, 2007; Kurz, Linden, & Sheehy, 2007; Schultz, Oskamp, & Mainieri, 1995). Therefore, those researchers may help to provide a broader understanding of factors related to pro-environmental behaviours including recycling behaviour.

Students have always played an active role in the activities leading to the development of environmental awareness on recycling. Several studies have been carried out to understand the attitudes and recycling behaviours of students. In addition,

the fact that students will be the ones who will manage and consume future resources has been effectively promoted studies related to students. It is possible to infer two different results from these studies. First, although the environmental attitudes of the students are very developed, their recycling behaviours are affected by the economic concerns (Bezzina & Dimech, 2011; Brodin & Anderson, 2008; Chen, Wu & Chen, 2009; Emanuel & Adam, 2011). Second, developed environmental awareness of the students reflect their recycling behaviours in the same level (Helferty & Clarke, 2009).

Tertiary students represent a population with the intellectual capability to assimilate the concept of sustainability (Sibbel, 2009) and therefore, students need to comprehend it so that they can become better stewards in the future (Sia Su, 2008). In fact, having knowledge alone is not sufficient in today's society but the important thing is to apply their knowledge to solve problems (Berman & Richie, 2006). In fact with the knowledge attained, an educated person shoulders the responsibility to ensure the knowledge is well used by society (Davis, Edmister, Sullivan & West, 2003). This shows the important role of the tertiary sector in providing and imparting a comprehensive environmental knowledge and information to students especially inculcating the recycling behaviour in their day to day life in campus and residential colleges.

The higher education setting involves many individuals who behave in ways that are contingent upon one another. After all, it is a powerful determinant of influence; students often study together, play together, work together, and eat together. In fact, some students are particularly influential among their peers. Students for example, are

sensitive to the physical campus surroundings. When students see how dormitories dispose off waste, they receive a message; it is part of the campus's hidden curriculum (Orr, 1996). The college campus thus presents an ideal place to study how social context affects the recycling behavior.

Understanding university students' attitudes and behaviors related to social issues is critical in order to reduce the considerable estrangement of young people from public life. Bok (2006) argued that public apathy is the norm among university students. Providing knowledge that can help to inform a more sustainable future also directly aligns with the public and social purposes of higher education. Kerr (2001) articulated, "As society goes, so goes the university; but also, as the university goes, so goes society", which suggests the university's obligation to attentively heed the national public dialogue and highlights the university's critical role in guiding change. If students can be empowered as citizens in the context of university then they will likely become empowered citizens in the larger society (Banks, 2009).

College and university graduates are citizens of a global community and they are expected to be articulate, skilled in principles and understanding sustainability once they take over a business/corporate job (Newport, Chesner & Lindner, 2003). Colleges and universities are places to educate members of society, including future leaders, by increasing public awareness on environmental issues and to increase their knowledge on recycling behaviour. The question arises as to why this study focuses on undergraduate business students? Business is a social profession and previous studies showed that a business degree has a better market value (Carducci, Deeds, Jones, Moretti, Reed, ...

Wheat, 1987). Business managers who apply sustainable principles in their business practices will be able to spot and indicate more profits (Newport, *et al.*, 2003). Therefore, if a student is exposed to examples of good practices and supported with sufficient environmental knowledge techniques and principles, including the benefit to recycle they will not ignore the environmental agenda/policy once they become managers or entrepreneurs (Wade, 1999).

Previous research shows that today's business students are the future managers and business executives (Benton, 1994; Fukukawa, Shafer & Meina, 2007). Today's business students will have the power to implement policies, to protect the environment and to be more socially responsible in the future. Their worldview, attitudes and perception toward the environment could significantly affect our sustainability in the future (Sia Su, 2008). Studies by Hosmer (1999), and Lysonski and Gaidis (1991) reveal that business students tend to lack interest in ethics courses and have higher propensity to engage in unethical behaviour. In fact ethical behaviour is the core of corporate social responsibility (Singhapakdi, Karande, Rao & Vitell, 2001).

Presently, teaching and research on ethical, social and environmental issues do not occur in business schools (Cordano, Welcomer, Schere, Pradenas & Parada, 2010). Therefore, business students seem to hold a weak pro-environmental orientation and give more priority to fiscal and financial goals rather than goals related to social responsibility (Fukukawa *et al.*, 2007). Sia Su (2008) stated that "most students profess to care for the environment, but there is considerable diversity on what they care for and the reasons for their environmental concerns". In fact, business organizations regard

maintaining a healthy environment as an asset to be valued by managers today and are not only expected to reduce lead times, improve quality, reduce costs and enhance flexibility, but they are also expected to become more environmentally responsible (Montabon, Meinyk, Stroofe, & Calantone, 2000). Therefore, a primary role of the business faculty or school of business is to prepare their students for a successful career in the business industry (Allison, Voss & Dryer, 2001).

1.2 Problem Statement

The total waste generation in Malaysia is estimated at 0.76kg/person/day and it is expected to increase year by year (Abdul-Talib & Ismail, 2004). A final report on National Waste Minimisation in Malaysia (2006) showed that in year 2004 the municipal waste generated was 8.7 million tonnes and it is expected to reach 15.7 billion tonnes in year 2020. Waste is either disposed in landfills or incinerated but with severe implications for the environment and human health. The Malaysian government through the Ministry of Housing and Local Government have spent millions of Malaysian Ringgit in advertisements and campaigns related to recycling. These efforts were aimed at the public to increase their participation in recycling. However, only two percent of solid waste generated was recycled with the remainder ending up at landfills (Abdul-Talib & Ismail, 2004; Mahmood, 2000). This rate is far below that of the developed countries such as Switzerland (22 percent), Denmark (19 percent), Germany (16 percent) and Finland (15 percent) as reported by WARMER (1995).

To reduce the amount of waste, the public needs to start reducing the amount of waste followed by reuse and recycle. The former Minister of Housing and Local

Government, Datuk Seri Ong Ka Ting said that if Malaysians can recycle five percent of the 15000 tonnes of solid waste produced daily, 750 tonnes of solid waste produced in the country need not be dumped at landfills and if a lorry can transport up to five tonnes on each trip to a landfill, recycling can reduce the number of trip made by 150. (Elizabert & Cheki, 2003).

Previous researches showed that the Malaysian environmental knowledge, environmental concern and awareness are low (Sharifah Aini, Lalily & Nurizan., 2005; Ebil, 1999; Our Green World, 2008). The awareness program on recycling conducted by the Minister of Housing and Local Government showed that the recycling behaviour among Malaysian is still low (Final Report on National Waste Minimisation in Malaysia, 2006). Although 90 percent of Malaysians is aware of recycling, only 15 percent recycle (Muhd Amirul, 2011). A past studies conducted by McDonald (1998) found that although respondents favour recycling they did not necessarily translate this into action. Therefore, in order to meet the recycling target, the key is to increase the community participation and through understanding of recycling behaviour which is voluntary, diverse and susceptible to change (Beazzina & Dimech, 2011). In Malaysia, recycling campaigns failed to produce desired results because of insufficient or lack of public participation (Chee & Narayanan, 2006; Chong, Matsufuji & Nasir, 2005; Omran, Mahmmod, Abdul Aziz & Robinson, 2009).

It is targeted that by the year 2020 the recycling rate should be 22 percent (National Waste Minimisation in Malaysia, 2006) but without public participation and contribution recycling would not be possible. Since the awareness on recycling is low,

consumers purposely dump all the solid waste into one recycling bin instead of separating it (Mega Fokus, 2011). Consumers are chucking things regardless of what the recycling bins are meant to hold and whether the items can be recycled or not (Elizabert & Cheki, 2003) and they feel that handling of waste is 100 percent the responsibility of the authority agency dealing with solid waste (Mega Fokus, 2011). The low recycling rate reflects the attitude among Malaysians (either lack of environmental knowledge or information), present influences of other group members or a lack of infrastructure (recycling bins). In fact, several studies showed that recycling by friends and neighbours was the most effective determinant for an individual to recycle (Bezzina & Dimech, 2011; Davio, 2001; Ericksen, 2006; Navarro, 2002; Oskamp, 1995; Oskamp, Harrington & Edwards, 1991; Spaccarelli, Zolik & Jason; 1990; Vining & Ebreo, 1992; Zhang, Prybutok, & Strutton, 2007; Zia, Devadas & Shukla, 2008).

Today's business students are the future managers and business leaders (Benton, 1994; Fukukawa *et al.*, 2007). Previous researches from developing countries such as the United States showed that their level of environmental concern, orientation and behaviour are low compared to non-business students (Benton, 1994; Dispoto, 1977; Ewert & Baker, 2001; Fukukawa *et al.*, 2007). As future managers and business leaders, business students need to be taught and be expose to environmental issues to enable them to transform ideas and strategies and blend them into cohesive green strategy. Previous researches on recycling activities in a university showed that they have significantly increased university's energy efficiency, reduced its waste, and bolstered the university's sustainability image (Kurkland, 2011; Leal-Filho, 1997; Pike, Shawn, Lawrimore, McGee, Taylor & Lamoreaux, 2003). However, a related recycling research

finding by Olson, Arvai and Thorp (2011) demonstrated that students displayed complete understanding of items which could be recycled on campus, knew specific collection point for recyclables, and were aware of recycling opportunities at the campus recycling facility. Therefore, this study would detremine the effectiveness of recycling campaigns conducted by Universiti Malaya, Universiti Putra Malaysia and Universiti Utara Malaysia and the recycling behaviour of undergraduate business students. A mixed finding on recycling behaviour of university students indicates from the knowledge and commitment gaps that either they are doing something to support the university or that recycling is still a concept and not a reality for them (Emanuel & Adam, 2011).

Previous studies on the application of the Theory of Planned Behaviour were focusing on intention rather than actual behaviour. In his study, Ayed (2010) found that most of the studies on the Theory of Planned Behaviour used intention as a dependent variable. This was supported by other researchers that examined intention rather on the actual behaviour (Armitage, 2008; Brain, 2008; Conner, Sandberg & Norman, 2010; Cordano, 1988; Hill, 2008; Kovac & Rise, 2011; Montesarchio, 2009; Taylor & Todd, 1995; Truelove, 2010; Trumbo & O'Keefe, 2001; Werder, 2002). However, a few studies found that intention can either fully mediate attitude or behaviour (Bagozzi, Baumgarther & Yi, 1989), attitude and perceived behaviour control and behaviour (Shim, Eastlick, Lotz & Warrington, 2001), and or does not mediate perceived behaviour control and actual behaviour (Ayed, 2010; Rise, Thompson and Verplanken, 2003). Another study by Canniere, Patrick, Pelsmacker and Geuens (2008) showed that intention fully mediates attitude and subjective norm with actual behaviour and partially

mediates perceived behavior control and actual behavior. Therefore, this study will fill the gap in examining the role of behavioural intention in mediating attitude toward recycling, subjective norm, perceived behaviour control and recycling behaviour. Based on the background, the current research seeks to investigate the relationship of attitude towards recycling, subjective norms, perceived behaviour control and behavioural intention, and recycling behaviour. The mediating role of behavioural intention on relationship between attitude towards recycling, subjective norms, perceived behaviour control and recycling behaviour is also investigated.

1.3 Research Questions

The specific research questions guiding this study are as follows:

a. Are there any differences in the recycling behaviour of undergraduate business students among Public Institutes of Higher Learning?

b. Does attitude towards recycling relate to recycling behaviour?

c. Does subjective norm relate to recycling behaviour?

d. Does perceived behaviour control relate to recycling behaviour?

e. Does attitude towards recycling relate to behavioural intention?

f. Does subjective norm relate to behavioural intention?

g. Does perceived behaviour control relate to behavioural intention?

h. Does behavioural intention relate to recycling behaviour?

i. Does behavioural intention mediate the relationship between attitude towards recycling, subjective norm, perceived behaviour control and recycling behaviour?

1.4 Research Objectives

The following objectives have guided this study:

a. To determine the recycling behaviour of undergraduates among three public institutes of higher learning.

b. To determine the relationship between attitude towards recycling and behavioural intention.

c. To examine the relationship between attitude towards recycling and recycling behaviour.

d.. To explore the relationship between subjective norm and behavioural intention.

e. To explore the relationship between subjective norm and recycling behaviour.

d. To find out the relationship between perceived behavioural control and behavioural intention.

g. To find out the relationship between perceived behaviour control and recycling behaviour.

h. To investigate the relationship between behavioural intention and recycling behaviour.

i. To determine whether behavioural intention mediates the relationship between attitudes towards recycling, subjective norm, perceived behaviour control and recycling behaviour.

The purpose of this dissertation is to understand the recycling behaviour of undergraduate business students in three public institutes of higher learning. University

students represent population of individuals from different backgrounds, states, religions and age from which future legislators, politicians, policy developers, managers, CEOs and national leaders will be drawn once they have positioned themselves in their organizations, corporations and other workplaces. In fact, their decisions will affect our future environment and consequently the health of our economy.

1.5 Significance of the Study

This study is expected to provide the research, practical and academic contributions. The following are the significance of this study:

Firstly, from the practical contribution aspect, the findings would benefit the higher education institutions. The findings will indicate the recycling behaviour of undergraduate business students towards environment although there is no formal environmental education in their curricula except the recycling campaigns conducted in the universities. It will also provide some indication as to whether the environmental campaigns including the recycling campaign conducted in the university are successful. The findings will help universities in implementing suitable and adequate recycling facilities in order to achieve the Malaysian goal of a 22 percent recycling rate by the year 2020. This study will provide a significant feedback to a university's top management and academicians of the possibility of incorporating environmental education as a core subject as directed in Malaysian National Policy on Environment and Agenda 21 of United Nations. Secondly, previous studies that are related to recycling behaviour had been conducted in western countries and but were less focused on business students. Therefore, the findings of this study will examine whether the

recycling behaviour of undergraduate business students in Malaysia will yield the same findings as the western studies. Furthermore, as behaviour within a country to another country is different (Cordano *et al.*, 2010) and findings may not be valid in other countries, future researches could demonstrate their applicability (Filzah, 2007). Therefore, this study will contribute and increased the depth by adding Malaysia to the list of references.

Thirdly, this study will provide information to business organizations on the sensitivity of undergraduate business students on environmental issues. The findings will provide some insights and indications on the possible business direction and strategy the future business leader will develop. Perhaps the findings of this study will help policy makers to revise current policies and strategies for an effective solid waste management and to encourage recycling behaviour.

Finally, the Theory of Planned Behaviour is a social psychology theory and previous studies have shown that this theory is able to predict the behaviour of respondents. A meta-analysis study on responsible environmental behaviour by Osbaldiston (2004) showed that the four theories; a) Responsible Environmental Behaviour by Hines, Hungerford and Tomera, 1987; Environmental Significantly Behaviour by Stern, 2000; Self Determination Theory by Deci and Ryan (2000); and Motivation Theory by Hornik, Cherian, Madansky and Narayana (1995) failed to predict and promote environmental behaviour and Osbaldiston (2004) recommended that future research should apply a social psychology theory. Therefore, this research is to confirm whether the Theory of

Planned Behaviour will be able to explain and predict the recycling behaviour of undergraduate business students.

1.6 Scope and Limitation of the Study

The scope of the study focuses on the undergraduate business students in three public universities namely, Universiti Malaya (UM), Universiti Putra Malaysia (UPM) and Universiti Utara Malaysia (UUM). The respondents are undergraduate business students (Bachelor of Business Administration (BBA) and Bachelor of Accounting (BAcct) under the Faculty of Business and Accountancy in UM, Faculty of Economics and Management in UPM and College of Business in UUM. The reasons why only those universities are chosen are as follows:

a. **Universiti Malaya**, or commonly known as UM is the oldest university in Malaysia. It was established in April 1949 in Singapore with the merger of the King Edward VII College of Medicine (founded in 1905) and Raffles College (founded in 1928). As the oldest university and established by our British coloniser, the graduates of UM are expected to uphold the image of UM as the premier university where famous and successful business, political and academician leaders graduated. Furthermore as Englishman they always ensure healthy environment within the campus. A survey by the European Commission among European Union countries showed that 74 percent of the United Kingdom environmental behaviour have high and felt that waste must be separated for recycling (TNS Opinion and Social Report, 2008). Although the oldest university, UM only aggressively conducted activities in 2009 with the

establishment of the UM Environmental Secretariat or commonly known as UMCARES on 1 September 2009. The aim of UMCARES is to educate the campus members on the environment.

b. **Universiti Putra Malaysia (UPM).** The origins of Universiti Putra Malaysia could be traced back to the establishment of the School of Agriculture on 21 May 1931 by John Scott, an administrative officer of the Straits Settlements. In conjunction with the growing importance of the agricultural sector in the country's economy, the role of the college became prominent and on July 1973, UPM started her first academic session as a university. As the Agriculture University, it is expected that the behaviour (graduates from UPM) is more tailored to preserving nature and maintaining a healthy environment.

c. **Universiti Utara Malaysia** (UUM) was officially established on 16 Feb 1984 and was set up to specialise in management education. This university is the brainchild of Tun Mahathir Mohamad (Fourth Malaysian Premier) and one of the institutes established in UUM is the Institute of Tun Mahathir's Thought. As a Management University, graduates are expected to possess a positive attitude, be ethical and behave pro-environmentally.

There were reasons why University Sains Malaysia (USM) and Universiti Kebangsaan Malaysia (UKM) were not chosen. Firstly, USM had embarked on sustainability effort since 2000. In year 2000, Kampus Sejahtera was established (focuses on spiritual, social, physical, mental, intellectual, emotional and environmental

aspects) and a year later in 2001, USM was launched as University in Garden (concept of an invitation to value, preserve and nurture the campus). Based on these initiatives, on 3 November 2008 USM was awarded an APEX status (Accelerated Program for Excellence). This award was to recognize USM over-arching principles in promoting a sustainable world, humanity for all and to maintain the future of mankind. Furthermore, their vision was to transform USM for a sustainable tomorrow. Among the activities carried out was the white coffin campaign (ban on using polystyrene-based containers) and campus-wide recycling projects which are the prime activities for USM.

Secondly, the sustainable development efforts of Universiti Kebangsaan Malaysia (UKM) started 17 years ago with the establishment of the Institute for Environment and Development (LESTARI) on 1st October 1994. The vision of LESTARI is to be a centre of excellence in research and training pertaining to environment and development in Malaysia and Asia Pacific region. Since then, various activities such as seminars, conferences and expeditions related to environmental aspects were conducted. Thus, USM and UKM were not chosen because their efforts and commitment towards promoting a healthy environment or sustainable development in the university had been conducted very much earlier as compared to UM, UPM and UUM. Therefore, since USM and UKM had long established the environmental efforts on environment it is expected the graduates had assimilated with these universities initiatives. The author choose UM, UPM and UUM because these universities just started their environmental activities, therefore it need to explore the recycling behaviour among undergraduate business students.

The age of respondents will be between 18 – 25 years of age which is typically the life stage of early adulthood and commonly live in a non-household residence such as a university residential college where conditions for environmentally responsible behaviour are much different than in a residential dwelling. This research study is limited to business students enrolled in a business-related undergraduate degree (BBA & BAcct) courses at UM, UPM and UUM and may not represent the whole population of undergraduate business students from the other public and private Institutions of higher learning.

1.7 Organization of the Thesis

This dissertation is divided into five chapters. Chapter two contains a review of literature concerning the importance of recycling, environmental development in Malaysia, sustainablity in University, waste management and recycling, recycling behaviour, and the Theory of Planned Behaviour. Chapter three discusses the research methodology used in this study. Chapter four presents the results of the research while chapter six discusses the results of the study, and provides the conclusions and recommendations for the management to increase recycling behaviour among university student.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

Environmental psychology which was created in the 1960s is to investigate the range of multifaceted interactions between the environment and humans (Kollmuss & Ayeman, 2002). Researchers in the environmental psychology field have been constantly studying the motivations and predictors of human behaviour affecting the environment, and proposing strategies that attempt to modify them. The results of these strategies are diverse and linked to other variables including demographic characteristics and the elements of the behaviour. There is no proven formula from a behavioural perspective to address environmental problems, but there is definitely a high recognition of the effectiveness of influencing human behaviour as an approach to solving them.

This study was designed to examine the recycling behaviour among undergraduate business students in universities. The review starts with the background to environmental research, environmental development in Malaysia, sustainability in universities, waste management and recycling, recycling behaviour and Theory of Planned Behaviour.

2.1 Background to Environmental Research

The evolution of environmental research started in the 1960s and mainly focused on pollution and energy conservation, which is a source of competitive advantage in business and politics over environmental issues (Straughan & Roberts, 1999). This

evolution has expanded the issues within the domain of environmental responsibility. In fact, different approaches have been established to encourage environmental behaviour in the past 30 years (Lehman & Gellar, 2004).

In the early 1970s, marketing efforts have attempted to identify the ecological oriented customer. A flurry of research was conducted to profile population segments that showed environmental concern (Anderson & Cunningham, 1972; Balderjahn, 1988; Kassarjian, 1971). Throughout the 1980s, other academic areas began concentrating on the ecologically-conscious public as well, such as sociology (Van Liere & Dunlap, 1981), education (Hines, Hungerford & Tomera, 1987) and psychology (Arbuthnot, 1977). Similar to marketing studies, these research projects concentrated for the most part on descriptive information, such as demography with focus on personality and psychological factors, such as attitude towards pollution and knowledge of environmental issues (Polonsky & Mintu-Wimsatt, 1995).

In the past, behavioural science research was conducted on general environmental concern rather than more restricted or specific topics (Oskamp, Harrington, Edwards, Sherwood, Okuda, & Swanson, 1991). After reviewing 23 articles that investigated factors relating to environmental concerns, Van Liere and Dunlap (1980) recommended that environmental concern should be studied in terms of more specific environmental issues such as recycling. Therefore, a few researchers conducted an investigation that focused on people's beliefs and attitude concerning trade-offs with other valued goals. For instance, Dunlap and Van Liere (1984) found that traditional

American values (such as support for economic growth) were detrimental to maintaining a strong pro-environmental stance.

The discrepancy between awareness and behaviour causes confusion among researchers, environmental educators, marketers and others who are interested in influencing environmental behaviour. Most environmental education programmes have worked with the assumption that increased knowledge would naturally bring about more responsible choices (Newhouse, 1990). However, an increasing number of studies show only a minimal correlation between attitude, knowledge and behaviour (Borden & Schettino, 1980) and the need for research into a wider set of variables becomes more obvious. In fact, several studies conducted in western countries showed that knowledge and awareness of environmental problems do not lead to more responsible environmental behaviour (Hungerford & Volk, 1990; Sia, Hungerford & Tomera, 1985/1986) and specifically their positive behaviour on recycling.

As been highlighted earlier, the present environmental issues are caused by human behaviour; therefore the focus of this study would be the recycling behaviour of undergraduate business student as pointed out by Stern (2005) "an individual's environmentally significant behaviour remains a frontier area in research."

2.2 The Importance of Recycling

What is recycling? Recycling is the process of separating, collecting and re-manufacturing or converting used or waste products into new materials. Recycling is a post-purchasing behaviour and a part of pro-environmental behaviour (Tilikidou &

Delistavrou, 2008). The recycling process involves a series of steps to produce new products. Recycling helps extend the life and usefulness of something that has already served its initial purpose by producing something that is useable. Almost everything what we see around us can be recycled. In other words, recycling is an activity by an individual in performing his/her act in putting product into recycling bins and also using ecologically produced products. Recycling has a lot of benefits that can help people and save the environment as well. Among the benefits are; (1) Recycling Saves the Earth, (2) Recycling Saves Energy, (3) Recycling Helps Mitigate Global Warming and Reduces Pollution, (4) Recycling Reduces Waste Products in Landfills, and (5) Recycling Helps you Save Money.

Over the last thirty years, as environmentalists, scientists and policymakers have been closely examining the world's ecological systems, the impossibility of limitless development on a finite earth has been recognized (Onwueme & Bosari, 2007). Environmental issue is now part of the national public conversation and it is expected to become a central issue in the political landscape in Malaysia. However a gap seems to exist between people's perception of environment as an issue and their levels of actual engagement (Omran *et al*, 2009).

Landfills around the world emit large amounts of methane, a greenhouse gas 32 times more potent than carbon dioxide (Bernstein *et al*., 2007). One of the best environmental offsets for this gas is to recycle, a process where old materials are melted down or reconstructed to create new items (Forester, 1988). While glass, aluminium, plastics, paper and cardboard are most commonly recycled, many other materials such as

batteries, paints, oils and electronics, are recyclable as well. Over the past decade, residential, university and business recycling programmes have become common across the United States (Gore, 2006). Although recycling ditto have increased in popularity, individuals tend not to recycle. In Malaysia, it required a longer term of education and awareness campaigns to change public attitude on recycling habits (Chong *et al.* 2005). One of the reasons is because recycling has not become a way of life although they are aware of recycling, but their awareness was not translating into practice (Omran *et al.*, 2009).

The recycling rate of each country is said to have reasonable relationship with each countries recycling policy, goal, programmes and incentives. Hence, countries like Switzerland, Denmark, Germany and Finland have well articulated policy, goal and program well defined incentives and consequently have higher recycling rates (Mansor, Alaigha & Khoo, 1999; WARMER, 1995). In fact, they manage to export their waste to others including Malaysia (Mansor *et al.*, 1999). An effective and efficient system of waste management is needed to cope with the mounting waste produced. Many researchers suggested that a more environmentally friendly alternative to waste management is recycling (Mannetti, Pierro & Livi, 2004). In the short run, recycling saves money while reducing excessive waste. In the long run, it extends the life span of the landfills, preserving earth's precious resources and conserving the environment (Werner, Byerly, White & Kieffer, 2004).

2.3 Environmental Development in Malaysia

2.3.1 Local Agenda 21. Malaysia has achieved many important milestones in environmental quality over the past three decades. The environmental awareness has increased substantially through formal and informal environmental education activities carried out by Governmental and Non-Governmental Organizations (NGOs). Since the Fifth Malaysia Plan (1986 – 1990), greater emphasis has been placed on preventive rather than curative measures. Furthermore, the environmental concerns cannot be addressed in isolation from other vital issues in nation building but the social, technological, economic, ecological and political factors should be considered together holistically.

In Malaysia, the responsibility to administer the various environmental - related laws rests with a number of federal, state and local government agencies. By virtue of the present cabinet functional set-up, MOSTI (Ministry of Science Technology and Environment) has an overall responsibility with the support of at least three implementing agencies, namely DOE (Department of Environment), Department of Wildlife and National Parks (PERHILITAN) and the Secretariat to the Atomic Energy Licensing Board. In promoting environmental education and awareness, the DOE (refer to www.doe.gov.my) conducted several initiatives with in collaboration with universities and ministries, such as:

a. **Sustainable City** – a collaborative effort between DOE and LESTARI, UKM. Award Sustainable City to local authorities based on five criteria; 1)

physical environment, 2) ecological initiatives, 3) environmental service, 4) environmental governance, and 5) education and awareness activities.

b. **Environmental Awareness Camp** – a ditto effort between DOE and the Ministry of Education.

c. **Inter Varsity Environmental Debate** – this debate which started in 1999 involves all institutes. The debate is a collaborative effort between DOE and Ministry of Higher Education.

d. **Malaysia Environmental Week** – a jointly organised event by DOE and Rakan Alam Sekitar.

e. **Sustainable School Environmental Award** – jointly organised by DOE and the Ministry of Education and technical support from LESTARI, UKM.

f. **Wira Alam Projek** – launched on 5 June 1998 to motivate students to actively participate in environmental conservation activities to protect and improve the quality of the environment.

g. **Recycle Used Hand Phone Campaign** – until 2009, a total of 400 recycle bins have been distributed by DOE to government agencies, private offices, telecommunication companies, public institute of higher learning and selected shopping malls.

h. **Rakan Alam Sekitar Programme** – launched in 2009 to increase awareness and participation of local committee in every parliamentary area.

i. **Annual Environmental Conference** – jointly organised by Asia Executive Program and DOE.

j. **International Conference on Water Resources** – it was organised by Universiti Teknologi Malaysia on 26 May and 27 May 2009.

k. **International Conference of Marine Ecosystem** – organised by Universiti Kebangsaan Malaysia from 26 May to 28 May 2009.

l. **Annual Waste Management Seminar** – sponsored by a private institute.

m. **1Malaysia: Toward a sustainable/landscape 'sustainable green'** - organised by Universiti Teknologi Malaysia and it was held on 19 Dec 2011.

n. **Regional Conference on Environmental and Earth Resources (RCER)** - organised by Universiti Malaysia Pahang on 7 and 8 Dec 2011.

2.3.2 Environmental Study/Research in Malaysia

The quick development of Malaysia's economy has expanded the urban population rapidly. This has created more job opportunities, education and also increased the demand for a good quality of life. However, at the same time it also increases the risk of degradation of environmental quality based on human activities. As one of the developing countries progressing within Southeast Asia, Malaysia has stated in her vision 2020 to be a developed country and projected to be a fully industrialized country. It should be noted that industrialization is often associated with direct and indirect threats posed by air, noise and water pollution, water shortages and contamination, bad transport system and traffic jam, and waste management system. Therefore, as industrialized and developed nations, they will face those environmental challenges (Cordano *et al.*, 2010). In fact, one of the major threats thta produce environmental degradation of the global environment is the unsustainable patterns of production and consumption particularly involving industrializing countries (Peterson, 1997).

Sharifah Aini *et al.* (2005) conducted research on the environmental awareness of Malaysian households focusing on environmental knowledge, attitude, and behaviour and their neighbourhood participation. Their study found that respondents' environmental knowledge is correlated positively with environmental attitude, behaviour and participation. Sharifah Aini *et al.*, (2005) proposed a rigorous campaign on environmental education to encourage sustainable consumption. Loon (2004) in his study on measuring environmental literacy among students of the Faculty of Science in Universiti Putra Malaysia indicates that more than 80 percent had a high level of attitude and this may due to the differences in their personality influenced by their lifestyles and family. Omran *et al* (2009) investigated household attitude on recycling in Alor Setar, Kedah and found that 59.9 percent (total respondents was 389) did not recycle. Among the reasons were because of inconvenience or lack of time, recycling facilities are too far and recycling is wasting their time.

Research on environmental concern and knowledge of Malaysian primary and secondary teachers was conducted by Aini *et al* (2003) in the state of Selangor. The total sample size was 285 teachers from primary and secondary schools and most of the respondents agreed that the government, private sectors and all individuals have the responsibility to protect the environment. The focus of the study by Aini *et al.* (2003) is on environmental concern, ecologically conscious consumer behaviour (ECCB) and nature-related activities. The findings showed that most of the respondents feel that their environmental concern is on health. However, the ECCB showed that the lowest score is the unwillingness to bring their container (mean-1.6) and recycling effort (mean-1.9). The frequently engaged behaviours are: usage of unleaded petrol (mean-3.5),

reduce consumption of water (mean-3.3), and saving electricity (mean-3.3). A positive correlation exists but it is low between the environmental knowledge and environmental attitude and behaviour. This showed that the practice or behaviour of school teachers depend on the direct financial benefits that they will gain.

Ebil (1999) conducted his research on environmental knowledge and attitudes of students (ages 13 to 17 years old) from ten (10) schools from Selangor, Pahang, Melaka and Negeri Sembilan. He divided the respondents into two groups (experimental group and control group). The results revealed that the experimental group had a significant change in environmental knowledge than the control group. The control group showed a negative change in attitude and a slight change from the experimental group. Furthermore, during the pre-test and post-test, it showed that the environmental knowledge and attitude of the students increased. This indicates that, once the knowledge on environment has been provided then it will improve the attitude of the groups.

Murad and Siwar (2008) conducted a study on factors influencing environmental behaviour of the urban poor households concerning solid waste management among the squatters and low-cost flats in Kuala Lumpur. Results showed that they behave in ways comporting with and conducive to environmental sound solid waste management. Since this group is a low income group and contributes less solid waste, they play an active role by recycling which reduces of solid waste.

A case study by Wee and Reduan (2010) on the attitude toward recycling showed that 65 percent of the respondents do not know the function of recycling bins and this shows that the knowledge is still low or the information has not reached to the grassroot community. Results demonstrated that parents, neighbours and friends influence the respondent's intention to recycle. The practice of responsible environmental and recycling behaviour among Malaysians is still low. An online survey by a global market insight and information group found that only 8 percent of Malaysian respondents have changed their recycling behaviour to benefit the environment (Our Green World, 2008). The survey by TNS also reported that 60 percent of respondents view the Malaysian environment as fair but they do not behave pro-environmentally (Our Green World, 2008).

2.4 Sustainability in Universities

2.4.1 Sustainability and the Importance of Environmental Education. Sustainability is a key issue for organizations in the twenty-first century as they increasingly acknowledge that their policies and practices have social and/or environmental consequences (Stubbs & Cocklin, 2008). A sustainability movement is currently occurring within the public institutes of higher learning in Malaysia. Sustainability efforts can take shape within and around various facets of university life: research; curriculum and education; university policy; management and operations; programmes and services; as well as the attitudes and behaviour of students, faculty and staff.

Much of the extant research in higher education has focused on institutional-based, top down methods of change. This study departs from and extends the body of knowledge on environmental education in the context of higher education in its focus on undergraduate students and in particular the recycling behaviour. Understanding the attitudes and recycling behaviours of university students can ultimately help inform formalized institutional change. Adopting a positive recycling behaviour culture requires that a mass of students exhibit an ethic of conservation which is an ingrained habit of behaving in ways that minimize impact on the environment (Friedman, 2008). A community that demonstrates an ethic on conservation imposes norms on themselves and acts voluntarily rather than having the norms dictated by others. Although most of the students have a broad environmental awareness before they enter tertiary institutions (Ridener, 1997) , they do not assess the environmental issues and take necessary actions to overcome them.

The United Nations encourages the young (referring to students) to be responsible for the environment in order that the long-term health of the planet can be assured (UN, 1992) Presently, students who graduated through specialized programmes, such as environmental science, environmental engineering and environmental studies are environmentally literate (Wade, 1999). There has been increasing support across the community for the implementation of environmental literacy and sustainability education at tertiary level (Thomas, 2004). For example, the University of Georgia established a program that will ensure that every student that graduated from the University of Georgia is environmentally literate (Moody, Alkaff, Garrison & Gallery, 2005).

At the international level, there are several initiatives to facilitate and promote environmental information, education or awareness at tertiary education. Among the initiatives are;

a. Talloires Declaration of University Leaders for a Sustainable Future, October 1990.

b. Halifax Action Plan for Universities of the conference on "Creating a Common Future", December 1991.

c. Swansea Declaration of the Association of Commonwealth Universities, August 1993.

d. Copernicus University Charter for Sustainable Development of the Conference of European Rectors, Autumn, 1993.

e. Kyoto Declaration of the International Association of Universities, November 1993.

f. Student Charter for a Sustainable Future of the student unions of the United Kingdom, July 1995.

g. The Haga Declaration, for Baltic countries, March 2000 (Kliucininkas, 2001).

The Talloires Declaration (see **Appendix A**) has been signed by 280 institutions from 47 countries and agreed that all universities should engage in research and education towards a sustainable future, and set an example of environmental responsibility by establishing programmes of resource conservation, recycling and waste reduction at the universities (University Leaders for a Sustainable Future, 1999).

Furthermore, the Association for the Advancement of Sustainability in Higher Education (AASHE) was established in 2005 as a leading organization in sustainability efforts and has over 300 institutional and system members. Since college or university campus is a place to study, it is also an excellent and appropriate place to model sustainable practices (Kahler, 2003). Therefore, colleges and universities should play a leading role in the environmental movement (Moody *et al*, 2005) and develop environmental strategies to solve environmental problems.

Ethics and values play an important role in the successful integration of environmental concepts into a business practice (Anderson, 1998; Welford, 2005). Therefore before students assume a job as managers, Wade (1999) suggested that as students, they need to thoroughly debate, reflect on and evaluate the environmental issues. In his study, Wade (1999) found that 60 per cent of respondents think their experience of environmental issues had influenced them positively about the environment and overall findings showed that the highest ranking ''action'' was energy conservation and the lowest ranking ''action'' was composting food waste. In a related study, Pike *et al.* (2003) stated that if the role of colleges and universities is to educate members of society, including future leaders, they must be at the forefront of the sustainability movement, by increasing public awareness on environmental issues and knowledge to create a sustainable environment for future generations. Since our ecology is fragile and important for our future, it was suggested that to award a degree to students they should be environmentally literate (Moody *et al*, 2005).

A survey in Australia by Mageswary, Zurida and Norita (2009) showed that only a small minority of tertiary institutions covered environmental education in the tertiary curricula. Mageswary *et al.* (2009) conducted an observations on an RMIT study group, and found several barriers to change; (1) do not know about environment, (2) do not know where or how to obtain relevant information on environment; (3) do not see how to combine information about the environment with the core knowledge of their course; and (4) lack of support. On the same issues, Peer, Goldman and Yavetz (2007) conducted a study involving a heterogeneous group of 765 first year teacher trainees from three colleges in Israel and the results showed that the trainees displayed positive attitudes towards the environment. However, their environmental knowledge was limited and their behaviour only moderate to translate it into responsible environmental behaviour (Peer, Goldman & Yavetz, 2007).

Therefore to practice sustainable behaviours, students need to be inculcated with appropriate values, taught and trained (Mageswary *et al.* 2009). Ajzen and Fishbein (1980) in his Theory of Planned Behaviour stated that knowledge and values influence the intended behaviour and ultimately determine the final behaviour to be performed. Palmer (1993) asserted that the biggest period of value change occurs during the higher education process. Furthermore, the role of institutions of higher learning is educating professionals and leaders of tomorrow's society (Zainal Abidin & Doost, 2008). In fact, studying in a higher education institute would be our last chance in our life (Kyridis, Mavrikaki, Tsakiridou, Daikpolus & Zigouri, 2005) and students should grasp the relevant knowledge and information before they are employed. College and University can initiate a lifelong change in the behaviour of future managers and policy makers if

knowledge is disseminated to the students (Christensen, Thrane, Jorgensen & Lehmann, 2009). Therefore, based on the above discussion higher education institutions should play a leading role in dealing with the environmental issues. This includes; training and educating students on environment, conducting research and development, promoting eco-friendly campaigns among staff and students and the most important step is to incorporating environmental education in their curricula.

Previous studies in colleges and universities focused on staff, academicians or students and mainly in the area of environmental education, campus sustainability and environmental literacy. Little effort was emphasized by previous studies on the attitude and behaviour of undergraduate business students. Therefore, public institutions of higher learning should initiate an environmental awareness programmes to ensure future sustainability. The inclusion of environmental education at tertiary level will enhance the knowledge on environment for the future leaders and increase the ability of business leaders in debating and incorporating ecological products or services in their organization. This shows that the important role of colleges and universities is to educate the members of society for future sustainability as has been stated by Palmer (1993), Pike *et al* (2003), and Zainal Abidin and Doost (2008). In fact, seven initiatives at the international level were launched to encourage the implementation of environmental literacy at tertiary level (Thomas, 2004).

Colleges and universities must shoulder an important role and responsibility in developing people's interest in the environment, to find solutions in solving environmental issues, and provide relevant training to professionals who will then

promote and support sustainable development in the future (Kyridis *et al*, 2005). Therefore, by integrating sustainability approach into campus operations, universities will have a positive effect such as reducing ecological footprint, monetary savings, decreasing waste stream, reducing pollution and energy, and developing a green campus (Kurkland, 2011; Leal-Filho, 1997; Pike *et al*, 2003).

2.4.2 Impact of Studying University Students

Studying students during university is particularly important because of the development that does and can occur during this time period. University impact is a broad concept that includes all the varieties of university experiences and tries to compare the effects on university and non-university students (Berman & Ritchie, 2006). The underlying assumption of university impact research is that every student who participates in any university undergoes impact from experiences. Christensen, *et al.* (2009), Kwan, Bray and Ginis (2009), and Zainal Abidin and Doost (2008) have all conducted research on university impact, attempting to understand how students change in university based on specific experiences and institutional arrangements. The conditions explored can include such factors as peer group, curricula exploration and place of residence. Berman and Ritchie (2006) for example explored the impact of university by investigating the direction and degree of change, how changes are shaped by individuals' characteristics, and the extent to which changes are attributable to university rather than other external influences.

A research by Schwarz, Wdowiak, Almer-Jarz and Breitenecker (2009), found that university students show significant changes in attitudes during the university where

they were committed to participate in programmes to clean up the environment. Schwarz *et al.* (2009) revealed the importance of peer group experience which will influence student development. On the issues of the importance of university students, it remained as a focus in attitude – behaviour research (Berman & Richie, 2006; Christensen *et al.*, 2009; Cordano *et al.*, 2010, Kwan *et al.*, 2009; Moody *et al.*, 2005; Sia Su, 2008; Zainal Abidin & Doost, 2008).

Therefore, this study is to explore the landscape of recycling behaviours. Attitudes are psychological in nature, so a framework that offers attention to the broader social context is useful in further understanding the attitude-behaviour relationship. This study will highlight how the undergraduate business students' shape their recycling behaviors. Derksen and Gartell (1993) captured the importance of broad social context from a sociological perspective in their article on the social context of recycling and stated that, "the conditional nature of the link between attitudes and behavior demonstrated merged only after connecting the individual to a particular social context" but it failed to consider social norms (Kollmuss & Agyeman, 2002), which are particularly important in the college context where peer groups are highly influential (Astin, Hatfield, Grindle & Bailey, 1993).

The higher education setting involves many individuals who behave in ways that are contingent upon one another. Proximity, after all, is a powerful determinant of influence; students often study together, play together, work together, and eat together. Further, some students are particularly influential among their peers. Senge (2008) deemed these influential individuals as "animateurs" – a French word for people who

create systemic change by role-modeling behaviour and bringing to life a new way of seeing that creates energy and focus. Social roles were broadly conceived for this research study in order to include the entire social context of public institutes of higher learning. Student's for example, are sensitive to the physical campus surroundings. When students see how dorms dispose of waste, they receive a message; it is part of the campus's hidden curriculum (Orr, 1996). The college campus thus presents an ideal place to study how social context affects the recycling behaviour.

Understanding university students' attitudes and behaviours related to social issues is critical in order to reduce the considerable estrangement of young people from public life. Bok (2006) argued that public apathy is the norm among university students. Gathering knowledge that can help to inform a more sustainable future also directly aligns with the public and social purposes of higher education. Kerr (2001) articulated, "as society goes, so goes the university; but also, as the university goes, so goes society", which suggests the university's obligation to attentively heed the national public dialogue and also highlights the university's critical role in guiding change. Mageswary *et al.*, (2009) asserted that higher education must provide the landscape for people to become involved in the critical issues facing society. If students can be empowered as citizens in the context of university then they will likely become empowered citizens in the larger society (Banks, 2009).

While the entire education sector is important in producing thoughtful and engaged citizens, the university setting may be uniquely positioned to address the issue of sustainability in the twenty-first century. First, in a setting that typically respects

academic freedom, students may be better positioned to openly and critically engage in a serious dialogue about sustainability. Second, university is a mark of emerging adulthood, and this transition into adulthood inevitably involves the need to develop and better solidify one's own attitudes and beliefs (Quaye, 2007). Simply put, there is a need to capture deep insights into the inter-workings of student recycling behaviours in the university context.

University and college campuses have been particularly noteworthy players in discussion about increasing community recycling rates. Each day college campuses are responsible for creating massive quantities of waste. Everyday campus activities produce waste such as white and coloured paper, magazines, soft-board books, cardboard, containers and utensils used by food service, plastic used in laboratories, used batteries, outdated electronic equipment and others. Universities are motivated to recycle because they must dispose of waste products and it is an opportunity to generate revenue through sale of recyclables. The campus recycling programme is the leadership role that universities play in society. Therefore, a university which attempts to integrate sustainability into campus operation often sees positive effect: reducing ecological footprint, monetary savings, decreasing waste stream, reducing pollution and energy and developing a green campus (Kurkland, 2011; Pike *et al*, 2003).

Therefore, to meaningfully study the recycling behaviour related to environment in a way that impacts our future, the study of university students makes sense. In terms of universities students' enrolment in Malaysia for year 2010, a total of 498,989 students were enrolled in Malaysian Public Institutes of Higher Learning (www.mohe.edu.my).

The high volume of enrolment consists of our future citizens and leaders who will go on to tackle the most critical issues facing society including environmental issues.

2.4.3 Environmental Behaviour of Undergraduate Business Students

Business and industry should be responsible for the environment in which they operate. Increasing consumer awareness of environmental issues especially in the more lucrative market of Europe and elsewhere, has meant that to be competitive in the international market place, products produced in Malaysia, must achieve a minimum standard of compliance to environmental 'friendliness'. Therefore, to achieve this, the business-industry sector community must be encouraged to take on a responsible stewardship role for the environment.

In today's business environment, most of the companies (small or large) are facing challenges and opportunities due to the growing concern for the environment. It has also become increasingly clear that most of the businesses have a significant environmental impact. In fact, business leaders recognize the importance of the social dimension of business on the 'human face of business', which implies the need for maximization of long term environmental enhancement and minimization of negative impact (WBCD, 2000). In dealing with this issue, managers and employees must effectively communicate with clients, trade partners and the public outside the firm to identify their needs and wants before any products or service is offered (Heitmann, Lehmann, & Herrmann (2007).

Medina Ross (2002; as cited by Azilah, 2004) summarized the eco-efficiency that appealed to business sectors because it offers several advantages:

a. The reduction of costs and liabilities associated with waste, pollution and consumption of resources.
b. The enhancement of quality of product and services fulfils consumers' aspirations and improves environmental health.
c. The increase in market share and the improvement of market opportunities.
d. The enhancement of image through increased consumers' confidence to make a purchase and improve employees' morale.

Therefore, to change the attitude of a company, it would require a comprehensive awareness approach or business responsiveness which will ultimately lead to changing business practices. Caroll (1979) revealed that business responsiveness is an essential philosophy (awareness and attitude) mode on strategy behind managerial response. In Malaysia, environmental and socially proactive firms are either internationally managed or part of an international chain.

Today's business leaders have the power to implement policies to protect the environment and to be more socially responsible in the future. In business organization, people are empowered with significant responsibilities within businesses (Ugboro & Obeng, 2000). This includes their business policies and strategies in relation to environmentally friendly products and practices. As business managers, their worldviews, attitudes and perceptions towards the environment could significantly affect our sustainability in the future (Sia Su, 2008). Various studies show that students who

are pursuing business degrees are expected to be future managers and business executives (Benton, 1994; Fukukawa *et al*, 2007). However, a number of studies (Hosmer, 1999; Lysonski & Gaidis, 1991) revealed business students tend to lack interest in ethic courses and have higher propensity to engage in unethical behaviour.

Presently, business students seem to hold a weak pro-environmental orientation and give more priority to fiscal and financial goals rather than goals related to social responsibility (Fukukawa *et al.*, 2007). This may due to lack of teaching and research on ethical, social and environmental issues by business schools (Cordano *et al.*, 2010). Sia Su (2008) stated that "most students profess to care for the environment, but there is considerable diversity on what they care for and the reasons for their environmental concerns". Dispoto (1977) compared various aspects of environmental orientation of those undergraduate students in the humanities versus the science and found that the science undergraduates have the higher scores.

Benton (1994) measured concern for the environment, willingness to act in environmentally friendly ways and involvement in pro-environmental behaviours among business and non-business undergraduate students. His results statistically showed significant differences between both groups; non-business students displaying higher levels of concern, willingness to act and engagement in pro-environmental behaviours than their counterparts. Ewert and Baker (2001) did a survey on students from ten (10) different majors at a Canadian university to investigate their differences in concern, belief and attitudes regarding the environment using the New Environmental Paradigm

approach. Their results showed that forestry and business administration majors reported lower pro-environment scores than their counterparts from other majors.

2.5 Waste Management and Recycling

2.5.1 Solid Waste Management. According to Mahmood (2000), the waste collection and disposal is the basis for the local authorities to regulate the disposal of waste in Malaysia. Although storage bins are mentioned in by the law, there is no standard set up in the types of containers in regard to the size and materials to be used and there are also issues on separation of waste. In addition, collection transportation and disposal of waste were not properly addressed in the by the law. These include restriction on dumping procedures and improper locations for the disposal of waste. Without law procedures we will not be able to maintain a high standard of services of proper waste management. The Ministry of Housing and Local Government (1998) pointed out the amount of waste generation in Malaysia is projected to increase 3.4 percent per year (refer to Table 2.1). In Malaysia, urban areas generate more paper and plastic waste compared to the rural areas that generate more organic waste (Mahmood, 2000). Waste composition varies according to the lifestyles.

Table 2.1
Estimated Population and Waste in Malaysia

Year	Population (million)	Estimated waste (tone/year)
1991	17 567 000	4 488 369
1994	18 917 739	5 048 804
2015	31 773 889	7 772 402
2020	35 949 239	9 092 611

Source: The Ministry of Housing and Local Government (1998).

Waste generation is estimated at 0.76kg/person/day and is expected to increase every year (Abdul-Talib & Ismail, 2004). The National Waste Minimisation Report in 2006 reported that the total of waste is 8,700 million tonnes in 2004 and considering the projected population and economic growth, the waste amount is expected to reach 15,700 million tonnes in 2020 which is more than expected based on Table 2.1. Based on the same data, the National Strategic Plan for Solid Waste Management (2005) reported that 17,000 million tonnes of municipal solid wastes were generated in Peninsular Malaysia daily and it is estimated to increase to more than 30,000 million tonnes in the year 2020. The data varies because the Local Authorities manage the solid waste separately but more importantly the amounts of solid waste keep increasing. For the cost of waste management services, it is estimated to be RM 360 million in 2001 or RM 70 per tonne of waste collected. Collection accounts for is 83 percent of the cost, disposal at 16 percent and recycling is only at 1 percent (National Strategic Plan for Solid Waste Management, 2005) or two percent (Abdul-Talib & Ismail, 2004; Mahmood, 2000).

Solid Waste Management, 2005) or two percent (Abdul-Talib & Ismail, 2004; Mahmood, 2000).

Based on the above statistics, it is anticipated that the government will spend RM 1.6 billion in 2020 in managing 30,000 million tonnes of waste. To date, the government has conducted various strategies, environmental activities, campaign in dealing this issue. Among the programmes is Recycling Campaign, no plastic bag on every Saturday, and encourage the use of eco-friendly electrical product by offering rebate. However, the wastes continue to increase and this may reflect low level of environmental behaviour, knowledge, concern and awareness among Malaysians (Ebil, 1999; Our Green World, 2008; Sharifah Aini *et al.*, 2005).

2.5.2 Recycling Programme in Malaysia.

Recycling in Malaysia was first introduced in Petaling Jaya in 1991 and involved source separation with kerbside collection by recycling vehicles. Then in 1996, Yellow Box Recycling was launched. Agumuthu (2001) reported that in the early stages the separation-at-source program organised by the Majlis Perbandaran Petaling Jaya (MPPJ) was well received by the residents. A total of 10,000 households were given recycling boxes where they could plan their recyclers and collection weekly. The recycling programme was launched throughout Malaysia in 1993. A total of 23 local authorities participated in this programme but most of them failed to achieve the recycling objectives (Mansor *et al.*, 1999). Later, the Malaysian Recycling Campaign was launched on 2 December 2000 by the Ministry of Housing and Local Government. The campaign encouraged customers to bring along recyclable paper bags or use baskets

when they go for shopping. The ministry emphasized on educating people about the 3R lifestyle through the printed and electronic media, a nationwide road show and working closely with the local authorities. Three major companies Alam Flora Sdn Bhd, Malaysian Newsprint Industries Sdn Bhd and Malaysian Sheet Glass Berhad have pledged their support in ensuring the campaign's success. The long term objective is to inculcate the habit of recycling among population.

In addition, the National Recycling Campaign aimed to reduce operation cost of solid waste management, minimise volume of waste disposal in landfills, reduce utilisation of raw materials and improve awareness and cooperation among stake holders (government, local authorities, manufacturer, policy makers, non-governmental organization and community based organization). The curbside recycling programme adopts the system of placing two to three containers in ensuring the community's comfort and it will more convenient for them to recycle their waste. The containers have three coloured designs; orange for plastic and aluminium products, blue for paper and brown for glass. Though it is expensive, it is found to be effective in achieving the collection (Raymond, 1995). This curb side programme varies from one municipality to another municipality in that it needs the participation of residents to carry out the separation prior to collection (George, Hilary & Samuel, 1993). A total of 30,000 containers were distributed to 30 local authorities in major towns and cities. The collecting centres were stationed strategically in supermarkets and shopping complexes, petrol stations and places where it is easy to park. Unfortunately, the population does not have sufficient thoughtfulness to administer such responsibilities and the bins are mostly filled with rubbish (Forti, Hansen, Kirbey, Agamuthu & Christensen, 2004).

Figure 2.1
Typical Curb-side Collection System

However, after the launch the recycling rate still remained low (Mansor *et al.*, 1999), between five percents to seven percents only (Final Report on National Waste Minimisation, 2006). The containers of curbside recycling center is shown in *Figure 2.1*, as being encouraged by the Department of Environment.

The public were not very responsive towards the programme although report showed success in certain municipalities (Abdul-Talib & Ismail, 2004). Recycling is increasing in Western Europe but countries of Eastern Europe, the Caucasus and Asia have relatively low recycling rates (William & Kelly, 2003). A successful implementation of a recycling campaign in a country requires both the national and local government to change the policies and strategies to get a higher level of public participation (Tucker & Spiers., 2003). The strategies include plans to encourage and persuade the public to change their current recycling behaviour. Addressing the public's

views on environmental issues is therefore important. Omran *et al.* (2009) argued that behaviour is dependent upon public interpretation of the recycling issues.

There are a few policies related to recycling in Malaysia. These include Privatization Policy, National Development Programme, National Environmental Policy and National Recycling Programmes. These policies are lacking in of both external (national level) and internal (local level) guidance which could cause problem for waste management at the municipality level. For example, legal definition of waste in Malaysia is not clearly defined and as a result the types of waste that should be managed by law cannot be defined clearly. Stakeholders are working on their own programme and objective and certain measures need to be taken to integrate efforts of the individual stakeholders into a single recycling programme.

2.5.3 Recycling Campaign/Activities in Selected Universities.

This section will highlight the recycling campaign/environmental activities in University Malaya (UM), Universiti Putra Malaysia (UPM) and Universiti Utara Malaysia (UUM).

2.5.3.1. **University Malaya (UM).** On 1 Sep 2009, the university established UMCARES (University Malaya Environmental Secretariat on 1 Sep 2009). The role and task of UMCARES is to plan and implement sustainable environment initiatives and projects which can potentially increase environmental awareness, understanding, appreciation and action among the campus community. It is also responsible to develop short and long term

strategies to transform UM as one of the leading universities in the country as an environmental sustainable campus. Among the recycling programmes and activities in 2009, 2010 and 2011 are; 1) car-boot sale (To encourage 5'Rs campaign (Reduce, Recycle, Reuse, Renew and Respect), 2) project white poison (Awareness campaign against using polystyrene), 3) green bazaar (an effort to promote awareness the importance of protecting the environment).

2.5.3.2. **Universiti Putra Malaysia (UPM)**. Universiti Putra Malaysia (UPM) introduced the 'Recycling Rally' program on 4th June 2010 to raise awareness on environmental issues through recycling activities. The aim of the recycling rally is to adopt recycling as a culture and it is also a part of the requirement for UPM's participation in the Green Metric Ranking of World Universities. The programmes introduced the Recycle & Reward concept where recyclable items such as papers, newspapers, plastic bag, plastic bottles and electronic items are weighed and rewarded with points, which then can be converted to attractive gifts. Therefore, based on the recycling rally, on 3 Jan 2011 UPM was ranked sixth among 95 universities in the world in the Green Metric World University Ranking 2010 (Green Metric). In fact, UPM is the only university of higher learning in Asia to successfully position itself among the top ten universities based on the university's excellence in promoting sustainability through environmental conservation and green technology.

2.5.3.3. **Universiti Utara Malaysia (UUM)**. On 13th May 2008, the eco-friendly campaign was initiated on the realisation that the University must play a

bigger and more pro-active role in inculcating awareness, change of attitudes and lifestyle among its students and staff. The campaign was implemented continuously throughout the years until its objectives have been met. The objectives of the Eco-Friendly campaign are; 1) To create an awareness among the UUM campus community of the importance of conserving the environment, 2) To nurture the love for the environment through eco-friendly projects organised, 3) To disseminate information and knowledge on how the UUM campus community can help make a difference and save the environment, and 4) To change the mindset and lifestyle of the UUM campus community so as to live in harmony with the environment. In ensuring the objectives are met, the action plan that was implemented are as follows; 1) The use of polystyrene is prohibited on campus, 2) The use of plastic bags is prohibited on campus, 3) A watchdog team comprising student activists and volunteers will be set up to advise those who do not follow this ruling."

Recycling of waste is one of the means to manage the burden of solid waste. However, in order to make recycling a major impact, it is vital that the students make recycling behaviour as a norm rather than the exception. Recycling education programmes are major means in achieving the recycling target. They seek to increase university community's knowledge about waste reduction and recycling behaviour, develop a positive attitude about such behaviour and encourage students to start recycling (Young, 1984). Although the selected university had conducted recycling campaign but to the author's knowledge no study has been conducted on the effectiveness and impact of those campaign whether it has change the recycling

behaviour of university students. In fact, recycling behaviour is hardly studied in Malaysia except writing articles on recycling in mass media (Chee & Narayanan, 2006).

2.6. Recycling Behaviour

Recycling has gained increasing attention as a mean of protecting the environment since it offers one of the most sensible solutions both economically and ecologically for managing waste. In Malaysia, various activities have been implemented by the government to increase awareness of the importance of communities' participation in recycling. Several television and radio advertisements have been aired as an effort to increase awareness on recycling. However, despite the effort and money spent, the campaign failed to inspire the public due to several reasons including lack support from the public and their negative attitude.

Hornik, Cherian, Michelle and Narayana (1995) did an extensive meta-analysis of 67 empirical studies on recycling and indicated two variables that might affect recycling activities; incentives and facilitators (or barriers) to social behaviour. An analysis by Zimmerman (1989) stated that people need to organise their environment so that it supports desired behaviours. A study by Vining and Ebreo (1990) showed that social influence as the concern over how friends and family might perceive one's recycling behaviour including their presence or support. In fact, the social influence can be powerful enough to sustain the recycling behaviour. De Young (1986) found that feeling about doing something good for the environment had a strong influence on recycling.

The motivational factors behind recycling attitude and behaviour have been studied in several researches which have sought to isolate specific traits that can be attributed to recycling participations. Bratt (1999) emphasized the need to understand the influence of consumers' environmental behaviour and to identify variables that predicted recycling behaviour. The study concluded that the social norm provided no relationship to behaviour. The findings by Oskamp *et al.* (1991) identified peer pressure as an important predictor or motivational factor of recycling behaviour. This means that when in the presence of others, an individual is inclined to make more socially responsible decisions especially when the peers also are practising it (recycling).

Boldero (1995) argued that recycling behaviour is likely to be influenced by situational factors such as the amount of effort involved, inconvenience, storage space and access to recycling schemes. Thomas (2001) emphasized the importance of public understanding and attention in determining participation rates in recycling. Attention is depends on success issues; not on the number of participation but how constantly and effectively they do it. Ewing (2001) found that the local authority's awareness and promotion campaign played important role in the success of recycling programme if the recycling campaigns and strategies used are poorly designed, the participation rates among communities will continue to remain low.

Tonglet, Phillip and Bates (2004) suggested that pro-recycling attitude is the major contributor to recycling behaviour and this attitude are influenced by; 1) having the appropriate opportunities, 2) facilities, 3) knowledge to recycle, 4) not deterred by the issues of physical recycling (time, space and inconvenience). Therefore, the

effectiveness of awareness campaigns relies upon improved understanding and higher participation by the public in the recycling services (Read, 1999). If a recycling programme is thought to be supported by sound environmental policies and is felt to be organized and controlled by good management then it will have a positive influence on an individual's recycling behaviour (Garces, Lafuente, Pedraja & Rivera, 2002).

Therefore, responsibility is placed on the government/agencies/institutions to implement effective programmes that consider the needs of individuals and the environment. If people perceive that recycling as an important issue, perhaps because of their knowledge of pro-active decisions taken by the government/agencies/institutions, they will invest their time and effort in a recycling program (Guerin, Crete & Mercier, 2001). Researchers found that high rates of recycling participation appear mainly in areas where communities are better educated and financially secured and where the requirements of the basic needs have been fulfilled (Tikka, Kuitunen & Tynys, 1999). However, most of the people still do not realise that improving environmental quality is not only the responsibility of the government but individuals too have important role.

2.7 Theory of Planned Behaviour

Behavioural scientists have long known how difficult it is to understand, much less predict individuals' behaviour. In fact, from social psychology to sociology, attitudes, attitude change and behaviours have been significant/prominent/critical source of research and reporting. There are a variety of literature exists regarding attitudes and behaviours such as the theory of planned behaviour.

The theory of planned behaviour (Ajzen, 1991) is an extension of the theory of reasoned action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). The theory of planned behaviour contains the original components of the theory of reasoned action, with the addition of perceived behaviour control. The theory of planned behaviour suggests that attitudes, norms and perceived behaviour control function independently to determine intention to perform (or not to perform) some behaviour. Intention is the immediate antecedent to behaviour.

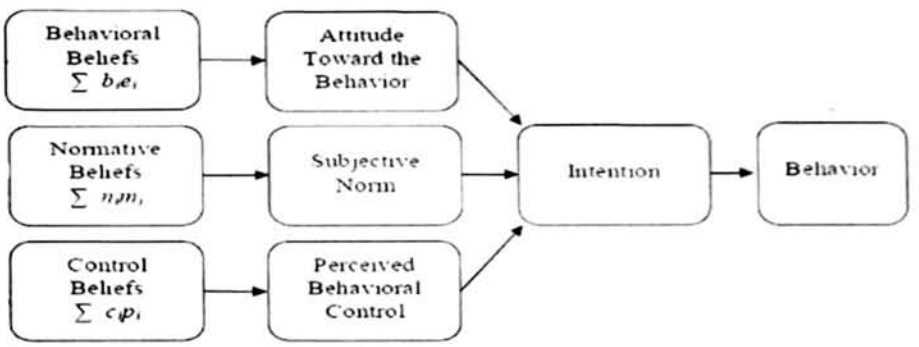

Figure 2.2.
Theory of Planned Behaviour

Intention is to capture the motivational factors which will influence behaviour. The indication of intention is how much effort the individual is planning to exert in the performance of the behaviour. Therefore, the stronger the intention to engage in behaviour, the more likely it should be executed. This relationship between intention and behaviour exists only if the behaviour in question is under volitional control.

2.7.1 Attitude.

Attitude has been interpreted and defined in various ways. Newhouse (1991) defines an attitude as "an enduring positive or negative feeling about a person, object or

issues". Eagly and Chaiken's (1993) defined, an attitude is "a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour". According to Beck and Ajzen (1991), attitude towards behaviour refers to "the degree to which a person has a favourable or unfavourable evaluation of the behaviour in question." Holmer and Kahle (1988) stated that "attitudes are based on values: beliefs that transcend specific situations and are used to resolve conflicts or make decisions". Therefore, the composition of attitude should contain several beliefs concerning a specific object or act (Follows & Jobber, 1999). The following section will discuss the relationship between attitude and behavioural intention, and attitude and behaviour.

2.7.1.1 The Relationship between Attitude and Actual Behaviour.

In most circumstances, attitude served to guide people's behaviour (Armitage & Christian, 2003) and the social psychology literature on behavioural research has established attitudes as important predictors of behaviour, behavioural intention and explanatory factors of individual behaviour (Kotchen & Reiling, 2000). Arbuthnot (2009) stated that "changing the attitude of world citizens is a necessary prerequisite to behaviour change". In fact, the scientific knowledge of the consequences of environmental degradation, and public information campaigns can potentially influence behaviour (Arbuthnot, 2008). Eagly and Chaiken (1993) found that there is a clear relationship between an individual's general behaviour rather than specific attitude and his or her intended behaviour. Therefore, it indicates that individual's general attitude is a good predictor to engage in a behaviour that is relevant to the attitude.

Measuring intentions increases the accessibility of both attitudes towards general behaviour and attitudes towards the salient specific options; these changes subsequently influence behaviour and would increase attitude accessibility (Morwitz & Fitzmons, 2004). Morwitz and Fitzmons (2004) also stated that based on previous studies it showed that the link between attitudes and behaviour grows stronger as the attitudes become more accessible and in turn affects choices.

This section discusses the findings of attitude-behaviour relations. The relationships have been discussed since 1929 and it was reported to be of low to non-significant relations (Ajzen & Fishbein, 1977). A theoretical and empirical research on attitude-behaviour relations were conducted by Azjen and Fishbein (1977), and the criteria of their analysis were based on four specific elements; action, target, context and time. The analysis was conducted on 109 articles on multiple act criterions and their focuses of research were only on two elements; action and target. The findings showed that 27 articles have low correspondence elements, 26 articles showed non-significant and one article had low relationship. The partial correspondence referred to lack of correspondence between action and target, 20 articles are not significant, 47 articles are inconsistent and only 4 articles have a high relationship. For high correspondence, 9 articles are inconsistent whereas 55 articles showed high relationships. The effect of correspondence on attitude – behaviour is shown in *Table 2.2*.

Table 2.2
Effect of correspondence on the attitude-behaviour relations

Correspondence	Not Significance	Low or inconsistent ($r < .40$)	High ($r \geq .40$)
Low	26	1	0
Partial	20	47	4
High	0	9	55

Source: *Ajzen and Fishbein, 1977.*

Note:
Low: no correspondence of element
Partial: lack of correspondence of target and action
High: correspondence of target and action exists

The findings from Ajzen and Fishbein (1977) showed that if the research focused on high correspondence (target and action) it will contribute to a high relationship. Ajzen and Fishbein (1977) concluded that "when the target and action elements of the attitudinal entities correspond to the target and action elements of behaviour entity, attitude-behaviour correlations were found to be high and significant although the validity of measurement is doubtful". The present study is to investigate recycling behaviour (action) of undergraduate business students (target-homogenous sample). A high correspondence exists in this study and it is expected that attitude–behaviour relationship will be significant.

Therefore, to show more concern for the environment is better than having a negative attitude towards the environment. Correspondence between attitudes and behaviour varies but there are consistent evidence that attitude is significantly related to environmental behaviour (Aini *et al.*, 2002; Artbuthnot, 1977; Ebreo & Vining, 2000; Garnder & Stern, 1996; Guangnano, Stern & Dietz, 1995; Nordlund & Garvil, 2002;

Oskamp, *et al.* 1991). Once attitude is specific to behaviour, it will contribute strongly to intention to act and actual follow-through (Nordlund & Garvill, 2002).

However, some research showed that the relationship between attitude and behaviour is inconsistent. Balderjahan (1988) conducted a causal model to predict environmentally responsible purchase behaviour; the result showed that the relationship between attitude towards pollution and purchase behaviour is not significant. A broader orientation like New Ecological Paradigm (NEP) also showed weaker direct correspondence between attitude and environmental behaviour (Poortinga, Lindasteg & Vlek, 2004; Vining & Ebreo, 1992). Several studies by Stern (2000); Stern, Dietz, Abel, Guangnano and Kalof, (1999), and Stern, Dietz, Kalof and Guangnano, (1995) argued that there is a weak correspondence between attitude and environmental behaviour because there is a causal chain leading from general values to specific behaviours.

Analysis study by Hines *et al*, (1987) on 51 environmental studies found that attitude – behaviour correlation was lower when the attitude was operationalized as a general attitude compared to specific attitude. A strong correlation only exists when attitudinal measure and the behavioural measure are in specificity. The low correlation between attitude and behaviour is because of the omission of intention, and effects of attitude on behaviour should be mediated by intention (Follows & Jobber, 1999). The reason why attitude-behaviour correlation decreases is because of beliefs about attitude are basically cognitive, whereas attitude is normally affectively (individual feeling) driven (Notani, 1998). Generally, research found a weak or modest relationship of attitude and behaviour correspondence, and Thapa (2010) identified three factors that

might contribute to weak predictability of attitude and behaviour relationship; 1) attitude specificity (specific versus general measures), 2) attitude measurement, and 3) effect of external factors.

There are a number of intrinsic factors identified by previous researchers as influential to recycling behaviour. The first one considered here is a respondent's attitudes about the environment. A review of four recycling studies that addresses environmental attitudes yields mixed conclusions. Two studies found that acknowledgement of and concern regarding general environmental problems is a predictor of recycling participation (Oskamp, *et al.*, 1991; Shultz & Oskamp, 1996). Two other studies, however found that general environmental concerns does not necessarily predict recycling behaviour (Shultz & Oskamp, 1996; Shrum, Lowrey & McCarty, 1995). One of these studies stated that the concern must be related specifically to a perceived seriousness of the waste problem (Oskamp, 1995).

Other studies indicated that recyclers and non-recyclers alike believe that recycling benefits had some positive impacts on the quality of their environment (Margai, 1997). One study asserted that the recyclers/non-recyclers difference was only a matter of degree regarding environmental concern not a fundamental difference. Specifically, their study found that recyclers' global environmental attitudes were stronger than those of non-recyclers and those recyclers' specific recycling attitudes were stronger than those of non-recyclers (Vining & Ebreo, 1992). In fact, Thorgersen (1996) stated that helping to conserve natural resources as the most important motive for recycling.

Recycling is related to values such as helpfulness and respect (Thorgersen, 1996) and desire to help solve a national problem (Oskamp *et al.* 1991). Many studies found that attitudes regarding recycling depend on the strength of belief that recycling leads to public benefits (Thorgersen, 1996).

2.7.1.2 The Relationship between Attitude and Behavioural Intention.

Attitude has been found to significantly affect an individual's intention to behave ethically or unethically (Ajzen, 1988, 1991; Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). Werder (2002) stated that attitudes of every individual towards a product symbolize information about an individual's self-identity. An individual's feelings, beliefs, and intention to act have all been construed in literature as being constituents of attitude-related action. Furthermore, relationship between attitude and behavioural intention is stable, strong and positive (Brian, 2008). According to Taylor and Todd (1995), if a person has a positive attitude, then he has stronger behavioural inclination and it is the opposite if he has more negative attitude. Intention plays an important role in attitude-behaviour relationship and it depends on the level of effort to perform the behaviour (Bagozzi, Yi & Baumgartner, 1990).

Most of the researchers found significant and positive correlations between attitude and behavioural intention. Regression analysis by Werder (2002) showed that the Pearson product-moment correlation contributed, $r = .208$ and significant at level of $p < .001$. Research by Cordano (1988) showed that relationship between attitude and behavioural intention is significant with the standard regression coefficient of .34. Study

by Joshi (2003) also found that attitude is the highest total variance that explained 28% compared to other variables. This demonstrated that when intentions were measured after participants elaborated on their attitude, their attitude became more accessible and their choices became more consistent with their attitudes (Morwitz & Fitzmons, 2004).

Previous research which are not related to environmental behaviour also found that attitude is an important predictor to intention (Bosnjak, Obermeier & Tuten, 2006; Buchnan, 2005; Shih & Fang, 2004). The possible reason is because most of the antecedents on behavioural intention are channelled through attitude construct (Page & Yuding, 2003). In his meta-analysis on perceived behaviour control by Notani (1998), showed that attitude is a more consistent predictor of behavioural intentions in all cases and contributed to a larger absolute coefficient. The strong relationship of attitude and intention suggests that people are more likely to engage in pro-environmental behaviour if they think this has positive consequences for themselves (Lindenberg & Steg, 2007).

2.7.2 Subjective Norms

Subjective norm is defined as "a person's perception that others desire the performance or non-performance of a specific behaviour, this perception may or may not reflect its importance what others actually think he/she should do" (Ajzen & Fishbein, 1980). Subjective norms refer to an individual's beliefs that the society such as family, friends, and course mates, believe that the individual should or should not engage in a specific behaviour. Research showed that people are influenced by the behaviour of others. This influence can pressure an individual to conform to the behaviour of a particular group, or may convey to either what most people do in a given situation (i.e.

descriptive norms) or behaviours that are associated with approval or sanctions (i.e. injunctive norms) by others (Reno, Cialdini & Kallgren, 1993). Therefore, since the environmental problems have a social dilemma, individual environmental attitude and behaviour is influenced by the norm of social groups such as friends and family (Granzin & Olsen, 1991; Hopper & Nielsen, 1991; Jackson, Olsen, Granzin & Burns, 1993; Oskamp, *et al.*, 1991; Taylor & Todd, 1995). For example, Granzin and Olsen (1991) reported that the behaviour such as recycling, reuse of clothes and furniture, and walking instead using the car for the sake of preserving the environment is subject to a normative influence from friends and associates.

2.7.2.1 The Relationship between Subjective Norm and Behavioural Intention.

A meta-analysis by Armitage and Conner's (2001) found that subjective norms were the weakest predictor of behavioural intention. This may due to the inability of subjective norms to capture normative feelings resulting from personal norms and descriptive norms. Descriptive norms refer to what people do and can be defined as beliefs that others are performing the target behaviour (Cialdini, Reno, & Kallgren, 1990) or in other word beliefs about what people typically do and it is different from subjective norms which are beliefs about what are the important actions others think one ought to do.

The importance of attitude and subjective norm in influencing the intention will be different for each individual and situation. Previous studies showed a significant relationship between subjective norm and behavioural intention (Bozionelos & Bennet, 1999; Zhang, Prybutok, & Strutton, 2007). However, research by Werder (2002)

demonstrated that relationship of subjective norm and behavioural intention is not significant (r = .078, p < .10). Other research findings also showed that subjective norm does not associate or influence intention (Bosnjak *et al.*, 2006; Buchnan, 2005; George, 2004; Shih & Fang, 2004; Wang, Chen, Chang & Yang, 2007). The non significant relationship between subjective norm and behavioural intention may be due to different lifestyles and behaviour patterns among students and people, sampling area and chosen population. For a short term subjective norm has a strong impact on intention and for students, subjective norm may play a lesser role in influencing behavioural intention (Werder, 2002).

2.7.2.2 The Relationship between Subjective Norm and Actual Behaviour.

The findings of Taylor and Todd (1995) showed that subjective norms influence behavioural inclination; therefore, the more positive the subjective norms, the stronger the behavioural inclination and vis-à-vis. Research findings from Sapp, Harrod and Zhao (1995) showed that subjective norm affect behaviour when intention was ill formed thus, showed a significant relationship. A related study by Biswas, Jane, Pullig & Daugghtridge (2000) demonstrated a significant correlation between subjective norms and recycling shopping behaviour and this may be due to the nature of consumers' recycling process that is public in nature. This is supported by a study done by Cordano (1988) from a structural equation modelling (SEM) and correlation analysis, his findings indicated that subjective norm has a strong relationship with behaviour. A contrary finding by Armitage and Conner (2001) claimed that subjective norm is the weakest prediction in the theory of planned behaviour and the problem may be due to measurement issues and potential differences among target behaviours.

2.7.3 Perceived Behaviour Control.

The term perceived behaviour control means, "the person's beliefs as to how easy or difficult the performance of the behaviour is likely to be .....beliefs about resources and opportunities may be viewed as underlying perceived behaviour control" (Ajzen & Madden, 1986). In the theory of planned behaviour, perceived behaviour control also can be used to predict behaviour directly. Perceived behaviour control plays the role of an exogenous variable that has a direct and indirect effect on behaviour through intentions. The indirect effect is based on the assumption that when people believe that they have little control over performing the behaviour, then their intentions to perform the behaviour may be lower even if they have positive attitudes or subjective norms. The direct path from perceived behaviour control to behaviour is believed to reflect the actual control an individual has over performing the behaviour. Perceived behaviour control may be substituted for a measure of actual control depending on how accurate the perception is (Ajzen, 1991) or to reflect true control over the behaviour (Notani, 1998). Perceived behaviour control is successful to predict behaviour when the behaviour that poses a problem is within his/her control because their perception of control is more accurate (Notani, 1998).

Ajzen (1991) stated that if individuals perceive constraints on intended behaviours, perceived behaviour control could help explain discrepancies between intentions and behaviour. Therefore, the importance of attitudes, norms and perceived behaviour control will vary across situations and behaviours. Furthermore, in a situation when attitudes and norms are strong, perceived behaviour control may have little effect on actual behaviour. However, when behaviours are perceived as a barrier to

performance, perceived behaviour control is an important factor in predicting behaviour (Ajzen, 1991). Azjen (1988) stated that perceived behaviour control have practical constraints relating to situational conditions whereas intention refers to an individual's willingness to perform behaviour. For example, if someone wants to use a solar water heater, but there are no solar water heaters to purchase, or materials or knowledge to make, then it is not possible for the individuals to use it.

Notani (1998) conducted a meta-analysis on perceived behaviour control in the theory of planned behaviour by examining 36 articles. The causal model estimation showed that all structural paths are significant and the path between perceived behaviour control-behaviour is the weakest (.14 at p <.10 level). The highest is the path between intention-behaviour (.38 at p <.01 level) followed by attitude-intention (.37 at p <.01 level), subjective norm-intention (.23 at p <.01 level) and perceived behaviour control-intention (.16 at p <.05 level). In his findings, Notani (1998) suggested that the application of perceived behaviour control should take the following considerations: (1) global measure (person overall perception) instead of belief-based (individual control belief that consider salient), (2) internal factor (under individual control and perception more accurate) instead of external factor (not within control and hard to estimate), (3) student sample better for perceived behaviour-intention relation and non-student sample for perceived behaviour control-behaviour relation, (4) familiar behaviour instead unfamiliar behaviour.

The interesting question is why student sample is better for perceived behaviour control-intention link; this is because generally students have superior cognitive test-

taking abilities and motivated to approach questionnaires consistently and rationally. However, for perceived behaviour control-intention link, students were inexperienced, had less knowledge, had an inaccurate or unstable perception of their control in performing their behaviour (Notani, 1998).

2.7.3.1 The Relationship between Perceived Behaviour Control and Behavioural Intention.

Gollwitzer (1993) stated that perceived behavioral control plays a role in the deliberation phase and influences the formation of intentions indirectly, through behavioral intentions. However, in contrast to Gollwitzer (1993) idea, Garling and Fujii (2001) proposed that perceived behavioral control influences the formation of intentions directly and it will show a negative relation between perceived behavioral control and intentions. This mean individuals who believe they have a low degree of control over the behavior should be more inclined to form intentions. Another idea is that perceived behavioral control moderates the relation between intentions and behaviour; that is if people perceive a high degree of control over a particular behavior then they see less need for forming intentions.

A study by Kokinaki (1999) showed that perceived behaviour control was the strongest predictor of purchase intention compared to the other predictors. A study by Taylor and Todd (1995) demonstrated that there is a positive correlation between perceived behaviour control and behavioural intention. Study on cancer screening by DeVellis, Blalock and Sandler (1990) showed that perceived behaviour control is able to predict behaviour intention better than attitude and subjective norm but it does not

support the path to actual behaviour. However, another study by Godin and Kok (1996) found that perceived behaviour control is able to predict intention and also behaviour.

Previous research findings also stated that perceived behaviour control influences and relates to intention (Bosnjak *et al.*, 2006; Shih & Fang, 2004; Wang *et al.*, 2007). A regression analysis by Werder (2002) revealed a significant and positive correlation between perceived behaviour control and intention but the result of regression coefficient by Cordano (1988) showed a significant finding but in reverse predicted direction (intention influence perceived behaviour control). In assessing whether perceived behaviour control influence intention or behaviour will much depend on an individual's belief (towards resources and opportunity) whether it is easy or difficult in performing the behaviour. Therefore, besides having positive attitude, having social reason to do so, a measure of perceived behaviour control should predict intention. If a person perceives that he or she has control over performing the behaviour, the person will form a strong intention to perform the behaviour provided his or her perceived behaviour control is accurate and reflects actual ability. However, a contrary research by Werder (2002), found that perceived behaviour control is the least significant predictor of recycling intention and actual behaviour and the result was non-significant ($r = 0.43$, $p < .25$, $r = .098$) and this maybe due to either the action is within his/her control.

2.7.3.2 The Relationship between Perceived Behaviour Control and Actual Behaviour.

Perceived behaviour control can directly predict behaviour or moderate the relationship between intention and behaviour when perceived behaviour control

accurately reflects the amount of actual control over the performance (Ajzen & Madden, 1986; Sheeran, Trafimow & Armitage, 2003). A finding by Joshi (2003) showed that the total explained variance of perceived behaviour control on behaviour is low (15.5%). The greater perceived or actual control over behaviour should be associated with improved predictors of behaviour by intention (Webb & Sheeran, 2006). Therefore, once the student has control over the behaviour, it will reflect on their actual behaviour. Research by Hill (2008) on pro/anti environmental behaviour found that only perceived behaviour control were significantly related to behaviour in four situations (from 16 situations) whereas attitude was significant in two situations (from 16 situations), subjective norm and behavioural intention were non-significant.

2.7.4 Behavioural Intentions.

Behavioural intention is often used as an indicator of behaviour when it is impossible to actually measure a specific individual behaviour (Schultz, 2001). Behavioural intention is a central tenet of the theory of planned behaviour (Azjen, 1985, 1991; Azjen & Madden, 1986; Fishbein & Azjen, 1975). The intentional strength is determined by a person's attitude towards the behaviour (positive or negative), subjective norms to perform the behaviour (exclusion of personal norms) and perceived behaviour control. Inclusion of intention as a mediator between attitudes and behaviour would improve the explanatory power of the model (Beck & Ajzen, 1991; Chan, 2001). In other words, behavioural intention is the best predictor of future behaviour and is driven by perception that is accurate or inaccurate, stable or unstable (Notani, 1998).

A study by Ajzen and Fishbein's (1980) and by Follows and Jobber (2000), have linked beliefs to attitudes and attitudes to behaviour by means of intention. Other researchers also demonstrated that intention as a mediating factor in attitude-behaviour relationships (Bagozzi, 1981; Burnkrant & Page, 1982; Fredericks & Dossett, 1983; Hwang, Kim & Jeng, 2000). In a finding by Armitage and Christian (2003) stated, "behavioural intention mediate the attitude-behaviour relationship, it is more significant rather than attitudes related directly to behaviour".

In a meta-analysis by Webb and Sheeran (2006) measured changes in intention and behaviour and found that if a medium-to-large change in intentions occurred then small-to-medium change in behaviour occurs. In fact, intention is assumed to capture the motivational factors that influence behaviour (Ajzen, 1991). Therefore although behaviour change was associated with intention change, behaviour did not change as expressed intentions did or "we do not always do what we wish or say we will do" (Arbuthnot, 2009). In fact not all behavioural intent is related to an individual (Eagly & Chaiken, 1993).

Ajzen and Fishbein (1980) noted that majority of social behaviours are under volitional control and as a result the direct antecedent to behaviour is intention. Social, economic and political impediments may exits that are outside the individual control that may prevent them from performing the behaviour in question. For example, if one is interested in correlations between recycling attitude and behaviours in an area that did not have public recycling facilities, results could be misleading if the individual was inclined to recycle but did not perform it because of the lack of available recycling

centres. For both these reasons, behavioural intention have acted to the cognitive hierarchy as a precedent to actual behaviours and often used as effective predictors although not perfect predictors of actual behaviours (Vaske & Donnelly, 1999).

2.7.4.1 The Relationship between Behavioural Intention and Actual Behaviour.

The fact is that intention is normally measured only correlate with real behaviour 0.30 or less in many studies (de Brujin, Kroeze, Oenema, & Brug, 2008; Staats, Harland, & Wilke, 2004) and the "appropriately measured" intentions accounts for 20-30% of the variance of future behaviour (Ajzen, 1991; Armitage & Connor, 2001; Cheung, Chan & Wong, 1999; Randall & Wolff, 1994; Sheeran, 2002; Sheeran & Orbell, 1998). A correlation study showed that intention is associated with average correlation between .39 to .47. Findings by Beville (2010) showed that the hierarchical regression of behavioural intention is positively associated with leisure physical activity behaviour. Research by Beck and Ajzen (1991) and Chan (2001) found that behavioural intentions engaging in unethical behaviour are highly correlated with actual unethical behaviours.

An environmentally responsible purchase behaviour research by Follows and Jobber (1999) found that the path between intention and behaviour is significant (74 percent explained variance). However, when intention was removed, the total explained variance dropped from 74 percent to 56 percent. This showed that intention played an important role and was able to increase the power of the model. Furthermore, intentions are the principal proximal determinants of behaviour, a stronger predictor and shows impact on behavioural achievement (Armitage & Christrian, 2003). In other words, stating one's intention to engage in behaviour is associated with an increased likelihood

of subsequently engaging in the behaviour when it is easy to mentally represent or imagine (Levav & Fitzsimons, 2006).

2.7.4.2 Mediating Effect of Behavioural Intention.

Mediator is a function of third variable and represents as the generative mechanism through which the focal independent variable is able to influence the dependent variable (Baron & Kenny, 1986). This variable interferes between the independent variables and the dependent variable and at the end of the analysis will modify the results of the findings. This study considered behavioural intention as a mediating variable between attitude towards recycling, subjective norm, perceived behaviour control and recycling behaviour.

Most of the research on Theory of Planned Behaviour focused on the intention than the act (behaviour). Ajzen (1985) stated that stated that 'if we interested in understanding human behaviour, not merely predicting it, we must identify determinants of intention. In the Theory of Planned Behaviour intention is a function of three basic determinants (attitude towards behaviour, subjective norm and perceived behaviour control). However, few researchers who applied Theory of Planned Behaviour were merely predicting rather than understanding the behaviour. For example, a study by Taylor and Todd (1995) stated that his study was examining intention to compost and recycle but he did not include measurement of behaviour. Hill (2008) also stated that 'his study is to predict specific intention but did not predict specific behaviour'. Other researchers such as Trumbo and O'Keefe (2001) study on intention to conserve water; Truelove (2010) predicted of global warming related behavioural intention;

Montesarchio (2009) study on the unethical intention of student and Cordano (1988), examined the relationship between environmental intention and environmental attitude of managers. This supported a research by Ayed (2010) that 'many studies stopped at behaviour intention as an endogenous variable (dependent variable)' and this had triggered Ayed (2010) use intention as mediating variable and actual behaviour as a dependent variable. Ajzen (1985) stated that behavioural intention interpreted as an intention to try to perform certain behaviour but it not necessarily to perform it (actual behaviour).

However, few studies used intention as mediating variable. A study by George (2004) found that intention has a mediating effect between perceived behavioral control and behavior however it do not determine full or partial mediation. Canniere *et al.* (2008) examined the mediating effect of intention in the relationship between attitude, subjective norm and perceived behavior control with actual behavior and it showed that the intention fully mediates attitude and subjective norm but partially mediate perceived behavioral control on actual behavior.

2.8 Application of Theory of Planned Behaviour

Previous studies showed that the Theory of Planned Behaviour has been applied in identifying or examining human behaviour including environmental behaviour (Armitage & Conner, 2001) and this theory is frequently used to describe the correlative components of behaviour (Azjen, 1988). Theory of planned behaviour is not only on cognitive psychology but also social psychology theory that explains the human decision process (Wang *et al*, 2007). In fact the theory of planned behaviour is recognized as the

most alluded to pro-environmental behaviours and the most accepted model in attitude research on recycling behaviour (Oom Do Valle, Reis, Meneses & Rebela, 2005). Furthermore, the theory of planned behaviour proved to be a model that would strengthen the determination and prediction of variables influencing behavioural intention (Werder, 2002). Most of the research on theory of planned behaviour focused on behavioural intent (Joshi, 2003) and only a few studies measured behaviour as a variable (Nigbur, Lyons & Uzzell, 2010). Meta-analysis by Armitage and Conner (2001), from 185 studies found only 19 studies measured behaviours.

One of the first studies to embrace attitude theory in the quest to explain environmental behaviour is Maloney and Ward's (1973) research by developing the "Scale for the Measurement of Ecological Attitudes and Knowledge." Consisting of four (4) subscales, Maloney and Ward's scale inventory included items on environmental knowledge, effect towards the environment and verbal commitment to engage in environmental behaviours. While not specifically grounded in the theory reasoned action or theory of planned behaviour, Maloney and Ward's subscales tap into theory reasoned action components.

Several researchers have adopted the theory of planned behaviour into pro-environmental behaviour including Hines *et al* (1986). A meta-analysis research by Hines and colleagues applied the Theory of Planned Behaviour to predict pro-environmental behaviour and the findings showed that intention, locus of control, attitudes, personal responsibility and knowledge were significantly correlated with pro-environmental behaviours. De Groot and Steg (2007) investigated whether the theory of

planned behaviour could predict behavioural intentions to use a park and ride facility in Groningen, The Netherlands and results revealed that positive attitudes, positive subjective norms and high perceived behaviour control towards the use of the park-and-ride facilities were strongly related to behavioural intentions.

Kaiser, Syibell and Urs (1999) utilized the theory of planned behaviour using a theoretical measurement tool in predicting environmental behaviour. Citing the shortcomings of previous theoretical research, Kaiser *et al.* (1999) commented the following areas: "(1) the lack of a unified attitude concept, (2) the lack of measurement correspondence between attitude and behaviour on a general level and (3) the lack of consideration of situational behaviour constraints beyond people's control". Based on this theory, Kaiser *et al.* (1999) recommended a modified version of the theory of planned behaviour to be used as a theoretical framework to increase the ability to predict environmental behaviours based on observed environmental attitudes. Cordano (1998) stated that theory of planned behaviour is very versatile and adaptable to any research of behavioural intention.

Theory of planned behaviour can be applied in various environmental behaviour studies. The literature review also stated that this theory is the most accepted model especially in recycling behaviour studies (Oom Do Valle *et al.*, 2005), and other related environmental behaviour studies (Cheung *et al.*, 1999; Harland, Staats & Wilke, 1999; Kaiser & Gutsher, 2003).). Hines *et al* (1986/1987) and Kaiser *et al.* (1999) had adopted the theory of planned behaviour in their studies to predict pro-environmental behaviour.

The premise underlying this theory is that the strongest proximal predictor of behaviour is the intention to carry out the behaviour.

Additionally, the theory stated that intention is best predicted by three constructs; attitude towards behaviour, subjective norms and perceived behaviour control. According to this theory, perceived behaviour control can override intention and independently predict behaviour when engaging in a behaviour which is not under volitional control of an individual (e.g. composting bins are absent). According to this theory, the intent to behave in an environmental behaviour will not result solely from a broad set of information about the benefits supporting the environment. As such, undergraduate business students have a positive attitude towards the environment, if they expect to behave pro-environmentally and supported by others. If they perceive that behaving pro-environmentally is in their control, the theory of planned behaviour would predict undergraduate business students' intention to behave pro-environmentally will be greater.

While the theory of planned behaviour suggests that individual attitudes, subjective norm, and perceived behaviour control influence their intention to act, the question is, will these three components be able to predict undergraduate business student's behavioural intent? Previous research showed a mixed findings of each components towards intention and it depends on the focus of the research. Study by Taylor and Todd (1999) showed a weak correlation (r = .186) between intention and actual behaviour and perceived behaviour control is the least significant predictor towards intention and actual behaviour (Werder, 2002).

Osbaldiston (2004) tested four behaviour theories (Responsible Environmental Behaviour Model by Hines *et al.*, 1997; Hornik Model by Hornik *et al.*, 1995; Environmentally Significant Behaviour Model by Stern, 2000; and Self Determination Theory by Deci & Ryan, 2000) in his meta-analysis and found that none of those theories were able to establish, predict and promote environmental behaviour. In his recommendation, Osbaldiston (2004) stated that future research on environmental behaviour should test the social psychology theory since it discusses the interaction of humans and human behaviour. Since this study is to examine the behaviour of undergraduate business students, therefore the theory of planned behaviour will be adopted. In fact, most of the studies that have been reviewed support the theory of planned behaviour and suggests that behavioural intention could be predicted from the attitude towards the environment, subjective norm and perceived behaviour control.

2.8.1 Theory of Planned Behaviour and Recycling Behaviour

There has been recent interest in exploring the use of models from social psychology to provide a theoretical framework for understanding householders' recycling behaviour (Davies, Foxall & Pallister, 2002) and more recently waste minimisation behaviours (Tonglet, *et al.*, 2004; Davis, Phillips, Read & Iida, 2006). The literature indicates that environmental attitudes and situational and psychological variables are likely to be important predictors of recycling behaviour. Further investigation on the influence of these factors requires a theoretical framework, such as that provided by the Theory of Planned Behaviour (Ajzen, 1991). The theory allows for systematic investigation of the factors which influence behavioural choices. It can be

used to predict, understand and change recycling behaviour and to design programmes to promote recycling activities. The theory has been successfully used to predict and explain a wide range of behaviours (Godin & Kok, 1996; Armitage & Conner, 2001).

The Theory of Planned Behaviour has been used in several studies which investigated recycling behaviour (Boldero, 1995; Chan, 1998; Cheung *et al.*, 1999; Davis *et al*, 2006; Davies *et al.*, 2002; Taylor & Todd, 1995; Terry, Hogg & White, 1999). The use of Theory of Planned Behaviour has been shown to be a good predictor of recycling behaviour. For example, in an analysis of Theory of Planned Behaviour using structural equation modelling on the data from Portuguese households, Oom Do Valle *et al.*, (2005) found a strong correlation between perceived control and recycling behaviours (r = .77). This suggests that if an individual's perceived control over recycling could be increased, and then perhaps his or her recycling behaviour could also be increased. However, structural equation modelling utilizes self-report measures, and not direct observation of behaviour.

As a result, studies using structural equation modelling techniques provide qualified support for the Theory of Planned Behaviour, but not evidence of its value in application. Motive for recycling is important in contributing to an individual's sense of control. Those who continue to recycle over time report feeling intrinsically motivated to recycle or have created new extrinsic motivations (Werner & Makela, 1998). Such extrinsic motivations can take the form of entertainment (e.g., a parent making it a family activity to crush cans, taking goods to a recycling facility for deposit) or making

the action intrinsically pleasing (e.g., thinking of the good that is done for the world through recycling). Those with the greatest motivation over time may have changed the way in which they recycle (*e.g.*, making recycling more convenient) in order to sustain the behaviour, creating greater reward for less work (Werner & Makela, 1998).

Oskamp *et al.* (1991) investigated factors influencing household recycling behaviour which includes; demographic, conservation knowledge (attitudes) and recycling behaviour. In terms of attitude related to recycling behaviour, the majority of Americans and young people in particular feel that the environment is a high legislative priority, with the most Americans indicating that the worry "a great deal" about pollution and can sympathize with environmental concerns (Public Agenda, 2010). Yet, in terms of recycling behaviour the existing research indicates that people are hesitant to take responsibility (Stoll-Kleeman, O'Riordan & Jaeger, 2001; Takacs-Santa, 2007). Essentially, while concern for the environment has become a cultural norm in western society (Derksen & Gartell, 1993) inconclusive findings exist in trying to provide explanatory factors in the relationship between attitudes and recycling behaviour. When inconclusive findings exist, research is warranted in trying to better understand the phenomenon. Discovering the best way to unpack the apparent incongruence between attitudes and recycling behaviour is imperative in working toward a more sustainable future.

One of recycling predictor cited by several studies is the presence of friends and neighbours who recycle (Oskamp, 1995). Research finding by Oskamp *et al.* (1991) stated that friends and neighbours are among the top three most important factors in

predicting recycling participation. Recyclers were much more likely to feel a personal obligation to recycle (Vining & Ebreo, 1992). Therefore, social pressure could be one of the motivations to recycle (Oskamp, 1995). Oskamp *et al.* (1991) collected a data from 221 randomly selected adults in a suburban city who are involved in recycling program and they found that friends and neighbours as a strong predictor to recycle. Similar findings by Bezzina and Dimech (2011), Davio (2001), Ericksen (2006), Navarro (2002), Nielsen and Ellington (1983), Oskamp (1995), Oskamp *et al.* (1991), Spaccarelli, Zolik and Jason (1990), Vining and Ebreo (1992), Zhang *et al.* (2007), Zia, Devadas and Shukla (2008) also found that recycling by friends and neighbours was the most effective determinants for an individual to recycle.

2.9 Conclusion

The aim of this chapter was to present a rationale for the conduct of this study through a review of past and current research. In fact, the literature review has served to help the author understand what has been studied and also to see where there may be some gaps. Previous studies have shown that there are many factors that can influence recycling behaviour. This issue is interesting and worth of study since no research has been conducted in the area of recycling behaviour involving undergraduate business students in Malaysia.

Therefore, through this study, the author hopes to contribute to the body of knowledge on recycling behaviour of future business leaders in Malaysia. Hopefully, when the undergraduate business students grasp the importance of preserving the environment and understand the severity of environmental issues, they will adopt with

higher levels of awareness of the consequences of human actions and are more likely to act in a responsible manner towards the environment (Korhonen & Lappalainen, 2004) especially once they occupy the position of CEO, policy maker/developer or business leaders in any organization.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

As reiterated earlier, this study intends to investigate the relationship between recycling behaviour and theory of planned behaviour constructs (attitude towards recycling, subjective norm, perceived behaviour control, behavioural intention) and the role of behavioural intention as a mediator between attitudes towards recycling, subjective norm, perceived behaviour control and recycling behaviour of undergraduate business students in university. In addition, this study analyzed if there is a difference of recycling behaviour among undergraduate business students from Universiti Malaya (UM), Universiti Putra Malaysia (UPM) and Universiti Utara Malaysia (UUM) including subpopulation categories of sex, age, and residence. The outline of this chapter covered the following; (1) research framework, (2) hypotheses (3) research design, (4) operational definition, (5) measurement of variables/instrumentation, (6) data collection – sampling and data collection procedure, and (7) techniques of data analysis.

3.1 Research Framework

The theory of planned behaviour was used in this study as the basis of research framework since this theory can be applied in a broad applicability (Armitage & Christian, 2003). In fact, this theory was adopted by many researchers in all aspect of studies dimension and it showed it is strong model in predicting consumer behaviour even across different geographical locations (Ayed, 2010). Therefore, this theory is to conform the applicability of this study related to recycling behaviour of undergraduate

business student. The focus of this study is to examine the relationship between attitude towards recycling, subjective norm, perceived behaviour control and behavioural intention including the mediating effect of behavioural intention between attitude towards recycling, subjective norm, perceived behaviour control and recycling behaviour. Based on the literature review discussed earlier, a theoretical framework (Theory of Planned Behaviour) for this study is illustrated in **Figure 3.1**.

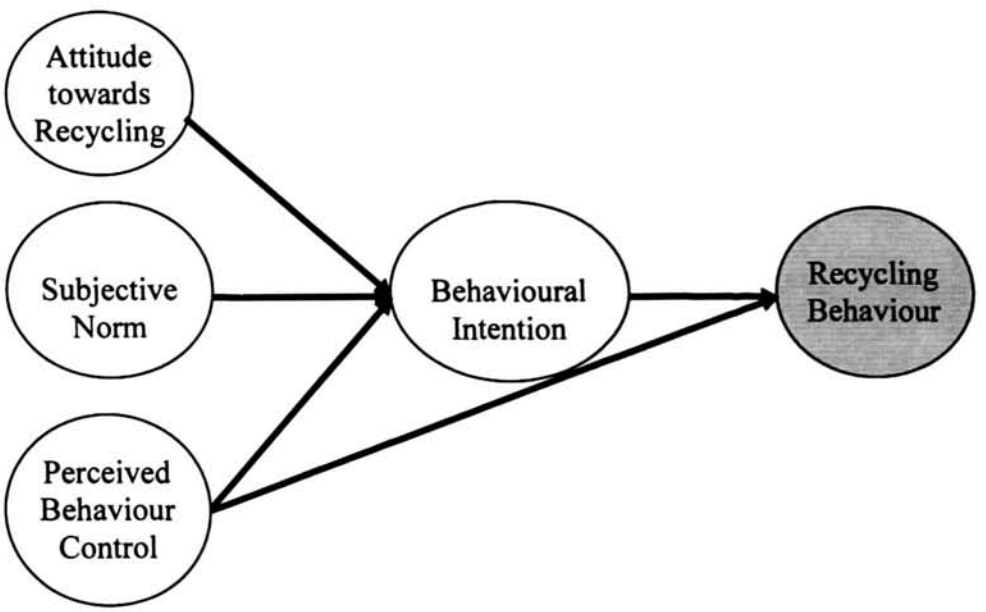

Figure 3.1.
Research Framework

As been discussed earlier in Chapter 2, most of the research used intention as dependent variable rather the actual behaviour (Armitage, 2008; Brain, 2008; Conner, Sandberg & Norman, 2010; Cordano, 1988; Hill, 2008; Kovac & Rise, 2011; Montesarchio, 2009; Taylor & Todd, 1995; Truelove, 2010; Trumbo & O'Keefe, 2001; Werder, 2002). This supported a research by Ayed (2010) that found that most of the studies on the Theory of Planned Behaviour used intention as dependent variable. Therefore, the role of behavioural intention as a mediator between attitudes towards

Therefore, the role of behavioural intention as a mediator between attitudes towards recycling, subjective norm, perceived behaviour control and recycling behaviour was discussed and presented.

3.2 Hypotheses

This study adopted the theory of planned behaviour and it is to conform the applicability of this theory on recycling behaviour of undergraduate business student from UM, UPM and UUM. Therefore, all of these constructs developed as individual hypotheses to test the recycling behaviour of undergraduate business students.

The more favourable the attitude towards recycling with respect to recycling behaviour, the stronger is the individual's intention to perform the recycling behaviour under consideration. Attitude has been found to significantly affect an individual's intention (Ajzen, 1988, 1991; Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). The relationship between attitude and intention is significant, stable, strong, consistent and positive (Brian, 2008; Cordano, 1988; Notani, 1998; Werder, 2002) and is the highest total variance compared to other variables (Joshi, 2003). Other findings also found that attitude is an important predictor to intention (Bosnjak *et al.*, 2006; Buchnan, 2005; Shih & Fang, 2004) and the main reason because intention of an individual is channelled through his/her attitude (Page & Yuding, 2003). Based on previous findings, it is hypothesized that;

Hypothesis 1: Attitude towards recycling is significantly influence behavioural intention.

Previous research showed that attitude is significantly related to behaviour (Aini *et al.*, 2002; Artbuthnot, 1977; Ebreo & Vining, 2000; Garnder & Stern, 1996; Guangnano, *et al.* 1995; Nordlund & Garvil, 2002; Oskamp, *et al.* 1991) since attitude served to guide people behaviour (Armitage & Christian, 2003). Once the attitude is specific to behaviour then it will contribute strong intent to act and follow-through (Nordlund & Garvill, 2002). However, few studies found that the relationship is inconsistent, not significant, low and weak correspondence between attitude and behaviour (Balderjahan, 1988; Hines, *et al.*, 1987; Poortinga *et al.*, 2004; Stern, *et al.*, 1995, 1999; Stern, 2000; Vining & Ebreo, 2002). This may due to omission of intention (Follows & Jobber, 1999), attitude specificity, attitude measurement and effects of external factors (Thapa, 2010). Therefore, it is hypothesized that;

Hypothesis 1a: Attitude towards recycling is significantly influence recycling behaviour.

The subjective norms pertain to the influence exercised by another individual or group towards a person exhibiting a specific behaviour. Previous studies showed that subjective norm and behavioural intention showed a significant relationship (Bozionelos & Bennet, 1999; Cordano, 1988; Zhang *et al.*, 2007). Joshi (2003) revealed that subjective norm is related to intention moderately and in the short term it has a strong impact on intention (Latimer & Ginis, 2005). Several studies showed an opposite findings that the relationship is not significant (Werder, 2002), and it does not associate or influence between subjective norm and intention (Bosnjak *et al.*, 2006; Buchnan, 2005; George, 2004; Latimer & Ginis, 2005; Shih & Fang, 2004; Wang, *et al.*, 2007).

The non-significant may due to different lifestyle, behaviour of respondent and sampling area. Thus, this study hypothesized that;

Hypothesis 2: Subjective norm is significantly associated to behavioural intention.

Several studies revealed that if subjective norm is positive than it is more positive in influencing behaviour (Taylor & Todd, 1995). Furthermore, if intention is ill performed it showed a positive relationship between subjective norm and behaviour (Sapp, *et al.*, 1995). A related study by Biswas, *et al.*, 2000 and Cordano, 1988 demonstrated that a significant and strong relationship existed between both variables. The only study that showed a weakest prediction of subjective norm towards behaviour compare other variables (theory of planned behaviour constructs) is from Armitage and Conner (2001). This may be because of measurement issue and differences among target behaviour. Therefore, it is hypothesized that:

Hypothesis 2a: Subjective norm is significantly associated to recycling behaviour.

Study by Taylor and Todd (1995) and Kokinaki (1999) demonstrated that there is a positive correlation between perceived behaviour control and behavioural intention. In fact, previous research findings stated that perceived behaviour control influence and relates to intention positively (Ajzen, 2002; Bosnjak *et al.*, 2006; Godin & Kok, 1996; Notani, 1998; Shih & Fang, 2004; Wang *et al.*, 2007). Findings by Notani (1998) showed a significant and positive correlation between perceived behaviour control and intention. Once perceived behaviour control directly affects intentions, and intentions

will directly affect actual behavior. However, finding by Cordano (1988) revealed that the regression coefficient of perceived behaviour control was significant but in reverse predicted direction. A contrary findings by Werder (2002) found that perceived behaviour control is the least significant predictor of intention and this may due to individual action whether it is within his/her control, and hence this study hypothesized that;

Hypothesis 3: Perceived behaviour control is significantly related to behavioural intentions.

Research by Notani (1998) found that perceived behaviour control is stronger predictor of actual behaviour. The more the individual is able to control, the more opportunities and resources he/she possesses that are advantageous to the manifested behaviour, then it is more likely the behaviour will occur. Perceived behaviour control may be substituted for a measure of actual behaviour depending on how accurate the perception (Ajzen, 1991). In fact, research findings by Hill (2008) on pro/anti environmental behaviour showed that perceived behaviour control significantly related to behaviour in most of the situations compare to other constructs of theory of planned behaviour. Perceived behavioral control is a concept of an individual's belief that he/she is in control of their behavior and the ability of them to perform it (Ajzen, 2002; Godin, Valois & Lepage, 1995). It is up to the individual whether or not the behavior to be performed. Based on Godin *et al.* (1995) findings, perceived behavioral control has been found to be predictors of behavior. Therefore, it is hypothesized that;

Hypothesis 3a: Perceived behaviour control is significantly associated with recycling behaviour.

Behavioural intention used as an indicator of behaviour (Schultz, 2001) and best prediction of future behaviour (Notani, 1998). In other word, behavioural intention acted to cognitive hierarchy as a precedent to actual behaviour although not perfect predictors (Vaske & Donnelly, 1999). Previous findings demonstrated that behavioural intention is highly correlates with behaviour (Beck & Ajzen, 1991; Beville, 2010; Chan, 2001; Joshi, 2003; Vaske & Donnelly, 1999) which is between 39 percent to 47 percent. However, some findings revealed although it is correlates but the path between intention and behaviour is significant but the total explained variance only within the range of 20 percent to 30 percent (Ajzen, 1991; Armitage & Connor, 2001; Cheung, *et al.*, 1999; de Brujin, *et al.*, 2008; Randall & Wolff, 1994; Sheeran, 2002; Sheeran & Orbell, 1998). Therefore, according to the theory of planned behaviour, performance of behaviour is a joint function of intentions and perceived behavioural control. Evidence concerning the relation between intentions and actions has been collected with respect to many different types of behaviours. It is found that when behaviours pose no serious problems of control, they can be predicted from intentions with considerably accuracy (Ajzen, 1991). As intentions are reported to be significant predictors of actual behaviour, it was, thus, hypothesised that:

Hypothesis 4: Behavioural intention is significantly associated with recycling behaviour.

Based on the mediating effects of proposed theoretical framework, it is hypothesized that:

Hypothesis 5: Behavioral intention mediates the relationship between attitudes towards recycling, subjective norm, perceived behaviour control and recycling behaviour.

Hypothesis 5a: Behavioral intention mediates the relationship between attitude towards recycling and recycling behaviour.

Hypothesis 5b: Behavioral intention mediates the relationship between subjective norm and recycling behaviour.

Hypothesis 5c: Behavioral intention mediates the relationship between perceived behaviour control and recycling behaviour.

Table 3.1, below listed the research hypotheses to answer the research questions of this study:

Table 3.1
Research Hypotheses

H1: Attitude towards recycling is significantly influence behavioural intention.
H1a: Attitude towards recycling is significantly influence recycling behaviour.
H2: Subjective norm is significantly associated to behavioural intention.
H2a: Subjective norm is significantly associated to recycling behaviour.
H3: Perceived behaviour control is significantly related to behavioural intention.
H3a: Perceived behaviour control is significantly associated with recycling behaviour.

Table 3.1 (Continued)

H4: Behavioural intention is significantly associated with recycling behaviour.
H5: Behavioral intention mediates the relationship between attitudes towards recycling, subjective norm, perceived behaviour control and recycling behaviour.
H5a: Behavioral intention mediates the relationship between attitudes towards recycling and recycling behaviour.
H5b: Behavioral intention mediates the relationship between subjective norm and recycling behaviour.
H5c: Behavioral intention mediates the relationship between perceived behaviour control and recycling behaviour.

3.3 Research Design

Research design referred to "the framework or blueprint for conducting a research project because it specifies the details of the procedures necessary for obtaining the information needed to structure or solve research problem" (Malhorta & Birks, 2000). This study conducted a survey method because it could be the best option to obtain personal and social facts, beliefs and attitude and also would provide the author a quantitative description of trends, attitudes, or opinions of a population (Creswell, 2006). The research design employed a primary data approach utilizing a set of structured questionnaire. The unit analysis for this study is an individual and treated as an individual data source.

The rationale of this survey research is to generalize from a sample of the population (undergraduate business students) of their recycling behaviour based on recycling campaign and activities in their universities. Survey research is preferred since because of economic reasons and speed of data collection. According to Cooper and Schindler (2006), survey research is a more accurate, less costly, and a faster method of gathering data compared to other data gathering methods such as interviews. The researcher collected the data using a self-administered survey. Self-administered surveys have several advantages; (a) allows contact with respondents, (b) wide geographic coverage at minimal cost, (c) requires less staff, and (d) respondents have time to think about the questions (Cooper & Schindler, 2006).

3.4 Operational Definition

a. **Recycling Behaviour** - a series of recycling activities adopted by students that includes using of recycle or ecology products and perform recycling activity by putting waste products (paper, glass, battery, bottles) into recycle bin.

b. **Behavioural Intention** – The undergraduate business student intent to recycle, to buy recycle product or to bringing their own container to university mall.

c. **Attitude towards recycling** – Based on the undergraduate business student cognitive belief on the important of recycling and purchase of eco-products.

d. **Subjective Norm** – The undergraduate business student belief that he or she received the social pressure from his or her peer college mate in performing recycling activities in university.

e. **Perceived Behaviour Control** – The belief about the amount of control an undergraduate business student feels he or she has over performing or participating recycling activities in the university.

3.5 Measurement of Variables/Instrumentation

The focus of this study is on recycling behaviour which encompassed five variables. TThis in line with a recommendation by Fishbein and Ajzen (1975) that stated "consistency is very important in using theory of planned behaviour and the focus of study must be same (specific) behaviour". Table 3.2, showed the total of measurement for each variables.

Table 3.2
Total of Measurement

Ser	Variables	Total Item
1.	Attitude	3
2.	Subjective Norm	3
3.	Perceived Behaviour Control	5
4.	Behavioural Intention	3
5.	Recycling Behaviour	10

3.5.1 **Dependant Variable** (Recycling Behaviour).

This study is designed to understand the behavioral tendencies based on respondents' attitudinal responses. In fact, action by an individual in a given situation is often different from what he/she actually does. The measurement for recycling behavior defined as a series of recycling activities that may be adopted by students. The activities include using of recycle or ecology products, recycling activity by putting products (paper, glass, battery, bottles) into recycle bin.

All items are common/familiar to respondents and easily performed at respective university campus and accomodation blocks. Total of ten items were selected for further analysis using seven scales. The internal consistency of the measurement by Hsu (2003) is .97 and this question was selected based on the study that is practically applied in real-world educational or social settings. The response scale is based on Likert scale from score 1 to 7 (Strongly Disagree to Strongly Agree). Table 3.3 below listed the items used to measure recycling behavior.

Table 3.3
Measurement of Recycling Behaviour

Itemss
I should use mugs instead of paper cups, use cloth instead of paper napkins and rags instead of paper towels.
I should bring my own container or reuse bags at the university mall.
I put expired batteries in the recycle bin.
I collect and recycle used paper.
I take empty bottles to a recycling bin.

Tabel 3.3 (Continued)

I should recycle paper, glass and/or metal waste products at the university or at home.
I would support the university policy that eliminates the use of paper cups and requires students to bring their own mug or container.
I talk to people that I notice doing something that harms the environment in an effort to persuade that person to stop the activity and do some recycling activity
I should set a positive environmental example (recycling) for my friends to follow.
I would support a university policy that adds a recycling fee to my course fees in order to support a campus recycling/eco-friendly campaign.

***Source**: Adapted from Hsu (2003).*

3.5.2 **Mediating Variable** (Behavioural Intention).

Behavioural Intention referred to undergraduate business student intention to recycle, to buy recycle product and bringing their own container to university mall. The measurement was adapted from Taylor and Todd (1995) with some modification to suit to the area of research. The measurements follow the guideline recommended by Ajzen (2006). The internal consistency for this measurement was .99, and Table 3.4, showed the items used to measure behavioural intention.

Table 3.4
Measurement for Behavioural Intention

Items
I intend to recycle
I intend to bring my own container or reuse bags to university mall
I intend to buy recycle products that my friends buy

***Source**: Adapted from Taylor and Todd (1995).*

3.5.3 Independent Variables

Attitude towards recycling referred to undergraduate business student behavioural information and cognitive belief on the important of recycling and using of eco-products. Attitude towards recycling is based on individual affective, cognitive and behavioural information belief on recycle which are varies according to individual strength. The measurement scale was adapted from Kibert (2000) using five-point Likert items ranging from (1) "strongly agree" to (5) "strongly disagree" and this study used a seven-point range of Likert scale. The internal consistency for this measurement was found to be .91 (Kibert, 2000). Table 3.5 displayed the measurement of items for attitude towards recycling.

Table 3.5
Measurement for Attitude towards Recycling

Items
I believe it is important for students to purchase eco-products that are environmentally safe.

Table 3.5 (Continued)

I believe it is important for students to recycle paper, cans and glass as musch as possible
I believe it is important for students to purchase paper products made from recycled paper

***Source**: Adapted from Kibert (2000).*

2. Subjective Norm referred to undergraduate business student's perception and belief that he or she will received the social pressure from his or her peer college mate in performing recycling activities in university. This measurement was adapted from Taylor and Todd (1995) and the scale ranging from (1) "strongly disagree" to (7) "strongly agree". The internal consistency was found .94 and Table 3.6 showed the measurement items for subjective norm.

Table 3.6
Measurement for Subjective Norm

Items
Most people who are important to me think I should recycle more.
Most people who are important to me think I should conserve the environment by recycling.
Most people in the university who are important to me think the natural environment is valuable and should be protected at all costs by conducting recycling activity.

***Source**: Adapted from Taylor and Todd (1995).*

3. Perceived Behaviour Control referred to the belief about the amount of control an undergraduate business student feels he or she has over in performing or participating recycling activities in the university. This measurement was adapted from Taylor and Todd (1995) and the scale ranges from (1) "strongly disagree" to (7) "strongly agree". The internal consistency was found to be .94 and Table 3.7 showed the measurement items for perceived behaviour control.

Table 3.7
Measurement for Perceived Behaviour Control

Items
Whether or not I recycle in university is entirely up to me.
I have complete control over the amount of recycling that I do in the university.
Recycling in the university takes too much effort.
I don't like to participate in environmental activities such as recycling in the university if they make my life more difficult.
Nothing can be done to increase recycling in the university.

Source: *Adapted from Taylor and Todd (1995)*

3.6 Validity and Reliability of the Instrument.

It is important to establish validity and reliability during data analysis (Creswell, 2006). Determination of content validity is judgmental, and the author accomplished this task by using a panel of people to judge how well the instrument meets the standards (Cooper & Schindler, 2003). To establish validity of the survey instrument, the author

selected a review panel (lecturers from UUM, UiTM Kedah and UiTM Perlis Campus) before pilot testing the instrument. The reviewer checked the instrument for appropriateness and readability, and helped the author to determine if the instrument measured what it purports to recycling behaviour measure.

The issue of validity and reliability for a survey instrument is an important component in research design for most social sciences. This gives the assurance that the topics included in the instrument are relevant issues pertaining to recycling behaviour among undergraduate business students. During the process of the instrument validation, the items for each variable were submitted to three (3) lecturers from UUM, two (2) lecturers from UiTM Kedah and one (1) lecturer from UiTM Perlis from 17 August 2009 to 2 September 2009 for content validity. This was followed by a pilot study in January 2010. The objectives of the pilot study were: (1) to find out potential problems that could occur in the survey process; (2) to identify the amount of time needed to respond to the instrument; (3) to observe the reaction of the students. In fact, a pilot study is to clarify the questionnaire's comprehensiveness and potential areas of ambiguity (Fink, 2006; Nardi, 2006). This procedure was used to carried out to produce a more comprehensive view of the questionnaire. The result of the pilot study was used to reword items and make it more appropriate and clearer for the actual study sample.

3.7 Data Collection Procedures

Self-administered questionnaires were used in data collection. Given the fact that the author had no direct access to the respondents, help from the head department was sought. The research instruments were hand delivered to the head departments of the

participating universities. The head of departments were told to randomly distribute the questionnaires to the undergraduate business students (registered in Bachelor of Business Administration and Bachelor of Accounting) in the Faculty of Business and Accounting of UM, Faculty of Economics and Management of UPM and College of Business of UUM. Each booklet was accompanied with a cover letter, stating the purposes of the study, confidentially of the gathered data, and instructions on how to answer the questionnaire. Participants were given an assurance of confidentiality and were told that there was no right or wrong answer to the items in the questionnaire.

To explain the purpose of the study and to seek permission from the universities, an introduction letter was sent to the head of department of respective faculty and college from UM, UPM and UUM. The introduction letter was accompanied with a sample of questionnaire. This approach was taken in order to give the head of department enough information on the objectives of the study. All the three universities allowed their undergraduate business students to participate in this study.

The setting of the study the normal classroom in the respective participating universities and the participation was voluntary. Respondents completed the questionnaire and returned it to their respective head of departments on the same day. This method produced higher response rates and at a lower cost compared to mailing them directly to each individual respondent (Litt & Turk, 1985). The data collection in UM and UPM was done consecutively. For example in UM it was done on 12 April and 13 April 2010, followed by UPM on 14 April and 15 April 2010. In UUM the data collection took five days from 20 April 2010 until 24 April 2010. The process of data

collection took approximately two weeks in the month of April 2010 (12 April until 24 April 2010). All distributed questionnaires were collected on the same day for UM and UPM, while for UUM the questionnaires were collected on the following day. The breakdown of undergraduate business student enrolled and a total sample collected from each university is shown in *Table 3.8.*

Table 3.8
The Breakdown of Sample

University	Total Enrolment Full Time Students	Sample Frame	Total Sample Frame	Sample Collected
University Malaya	**Faculty of Business and Accounting**			
	a. Bachelor of Accounting	761		
	b. Bachelor of Business Admin	404	}1165	94
University Putra Malaysia	**Faculty of Economics and Management**			
	a. Bachelor of Accounting	616		
	b. Bachelor of Business Admin	476	} 1092	96
University Utara Malaysia	**College of Business**			
	a. Bachelor of Accounting	1667		
	b. Bachelor of Business Administration	2561	} 4228	220
Total			**6485**	**410 (82%)**

3.8 Sampling

This research adopted a non-probability sampling using the convenience sampling since the information collected from the samples are conveniently available. In this case the author has identified samples of undergraduate business students from the Faculty of Business/College of Business from Universiti Malaya (UM), Universiti Putra Malaysia (UPM) and Universiti Utara Malaysia (UUM). Convenience sampling is

the best way of collecting information quickly and efficiently (Cavana, Delahaye, & Sekaran, 2001). The samples of undergraduate business students were from three (3) public universities. These groups of undergraduate business students were selected based on several reasons; 1) they have completed business ethic courses/modules, 2) they have adapted themselves the condition of the campus environment, 3) they have been exposed to management rules and regulations related to recycling issues.

On the sample size, Rascoe's (1975) rule of thumb suggested that a sample larger than 30 or less than 500 is appropriate for most of the research. If multiple regression analysis is used, the sample should be preferably ten times more than the number of variables used (Rascoe, 1975). In this study, there were five explanatory variables which are; three independent variables, one mediating variable and one dependent variable (5 x 10) and the acceptable number should be 150 samples. Based on the scientific guidelines of sample size decision by Cavana *et al.* (2001), if the total sample frame is 6485 then only 361 undergraduate business students will be the sample. Therefore to conduct the statistical analysis and to ensure a sufficient sample size based on the population, a range of 150 (as suggested by Rascoe, 1975) and 361 (as suggested by Cavana *et al.*, 2001) would represent an adequate sampling size.

3.9 Techniques of Data Analysis.

After collecting the data, the author entered all the data into the database. The researcher employed the SPSS software package version 20.0 to codify data and to facilitate analysis of data. Prior to the analysis of the data, any missing data (unanswered question) were removed. This was followed by data cleaning and testing the normality

using Skewness and Kurtosis. The next step was applying the boxplot by identifying the median positioned in the centre of the box. If the median is closer to the top of the box, then the distribution is negatively skewed and if it is closer to the bottom it is positively skewed. Through the identification from the boxplot, the outliers will be determined. Statistical techniques that were employed include; descriptive statistics (to describe the characteristic of respondents), factor analysis and reliability analysis (to test the goodness of measures), correlation analysis (to describe relationship between variables), and hierarchical regression analysis (to test the impact of independent variables on dependant variables, as well as the influence of the mediating variable between independent variables and dependant variable).

3.9.1 Goodness of Measure

In nearly all cases, measurement items should undergo the process of data testing to establish the goodness of data. It is imperative that all measurement items listed in the questionnaire accurately measure study variables (Cavana *et al.*, 2000). The use of good instruments has been proven to ensure accurate and reliable results which subsequently enhance the scientific quality of a research. However, to ascertain the accuracy of measurement in this study, all items had undergone the process of data testing the goodness of data by applying both validity and reliability analyses on them.

3.9.1.1 Factor Analysis

The first goodness of measure is factor analysis. Factor analysis is a multivariate statistical approach that was used to analyse interrelationship among large number of variables and it is an interdependence technique, whose primary purpose is to define the

underlying structure among variables in the analysis (Hair *et al.*, 2006). It is a statistical technique used for reducing a large number of variables to a meaningful, interpretable and manageable set of factors. In assessing the appropriateness of factor analysis, the minimum requirement is to have at least five times as many observations as there are variables to be analysed. The more acceptable size would have a ten-to-ten ratio (Hair, Anderson, Tatham & Black, 2006) or commonly known 'ten rule of ten'. Assumptions recommended by Hair *et al.*, (2006) in conducting factor analysis are as follows:

1. When partial correlation is low, then only the true factor exists because the variable could be explained by the factors (variates with loading for each variable). However, no true underlying factors will exists when the partial correlations is high. Thus, larger partial or anti-image correlations (negative value of the partial correlation) might implicate a data matrix which is not suited for factor analysis (Hair *et al.*, 2006).
2. The *Kaiser-Meyer Olkin measure of sampling adequacy* (KMO) is another measure to quantify the degree of intercorrelations among the variables and the appropriateness of the factor analysis. As mentioned by Hair *et al.*, (2006), the index ranges from 0 to 1, whereby 1 entails each variable is perfectly predicted without error by the other variables. The guidelines for interpretations are as follows; 1) *.80 or above is meritorious*, 2) *.70 to .79 is middling*, 3) *.60 to .69 is mediocre*, 4) *.50 to .59 is miserable*, and 5) *.49 below is considered unacceptable*. The guideline also extended for both the overall test and each individual variable.

3. To determine the appropriateness of factor analysis the *Bartlett's test of sphericity,* this examines the presence of sufficient number of significant correlations among the variables. Purposively, it could provide the statistical probability that the correlation matrix had significant correlations among some of the variables. The *Bartlett's test of sphericity* is at least significant at .50 which indicates sufficient correlations exist among variables.
4. The *varimax orthogonal rotation* was used for data interpretation because this rotation seemed to be well developed and also widely used by researchers due to its availability in the computer packages. The outcomes of the rotation have revealed the factor loadings of the variables. Hair *et al.* (2006) stated that the practical significance guideline of factor *loading* as follow:
    a. Factor loading in the range ± 0.30 to ± 0.40 cosidered meet minimal level for interpretation and ± 0.40 is considered important.
    b. Loading ± 0.50 or greater considered practical significance.
    c. Loading exceeding ± 0.70 indicate well define structure.
    d. Although Hair *et al.* (2006) recommended the significant factor guidelines for sample size 412 is .30, but in this study the significant factor loading is .50 as suggested by Hair *et al* (2006) that loadings of ± 0.50 were considered practical significance.
5. The *anti-image correlation* of items is greater than .50.
6. The *communalities* of items must be greater than .50, and any communalities less than .50 as not having sufficient explanation.
7. The *eigenvalues* is considered more than1 for the factor analysis extraction.

In addition to these assumption, the criterion for factors extraction used in this study was latent root or given values greater than 1, whereby all factors with latent roots less than 1 considered insignificant and subsequently disregarded. Concurrently, the screen test criterion was applied to identify the optimum number of factors that needed to be extracted before the amount of unique variance began to dominate the common variance structure (Hair *et al.*, 2006)

3.9.1.2 Reliability Analysis.

The second goodness of measure applied was reliability analysis which is practically used to test the internal consistency of all measurement items. After the confirmation of dimension was established from the three separate factor analysis, the reliability testing for each dimension was conducted to obtain Cronbach's alpha reliability coefficients for all new established dimensions.

Reliability is the degree to which a study variable measures what it intends to measure or project its true value. Therefore, if the same measure used repeatedly, more reliable measures shows greater consistency than less reliable measure (Hair *et al.*, 2006) and Cronbach's alpha coefficient will assess the reliability of each factor. Nunnally (1978) suggest using Cronbach's alpha, where a value greater than .70 that indicates good internal consistency. Hair *et al.* (1998) also proposed that realibility estimates between .60 to .70 represent the lower limit of acceptability in quantitative research studies. If research is conducted on the explorartory nature of research, alpha value greater than .60 is considered adequate (Chen & Chai, 2010:31). In general, Sekaran (2000) suggested that the Cronbach's alpha less than .60 ($\alpha < .60$) is poor, if

alpha value more than .70 ($\alpha > .70$) is acceptable, and those over .80 ($\alpha > .80$) considered good. Thus, the higher the alpha value or the closer the reliability coefficient to 1.0, the higher the reliability of the measurement items (Sekaran, 2000).

3.9.2 Descriptive Statistics

Descriptive statistics is to show the general perception of respondents on each category of the questionnaire which includes frequency, percentages, mean and standard deviation (Cavana *et al.*, 2001). It enables the author to know how frequent a certain phenomenon occurs and the mean average score of a set of data collected including the extent of the variability in the set (Sekaran, 2000). Mean score and standard deviation were used to determine central tendency and variance from the mean. Mean scores were computed by equally weighting the mean of all items in each construct. The measurement items used for these variables were *seven-point Likert scale*. All valid cases were analyzed on all variable; independents (3), mediator (1) and dependent (1). For the purpose of interpretation, the range of seven-point interval scale was categorized into equal sized categorizes of low, moderate and high. Subsequently, the mean scores of less than 3.00 {(6/3 + lowest value (1)} was treated as low; mean scores of 5.00 {(highest value (7) - 6/3} were treated as high and those values between 3.00 to 5.00 were treated as moderate level.

3.9.3 Correlation Analysis

Pearson correlation analysis was used to describe the strength, direction and strength of the bivariate relationship of all the variables. In the present study, the

computation of the Pearson correlation coefficients was performed to understand the relationship between three main variables; independent, dependant and mediating.

The values of the correlation coefficients (r) imply the strength of the relationship between the variables under investigation. The positive and negative signs indicate the direction of the relationship. A positive correlation indicates that as one variable increases, the other variable increases. A negative correlation indicates that as one variable increases the other variable decreases (Hair *et al.*, 2006; Sekaran, 2000). The value of the correlation coefficient ranged from – 1 to + 1, and a perfect correlation of 1, or – 1 implied that the value of one variable can be determined exactly by knowing the value of the other variables. The value of + 1 indicates a perfect positive relationship, 0 indicates no relationship and – 1 indicates a perfect negative or reverse relationship (Hair *et al.*, 2006).

All the five constructs of this study were tested for correlation analysis. The reason for conducting this analysis is to verify whether multicollinearity among variables exists and also to investigate the bivariate relationship between variables (Hair *et al.*, 2006; Sekaran, 2000). Multicollinearity normally represents the degree to which a variable can be explained by other variables in the analysis. Thus, it is important to verify the degree of multicollineraity before running regression analysis because it may complicate the interpretation of the variation as it is more difficult to determine the effect of any single variable (Hair *et al.*, 2006). Specifically, as multicollinearity increase it may complicate the interpretation of the variationas it is more difficult to ensure the effect of any single variable in the study (Hair *et al.*, 2006). Thus,

multicollinearity exists whenever the correlation coefficient exceeds 0.80 (Berry & Feldman, 1985).

The correlation analysis of this study was subjected to two-tailed test of statistical significance at two different levels: highly significant ($p < 0.01$) and significant ($p < 0.05$). The strength of the relationship between variables was interpreted in terms of their correlation coefficient based on Rowntree (1981) guidelines as follows; 0 to 0.2 is very weak, negative; 0.2 to 0.4 is weak, low; 0.4 to 0.7 is moderate; 0.7 to 0.9 is strong, high marked; and 0.9 to 1.0 is very strong, very high.

3.9.4 Multiple Regression Analysis

Since correlation analysis does not provide the answer as to how much the variance in a dependent (criterion) variable can be explained when several independent variables are theorized to concurrently influence it, a multiple regression analysis is normally used to serve the purpose. According to Hair *et al.* (2006), multiple regression analysis appears to be the most extensively used multivariate technique to answer two main researches; to predict and/or explain.

Although the procedure for calculating the statistical in multiple regression analysis and a hierarchical regressions analysis are similar, the analysis processes of both regressions seem to be different. In multiple regression, the decision on which variable to enter is basically depended upon the statistical criteria and only one variable is entered at each stage of analysis.

3.9.5 Hierarchical Regression Analysis

A mediator is an intervening variable which accounts for the relationship between the predictor and the outcome. For this study, in order for behavioural intention of undergraduate business students to be considered a mediator, the variable must account for the relationship between the three predictors; namely attitude towards recycling, subjective norm and perceived behaviour controls, with recycling behaviour among undergraduate business students.

Thus, to test the mediator relationship, the multiple regression analysis was also performed according to the method and steps suggested by MacKinnon, Warsi and Dwyer (1995) and Baron and Kenny (1986). According to MacKinnon *et al.* (1995), mediation is generally present when:

1. Step 1 - The Independent Variable (IV) significantly affects the Mediator Variable (MV).
2. Step 2 - The IV significantly affects the DV (Dependant Variable) in the absence of the MV.
3. Step 3 - The MV has a significant unique effect on the DV.
4. Step 4 - The effect of IV on the DV shrinks upon the addition of the MV to the model.

In step 1 to step 3, all variables must produce a significant result. Any of variable produced insignificant result should be dropped for step 4. To test whether a full or partial mediator in the relationship, the author utilized the steps suggested by Baron and Kenny (1986). In step 1, the independent variables were regressed on the dependent

variable. In step 2, the mediating variable was introduced to examine the effect of the mediating variable on the relationship between the independent variables and the dependent variable. The full mediating effect exists if the impact of the independent variables on the dependent variable controlling the mediating variable is insignificant. As for the partial mediating effect, it exists when the standardized beta of the relationship between the independent variables and dependent is reduce but still significant.

However, before conducting the analysis, the data were first examined to detect any serious violations on the three main assumptions underlying the regression analysis specifically linearity, homoscedasticity and normality of the error distribution (Hair *et al.*, 2006). The first assumption was related to linearity issue. In multiple regression with more than one independent variable like the current study, linearity was assessed through an analysis of partial plots which exhibit the relationship of a single independent variable to the dependent variable. (Hair *et al.*, 2006).

Secondly, the assumption of homoscedicity (equal variance) could be observed through residual plots. To diagnose any heteroscedasticity (unequal variance) among variable, the residual can be plotted against the predicted dependent values and then compare them with the null plot (Hair *et al.*, 2006). The scatter plots depicted no discernible patterns, which indicate homoscedasticity in the multivariate (the set of independent variables) cases. Finally, the assumption of normality of the error term distribution was examined through normal probability plot (P – P) of the regression standardized residual.

3.10 Conclusion

In this chapter, the theoretical framework of theory of planned behaviour and research methodology including research design, sample design, questionnaire design, data collection and statistical technique were discussed. The purpose of this study is to identify the relationship between the attitude towards recycling, subjective norm, perceived behaviour control toward behavioural intention, and recycling behaviour of undergraduate business students. Descriptive statistics is used to get a general understanding of the population. Correlation analysis is used to better understand the relationship between the Theory of Planned Behaviour constructs. Hierarchical multiple regression analysis identified the relationship between three independent variables with the mediator, and the mediator with the dependent variable.

CHAPTER FOUR

RESEARCH FINDINGS

4.0 Introduction.

This chapter presents the results of data analysis performed using SPSS (version 20.0) statistical package. Discussions in this chapter are divided into three main sections namely: (1) the overview of data collected comprising of explanations on the response rate and demographic profile of respondents; (2) analysis on the goodness of the measures of the study variables to test their validity and reliability; and (3) the results of the findings for the hypothesized model.

4.1 Response Rate

A total of 500 sets of questionnaire had been distributed to the selected respondents and 410 (82 percent) questionnaires were returned. However, only 387 (77.4 percent) of the questionnaires were completed whereas 23 questionnaires were excluded because a large portion of the survey was not answered. Next, a parametric statistical testing was performed to check on the data set. This is to ensure that no influential outlier exists and the said data used do not violate the normality assumption required for hypothesis testing. The outliers based on the box plot chart indicated the outliers in this study. Total of 17 questionnaires were rejected from 387 questionnaires due to outliers and only 370 questionnaires (74 percent) were coded, analyzed and used for hypotheses testing. Result for skewness and kurtosis, histogram and boxplot during data cleaning are attached in **Appendix B** and the questionnaire used in this study is shown in **Appendix C.**

4.2 Respondent's Demographic Profile

This section elaborates on the respondents' demographic profile as stated and answered by the respondents. Among the respondents' profiles obtained are their gender, age group, marital status, institution enrolled, program registered, and years of study, resident and hometown status.

The sample consisted of 370 undergraduate business students registered in three public universities (Universiti Malaya, Universiti Putra Malaysia and Universiti Utara Malaysia). The majority of the sample were female (n = 276; 74.6 percent) compared to male. (n = 94; 25.4 percent). This distribution is the true reflection of registered students in most public institutions of higher learning in Malaysia with the majority of females pursuing tertiary studies compare to male. With regard to age, the majority of the samples were between 21 to 30 years old (n = 303; 81.9 percent), followed by the 18 to 20 years old range (n = 65; 17.6 percent) and 2 students (0.5 percent) were between 31 to 40 years old. The respondents' marital status was predominantly single (n = 358; 96.8%) which reflects the real population proportion of students in higher institutions in Malaysia that registered in the undergraduate programs, and only 2.7 percent (n = 10) were married.

The majority of respondents were from Universiti Utara Malaysia (n = 205; 55.4 percent), followed by Universiti Putra Malaysia (n = 84; 22.7 percent) and Universiti Malaya ((n = 81; 21.9 percent). This is due to the sampling frame of respondents

registered in faculty/school of business in those universities, where the total number of business students in Universiti Utara Malaysia is 4228 students (65 percent), Universiti Malaya registered only 1092 students (16.8 percent) and Universiti Putra Malaysia only 1165 students (18.0 percent). Majority of the respondents were in their third year (n = 119; 32.2 percent), followed by fourth year (n = 105; 28.4 percent), second year (n = 87; 23.5 percent), and first year students (n = 57; 15.4 percent). About 330 (89.2 percent) respondents stayed on campus whereas 40 (10.8 percent) respondents stay outside the campus. Most of the respondents were from urban areas contributed 51.9 percent (192 respondents) and 170 respondents were from rural areas (45.9 percent). *Table 4.1* provides the summary of the respondents' profiles. The SPSS output is provided in **Appendix D**.

Table 4.1
Summary of Respondents' Demographic Profile

Profiles	Categories	Frequency	Percentage
Gender	Male	94	25.4
	Female	276	74.6
Age Group	18 – 20	65	17.6
	21 – 30	303	81.9
	31 – 40	2	0.5
Marital Status	Single	358	96.8
	Married	10	2.7
	Others	2	0.5
Institutions	UUM	205	55.4
	UM	81	23.5
	UPM	84	22.7
Year of Study	First year	57	15.4
	Second year	87	23.5

Table 4.1 (Continued)

	Third year	119	32.2
	Fourth year	105	28.4
	Missing	2	0.5
Resident	On Campus	330	89.2
	Off Campus	43	10.8
Hometown Status	Rural	170	45.9
	Urban	192	53.9
	Missing	2	2.2

4.3 Goodness of Measures

As mentioned in Chapter 3, the goodness of measures must be utilized to test the validity and reliability of a measurement scale used in a study including factor and reliability analysis. The goodness of measures reduced the number of items to a smaller set of factors and has proven to enhance the credibility of the measurement scales and subsequently increases the level of reliability.

4.3.1 Factor Analysis

The factor analysis established whether a common factor or more than one factor is present in the response to the items. Some items sometimes represent the same ideas of certain items that were going to be explored. The aim of factor analysis is: (1) to understand the underlying structure in the data matrix, (2) identifying the most parsimonious set of variables, and (3) to establish the goodness of measures for testing the hypotheses (Hair *et al.*, 2006). The significant factor loading of this study is .50 as suggested by Hair *et al* (2006) that loadings of ± 0.50 were considered significance acceptable.

4.3.1.1 Factor Analysis on Independent Variables

Initially, the principal component analysis method was first run. It was discovered that all three factors met the selection criteria of given values greater than 1.0 which also explained a total variance of is more than 50 percent. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (MSA) value of 0.746 exceed the recommended value of 0.50 as the practically significant loading (Hair *et al*, 2006) and it indicates that the items were interrelated and share a common factor. The Bartlett's test of sphericity (a test for the presence of correlation and not the pattern of these correlations) was significant (Chi square = 803.325, p = .000). These results validated the adequate number of significant inter-correlations required of a variable and the appropriateness of factor analysis (Hair *et al*, 2006). The full SPSS output is given in **Appendix E**.

Based on Table 4.2, the discussions for each factor are given as follows:

(1) **Factor 1** - Factor 1 consists of three items (A1, A2, A3) that recorded factor loading more than .50 (significant loading) ranging from 0.642 to 0.862. The eigenvalue is 2.173 with 24.145 percent of the total variance in the data Therefore this factor is labelled as **Attitude towards Recycling**.

(2) **Factor 2** - This factor was represented by three items. The factor loading for all items were recorded ranging from 0.587 to 0.815. The eigenvalue is 1.862 with 20.686 percent of the total variance in the data. Thus, all items were retained and this factor labelled as **Subjective Norm**.

(3) **Factor 3** - This factor represented by two items P1 and P2 that recorded more than 0.50 (significance level) and the factor loading accounted 0.778 and 0.844 respectively. The eigenvalue of this factor is 1.606 percent accounted for 17.844 percent of the total variance in the data. This factor labelled as **Perceived Behaviour Control.**

Table 4.2
Rotated Factors and Factor Loading for Attitude towards Recycling, Subjective Norm and Perceived Behaviour Control (Independent Variables)

Item	Components		
	1	2	3
Attitude towards Recycling			
I believe it is important for students to purchase eco-products that are environmentally safe.	**.804**	.147	
I believe it is important for students to recycle paper, cans and glass as much as possible.	**.862**		
I believe it is important for students to purchase paper products made from recycled paper.	**.642**	.217	.220
campus such as those caused by air or water pollution.			
Subjective Norm			
Most people who are important to me think I should recycle more.	.162	**.815**	
Most people who are important to me think I should conserve the environment by recycling.	.138	**.728**	.184
Most people in the university who are important to me think the natural environment is valuable and should be protected at all costs by conducting recycling activity	.411	**.587**	
Perceived Behaviour Control			
Whether or not I recycle in university is entirely up to me.	.108	.204	**.778**
I have complete control over the amount of recycling that I do in the university.	.226		**.844**
Whether or not I implement more pollution prevention practices in the university is within my control.	-.307	.452	.441
Eigenvalue	2.17	1.86	1.60
Total Variance Explained	24.14	20.68	17.84
KMO	**.746**		
Bartlett's Test of Sphericity	**803.3**		

4.3.1.2 Factor Analysis on Dependent Variable

This factor consists of nine items. Initially in the first analysis, item B3 recorded low factor loading 0.447 and this item was dropped. In the second analysis, all eight items recorded values ranging 0.592 to 0.753 which is more than 0.50 of significance loading suggested by Hair *et al.* (2006). The eigenvalue is 3.756 accounted for 46.954 percent of the variance in the data. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (MSA) value of 0.845 exceed the recommended value of 0.50 as the practically significant loading (Hair *et al*, 2006) and it indicates that the items were interrelated and share a common factor. The Bartlett's test of sphericity (a test for the presence of correlation and not the pattern of these correlations) was significant (Chi square = 1025.154, p = .000).The factor loading for dependent variable is shown on Table 4.3 and the SPSS output is given in **Appendix F**.

Table 4.3
Rotated Factors and Factor Loading for Dependent Variables

Item	Components 1
I should bring my own container or reuse bags at the university mall.	**.677**
I collect and recycle used paper.	**.753**
I take empty bottles to a recycling bin.	**.719**
I should recycle paper, glass and/or metal waste products at the university or at home.	**.757**
I would support the university policy that eliminates the use of paper cups and requires students to bring their own mug or container.	**.617**
I talk to people that I notice doing something that harms the environment in an effort to persuade that person to stop the activity and do some recycling activity.	**.749**
I should set a positive environmental example (recycling) for my friends to follow.	**.592**
I would support a university policy that adds a recycling fee to my course fees in order to support campus recycling/eco-friendly campaign.	**.527**

Table 4.3 (Continued)

Eigenvalue	3.756
Total Variance Explained	46.95
KMO	**.845**
Bartlett's Test of Sphericity	**1025.1**

4.3.1.3 Factor Analysis on Mediating Variable

The factor analysis for mediating variables consists of three items of behavioural intention. In the first analysis, two items recorded more than .80 (I2 = 0.882 and I1 = .853) and one item (I3 - *I intend to buy recycle products that my friends buy*) accounted low factor loading (0.394). This item was dropped for futher analysis. In the second analysis, item I1 and I2 recorded the same loading (0.893). However, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (MSA) value only recorded 0.50 which is at par or equivalent with the recommended value of 0.50 as the practically significant loading (Hair *et al*, 2006). The Bartlett's test of sphericity (a test for the presence of correlation and not the pattern of these correlations) was significant (Chi square = 167.369, $p = .000$). The eigenvalue is accounted for 1.593, and recorded 79.67 percent of the total explained variance. The SPSS output is given in **Appendix G** and factor loading for mediating variable as shown on Table 4.4..

Table 4.4
Rotated Factors and Factor Loading for Mediating Variables

	Components
Item (As in the Questionnaire)	**1**
I intend to recycle	**.893**
I intend to exercise by bringing my own container or reuse bags to university mall	**.893**
Eigenvalue	1.593
Total Variance Explained	79.67
KMO	**.50**
Bartlett's Test of Sphericity	**167.3**

4.3.2 Reliability Analysis

The reliability for each measure was examined by computing its Cronbach's alpha. The reliability of a measure indicates the stability and consistency of the instrument in measuring a concept and helps to assess the goodness of a measure (Sekaran, 2003). Nunnally (1978) suggested the Cronbach's value greater than .70 that indicates good internal consistency. Hair *et al.* (1998) also proposed the internal consistency between .60 to .70 represent the lower limit of acceptability. Suggestion by Sekaran (2003), the minimum acceptable reliability is set at .60. The findings of this study showed that the reliability for attitude towards recycling (.751), recycling behaviour (.825) and behavioural intention (.745) are above .70 (good internal consistency as suggested by Nunnally, 1978). The remaining variables, subjective norm (.674) and perceived behaviour control (.644) is below than .70 value but were close enough to be considered reliable and as suggested by Sekaran (2003) that .60 can be accepted as minimum acceptable reliability. As shown in Table 4.5, the Cronbach's alphas for all variables and the SPSS output is provided in **Appendix H.**

Table 4.5
Reliability Coefficient for the Study Variables

No	Variables	Number of New Items	Reliability
	Independent Variables		
1	Attitude towards Recycling	3	.751
2	Subjective Norm	3	.674
3	Perceived Behaviour Control **	2	.644
	Mediating Variable		
4	Behavioural Intention	2	.745
	Dependent Variable		
5	Recycling Behaviour	8	.825
	Total Measurement Items	18	

Note: ** recoded to positive statement.

4.3.3 Descriptive Analysis

Descriptive analysis was able to provide an overview of the respondent's perception of the variables. This analysis also was conducted to ensure the validation and reliability processes to ascertain the mean scores and standard deviation for the constructs. The mean score of the items in each of the factors was then used for hypotheses testing. The means and standard deviations of the study variables are shown in Table 4.6. As discussed earlier in Chapter 3, there were five variables; independent (3), mediator (1) and dependent (1). The mean score of less than 3.00 {(6/3 + lowest value (1)} was treated as low; mean score ofmore than 5.00 {(highest value (7) - 6/3} was treated as high and those values in between 3.00 to 5.00 were treated as moderate level.

In the intial analysis the items of perceived behaviour control recorded low mean scores (3.64) compare to other variables. However, after perceived behaviour control was computed and re-coded to the positive statement. The results showed the mean score increase to 4.56. Overall, the results demonstrated that the mean scoresfor individual items are ranging from as below as 4.66 (moderate level) to the highest of 5.86 (highest level) and no low level of mean score. Attitude towards recycling (5.68), subjective norm (5.19) and behavioural intention (5.27) recorded high level mean score. Recycling behaviour and perceived behaviour control recorded moderate level at 4.85 and 4.36 respectively. This implicates that all independent variables (attitude towards recycling, subjective norm and perceived behaviour control) influence dependent variable (recycling behaviour). The high mean scores (5.27) of the mediating variable

conform that behavioural intention mediates all independent variables to recycling behaviour.

Based on this finding, it showed that the attitude towards recycling influenced more than other independent variables toward recycling behaviour. This implicates that once the respondents possessed a positive attitude towards recycling, the possibility to recycle will be higher. Therefore, their attitudes towards recycling depend on the level of knowledge and information he/ she has on the importance and benefit of recycling. This was followed by the subjective norm and perceived behaviour control. The standard deviations for all variables seem to fall between the ranges of 0.960 to 1.468, which reflect the existence of considerably acceptable variability within the data set. This indicates that all answers on the studied variables were substantially different from one respondent to another, thus signifying the existence of tolerable variances in responses.

The descriptive statistic for each item is shown in Table 4.6 and for principal construct as shown on Table 4.7. The highest mean scores among is item are from the attitude towards recycling dimension (5.85). The highest item is '*I believe it is important for students to recycle paper, cans and glass as much as possible*'. This implicates that the respondents believed the importance of recycling and reusing recycled products for the benefit of the organization and the community. The lowest mean score item was 4.66 (moderate level) from the perceived behaviour control item '*I like to participate in environmental activities such as recycling in the university if they make my life more difficult*' (positive statement) and if the statement is in negative statement the mean score is only 3.64. This implicate that the respondent felt that the success of the recycling

activity is the university's responsibility and students have low influence towards these issues. This is similar with the findings by Omran *et al.* (2009) that most of the households in Alor Setar, Kedah felt that the environmental issue is the government's responsibility. In fact, recycling is not compulsory but only a voluntary effort. However, if a student wants to recycle but the facilities is not provided by the university then he/she unable to perform this behaviour. Therefore, it is university responsibilities to provide recycling bin and reward to student that perform recycling in the campus. The SPSS output as shown on **Appendix I**.

Table 4.6
Descriptive Statistic for Each Item

Variables / Items	**Mean**	**SD**
Attitude towards Recycling		
I believe it is importance for students to recycle paper, cans and glass as much as possible.	5.76	1.827
I believe it is importance for students to purchase paper products made from recycled paper.	5.85	1.232
I believe it is important for students to purchase eco-products that are environmentally safe.	5.41	1.559
Subjective Norm		
Most people who are important to me think I should recycle more.	5.23	1.367
Most people who are important to me think I should conserve the environment by recycling.	4.90	1.410
Most people in the university who are important to me think the natural environment is valuable and should be protected at all costs by conducting recycling activity.	5.37	1.291
Perceived Behaviour Control *(Recode to Positive)*		
Something can be done to increase recycling in university.	4.92	1.365
I like to participate in environmental activities such as recycling in the university if they make my life more difficult.	4.66	1.193
Behavioural Intention		
I intend to recycle	5.28	1.248
I intend to exercising by bringing my own container or reuse bags to university mall	5.38	1.393

Table 4.6 (Continued)

Recycling Behaviour		
I should bring my own container or reuse bags at the university mall.	4.92	1.393
I collect and recycle used paper.	4.75	1.440
I take empty bottles to a recycling bin.	4.69	1.551
I should recycle paper, glass and/or metal waste products at the university or at home.	5.15	1.225
I would support the university policy that eliminates the use of paper cups and requires students to bring their own mug or container.	5.05	1.352
I talk to people that I notice doing something that harms the environment in an effort to persuade that person to stop the activity and do some recycling activity.	4.71	1.349
I should set a positive environmental example (recycling) for my friends to follow.	5.22	1.297
I would support a university policy that adds a recycling fee to my course fees in order to support campus recycling/eco-friendly campaign.	4.52	1.841

Table 4.7
Descriptive Statistics of all Principal Constructs (N=370)

Variables	Mean	SD	The results represent that respondent.....
Independent Variables			
Attitude towards Recycling	5.68	1.00	Have a high positive attitude on recycling
Subjective Norm	5.19	0.98	Friends play an important role in influencing respondents
Perceived Behaviour Control	4.56	1.46	Have a satisfactory control over recycling activity
Mediating Variable			
Behavioural Intention	5.27	0.96	Have high intent and committed to recycle
Dependent Variable			
Recycling Behaviour	4.85	1.16	Frequently engage and perform recycling behaviour activities

4.3.4 Correlations Analysis

The correlations analysis identifies the inter-correlation among the study variables. The correlations among the variables are reported in Table 4.8. The attitude towards recycling variable was significantly correlated with behavioural intention

(Hypothesis 1) and recycling behaviour (Hypothesis 1a). The subjective norm variable also was significantly correlated with behavioural intention (Hypothesis 2) and recycling behaviour (Hypothesis 2a). The perceived behaviour control also was significantly correlated with behavioural intention (Hypothesis 3) and recycling behaviour (Hypothesis 3a). For behavioural intention, as expected it is significantly correlated with the recycling behaviour (Hypothesis 4). The correlation results conforms that there is a significant association amongst the dependant and independent variables, the dependent variables and mediating variable.. The analysis demonstrated a multi-collinearity does not exist in this study because the correlation coefficient (*r*) is less than .80 (Berry & Feldman, 1985) and variables are ready for subsequent regression analyses. The SPSS output is provided in **Appendix J.**

Table 4.8
Pearson Correlations of Study Variables (N=370)

	Recycling Behaviour	**Attitude towards Recycling**	**Subjective Norm**	**Perceived Behaviour Control**	**Behavioural Intention**
Recycling Behaviour	1				
Attitude towards Recycling	.423**	1			
Subjective Norm	.448**	.425**	1		
Perceived Behaviour Control	.359**	.284**	.343**	1	
Behavioural Intention	.569**	.465**	.388**	.237**	1

** Correlation is significant at the 0.01 level (2-tailed).

Table 4.9, listed the correlation results based on the research hypotheses:

Table 4.9
Correlation of Research Hypotheses

Hypotheses	Correlation
H1: Attitude towards recycling significantly influence behavioural intention.	.465
H1a: Attitude towards recycling significantly influence recycling behaviour.	.423
H2: Subjective norm is significantly associated to behavioural intention.	.388
H2a: Subjective norm is significantly associated to recycling behaviour.	.448
H3: Perceived behaviour control is significantly related to behavioural intentions.	.237
H3a: Perceived behaviour control is significantly associated with recycling behaviour.	.359
H4: Behavioural intention is significantly associated with recycling behaviour.	.569

4.3.5 Multiple Regression Analysis

The overall inspection on the data demonstrated that there was no serious violation of the three main assumptions; 1) linearity issues, 2) homoscedasticity, and 3) normality of the error term distribution. Therefore, all the data are ready to regress and the hierarchical regression analyses is based on the standard coefficient beta (β) and *R* square which provides evidence of whether to support or not to support the hypotheses. The hierarchical regression analysis was performed to examine the relationship between the independent variables and the dependent variables. According to MacKinnon *et al.* (1995), mediation generally is present when:

1. The Independent Variable (IV) significantly affects the Mediator Variable (MV).
2. The IV significantly affects the DV (Dependant Variable) in the absence of the MV.
3. The MV has a significant unique effect on the DV.
4. The effect of IV on the DV shrinks upon the addition of the MV to the model.

A mediator is an intervening variable, which accounts for the relationship between the predictor and the outcome. For this study, in order for behavioural intention of undergraduate business students to be considered a mediator, the variable must account for the relationship between the three predictors; namely attitude towards recycling, subjective norm and perceived behaviour controls, with recycling behaviour. A full mediation exists if step 4 produced an insignificant results, whereas, if significant result is obtained then a partial mediation exists (Baron & Kenny, 1986).

4.3.5.1 Discussion on Full Regression Model

This section discussed the four step result obtained from the hierarchical multiple regression analysis.

4.3.5.2 Relationship between Independent Variables and Mediating Variable

Multiple regression analysis was carried out to test the direct relationship between independent variable (attitude towards recycling and subjective norm) and mediating variable (behavioural intention). The illustration is as shown in *Figure 4.1*.

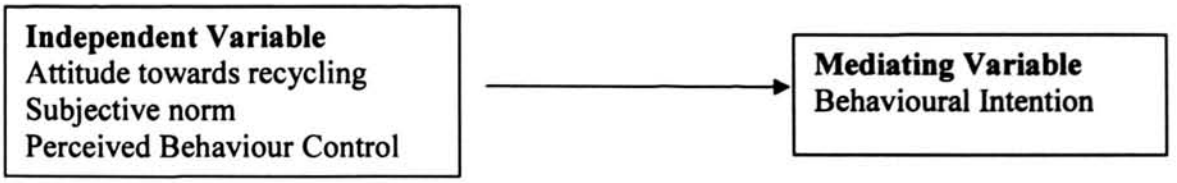

Figure 4.1
The Relationship between Independent Variables and Dependent Variable

This regression analysis is to test hypotheses 1, 2 and 3 and it was hypothesized that both independent variables have a significant relationship. It is to determine the relationship of independent variables and mediating variable. The result of the regression analysis is as shown on Table 4.10 and the SPSS output is provided in **Appendix K.**

Table 4.10
Relationship between Independent Variables and Mediating Variable

Independent Variables	**Standard Coefficient Beta (β)**	**Significance**
Attitude towards Recycling	**.355**	.000*
Subjective Norm	**.216**	.000*
Perceived Behaviour Control	**.061**	.205
R Square	**.264**	
Adjusted R Square	.257	
F Change	43.653	
Sig. F Change	.000	

Note: * < .001.

Based on Table 4.9, it was found that attitude towards recycling and subjective norm influenced behavioural intention except for perceived behaviour control. The standardized coefficient beta of attitude towards recycling ($\beta = .355$, $p < .001$) and subjective norm ($\beta = .216$ $p < .00$), shows the variables are significantly associated with

behavioural intention. However, perceived behaviour control is not siginificant with standard coefficient is only at $\beta = .061$. The independent variables explained 26.4 percent ($R^2 = .264$) of the variance of behavioural intention.

Results for individual independent variable demonstrated that attitude towards recycling explained more compared to other variables and this result is similar with the previous findings that attitude towards recycling is the most consistent predictor of behavioural intentions in all cases and contributed to a larger absolute coefficient compare to the other constructs of theory of planned behaviour (Cordano, 1988; Joshi, 2003; Lindenberg & Steg, 2007; Morwitz & Fitzmons, 2004; Notani, 1998; Taylor & Todd, 1995; Trumbo & O'Keefe, 2001; Werder, 2002). This means that as the respondent's attitude towards recycling increased, their intention to engage in recycling activities will also increase.

Previous research on subjective norm contributed mixed findings. The result of this study showed that subjective norm is significant and similar with finding by Park *et al.* (1988) that recorded a significant relationship between subjective norm and behavioural intention to recycle. However, findings from Bosnjak *et al.* (2006); Buchnan (2005); George (2004); Shih & Fang (2004); Wang *et al.* (2007); Taylor and Todd (1995); and Werder (2002) produced opposite findings. In fact, findings from Taylor and Todd (1995) revealed that subjective norm is negatively correlated with intention to recycle. This may be due to the maturity of the recycling program. Since the focus of this study involved students, subjective norm play a lesser role in influencing behavioural intention compared to attitude as suggested by Werder (2002).

The finding on perceived behaviour control is similar with the findings by Werder (2002) that relationship between perceived behaviour control and intention was insignificant with the standardized coefficient beta recorded at .47. In fact, the standardized coefficient beta finding by Notani (1998) also accounted only .16 and this study only .061. This finding showed that the undergraduate business student perceived recycling to be a behaviour that is entirely or virtually entirely within their control. Hence, hypotheses 2 and 3 are supported. Table 4.11 listed the result of the hypotheses.

Table 4.11
Hypotheses Testing for Independent Variables towards Mediating Variable

Hypotheses Testing	**Results**
H1: Attitude towards recycling will significantly influence behavioural intention	Supported
H2: Subjective norm will significantly associate to behavioural intention.	Supported
H3: Perceived behaviour control will significantly associate with behavioural intention.	Not Supported

4.3.5.3 Relationship between Independent Variables and Dependent Variable

Multiple regression analysis was carried out to test the direct relationship between independent variables (attitude towards recycling and subjective norm) and dependent variable (recycling behaviour). Illustrations are as shown in Figure 4.2. It was hypothesized that hypotheses 1a, 2a and 3a will be significantly related between independent variables (attitude towards recycling, subjective norm and perceived behaviour control) and dependent variable (recycling behaviour). Table 4.12, indicates the results of multiple regression analysis and the output of the SPSS is provided in **Appendix L**.

Figure 4.2
The Relationship between Attitude toward Recycling, Subjective Norm, Perceived Behaviour Control and Recycling Behaviour.

Table 4.12
Relationship between Independent Variables and Dependent Variable

Independent Variables	**Standard Coefficient Beta (β)**	**Significance**
Attitude towards recycling	**.251**	.000*
Subjective Norm	**.275**	.000*
Perceived Behviour Control	**.194**	.000*
R Square	**.299**	
Adjusted R Square	.293	
F Change	51.932	
Sig. F Change	.000	

Note: * < .001.

The results indicated that the standardized coefficient for attitude towards recycling is at $\beta = .280$, $p < .001$, subjective norm is $\beta = .261$, $p < .001$ and perceived behaviour control $\beta = .194$, $p < .001$. This showed all variables were significantly associated with recycling behaviour. The finding of this study similar to research findings by Conner, Sandberg and Norman (2010), and Kovac and Rise (2011) that attitude towards recycling, subjective norm and perceived behaviour control are significant to recycling behaviour.

Results for individual independent variables showed that from the previous findings, relationship between attitude and behaviour is consistent and related (Aini *et al.*, 2002; Artbuthnot, 1977; Ebreo & Vining, 2000; Garnder & Stern, 1996; Guangnano, Stern & Dietz, 1995; Kraft *et al.*, 2005; Nordlund & Garvil, 2002; Oskamp, *et al.* 1991). Since the measurement of attitude is specific to recycling behaviour, this result produced a strong intent to act and follow-through behaviour (Nordlund & Garvill, 2002). This study also revealed that subjective norm is related to recycling behaviour and also consistent with prvious findings by Biswas *et al.* (2000) Cordano (1988) Kraft *et al.*(2005). It showed that from this study it seems that their friends do influence their act to recycle. Findings by Davis *et al.* (2009), Joshi (2003), Kraft *et al.* (2005), Sheeran, Trafimow & Armitage (2003) and Webb & Sheeran (2006) are consistent with this finding that perceived behaviour control is significantly related to behaviour although the total explained variance is low compared to other independent variables. Hence, hypotheses 1a, 2a and 3a are supported. The result of the hypotheses is shown in Table 4.13.

Table 4.13
Hypotheses Testing for Independent Variables towards Dependent Variable

Hypotheses Testing	**Results**
H2a: Attitude will be significantly influence recycling behaviour	Significant
H3a: Subjective norm will be significantly associated to recycling behaviour.	Significant
H3a: Perceived behavioural control will be significantly associated with recycling behaviour.	Significant

4.3.5.4 Relationship between Mediating Variable and Dependent Variable

Multiple regression analysis was carried out to test the direct relationship between mediating variable (behavioural intention) and dependent variable (recycling behaviour). Illustration of the relationship is as shown on Figure 4.3. It was hypothesized that hypotheses 4, having significant relationship between behavioural intention and recycling behaviour. Table 4.14, is the result of multiple regression analysis and the output of SPSS is shown in **Appendix M.**

Figure 4.3
The relationship of behavioural intention and recycling behaviour

Table 4.14
Relationship between Mediating Variable and Dependent Variable

Variable	Standard Coefficient Beta (β)	Significance
Behavioural Intention	**.569**	.000*
R Square	**.324**	
Adjusted R Square	.322	
F Change	176.595	
Sig. F Change	.000	

Note: * < .001.

Results showed that behavioural intention explained 32.4 percent (R^2 = .319) of the variance in recycling behaviour. The standard coefficient beta for behavioural intention is β = .569. Therefore, it indicates that behavioural intention is significantly associated with recycling behaviour and in tandem with previous findings that the *"appropriately measured"* intentions accounts for 20-30 percent of the variance of

future behaviour (Ajzen, 1991; Armitage & Connor, 2001; Corner & Armitage, 1998; Cheung, Chan & Wong, 1999; Godin & Kok, 1996; Randall & Wolff, 1994; Sheeran, 2002; Sheeran & Orbell, 1998). Although this percentage (32.4 percent) is small, it indicates a number of respondents enact their positive intention to perform recycling activities due to; (1) the presence of intention to recycle, (2) possess knowledge of how to full fill the goal, and (3) knew his/her intention to recycle. Therefore, this hypothesis is supported and the result of this hypothesis is as shown on Table 4.15.

Table 4.15
Hypotheses Testing for Mediating Variable towards Dependent Variable

Hypotheses Testing	**Results**
H4: Behavioural intention will be significantly associated with recycling behaviour.	Supported

4.3.5.5 Test of Mediation

The hierarchical regression analyses were carried out to examine the relationship between the independent variables and dependent variable. To test the mediating effect, Baron and Kenny (1986) approach was implemented. Specifically, hypothesis 5 posits that behavioural intention mediates the relationship between attitude towards recycling, subjective norm, perceived behaviour control and recycling behaviour.

As been highlighted in Chpater 3, to test mediation effect all variables must produced a significant result in step 1 to step 3. If any variable showed insignificant result, then this variable would be dropped for mediation effect testing (step 4). Therefore, since perceived behaviour control demonstrated insiginificant result in step 1

then it this variable will be dropped in step 4. The restatement of hypothesis 5 is '*The Mediation Effect of Behavioural Intention on the Relationship between Attitude towards Recycling, Subjective Norm and Recycling Behaviour*' and hypothesis 5c will not be tested.

A mediator is an intervening variable which accounts for the relationship between the predictor and the outcome. For this study, in order for behavioural intention of undergraduate business students to be considered a mediator, the variable must account for the relationship between the two predictors; namely attitude towards recycling and subjective norm with recycling behaviour. As suggested by Baron and Kenny (1986) a full mediation exists if step 4 produced an insignificant result, whereas, if significantresult is obtained then a partial mediation exists.

4.3.5.6 The Mediation Effect of Behavioural Intention on the Relationship between Attitude towards Recycling, Subjective Norm, and Recycling Behaviour

Multiple regressions were carried out to test the mediating effect of behavioural intention on the relationship between independent variables (attitude towards recycling and subjective norm) and dependent variable (recycling behaviour). The illustration is depicted in Figure 4.4.

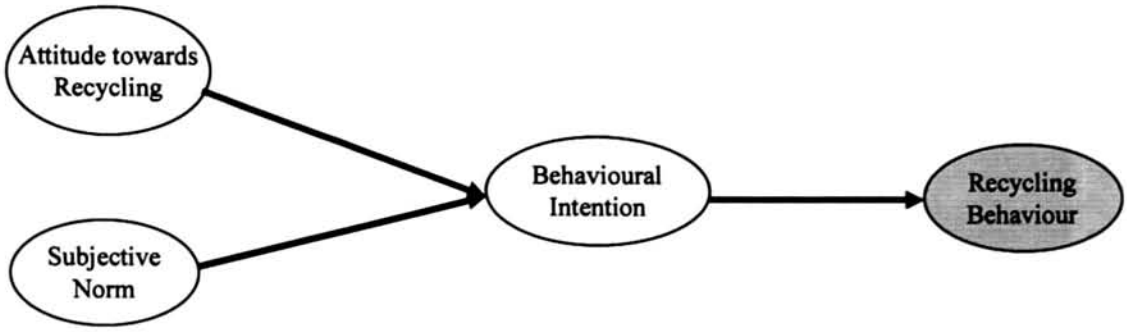

Figure 4.4:
Behavioural Intention mediate the relationship between Attitude towards recycling, Subjective Norm and Recycling Behaviour

In testing the mediation effect, Baron and Kenny (1986) stated that the full mediating effect exists if the impact of the independent variables on the dependent variable controlling the mediating variable is insignificant and partial mediating effect is when the beta coefficient of the relationship between the independent variables and dependent is reduced and significant. MacKinnon *et al.* (1995) stated that the mediation is generally present when the effect of independent variable on the dependent variable shrinks upon the addition of the mediating variable to the model. The result from the hierarchical regression analysis is provided in *Table 4.15* and it showed that attitude towards recycling and subjective norm explained 27.4 percent of the variance in recycling behaviour in step 1 and increased to 39.0 percent in step 2. It specifically showed that the inclusion of behavioural intention has increased the power to 11.6 percent of variance. The beta coefficient for independent variables in step 1 is significant; attitude towards recycling is at .346, and subjective norm is at .276.

In step 2, the results showed that beta coefficient for attitude towards recycling is significant at $\beta = .189$, and subjective norm also significant with beta coefficient at $\beta = .182$). This showed that the mediation is present at step 2, since attitude towards recycling and subjective norm shrink upon the addition of behavioural intention ($\beta = .420$), as suggested by McKinnon *et al.*, 1995. For the mediating effect, it showed that behavioural intention partially mediates attitude towards recycling and subjective norm with recycling behaviour since the result of beta coefficient is reduced and significant (Baron & Kenny, 1986).

Most of the previous studies that applied Theory of Planned Behaviour focused on intention rather than the actual behaviour (Armitage, 2008; Ayed, 2010; Brain, 2008; Conner, Sandberg & Norman, 2010; Cordano, 1988; Hill, 2008; Kovac & Rise, 2011; Montesarchio, 2009; Taylor & Todd, 1995; Truelove, 2010; Trumbo & O'Keefe, 2001; Werder, 2002) and the role of intention as mediator was ignored. However, few studies found that intention fully mediates attitude and behaviour (Bagozzi, Baumgarther & Yi, 1989), fully mediates attitude and behaviour (Shim *et al.* 2001), and intention do not mediates perceived behaviour control and actual behaviour (Ayed, 2010). Study by Canniere *et al.* (2008) also found that intention fully mediates attitude towards recycling and subjective norm with actual behaviour.

The output of SPSS is shown in **Appendix N**. Table 4.16 depicts the results of hierarchical regression analysis and Table 4.17, listed the summary of the hypothesis 5.

Table 4.16
The Mediating Effect of Behavioural Intention on the relationship between Attitude, Subjective Norm, and Recycling Behaviour

Dependent Variable	Variables	Std Beta Step 1	Std Beta Step 2
	Independent		
Recycling Behaviour	Attitude	.346*	.189*
	Subjective Norm	.276*	.182*
	Mediating		
	Behavioural Intention		.402*
	R^2	.274	.390
	Adjusted R^2	.270	.385
	R^2 Change	.274	.116

Note: * < .001.

Table 4.17
Hypotheses Testing Results from Hierarchal Using Behavioural Intention as a Mediator in the Relationship between Attitude towards Recycling, Subjective Norm and Recycling Behaviour

Hypotheses	Findings
H5: Behavioural intention mediates the relationship between attitude towards recycling, subjective norm and recycling behaviour.	
H5a: Behavioural intention mediates the relationship between attitude towards recycling and recycling behaviour.	Partial Mediation
H5b: Behavioural intention mediates the relationship between subjective norm and recycling behaviour.	Partial Mediation

4.4 Summary of Findings

There were 370 respondents or about 74 percent valid responses used in a series of analysis in this study. All measurement items have undergone the goodness of

measure testing namely; factor analysis, reliability test, descriptive test, correlation and multiple regression analysis. For factor analysis, the *Kaiser-Meyer-Olkin* (KMO) *Measure of Sampling Adequacy* (MSA) value for independent variables is at 0.866, and dependent variable is at 0.854 exceed the recommended value of 0.50 as the practically significant loading. For mediating variable, the *Kaiser-Meyer-Olkin* (KMO) *Measure of Sampling Adequacy* (MSA) is at 0.500 which is on the borderline with the recommended value. All items were interrelated and share a common factor (Hair *et al.*, 2006). The *Bartlett's Test of Sphericity* for all variables was significant and *Measuring Sampling of Adequacy* (MSA) value for each individual item demonstrated that it is above .60 that is recommended by Blaikie (2003).

The Cronbach's alpha used in this study is reliable since all factors were higher than .60, the above of the lower limit of acceptability (Cronbach's alpha > .60) as suggested by Sekaran (2003). The results for descriptive statistics have shown substantially acceptable mean scores and standard deviation. This implicates that independent variables influences dependent variable and the high mean score of mediating variable showed that it mediate independent variables with dependent variable. To determine the interrelationships of the variables, correlation analysis was conducted and results showed that attitude towards recycling, subjective norm and perceived behaviour control are significantly correlated with recycling behaviour and behavioural intention. The highest correlation is between behavioural intention and recycling behaviour. Multiple regressions were conducted to test the relationship between attitude, subjective norm, perceived behaviour control, behavioural intention

and recycling behaviour. Results showed that the relationships of independent variables and dependent variable, independant variables (attitude towards recycling and subjective norm) and mediating variable, and mediating variable and dependent variable were significant and it demonstrated that the relationships exist. However, perceived behaviour control was dropped for mediaton effect due to insignificant result (relationship between perceived behaviour control and behavioural intention). To test the mediation effect of behavioural intention in the relationship between attitude towards recycling, subjective norm, and recycling behaviour, a hierarchical regressions analysis was conducted. Result of this study showed that partial mediation is present since attitude toward recycling and subjective norm are significant (Baron & Kenny, 1986). In fact, both independant variables (attitude towards recycling and subjective norm) shrink upon the addition of mediating variable (behavioural intention).

Behavioural intention partially mediates attitude towards recycling and subjective norm. This implied that attitude towards recycling and subjective norm can directly influence recycling behaviour. Ajzen (1991) stated that attitude and subjective norm focused on the personal factor and both variables are the primary determinants of behaviour. This means that participants had stronger behaviour to engage recycling activity if they had positive attitude towards recycling and the perceptions of other (approval or disapproval) to perform actual behaviour impact participant's behaviour. Summary of the hypotheses testing is summarized in *Table 4.17*.

Table 4.18

Summary of the Research Objective, Research Question and Hypotheses Testing Results

Research Objective	Research Question	Hypothesis	Result
To determine the relationship between attitude towards recycling and behavioural intention.	Does attitudes towards recycling relate to recycling behaviour?	H2: Attitude toward recycling is significantly influence behavioural intention	**Supported**
To examine the relationship between attitude towards recycling and recycling behaviour.	Does subjectie norm relate to recycling behaviour?	**H2a**: Attitude toward recycling is significantly influence recycling behaviour.	**Significant**
To explore the relationship between subjective norm and behavioural intention	Does perceived behaviour control relate to recycling behaviour?	**H3**: Subjective norm is significantly associated to behavioural intention.	**Supported**
To explore the relationship between subjective norm and recycling behaviour.	Does attitudes towards recycling relate to behavioural intention?	**H3a**: Subjective norm is significantly associated to recycling behaviour.	**Significant**
To find out the relationship between perceived behavioural control and behavioural intention.	Does subjective norms relate to behavioural intention?	**H3**: Perceived behaviour control is significantly related to behavioural intentions.	**Not Supported**
To find out the relationship between perceived behaviour control and recycling behaviour.	Does perceived behaviour control relate to behavioural intention?	**H3a**: Perceived behaviour control is significantly associated with recycling behaviour.	**Significant**
To investigate the relationship between behavioural intention and recycling behaviour.	Does behavioural intention relate to recycling behaviour?	**H4**: Behavioural intention is significantly associated with recycling behaviour	**Supported**
To determine whether behavioural intention mediates the relationship between attitudes towards recycling, subjective norm, perceived behaviour control and recycling behaviour.	Does behavioural intention mediate the relationship between attitude towards recycling, subjective norm, perceived behaviour control and recycling behaviour?	**H5** : Behavioural intention mediates the relationship between attitudes towards recycling, subjective norm and recycling behaviour.	
		H5a: Behavioral intention mediates the relationship between attitudes towards recycling and recycling behavior.	**Partially Mediated**
		H5b: Behavioral intention mediates the relationship between subjective norm and recycling behavior.	**Partially Mediated**

CHAPTER FIVE

DISCUSSION AND CONCLUSION

5.0 Introduction

This chapter summarizes and discusses the results from the data analysis of this study to answer the research questions. It includes discussion of the implication, limitations and suggestions for future research. Finally, conclusion of the study is included in this chapter.

5.1 Recapitulation of the Study Findings

This study was attempted to find out or determine the recycling behaviour of undergraduate business students from three public institutions of higher learning. Specifically, the objectives of this study are; (1) to determine the recycling behaviour of undergraduates in three Public Institutes of Higher Learning, (2) to determine the relationship between attitude towards recycling and behavioural intention, (3) to examine the relationship between attitude towards recycling and recycling behaviour, (4) to explore the relationship between subjective norm and behavioural intention, (5) to explore the relationship between subjective norm and recycling behaviour, (6) to find out the relationship between perceived behavioural control and behavioural intention, (7) to find out the relationship between perceived behaviour control and recycling behaviour, (8) to investigate the relationship between behavioural intention and recycling behaviour, and (9) to determine whether behavioural intention mediates the

This study adopted a survey method based on non-probability sampling using the convenience sampling since the information could be collected from the undergraduate business students in three public universities. Data was gathered from University Malaya (UM), Universiti Putra Malaysia (UPM) and Universiti Utara Malaysia (UUM). A total of 500 questionnaires were distributed and 410 (82 percent) were returned. However, only 370 (74 percent) were usable, coded and analysed. To examine a meaningful, interpretable and manageable set of factors, factor analyses were utilized. The internal consistency of the measures was tested by computing the Cronbach's alpha. Finally, the hypotheses were analysed using hierarchical analysis. The summary of theresearch objective, research question and hypotheses testing is presented in Table 5.1.

Table 5.1
Summary of the Hypotheses Testing

Research Objective	**Research Question**	**Hypothesis**	**Result**
To determine the relationship between attitude towards recycling and behavioural intention.	Does attitudes towards recycling relate to recycling behaviour?	H2: Attitude toward recycling is significantly influence behavioural intention	**Supported**
To examine the relationship between attitude towards recycling and recycling behaviour.	Does subjectie norm relate to recycling behaviour?	**H2a**: Attitude toward recycling is significantly influence recycling behaviour.	**Significant**
To explore the relationship between subjective norm and behavioural intention	Does perceived behaviour control relate to recycling behaviour?	**H3**: Subjective norm is significantly associated to behavioural intention.	**Supported**
To explore the relationship between subjective norm and recycling behaviour.	Does attitudes towards recycling relate to behavioural intention?	**H3a**: Subjective norm is significantly associated to recycling behaviour.	**Significant**
To find out the relationship between perceived behavioural control and behavioural intention.	Does subjective norms relate to behavioural intention?	**H3**: Perceived behaviour control is significantly related to behavioural intentions.	**Not Supported**

Table 5.1 (Continued)

To find out the relationship between perceived behaviour control and recycling behaviour.	Does perceived behaviour control relate to behavioural intention?	**H3a**: Perceived behaviour control is significantly associated with recycling behaviour.	**Significant**
To investigate the relationship between behavioural intention and recycling behaviour.	Does behavioural intention relate to recycling behaviour?	**H4**: Behavioural intention is significantly associated with recycling behaviour	**Supported**
To determine whether behavioural intention mediates the relationship between attitudes towards recycling, subjective norm, perceived behaviour control and recycling behaviour.	Does behavioural intention mediate the relationship between attitude towards recycling, subjective norm, perceived behaviour control and recycling behaviour?	**H5** : Behavioural intention mediates the relationship between attitudes towards recycling, subjective norm and recycling behaviour.	
		H5a: Behavioral intention mediates the relationship between attitudes towards recycling and recycling behavior.	**Partially Mediated**
		H5b: Behavioral intention mediates the relationship between subjective norm and recycling behavior.	**Partially Mediated**

Based on the summary of these hypotheses testing of hypotheses 1 and 1a, it showed that attitude towards recycling was significantly related to behavioural intention and recycling behaviour. Hypothesis 2 and 2a indicated that the subjective norms were significantly related to behavioural intention and recycling behaviour. However, in hypothesis 3 perceived behaviour control is not significantly related with behavioural intention but significantly related in hypothesis 3a. In hypothesis 4, behavioural intention significantly related to recycling behaviour. Finally, in hypothesis 5, perceived behaviour control was dropped due to insignificant relationship with behavioural intention and results from hierarchical analysis showed that behavioural intention

partially mediates attitude towards recycling and subjective norm on recycling behaviour since both variables produced significant results.

5.2 Discussion of Findings

One of the great concerns for recycling is how to establish, manage and operate effective and efficient recycling systems and more importantly the recycling behaviour of an individual. In principal, the recycling activities tag line should be *"material cycle society - the right thing to do"*. If this notion is perceived positively by society, therefore each of the individual feels it is a moral obligation for them to recycle (Davies *et al.*, 2002; Vining & Ebreo, 1992). Therefore, in the following section the discussion on recycling behaviour of undergraduate business students from the selected universities, the relationship of attitude toward recycling and subjective norm with behavioural intention and recycling behaviour is presented. Finally, the discussion focuses on the role of behavioural intention in mediating the independent variables with the dependent variable.

5.2.1 The Recycling Behaviour of Undergraduate Business Students of Public Institutes of Higher Learning

The first research question is to determine the recycling behaviour of undergraduate business students from Universiti Malaya (UM), Universiti Putra Malaysia (UPM) and Universiti Utara Malaysia (UUM). Based on the *levene statistic*, the *p*-value is .55 which is more than .05 (significant level). This showed it met the assumption of homogeneity of variances. Result from ANOVA between UM, UPM and UUM, showed that the *p*-value is (0.000) which is less than .05. This means that there is

a difference of recycling behaviour at least for two groups. The multiple comparison of three PIHLs showed that the *p*-value between UM and UPM and UUM and UPM is significant (.000) which is less than .05 and there is a difference between UM and UPM, and UUM and UPM. However, the *p*-value between UM and UUM is (.200) which is more than .05 and showed no difference. The final result of SPSS is shown in **Appendix O.**

Based on the above analysis, it showed that the recycling behaviour of undergraduate business students from UM and UUM is the same. For UUM, the only campaign conducted was the eco-friendly campaign in 2008 and in fact no other activity or centralised campaign was conducted to promote environmental awareness specifically for recycling activities. In UM, the environmental activities are to be conducted by UMCARES (University Malaya Environmental Secretariat) but so far no recycling program has been conducted. The question is why is there no difference of recycling behaviour between UM and UUM undergraduate business students? This may be due to several reasons; (1) both are universities still at early stages in promoting sustainable practices, (2) both universities are not committed in promoting and ensuring the success of environmental campaigns, (3) students were not involved directly in this campaign, and (4) the environment in the universities does not encourage/motivate them to act pro-environmentally, and (5) students lack information on the benefits of recycling and where to recycle.

Emanuel and Adams (2011) conducted a study on the University of Hawaii and the University of Alabama and focused on student perception on campus sustainability.

The University of Alabama is in the early stage of embracing sustainability compared to the University of Hawaii. The result showed that students from the University of Hawaii participated in environmental programs and were willing to help to create a sustainable university. However, students from the University Alabama was only waiting and watching the university administrator's commitment before perfoming sustainability practices. The University of Alabama and the University Hawaii finding is similar with the finding of this study. UM and UUM is still at an early stage in promoting sustainable practice compared to UPM. Furthermore, no recycling activities or program was conducted in UM and UUM. Therefore, students have no information and knowledge on how to perform recycling activities. A study by Sharifah Aini *et al.* (2003) found that households in Selangor dislike recycling because they have insufficient knowledge to guide their recycling behaviour. Therefore, the recycling behaviour of students from UM and UUM are the same because they have no knowledge on the recycling or sustainability activity conducted by both the universities administrators. It is believed that if both the universities administrators are committed and organize a recycling activity that involves student participation, the result of this finding would be better.

Why is the recycling behaviour of UPM students better than UM and UPM? This result is in line with the finding by Emanuel and Adam (2011) on the level of sustainable initiatives and commitment between the University of Hawaii and the University of Alabama. In fact, the UPM administrators are committed in inculcating and promoting recycling behaviour among their undergraduates such as organizing a recycling program. Based on the web surfing of the three universities, UPM is the only university that conducted a specific program or activities on recycling and provide an incentive

(reward) to the recyclers. In fact, the recycling campaign conducted by UPM had given them an added advantage to be awarded Green Metric World University in 2011. Due to this reason, UPM students were involved directly in the recycling activity hence this had provided them with sufficient knowledge on sustainability.

5.2.2 The Relationship between Attitude towards Recycling and Behavioural Intention

The second research question is to determine the relationship between attitude towards recycling and behavioural intention. Hypothesis 1 posits that attitude towards recycling will significantly influence behavioural intention. This study found that attitude towards recycling significantly related to behavioural intention (β = .355, p < .01). Attitude towards recycling was found to be the strongest predictor of behavioural intention. This finding demonstrated that attitude explained more compared to other variables and this finding is similar with the previous findings that attitude is the most consistent predictor of behavioural intentions in all cases and contributed to a larger absolute coefficient compared to the other constructs of Theory of Planned Behaviour (Cordano, 1988; Joshi, 2003; Lindenberg & Steg, 2007; Morwitz & Fitzmons, 2004; Notani, 1998; Taylor & Todd, 1995; Trumbo & O'Keefe, 2001; Werder, 2002).

Findings by Werder (2002) on the intention to recycle household waste showed that the standardized coefficient is .208 and attitude is the stronger predictor than other variables. This means that as the respondent's attitude towards recycling increased, their intention to engage in recycling activities will also increase. This is because once a person has a positive attitude, then he or she has a stronger behavioural inclination

(Taylor & Todd, 1995). This is supported in a study by Brian (2008) that the relationship between attitude and intention would remain stable, strong and positive. Furthermore, it is suggested that people are more likely to engage in pro-environmental behaviour if they think this has positive consequences for themselves (Lindenberg & Steg, 2007).

In general, the finding of this study indicates that the attitude of undergraduate business students on recycling is positive and able to influence their intention to perform recycling activities in their respective university campus. However, their intent to recycle depends on the sufficient knowledge and information they have whether it is been translated to their mind or behavioural belief. It is believed that if the students are exposed to any environmental activities then their intention to participate and preserving the environment would be greater. As been discussed earlier, Ajzen (1991) stated that the attitude is one of the primary determinants of intention and therefore the chances for undergraduate business students to engage in recycling activity are better.

5.2.3 The Relationship between Attitude towards Recycling and Recycling Behaviour

The third research question is to examine the relationship between attitude towards recycling and recycling behaviour. Hypothesis 1a posits that attitude will significantly influence recycling behaviour. Result showed that attitude significantly related to recycling behaviour ($\beta = .251$, $p < .01$). This finding is consistent with the previous finding on the significant relationship between attitude and actual behaviour. (Aini *et al.*, 2002; Artbuthnot, 1977; Ebreo & Vining, 2000; Garnder & Stern, 1996;

Guangnano, Stern & Dietz, 1995; Kraft *et al.*, 2005; Nordlund & Garvil, 2002; Oskamp, *et al.* 1991).

This finding showed that attitude towards recycling and recycling behaviour ((β = .251) decreases compared to the result between attitude towards recycling and behavioural intention (β = .355). This result is consistent with the previous findings that this may due to; (1) the omission of intention (Follows & Jobber), (2) attitude should be an individual driven feeling not cognitive (Notani, 1998), (3) attitude measurement (Thapa, 2010), (4) effect of external factors (Thapa, 2010).

The result implies that undergraduate business students who have a better attitude towards recycling would likely perform recycling activities. However, presently in Malaysia the attitude of the Malaysian community on recycling is still low. This is in line with the finding by Sharifah Aini *et al.* (2003) that the environmental awareness among respondents is still low although various strategies had been implemented to educate and increase community environmental awareness in Malaysia. As it has been highlighted in Chapter Two, the amount of solid waste in Malaysia is increasing year by year and although 90 percent of Malaysians' are aware on benefits of recycling but only 15 percent recycle (Muhd Amirul, 2011). Therefore, it is interesting to note that in this study although attitude towards recycling is related to recycling behaviour but it is not put into practice. It is believed that the main reason is the lack of community participation and support because recycling activities are voluntary, individual willing to change and care for the environment for future generations. If each individual recycles and a monetary benefit is awarded, then it is expected a majority of Malaysians would

recycle. This is in tandem with findings conducted in Malaysia by Aini *et al* (2003) that the respondent's behaviour on the environment is based on direct financial benefits they gain. Furthermore, people will only comply when pro-environmental behaviour aligns with self interest (Ajzen, 1991).

5.2.4 The Relationship between Subjective Norm and Behavioural Intention

The fourth research question posits that subjective norm has a significant direct effect on behavioural intention. Hypothesis 2 posits that subjective norm will significantly influence behavioural intention. Result showed that subjective norm significantly related to behavioural intention ($\beta = .216, p < .01$) which implicates that the undergraduate business student were influenced by their college mate as far as their recycling intention was concerned. In other words, there was an indication that their collegemate controlled their decision to participate in recycling. This result is consistent with previous research (Bozionelos & Bennet, 1999; Park, Levine, Sharkey, 1988; Zhang, Prybutok, & Strutton, 2007) that subjective norm and behavioural intention showed a significant relationship. For example, Park *et al* (1988) conducted a study at the University of Hawaii with 200 students of whom about 65 percent were of Asian descent and the result showed that their friends (social in nature) had a significant influence on their intention to recycle. This may be due to the fact that people are motivated to recycle by actual pressure they receive from family and friends (Aceti, 2002).

Fielding *et al.*, (2008) stated that subjective norms predict intention because; 1) conceived as the pressure we feel from others to perform and not to perform, 2) norm of

relevant group will influence intention; 3) behaviour will be influenced by the expectation and behaviour of group members. However, a previous study showed that subjective norm has little influence over intention to behave or actually behave because each individual had a different perpective (White *et al.*, 2009). In fact, several studies revealed that the relationship between subjective norm and intention is not significant (Werder, 2002) and also subjective norm does not influence or associate with intention ((Bosnjak *et al.*, 2006; Buchnan, 2005; George, 2004; Shih & Fang, 2004; Wang, Chen, Chang & Yang, 2007).

The significant relationship of subjective norm with intention of this study implies that the influence of others (especially their friends in the university) may influence undergraduate business students to be involved in recycling activities in the university. Therefore, if each of individual close to the undergraduate business students has a different perpective or lifestyle then the level of influence towards student intention may also differ. In fact as a student, friends may influence their intent since within the university campus they socialized together. However, upon graduation the influence of friends would be lesser (Werder, 2002).This finding could provide information to the university management that any promotions of campaigns should be done holistically and involve all levels in the university so that each individual will have a common understanding on the importance of recycling.

5.2.5 The Relationship between Subjective Norm and Recycling Behaviour

The fifth research question posits that subjective norm has a significant direct effect on recycling behaviour. Hypothesis 2a posits that subjective norm will

significantly influence recycling behaviour. Result showed that subjective norm significantly related to recycling behaviour ($\beta = .275, p < .01$). This study is similar with the previous findings that revealed subjective norm is related to recycling behaviour (Biswas *et al.*, 2000; Cordano, 1988; Kraft *et al.*, 2005). It showed that their college mates and friends do influence their act to either recycle or not. However, subjective norms do not play an important part in behaviour decision making (Fielding *et al.*, 2008) because an individual decision was partly influenced by other groups of people. Presently, most people would regard each recycling program as good or worthy of participation but most of them do not participate. In general, explanations of lack of participation in the recycling program could be: "*One person can't make much difference*", *Why should I comply if a lot of other people aren't recycling?*", "*This won't affect me because ...*". If this reasoning were given by their friends, then the possibility for students to perform recycling will be low. The result of this study showed that the relationship between subjective norm and intention is better than recycling behaviour. This implies that the influence by their college mates is more towards his or her intention rather than performing the actual behaviour.

A study by Dahab, Gentry and Su (1994) reported that norm (subjective norm) is present in every community. The differences in a community cannot account for all the variation in behaviours. This means different levels of individual internalization of norm interact with the social context and produces differences in values that individuals assign to behavioural outcomes. For example; a Malaysian normally makes a decision based upon the influence and information gathered from referent groups such as friends, parents and lecturers. In fact, some of this information is transformed to be knowledge

(cognitive belief) before an individual decides to recylcle or not. An individual commitment to conserve the environment is influenced by their spouse, family members, friends and neighbours (Neuman, 1986). Therefore, if their college mates is likely to engage in recycling behaviour and have a sense of moral obligation towards the environment (White *et al.*, 2009) then there is a possibility that they will influence the undergraduate business student to perform the same behaviour.

5.2.6 The Relationship between Perceived Behaviour Control and Behavioural Intention

The sixth research question posits that perceived behaviour control has a significant relationship with behavioural intention. Hypothesis 3 posits that perceived behaviour control is significantly associated with behavioural intention. The standard coefficient of perceived behaviour control is .061 (p =.205) and result showed insignificant result with behavioural intention.. The undergraduate business students felt they were not in complete control whether they recycle or not. This finding is consistent with the finding by Werder (2002) that perceived behaviour control is the least significant predictor of intention compared to other constructs in the theory of planned behaviour. Generally, this result supported with previous research that perceived behaviour control and behavioural intention has insignificant relationship (Garling & Fujii, 2001; Werder, 2002). This showed that the undergraduate business student have no control over the recycling activities in the universities. For example, if the undergraduate business students intend to recycle, but there are no recycling bins for them to recycle then their intention to recycle is less. If university can be provides sufficient opportunitiesfor student to recycle, they will have no reason not to act. The

possible way to increase student participation in recycling activities in the university is to provide motivation (rewards) which then will signal their intention to participate in recycling activity.

5.2.7 The Relationship between Perceived Behaviour Control and Recycling Behaviour

The seventh research question deals with an association between perceived behaviour control and recycling behaviour. Hypothesis 3a posits that perceived behaviour control will significantly relate to recycling behaviour. This study found that perceived behaviour control is significantly related to recycling behaviour (β =.194, $p <$ .01). The result implies that undergraduate business students felt they are easy to perform and were in complete control whether they recycle or not. In fact, a direct connection between perceived behaviour control and recycling behaviour can only be expected if actual control and perceived behaviour control are approximately the same (Ajzen, 1991). The undergraduate business students may have misinterpretation of how easy and convenient it is to recycle on a continous basis. For example, the effort to recycle might linked directly to the accessibility of recycling facilities. However, one might be perceive the recycling activity as second nature or an internalized habit but the reality is often neither the behaviour nor the intention for it to happen.

The significant relationship of perceived behaviour control and recycling behaviour is in line with the previous findings by Davis *et al.* (2009), Hill (2008), Joshi (2003), Kraft *et al.* (2005) and Webb and Sheeran (2006). Ajzen & Madden (1986) and

Sheeran *et al.* (2003) stated that perceived behaviour control can predict actual behaviour when it reflects the amount of actual control over the performance.

5.2.8 The Relationship between Behavioural Intention and Recycling Behaviour

The eighth research question deals with a relationship between behavioural intention and recycling behaviour. Hypothesis 4 posits that behavioural intention will significantly relate to recycling behaviour. This study found that behavioural intention is significantly related to recycling behaviour (β =.567, p < .001).The result implies that undergraduate business students have a higher intent and act on performing recycling activities. This finding was in line with previous assertions made by Beville (2010) and Follows and Jobber (1999). The behavioural intention explained 32.4 percent which is higher compared to previous research findings that recorded only 20 percent to 30 percent (Ajzen, 1991; Armitage & Connor, 2001; Cheung, Chan & Wong, 1999; Randall & Wolff, 1994; Sheeran, 2002; Sheeran & Orbell, 1998).

In fact, the simple act of stating one's intent to engage in behaviour is associated with an increased likelihood of subsequent engaging in the behaviour (Levav & Fitzimons, 2006). Therefore, in measuring intention the salience thought and the subsequent behaviour is more consistent with these thoughts than when the question is not asked (Morwitz & Fitzimons, 2004). The results from this study corresponded with research by Armitage and Christian (2003) that intention is the principal determinant of behaviour, the stronger predictor contributes greater impact on behavioural achievement. The finding of this study revealed that the undergraduate business students are aware of the need and benefits of recycling. Their attitude towards recycling is positive, their

intent is supported and influenced by their friends in performing the recycling activity. Therefore, it implicates that undergraduate business students' recycling behaviour intent to recycle is significant.

5.2.9 The Mediating Role of Behavioural Intention

The last (ninth) research question deals with the mediating role of behavioural intention. Specifically, the objective was to determine the mediating role of behavioural intention on the relationship between attitude towards recycling, subjective norm, perceived behaviour control and recycling behaviour. Findings showed that the total variance explained in step 1 (relationship between independent variables and dependent variable) is only 26.6 percent (r = .266). The inclusion of behavioural intention (mediating variable) in step 2, increased the total explained variance to 39.7 percent (r = .397) and this increased to 13.1 percent, and it showed that behavioural intention has improved the explanatory power of the model (Beck & Ajzen, 1991; Chan, 2001). The result implies that behavioural intention mediates the whole model of the theory of planned behaviour.

Behavioural intention has been hypothesized to mediate the relationship between attitude towards recycling, subjective norm, and recycling behaviour. Result showed that attitude towards recycling, subjective norm, and recycling behaviour are mediated by behavioural intention. It has been found that behavioural intention partially mediates the relationship between attitude towards recycling and subjective norm and recycling behaviour. Based on the hierarchical analysis the beta coefficient for attitude toward recycling is at .346 (significant) at step 1 and reduced to .189 (significant), for subjective

norm is at .276 (significant) at step 1 and reduced to .182 (significant). This means that the effect of the independent variables (attitude towards recycling and subjective norm) on the dependent variable (recycling behaviour) shrinks upon the addition of the mediator (recycling behaviour).

Based on the hierarchical analysis it showed that behavioural intention partially mediate attitude towards recycling and recycling behaviour. Bagozzi and Baumgartner (1989) stated that *'if intention partially mediates, then a consideration might be given to non-rational or non-volitional startegies'*. The standard coefficient is at β.346 at step 1 and reduced to β .189 which resulted significant finding. This implies that attitude towards recycling has direct impact on respondent recycling behaviour. This finding supported a statement by Brian (2008) that the attitude-behaviour relationship is stable, strong and positive. Furthermore, inmost cases attitude served to guide people's behaviour (Armitage & Christian, 2003). Morwitz and Fitzmons (2004) stated that the link between attitudes and behaviour grows stronger as the attitudes become more accessible and in turn affects choices. Since the measurement of behaviour is specific to recycling behaviour, Nordlund and Garvill (2002) believed that it will contribute strongly intention to act and actual follow-through. Therfore, in this study it shows that undergraduate business student are more disposed to engage in recycling activities and believes this actvitiy is acheieveable.

In this study, it was demonstrated that behavioural intention partially mediates the relationship between subjective norm and recycling behaviour. This implies that subjective norm has a direct impact on respondent recycling behaviour. Therefore, if

undergraduate business students feel that his/her close friend or college mate influence their recycling behaviour, and then there is no role of behavioural intention. For example, if his/her friends influence or advice her or him to recycle bottles and paper into a recycling bin, or purchase paper products from recycled paper, and he/she may act to do so although he/she has no intention to do so. This is because, Malaysian consumer personalities are more on collectivism (Soonthonsmai, 2001) that indicates their act and decision is influenced by other members of a group. It is believed that, once people are influenced by the behaviour of others, it would pressure an individual to conform to the behaviour most people do (Reno, Cialdini & Kallgren, 1993). Since most of the undergraduate students live in the same campus, therefore their daily interaction with friends may influence his or her recycling behaviour although he or she is a non-recycler.

5.3 Research Implication

Several implications can be derived from the results of this study which will further extend the growing body of literature in recycling behaviour. This research has several implications for business organizations, researchers, policy makers and university top management with an interest in examining recycling behaviour among undergraduate business students.

5.3.1 Research Contribution

Several empirical studies have tested the Theory of Planned behaviour and found that it supports the predictive ability of this model for volitional behaviours. However, during testing the mediation of behavioural intention, perceived behaviour control was

dropped due to insiginificant result in regard to the relationship with behavioural intetntion. This study showed that the recycling behaviour is non-volitional behaviour and Theory of Reasonned Action is more appropriate to be adopted. The Theory of Reasonned Action supported the role of behavioural intention as mediator between attitude towards recycling, subjective norm and recycling behaviour. The inclusion of behavioural intention has increased the explanatory power of the model.

The subjective norms and perceived behavioural control are variables that require reflective and honest answers about potential shortcomings. In the case of subjective norm, an individual has to admit it is potentially driven only by compliance with the wishes of others. For perceived behaviour control, an individual should admit to potential lack of volition over one's own behaviour. Therefore, neither of the two are traits that a person may easily admit. Thogersen (1996) suggested that recycling should be treated as an instance of pro-social behaviour because of its benefit to society and the environment. Therefore based on Thogersen (1996) suggestion, attitude regarding recycling behaviour is not based on through calculation but they are function of the person's beliefs in what is the right or wrong thing to do.

To the author's knowledge, this is the first study that applied the Theory of Planned Behaviour on recycling behaviour of undergraduate business students from Public Institute of Higher Learning in Malaysia. Eventhough research on recycling behaviour has been quite extensively studied in western countries but it is hardly conducted in Malaysia. Hence, this study adds on to the body of knowledge in recycling behaviour literature. The variables of this theory proved that it is able to predict the

recycling behaviour of respondents. It is expected that other external variables may influence the recycling behaviour among the recyclers and thus improve the power of this theory.

The concentration of previous study on the Theory of Planned Behaviour is on the intention not the actual behaviour. Only few studies used intention as a mediating variable. This study contributes and adds to the literature on the mediating effect of intention on the relationship of attitude towards recycling, subjective norm, perceived behaviour control and recycling behaviour.

5.3.2 Implication of the Study

This finding indicated all factors that have been discussed in this study are relevant and important in predicting the recycling behaviour of undergraduate business students. Based on the above discussion, the government, business entities and university management could create relevant strategies and policies in promoting recycling behaviour among the Malaysian community, business organization and university staff. This study has several valuable implications, as described in the following sections.

5.3.2.1 Implication to the Government

The results of this study offer several suggestions to the government in ensuring the recycling target rate of 22 percent in the year of 2020 is achieved. Based on the National Strategic Plan for Solid Waste Management (2005) it is targeted by that year

the recycling for specific waste stream should be 30 percent for paper and softboard, 20 percent for plastic, 50 percent for glass and 75 percent for metals.

The finding of this study revealed that attitude towards recycling is the strongest predictor and also explained more compared to other variables in the relation between behavioural intention and recycling behaviour. This showed that the undergraduate business students had a positive attitude in their participation in recycling activities. It is believed that by providing formal or informal education, awareness and campaigns on the environmental issues to the community, individual knowledge will be enhanced. As their knowledge increases the attitude and behaviour towards the environment tend to increase their action (Holt, Homewood & Kirby, 1999; Kalantari, Shahbanali, Asadi & Mohammadi, 2007; Negev, Sagy, Garb, Salzberg & Tal, 2008; Pe'er, Goldman & Yavetz, 2007).

Therefore, to change the behaviour of the Malaysian community is to raise continuous and progressive awareness activities and the focus should be on the younger generation including school children. In fact, children can influence the awareness and behaviour of adults. In this regard, the mind-set and behaviour among the young generation may have a great influence on the general public. It is suggested that the government provide environmental education in all schools and promote active participation in community activities. Among the activities is source separation of recyclable materials. The government must also strongly call on family participation in such activities so that the younger generation and adults can learn together the importance of recycling. Therefore, by implementing this approach all levels of the

community will be aware of the need to recycle and this will trigger others to influence each another to recycle and this would promote a positive attitude for them to recycle.

The government should also raise awareness among business entities by encouraging them to maximize utilisation of recycleable raw materials for production, reduce use of packaging and container materials in the manufacturing and distribution of products, voluntary collection of used or consumed products through cooperation among manufacturers, distributors, and retailers. To promote these activities, raising awareness and participation of corporate managers in recycling activities is of great importance.

Presently the government conducts public campaigns through the mass media such as newspapers and Televison as one of the effective methods to raise awareness of the general public. This method is usually regarded as a one-way flow of message to the public. Therefore, to increase public awareness of recycling activities, the government should encourage an active participation and feedback of readers and viewers. The tactic of sending messages to the public should also be accompanied by a means for them to reciprocate or provide feedback. This requires the media to establish a platform, such as the website/twitter/facebook, for information exchange and discussion. Indeed, access to the internet might encourage the public to participate more freely in discussions on recycling or environmental issues.

The market supports the active recycling of some items of value, such as used paper and aluminium cans. On the other hand, the low market values and fluctuations in prices for used glass, bottles and plastic wastes tend to discourage active recycling of

these items. It is suggested the government offer incentives in order to stabilise and further enhance recycling activities in Malaysia. These incentives need to focus on strengthening the domestic market and domestic recyclers and manufacturers. At the same time, a continuous effort should be conducted at the state and national level in providing enough recycling bins at designated and easily accessible recycling centres for smooth and convenient ecycling activities by the community.

5.3.2.2 Implication to Business Industry

Among the actions that need to be taken is also raising awareness of business entities. This should includes waste minimisation through the introduction of cleaner production, maximised utilisation of recyclable raw materials for production, non or reduced use of packaging and container materials in the manufacturing and distribution of products, voluntary collection of used or consumed products through cooperation among manufacturers, distributors and retailers. Business entities also should create a provision of product information that is useful for reuse and recycling, design and manufacturing of eco-friendly products, establish an organisation to certify eco-friendly products within the business organization and also establish their own recycling system as waste management player.

5.3.2.3 Implication to the University Management

The survey generated a number of valuable findings and it can be concluded that, undergraduate business students were generally aware of the recycling activities. It is important for the university to progressively educate the students on the benefits of recycling and create practical knowledge and experience in organizing a successful

recycling campaign in the university. This is in line with the aspiration of the Malaysian government in achieving a 22 percent recycling rate by the year 2020.

Firstly, the result of this study showed that an individual's who is close to a respondent, influences his or her behaviour in the decision to recycle. Therefore, a word-of-mouth campaign, providing a recycling signage (billboard), a continuous recycling campaign in the campus should be conducted and involve all students and staff of the university. By implementing it, all university members are aware of this campaign and each individual will advise each other on the importance of recycling. Secondly, facilities should be provided to ensure progressive environmental practices into action by all members of a university. For example; provide recycle bins at strategic locations and selling eco-products at the university mall. It is suggested an enforcement unit or appointed university recycling coordinator monitor the effectiveness of the recycling campaign and educate the members of a university to adhere to the recycling guideline provided by the university.

Thirdly, it is suggested that the university management should train student leaders to serve as advocates for sustainability and with their enthusiasm, it is expected the student leaders can generate and lead other students to increase sustainability efforts in the campus by implementing recycling activities. If student leaders can be trained as sustainability advocators other students will respect them and this will influence them to follow their footsteps.

Fourthly, the academic and student affairs department of the university should work together in fostering recycling cultures or habits in the university. Without the support of one realm or the other, synergy is lost. Students as a whole are not encouraged to separate their academic and socio-emotional requirements, so the universities also cannot separate academic achievement from student affairs either. Activities outside the classroom related to recycling activities must be linked to academic content. For example, students and faculty members conducted community service activities by collecting and recycling empty bottles and paper.

Finally, appropriate human and financial resources should be allocated to allow an academician to conduct a research on the recycling program in the university. This research would assist the management on whether the recycling campaign meet the recycling objectives.

5.3.2.4 Academic Implication

This study contributes to a growing literature on the human element on recycling. This research was theory-driven and it is useful to compare it to prior research in other context areas and to use the findings for future research extension. Examples of further research needed in the area of environmental management and education includes the development and evaluation of school and university curricula as well as intervention and evaluation studies aimed at homeowners and organizations. Psychologists, sociologists and other behavioural scientists can bring to this research a quantitatively-based, human-oriented expertise typically not found among engineers or other technologically-trained professionals.

The greatest challenge for social and behavioural scientists on the environmental issues is to increase their credibility among policy makers. In fact, there has been a lack of communication between the academic and the policy-maker. The academicians should conduct problem –driven as well as theory-driven research. This means that the application of theory should focus on 'real life' problems rather than applying theory to a new content area simply for theory's sake. This applied approach gives policy-makers the signal that the research is of consequences rather than merely an intellectual exercise.

5.4 Limitation of the Study

There are few limitations related to this study. The first limitation is with respect to the representatives of the study sample. The sample is limited to undergraduate business students from three Public Institutes of Higher Learning. Therefore, it may not be appropriate to generalize this finding to all undergraduate business students in Malaysia. Thus, it is suggested that any future study should involve other institutions as well private institutions for generalization purposes and also involving non-business students.

A second limitation is in regard to the survey instrument (self-completed questionnaire). There is no assurance that the attitude towards recycling and actual recycling behaviour of the participants indicates the true reflection of themselves. One way to classify participants is through direct observation.

Third, reflecting the relationship between behavioural intention and recycling behaviour. This study cannot effectively conclude that a strong relationship of any parameter to behavioural intention will automatically lead to actual recycling behaviour. It was previously mentioned that there is theoretical evidence indicating positive behavioural intention leads to positive recycling behaviour. The ultimate proof of having measured the complete model would be to actually measure recycling behaviour. This could entail activities such as measuring the amount of recycled garbage in the university.

Another possible limitation concerns the measures used to determine perceived behaviour control. Since recycling is a behaviour that depends on a large extent of one's perception of how easy or difficult it is to perform the actual recycling behaviour, it might be interesting to include several efficacy questions in future research to explore the relationship between behavioural intention and actual recycling behaviour.

5.5 Recommendations for Future Research

It is suggested that for future research, a similar study could be conducted which uses different research methodologies, such as qualitative methods. While the first idea serves primarily to uncover the most appropriate and most reliable technique for asking recycling questions, the second suggestion aims at discovering new insights into the topic. Since survey technique delivers pre-fabricated options to a question, they give very little room for a respondent to elaborate on an issue. The use of in-depth interviews or focus groups may discover underlying values or motivations as to why people do or do not recycle and may lead to greater understanding.

Theory of Planned Behaviour can be applied to most of the studies including recycling behaviour. Future research should consider other external variables that may influence the recycling behaviour among the recyclers. This external variable may also improve the power of this theory. Recycling behaviour could also be analysed at the interaction between university and individual recycling. Since it has become a practice in some organizations to encourage and engage their employees in recycling office materials, it would be of interest to ascertain whether university recycling behaviour has an influence on the personal recycling behaviour.

It is suggested that future research should examine the recycling behaviour of non-business students and also to include the private higher learning institutions. This would then be able to conform to the previous studies in western countries that found non-business students are more pro-environmental than business students. Future research might also explore the cultural differences within the Malaysian community. The cultural diversity triggers a possibility to conduct a research on people from different background for example; the Malays, Chinese, Indians, Dayak, Ibans, Kadazans and others.

5.6 Conclusion

The purpose of this chapter was to provide an overview of the research study and started with the recapitulation of the finding and discussion of the result from the data analysis of this study to answer the research questions. It includes discussion of the implication, limitations and the last section on the suggestions for future research.

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APPENDIX A:
TALLOIRES DECLARATION

THE TALLOIRES DECLARATION

On the Civic Roles and Social Responsibilities of Higher Education

September 17, 2005

In this century of change, we note with optimism that access to university education is increasing, that one-half of the students enrolled in institutions of higher education live in developing nations, and that the number of university students worldwide is expected to double between 2000 and 2025. The potential for social participation by students young and old, now and in the years to come, is massive. The extent to which this potential can be realized will depend on universities worldwide mobilizing students, faculty, staff and citizens in programs of mutual benefit.

We are dedicated to strengthening the civic role and social responsibility of our institutions. We pledge to promote shared and universal human values, and the engagement by our institutions within our communities and with our global neighbors. We urge the one hundred million university students, and the many millions of faculty, staff, alumni and members of governing bodies throughout the world to join us in these initiatives.

We believe that higher education institutions exist to serve and strengthen the society of which they are part. Through the learning, values and commitment of faculty, staff and students, our institutions create social capital, preparing students to contribute positively to local, national and global communities. Universities have the responsibility to foster in faculty, staff and students a sense of social responsibility and a commitment to the social good, which, we believe, is central to the success of a democratic and just society.

Some of our universities and colleges are older than the nations in which they are located; others are young and emerging; but all bear a special obligation to contribute to the public good, through educating students, expanding access to education, and the creation and timely application of new knowledge. Our institutions recognize that we do not exist in isolation from society, nor from the communities in which we are located. Instead, we carry a unique obligation to listen, understand and contribute to social transformation and development. Higher education must extend itself for the good of society to embrace communities near and far. In doing so, we will promote our core missions of teaching, research and service.

The university should use the processes of education and research to respond to, serve and strengthen its communities for local and global citizenship. The university has a responsibility to participate actively in the democratic process and to empower those who are less privileged. Our institutions must strive to build a culture of reflection and action by faculty, staff and students that infuses all learning and inquiry.

Therefore, we agree to:

- Expand civic engagement and social responsibility programs in an ethical manner, through teaching, research and public service.
- Embed public responsibility through personal example and the policies and practices of our higher education institutions.
- Create institutional frameworks for the encouragement, reward and recognition of good practice in social service by students, faculty, staff and their community partners.
- Ensure that the standards of excellence, critical debate, scholarly research and peer judgment are applied as rigorously to community engagement as they are to other forms of university endeavor.
- Foster partnerships between universities and communities to enhance economic opportunity, empower individuals and groups, increase mutual understanding and strengthen the relevance, reach and responsiveness of university education and research.
- Raise awareness within government, business, media, charitable, not-for-profit and international organizations about contributions of higher education to social advancement and wellbeing. Specifically, establish partnerships with government to strengthen policies that support higher education's civic and socially responsible efforts. Collaborate with other sectors in order to magnify impacts and sustain social and economic gains for our communities.
- Establish partnerships with primary and secondary schools, and other institutions of further and higher education, so that education for active citizenship becomes an integral part of learning at all levels of society and stages of life.
- Document and disseminate examples of university work that benefit communities and the lives of their members.
- Support and encourage international, regional and national academic associations in their efforts to strengthen university civic engagement efforts and create scholarly recognition of service and action in teaching and research.
- Speak out on issues of civic importance in our communities.
- Establish a steering committee and international networks of higher education institutions to inform and support all their efforts to carry out this Declaration.

We commit ourselves to the civic engagement of our institutions and to that end we establish the Talloires Network, with an open electronic space for the exchange of ideas and understandings and for fostering collective action.

We invite others to join in this Declaration and to collaborate in our civic work.

TALLOIRES CONFERENCE 2005

LIST OF PARTICIPANTS

PRESIDENTIAL ATTENDEES

President Gustavo Alvim, Methodist University of Piracicaba, Brazil

President David Arnold, American University in Cairo, Egypt

Rector Azyumardi Azra, Syarif Hidayatullah State Islamic University, Indonesia

President Lawrence S. Bacow, Tufts University, United States of America

President Gasim Badri, Ahfad University for Women, Sudan

Interim Vice-Chancellor Marcus Balintulo, Cape Peninsula University of Technology, South Africa

President Aaron Ben-Ze'ev, University of Haifa, Israel

President Crispin P. Betita, Notre Dame of Marbel University, Philippines

Vice Chancellor Kerry Cox, University of Ballarat, Australia

Vice Chancellor Julian Crampton, University of Brighton, United Kingdom

President John J. DeGioia, Georgetown University, United States of America

President Emeritus John DiBiaggio, Tufts University, United States of America

Rector Silvio Israel Feldman, National University of General Sarmiento, Argentina

President Roderick Floud, London Metropolitan University, United Kingdom

President Mark Gearan, Hobart and William Smith Colleges, United States of America

Vice Chancellor Brenda Gourley, The Open University, United Kingdom

Former President Sung-Joo Han, Korea University, South Korea

President Monica Jimenez de la Jara, Catholic University of Temuco, Chile

Vice Chancellor John Kaburise, University for Development Studies, Ghana

President Shamsh Kassim-Lakha, Aga Khan University, Pakistan

Vice Chancellor Mathew L. Luhanga, University of Dar es Salaam, Tanzania

Rector Radmila Marinkovic-Neducin, University of Novi Sad, Serbia and Montenegro

President José Ignacio Moreno León, Metropolitan University at Caracas, Venezuela

President Sari Nusseibeh, Al-Quds University, Palestine

Vice Chancellor Janice Reid, University of Western Sydney, Australia

Vice Chancellor Rupa Shah, SNDT Women's University of Mumbai, India

Vice Rector Bruno Sion, Saint-Joseph University, Lebanon

Rector Juan Vela Valdés, University of Havana, Cuba

President Vo-Tong Xuan, An Giang University, Vietnam

SPECIALISTS AND SPEAKERS

Alison Bernstein, Vice President, Ford Foundation, United States of America

Tom Ehrlich, Senior Scholar, Carnegie Foundation for the Advancement of Teaching, United States of America

Robert M. Hollister, Dean, University College of Citizenship and Public Service, Tufts University, United States of America

Iqbal Paroo, President and COO, Omidyar Network, United States of America

Susan Stroud, Executive Director, Innovations in Civic Participation, United States of America

Judith Torney-Purta, Professor, University of Maryland, United States of America

REPRESENTATIVES OF CO-SPONSORING ORGANIZATIONS

Liz Hollander, Executive Director, Campus Compact, United States of America

John Rowett, Secretary General, Association of Commonwealth Universities, United Kingdom

José Ignacio Moreno León, Inter-American Organization for Higher Education, Canada

STAFF

Kathleen Dunn, Special Projects Associate, Tufts University, United States of America

Gabriella Goldstein, Director, Tufts University European Center, France

Grace Hollister, Program Assistant, Innovations in Civic Participation, United States of America

Judy Olson, Chief of Staff, Office of the President, Tufts University, United States of America

Helene Perold, Rapporteur and Report Writer, Helene Perold & Associates, South Africa

Paul Tringale, Director of Conference Bureau and Summer Sessions, Tufts University, United States of America

APPENDIX B:
DATA CLEANING

DATA CLEANING

Renamed variables

- ❖ **Attitude Towards Recycling (A1, A2, A3)**
- A1 – I believe it is important for students to purchase eco-products that are environmentally safe **(A1)**
- A2 – I believe it is important for student to recycle paper, can and glass as much as possible **(A2)**
- A3 – I believe it is important for students to purchase paper products made from recycled paper **(A3)**
- ❖ **Subjective Norm (S1, S2, S3)**
- S1 – Most people important to me think I should exercise more **(S1)**
- S4 – Most people important to me think I should conserve more energy **(S2)**
- S5 – Most people in the university who are important to me think the natural environment is valuable and should be protected at all costs by conducting recycling activity **(S3)**
- ❖ **Perceived Behavior Control (P1, P2)**
- P5 – I don't like to participate in environmental activities in the university if they make my life more difficult **(P1)**
- P9 – Nothing can be done to increase recycling in university **(P2)**
- ❖ **Behavioral Intention (I1, I2, I3, I4)**
- I1 – I intend to recycle **(I1)**
- I3 – I intend to buy recycle products that my friends buy **(I2)**
- B6 – I should use paper, glass and / or metal waste products at university or at home **(I3)**
- B9 – I should set a positive environmental example for my friends to follow **(I4)**
- ❖ **Recycling Behavior (B1, B2, B3)**
- B2 – I should bring my own container or reuse the bags to the university mall **(B1)**
- B7 – I would support university policy that eliminates the use of paper cup and required student to bring their own mug or container **(B2)**
- B22 – I would support a university policy that adds a recycling fee to my course fees in order to support on campus recycling / eco friendly campaign **(B3)**

2. Renamed ID (redundant)
   - 2 (frequency = 2) → renamed to 2.1 and 2.2
   - 92 (2) → renamed to 92.1 and 92.2
   - 210 (2) → renamed to 210.1 and 210.2
   - **TOTAL = 6**

3. Missing Data (*before removed respondent, N = 410)

	Missing Code	
Variables	98	99
A1	0	2
A2	0	2
A3	0	6
S1	0	6
S2	1	8
S3	0	7
P1	0	2
P2	1	2
P3	0	2
P4	0	1
P5	1	2
I1	0	1
I2	0	2
I3	0	2
B1	0	1
B2	0	1
B3	0	2
B4	0	2
B5	0	2
B6	1	0
B7	0	0
B8	0	0
B9	0	0
B10	1	0
Total	**5**	**53**

*98 = answered 2 or more, *99 = not answered

Nmissing

		Frequency	Percent
Valid	0	387	94.4
	1	9	2.2
	2	5	1.2
	3	1	.2
	4	6	1.5
	5	1	.2
	8	1	.2
	Total	410	100.0

*0 = all questions answered, … , *8 = 8 questions unanswered

4. Removed unanswered questionnaire (due to ID)
    - 188 – 200 (frequency = 13)
    - 362 – 364 (3)
    - 378 – 380 (3)
    - 382 (1)
    - 389 – 394 (6)
    - 396 (1)
    - 399 (1)
    - 401 – 402 (2)
    - 405 – 408 (4)
    - 410 (1)
    - 414 (1)
    - 416 – 418 (3)
    - 421 – 423 (3)
    - 426 – 427 (2)
    - 430 (1)
    - 432 (1)
    - 437 (1)
    - 447 – 448 (2)
    - 455 (1)
    - 458 – 462 (5)
    - **TOTAL UNANSWERED = 55 , TOTAL SAMPLE SIZES, N = 410**

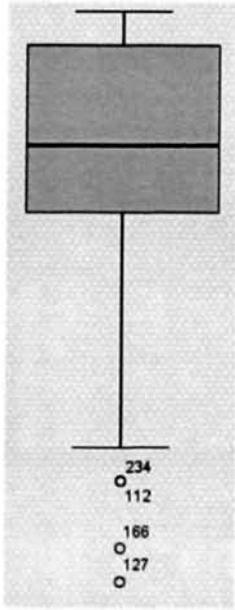
        - Removed ID 463 (from UPSI)
        - Removed ID 54 (answered only demographic part)
        - Removed 23 respondent with missing data (ID = 4, 13, 29, 53, 66, 75, 80, 84, 93, 103, 107, 114, 182, 203, 206, 220, 245, 253, 302, 304, 353, 355, 453)

    TOTAL SAMPLE SIZES = 387

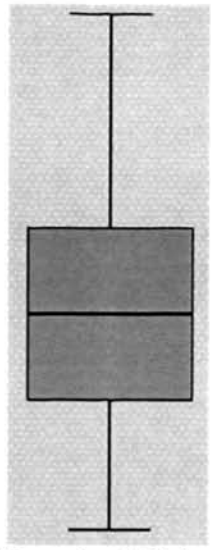
5. Data Cleaning
    a. Normality
        i. Skewness and Kurtosis (before recode)

Variables	Skewness	Kurtosis
Attitude Towards Recycling	-0.778	0.448
Subjective Norm	-0.634	0.612
Perceived Behavior Control	0.218	-0.601
Behavioral Intention	-0.198	-0.345
Recycling Behavior	-0.340	0.268

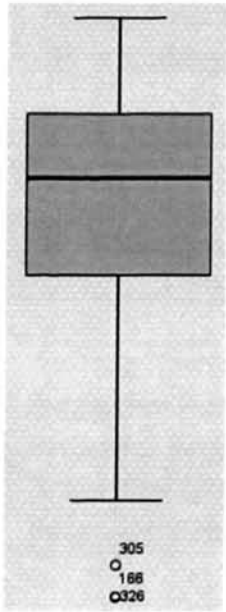
ii. Outliers



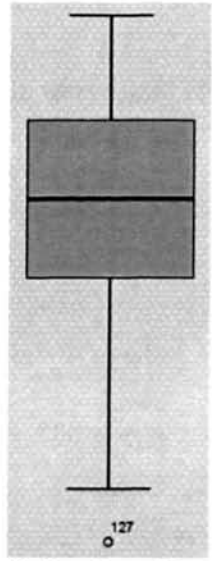
Attitude Towards Recycling



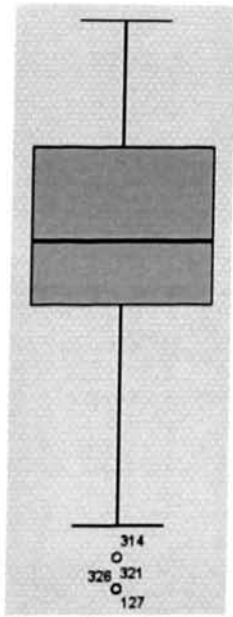
Perceived Behavior Control



Subjective Norm



Behavioral Intention



Recycling Behavior

Removed respondents with outliers (ID = 262, 123, 176, 138, 335, 358, 344, 351, 138, 420, 95, 233, 42, 176, 179, 143, 99)

- **Recode questions P1 & P2 to positive statement**
  - I don't like to participate in environmental activities in the university if they make my life more difficult **(P1)**
  - Nothing can be done to increase recycling in university **(P2)**

TOTAL SAMPLE SIZES, N = 370 (after recode)

- Skewness and Kurtosis (after)

Variables	Skewness	Kurtosis
Attitude Towards Recycling	-0.537	-0.448
Subjective Norm	-0.201	-0.560
Perceived Behavior Control	-0.194	-0.635
Behavioral Intention	-0.135	-0.488
Recycling Behavior	-0.176	-0.053

APPENDIX C:
QUESTIONNAIRE

UNIVERSITI UTARA MALAYSIA

THIS DOCUMENT SHALL ONLY BE USED TO PROVIDE AUTHORIZATION FOR VOLUNTARY CONSENT

DISSERTATION TITLE

PRO-ENVIRONMENTAL BEHAVIOR AMONG UNDERGRADUATE BUSINESS STUDENT IN MALAYSIA

I, Abdullah bin Osman, a doctoral student at College of Business, Universiti Utara Malaysia. Currently I am pursuing my study in Doctor of Business Administration and one of the degree requirements is to conduct a research study,

DIRECTIONS FOR THE PARTICIPANT:

You are being asked to participate in my research study. Please read this carefully. This form provides you with information about the study. The Principal Investigator (Abdullah bin Osman) will answer all of your questions. Ask questions about anything you don't understand before deciding whether or not to participate. You are free to ask questions at my time before, during, or after your participation in this study. Your participation is entirely voluntary and you can refuse to participate without penalty or loss of benefits to which you are otherwise entitled. You acknowledge that you are undergraduate business student, registered as full time student and currently at year two or three.

PURPOSE OF THIS RESEARCH STUDY The purpose of this study is to investigate the relationship of attitude, subjective norm, perceived behavioural control, and behavioural intentions toward pro-environmental behaviour of undergraduate business students from three Public Higher Learning Institutions in Malaysia.

PROCEDURES: You will be asked to complete a two-part survey. Part I will ask questions pertaining related to demographic characteristics and Part II will ask you to answer questions related to attitude, subjective norm, perceived behavioural control, behavioural intentions and

pro-environmental behaviour. You should complete your survey independently, without comparing answers. This survey should take about 20-30 minutes to complete.

POSSIBLE RISKS OR DISCOMFORT. This study involves minimal risk. You may find that some of the questions are sensitive in nature. In addition, participation in this study requires minimum amount of your time and effort.

POSSIBLE BENEFITS: There may be no direct benefit to you in participating in this research, but knowledge may be gained which may help add to what is known about undergraduate business student attitude and behaviour in the future. As a future manager and business executive, this finding will give additional information of the future landscape on managerial thinkers on environment. The benefits of this study also will help the academician and policy makers to re-study other approaches in inculcating and disseminating environmental knowledge at all levels of education as stipulated in our national policy on environment.

FINANCIAL CONSIDERATIONS: There is no financial compensation for your participation in this research. There are no costs to you as a result of your participation in this study,

ANONYMITY: Surveys will be anonymous. You will not be identified and data will be reported as group responses, Participation in this survey is voluntary and return of the completed survey will constitute your informed consent to participate. The results of this study may be published in a dissertation, scientific journals or presented at professional meetings. In addition, your individual privacy will be maintained in all publications or presentations resulting from this study. All the data gathered during this study, which were previously described, will be kept strictly confidential by the researcher. All information will be held in strict confidence and will not be disclosed unless required by law or regulation.

RIGHT TO WITHDRAW. You are free to choose whether or not to participate in this study. There will be no penalty or loss of benefits to which you are otherwise entitled if you choose not to participate.

CONTACTS FOR QUESTIONS/ACCESS TO CONSENT FORM: Any further questions you have about this study or your participation in it, either now or any time in the future, will be answered by Abdullah bin Osman (Principal Investigator) who may be reached at 019-512 8987 and Dr Filzah Md Isa or Dr Siti Norezam Othman my supervisors who may be reached at. 04-928 5626/5061/7141 If any problems arise as a result of your participation in this study, please call the Principal Investigator and the supervisors immediately.

Please retain this consent form for your records.

INVESTIGATOR'S AFFIDAVIT I hereby certify that a written explanation of the nature of the above project has been provided to the person participating in this study. A copy of the written documentation provided is attached hereto. By the person's consent to voluntary participate in this study, the person has represented that he/she is at least 18 years of age, and he/she does not have a medical problem or language or educational barrier that precludes his/her understanding of my explanation. Therefore, I hereby certify that to the best of my knowledge the person participating in this study understands clearly the nature, demands, benefits, and risks involved in his/her participation.

.....

ABDULLAH BIN OSMAN

Part I. This section of survey includes questions about you. Please remember that your responses are confidential and we only use this information for statistics analysis purposes

DEMOGRAPHIC

1. Your gender

□ male □ female

2. Your age

□18-20 □ 21-30 □ 31-40 □ 41-50

3. Please indicate your marital status

□ Single □ Married □ Other

4. Which university that you are enrolled in (UM, UPM, UUM)

.....

5. Specify which program or degree that you are registered in (e.g. BIM, BBA, BHRM)

.....

6. What year are you officially in? (Please select only one option)

1. First year ( )
2. Second year ( )
3. Third year ( )

7. What is you major? (Please specify, e.g. Marketing, Accounting)

.....

8. Where do you live?

1. On campus ( )
2. Off campus ( )

9. What type of area is your hometown?

1. Rural ( )
2. Urban ( )

Part II. In this section, please indicate your level of agreement or disagreement with each of the following statements about the attitude toward environment, subjective norm, perceived behavioral control, behavioral intention and pro-environmental behavior of undergraduate business student from Malaysian Public of Higher Learning Institutions.

Bahagian I. *Sila nyatakan samada anda bersetuju atau tidak bersetuju dengan setiap pernyataan mengenai sikap terhadap alam sekitar (attitude toward environment), norma subjektif (subjective norm), berupaya mengawal tingkah laku yang boleh nampak (perceived behavioral control), tingkah laku yang mempunyai tujuan/niat (behavioral intention), dan kelakuan pro alam sekitar (pro-environmental behavior) di kalangan pelajar ijazah pertama perniagaan daripada universiti tempatan.*

Please use the following key to indicate the degree that you agree or disagree with each statement. Circle the number following the statement that matches your level of agreement.

Tandakan tahap persetujuan anda pada setiap pernyataan. Bulatkan tahap pernyataan yang anda setuju.

1	2	3	4	5	6	7
Strongly Disagree	Disagree		Neutral		Agree	Strongly Agree

ATTITUDE TOWARDS RECYCLING *(SIKAP TERHADAP KITAR SEMUA)*

A1 - I believe it is important for students to purchase eco-products that are environmentally safe 1 2 3 4 5 6 7

Saya beranggapan adalah perlu pelajar membeli produk yang selamat dari aspek alam sekitar

A2 - I believe it is important for students to recycle paper, cans and glass as much as possible 1 2 3 4 5 6 7

Saya beranggapan adalah perlu bagi pelajar sentiasa mengitar semula kertas, tin dan gelas

A3 - I believe it is important for student to purchase paper products made from recycle paper 1 2 3 4 5 6 7

Saya beranggapan adalah perlu bagi pelajar membeli kertas yang menggunakan bahan yang telah dikitar semula

SUBJECTIVE NORM (*NORMA SUBJEKTIF)*

S1 - Most people who are important to me think I should recycle more 1 2 3 4 5 6 7

Individu yang penting kepada saya beranggapan saya sepatutnya memperbanyakkan kitar semula

S2 - Most people who are important to me think I should conserve the environment by recycling 1 2 3 4 5 6 7

Individu yang penting kepada saya beranggapan saya sepatutnya memelihara alam sekitar dengan melakukan kitar semula

S3 - Most people in this university who are important to me think that natural environment is valuable and should be protected at all costs by conducting recycling activities. 1 2 3 4 5 6 7

Individu yang penting kepada saya beranggapan bahawa alam sekitar adalah berguna dan perlu dipelihara sebilang masa dengan melaksanakan aktiviti kitar semula.

PERCEIVED BEHAVIOR CONTROL *(KEUPAYAAN UNTUK MENGAWAL TINGKAHLAKU)*

P1 - Whether or not I recycle in university is entirely up to me 1 2 3 4 5 6 7

Samada saya membuat kitar semula di universiti adalah terpulang kepada saya

P2 - I have complete control over the amount of recycling that I do in the university 1 2 3 4 5 6 7

Saya dapat mengawal sepenuhnya jumlah barangan yang saya kitar semula di university

P3 - Recycling in the university takes too much effort 1 2 3 4 5 6 7

Kitar semula di universiti mengambil masa dan tenaga yang banyak

P4 - I don't like to participate in environmental activities such as recycling in the university if they make my life more difficult 1 2 3 4 5 6 7

Saya tidak berminat mengambil bahagian dalam aktiviti alam sekitar seperti aktiviti kitar semula di universiti jika ia membebankan saya

P5 - Nothing can be done to increase recycling in the university 1 2 3 4 5 6 7

Tidak ada apa yang boleh dilaksanakan bagi mempertingkatan aktiviti kitar semula di university

BEHAVIORAL INTENTION (*NIAT UNTUK BERTINGKAHLAKU*)

I1 - I intend to recycle

Niat saya ialah untuk kitar semula

1 2 3 4 5 6 7

I2 - I intend to exercise by bringing my own container or reuse bags to university mall

Niat saya ialah untuk melaksanakan tanggungjawab dengan membawa bekas makanan atau bag kitar semula sendiri ke university mall

1 2 3 4 5 6 7

I3 - I intend to buy recycle products that my friends buy

Niat saya ialah untuk membeli produk kitar semula yang sama dibeli oleh rakan saya

1 2 3 4 5 6 7

RECYCLING BEHAVIOR (*TINGKAHLAKU UNTUK MENGITAR SEMULA*)

B1 - I should use mugs instead of paper cups, use cloth instead of paper napkins, and rags instead of paper towels.

Saya akan menggunakan cawan daripada cawan kertas, kain daripada kertas napkin dan kain buruk daripada tuala kertas

1 2 3 4 5 6 7

B2 - I should bring my own container or reuse bags at the university mall

Saya akan membawa bekas makanan saya atau beg kitar semula ke university mall

1 2 3 4 5 6 7

B3 - I put expired batteries in the garbage.

Saya meletakkan bateri yang tidak boleh digunakan dalam tong sampah.

1 2 3 4 5 6 7

B4 - I collect and recycle used paper.

Saya mengutip dan menggunakan kertas kitar semula

1 2 3 4 5 6 7

B5 - I take empty bottles to a recycling bin.

Saya membawa botol kosong ke tempat kitar semula

1 2 3 4 5 6 7

B6 - I should recycle paper, glass and/or metal waste products at the university or at home

Saya sepatutnya kitar semula kertas, gelas dan bahan dari besi di universiti atau di rumah

1 2 3 4 5 6 7

B7 - I would support the university policy that eliminates the use of paper cups and requires student to bring their own mug or container

Saya menyokong dasar universiti yang melarang penggunaan cawan kertas dan pelajar digalakkan membawa cawan dan bekas makanan sendiri

1 2 3 4 5 6 7

B8 - I talk to people that I notice doing something that harms the environment in an effort to persuade that person to stop the activity. and do some recycling activities. 1 2 3 4 5 6 7

Saya akan bercakap kepada mana-mana inidividu yang saya perhatikan telah melakukan mana-mana aktiviti yang menjejaskan alam sekitar dengan melaksanakan aktiviti kitar semula

B18 - I should set a positive environmental example (recycling) for my friends to follow. 1 2 3 4 5 6 7

Saya sepatutnya menunjukkan contoh yang positif terhadap pemeliharaan alam sekitar (kitar semula) agar rakan saya juga akan mengikutinya

B22 - I would support a university policy that adds a recycling fee to my course fees in order to support a campus recycling/eco-friendly campaign 1 2 3 4 5 6 7

Bagi menyokong kempen kitar semula/kempen mesra alam di universiti dan bersetuju jika pihak universiti memasukkan yuran kitar semula dalam yuran pengajian

Additional Comment (*Komen Tambahan*):

APPENDIX D:
SUMMARY OF PROFILES

Statistics

		Gender	Age	Status	IPTA	Year	Live	Hometown
N	Valid	370	370	370	370	368	370	362
	Missing	0	0	0	0	2	0	8
Mean		1.75	1.83	1.04	2.34	2.74	1.11	1.53
Median		2.00	2.00	1.00	3.00	3.00	1.00	2.00
Mode		2	2	1	3	3	1	2
Std. Deviation		.436	.391	.218	.814	1.037	.311	.500
Variance		.190	.153	.047	.662	1.076	.097	.250
Minimum		1	1	1	1	1	1	1
Maximum		2	3	3	3	4	2	2

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	94	25.4	25.4	25.4
	Female	276	74.6	74.6	100.0
	Total	370	100.0	100.0	

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-20	65	17.6	17.6	17.6
	21-30	303	81.9	81.9	99.5
	31-40	2	.5	.5	100.0
	Total	370	100.0	100.0	

Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	358	96.8	96.8	96.8
	Married	10	2.7	2.7	99.5
	Other	2	.5	.5	100.0
	Total	370	100.0	100.0	

IPTA

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	UM	81	21.9	21.9	21.9
	UPM	84	22.7	22.7	44.6
	UUM	205	55.4	55.4	100.0
	Total	370	100.0	100.0	

Year

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	First year	57	15.4	15.5	15.5
	Second year	87	23.5	23.6	39.1
	Third year	119	32.2	32.3	71.5
	Fourth year	105	28.4	28.5	100.0
	Total	368	99.5	100.0	
Missing	99	2	.5		
Total		370	100.0		

Live

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	On campus	330	89.2	89.2	89.2
	Off Campus	40	10.8	10.8	100.0
	Total	370	100.0	100.0	

Hometown

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Rural	170	45.9	47.0	47.0
	Urban	192	51.9	53.0	100.0
	Total	362	97.8	100.0	
Missing	98	1	.3		
	99	7	1.9		
	Total	8	2.2		
Total		370	100.0		

APPENDIX E: RESULTS OFTHE FACTOR ANALYSIS ON INDEPENDENT VARIABLES

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.746
Bartlett's Test of Sphericity	Approx. Chi-Square	803.325
	df	36
	Sig.	.000

Communalities

	Initial	Extraction
P1_5	1.000	.659
P2_5	1.000	.764
P3	1.000	.493
A1	1.000	.670
A2	1.000	.755
A3	1.000	.508
S1	1.000	.691
S2	1.000	.583
S3	1.000	.519

Extraction Method: Principal Component Analysis.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.062	34.024	34.024	3.062	34.024	34.024
2	1.457	16.193	50.217	1.457	16.193	50.217
3	1.121	12.459	62.676	1.121	12.459	62.676
4	.804	8.929	71.605			
5	.678	7.531	79.137			
6	.570	6.332	85.469			
7	.517	5.742	91.211			
8	.453	5.039	96.250			
9	.338	3.750	100.000			

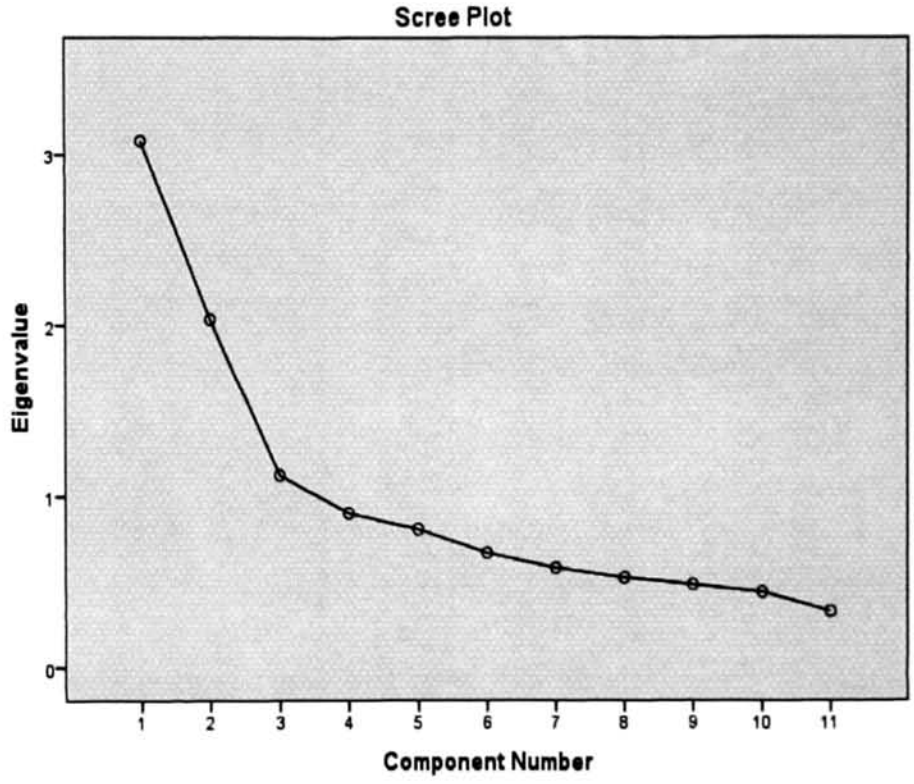
Rotated Component Matrix[a]

	Component		
	1	2	3
P1_5	.108	.204	.778
P2_5	.226		.844
P3	-.307	.452	.441
A1	.804	.147	
A2	.862		
A3	.642	.217	.220
S1	.162	.815	
S2	.138	.728	.184
S3	.411	.587	

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.



APPENDIX F:
RESULTS OF THE FACTOR ANALYSIS ON DEPENDENT VARIABLE

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.845
Bartlett's Test of Sphericity	Approx. Chi-Square	1025.154
	df	28
	Sig.	.000

Communalities

	Initial	Extraction
B2	1.000	.458
B5	1.000	.517
B6	1.000	.574
B7	1.000	.450
B8	1.000	.562
B9	1.000	.351
B10	1.000	.278
B4	1.000	.567

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.756	46.954	46.954	3.756	46.954	46.954
2	.984	12.302	59.256			
3	.811	10.138	69.393			
4	.723	9.034	78.428			
5	.559	6.987	85.415			
6	.469	5.866	91.280			
7	.363	4.532	95.812			
8	.335	4.188	100.000			

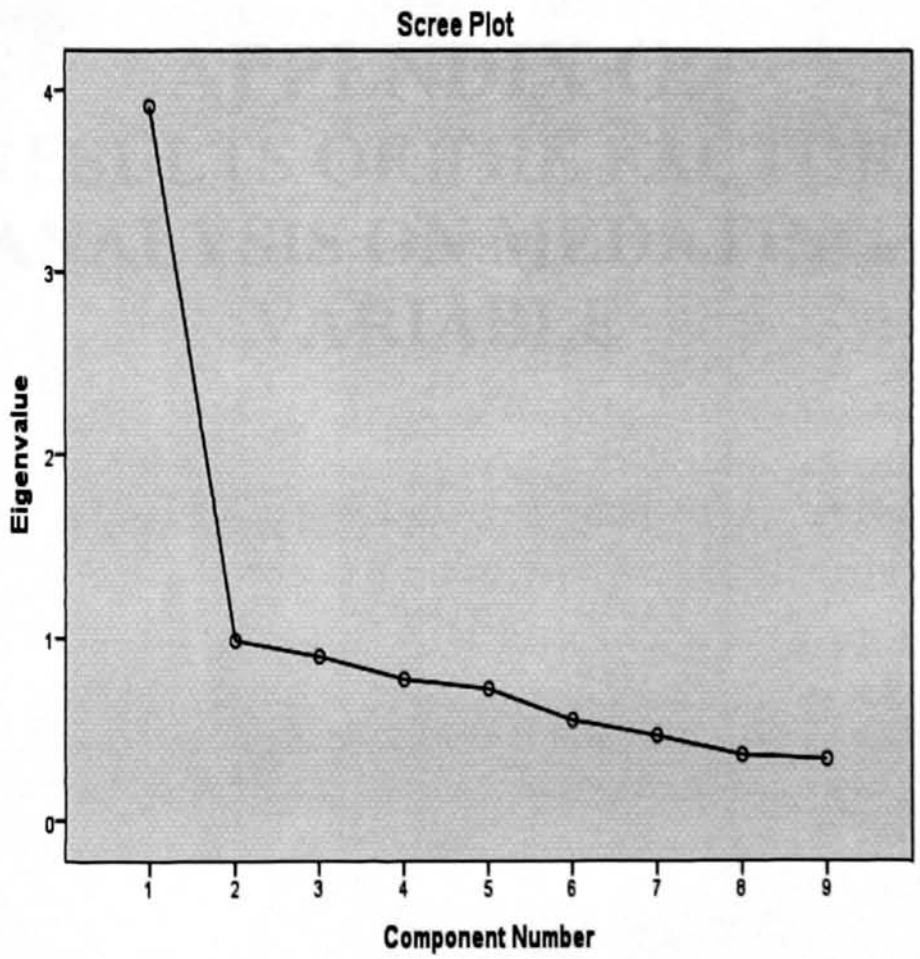
Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component
	1
B2	.677
B5	.719
B6	.757
B7	.671
B8	.749
B9	.592
B10	.527
B4	.753

Extraction Method: Principal Component Analysis.

a. 1 components extracted.



APPENDIX G:
RESULTS OF THE FACTOR ANALYSIS ON MEDATING VARIABLE

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.500
Bartlett's Test of Sphericity	Approx. Chi-Square	167.369
	df	1
	Sig.	.000

Communalities

	Initial	Extraction
I1	1.000	.797
I2	1.000	.797

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.593	79.673	79.673	1.593	79.673	79.673
2	.407	20.327	100.000			

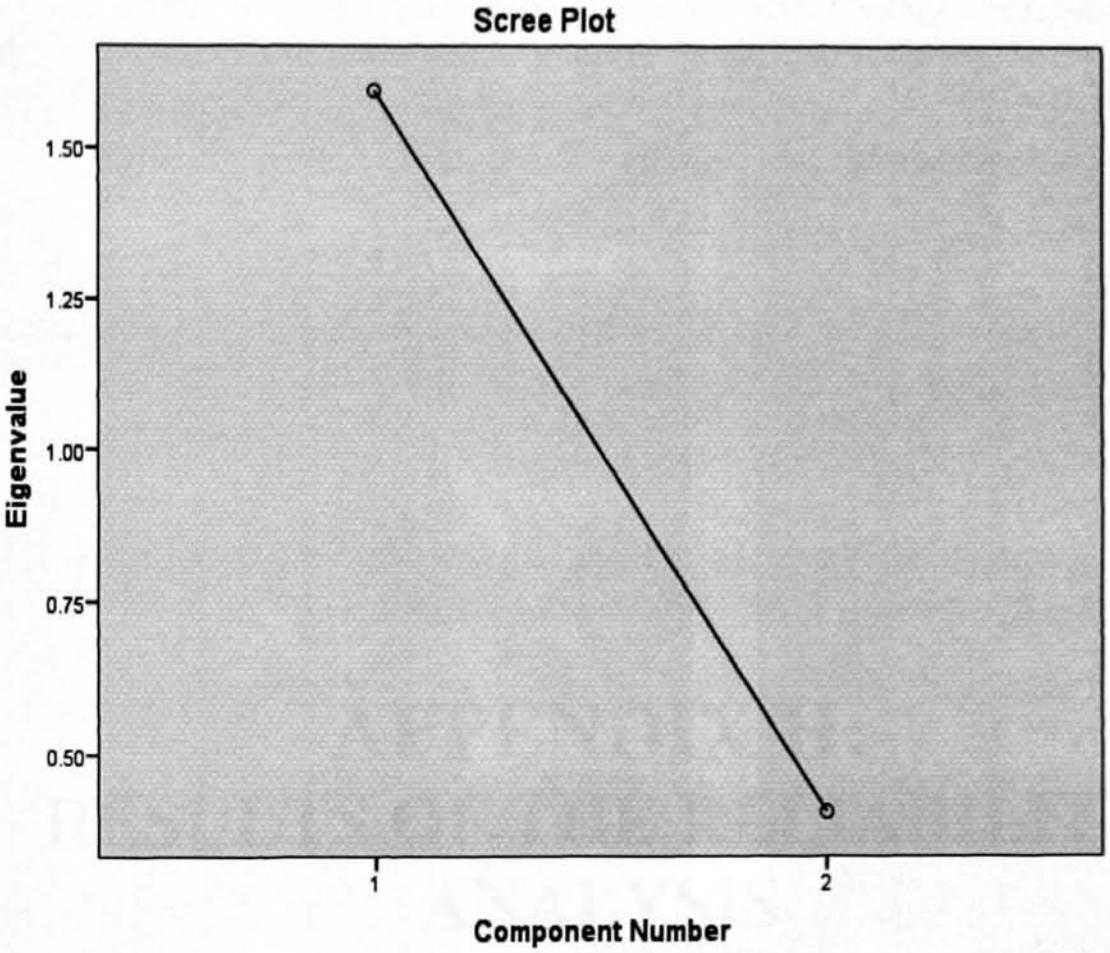
Extraction Method: Principal Component Analysis

Component Matrix[a]

	Component
	1
I1	.893
I2	.893

Extraction Method: Principal Component Analysis.

a. 1 components extracted.


Scree Plot
Eigenvalue
1.50
1.25
1.00
0.75
0.50
1
2
Component Number

APPENDIX H:
RESULTS OF THE RELIABILITY ANALYSIS

ATTITUDE TOWARDS RECYCLING

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.751	.752	3

Inter-Item Correlation Matrix

	A1	A2	A3
A1	1.000	.633	.384
A2	.633	1.000	.492
A3	.384	.492	1.000

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
A1	11.15	5.027	.588	.407	.660
A2	11.09	5.050	.679	.473	.554
A3	11.50	5.884	.483	.251	.774

SUBJECTIVE NORM

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.674	.674	3

Inter-Item Correlation Matrix

	S1	S2	S3
S1	1.000	.421	.409
S2	.421	1.000	.393
S3	.409	.393	1.000

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
S1	10.14	5.772	.498	.248	.564
S2	10.48	5.666	.485	.236	.581
S3	10.00	6.134	.476	.227	.592

PERCEIVED BEHAVIOUR CONTROL

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.644	.648	2

Inter-Item Correlation Matrix

	P1_5	P2_5
P1_5	1.000	.479
P2_5	.479	1.000

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
P1_5	4.64	1.544	.479	.230	.
P2_5	4.90	2.023	.479	.230	.

BEHAVIOURAL INTENTION

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.745	.745	2

Inter-Item Correlation Matrix

	I1	I2
I1	1.000	.593
I2	.593	1.000

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
I1	5.37	1.598	.593	.352	.
I2	5.26	1.715	.593	.352	.

RECYCLING BEHAVIOUR

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.825	.833	9

Inter-Item Correlation Matrix

	B1	B2	B4	B5	B6	B7	B8	B9	B10
B1	1.000	.406	.282	.136	.315	.229	.232	.220	.141
B2	.406	1.000	.429	.332	.425	.495	.404	.278	.347
B4	.282	.429	1.000	.647	.466	.337	.484	.349	.324
B5	.136	.332	.647	1.000	.466	.271	.475	.387	.283
B6	.315	.425	.466	.466	1.000	.535	.558	.375	.219
B7	.229	.495	.337	.271	.535	1.000	.412	.247	.387
B8	.232	.404	.484	.475	.558	.412	1.000	.423	.258
B9	.220	.278	.349	.387	.375	.247	.423	1.000	.257
B10	.141	.347	.324	.283	.219	.387	.258	.257	1.000

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
B1	38.82	63.223	.353	.216	.828
B2	38.94	58.830	.596	.405	.800
B4	39.10	57.559	.641	.511	.794
B5	39.13	58.083	.565	.494	.803
B6	38.66	60.125	.637	.496	.798
B7	38.80	60.080	.552	.424	.805
B8	39.09	59.224	.614	.433	.799
B9	38.59	62.377	.473	.257	.814
B10	39.33	58.853	.411	.232	.827

APPENDIX I:

RESULTS OF DESCRIPTIVE STATISTICS

Descriptive Statistics

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Err
Attitude Towards recycling	370	5.5567	.86094	-.344	.127	-.616	.2
Subjective Norm	370	4.8950	1.06273	-.350	.127	-.156	.2
Perceived Behavior Control	370	3.5266	1.39738	.092	.127	-.712	.2
Behavioral Intention	370	5.3900	.95276	-.222	.127	-.456	.2
Recycling Behavior	370	5.3596	.97614	-.082	.127	-.848	.2
Valid N (listwise)	370						

ATTITUDE TOWARDS RECYCLING

Statistics

		A1	A2	A3
N	Valid	370	370	370
	Missing	0	0	0
Mean		5.76	5.85	5.41
Median		6.00	6.00	5.00
Mode		7	7	5
Std. Deviation		1.352	1.232	1.249
Variance		1.827	1.518	1.559
Range		6	6	6
Minimum		1	1	1
Maximum		7	7	7
Percentiles	25	5.00	5.00	5.00
	50	6.00	6.00	5.00
	75	7.00	7.00	6.00

SUBJECTIVE NORM

Statistics

		S1	S2	S3
N	Valid	370	370	370
	Missing	0	0	0
Mean		5.23	4.90	5.37
Median		5.00	5.00	5.50
Mode		6	5	6
Std. Deviation		1.367	1.410	1.291
Variance		1.870	1.989	1.665
Range		6	6	6
Minimum		1	1	1
Maximum		7	7	7
Percentiles	25	4.00	4.00	5.00
	50	5.00	5.00	5.50
	75	6.00	6.00	6.00

BEHAVIOURAL INTENTION

Statistics

		I1	I2
N	Valid	370	370
	Missing	0	0
Mean		5.28	5.38
Median		5.00	5.00
Mode		5	5
Std. Deviation		1.270	1.248
Variance		1.612	1.558
Range		6	6
Minimum		1	1
Maximum		7	7
Percentiles	25	4.00	5.00
	50	5.00	5.00
	75	6.00	6.00

RECYCLING BEHAVIOUR

Statistics

		B1	B2	B4	B5	B6	B7	B8	B9	B10
N	Valid	370	370	370	370	370	370	370	370	370
	Missing	0	0	0	0	0	0	0	0	0
Mean		5.00	4.92	4.75	4.69	5.15	5.05	4.71	5.22	4.52
Median		5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Mode		6	5	5	5	5	5	5	5	5
Std. Deviation		1.507	1.393	1.440	1.551	1.225	1.352	1.349	1.297	1.841
Variance		2.271	1.940	2.075	2.404	1.500	1.827	1.820	1.682	3.389
Range		6	6	6	6	6	6	6	6	6
Minimum		1	1	1	1	1	1	1	1	1
Maximum		7	7	7	7	7	7	7	7	7
Percentiles	25	4.00	4.00	5.00	4.00	4.00	4.00	4.00	4.00	3.00
	50	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
	75	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00

APPENDIX J:

RESULTS OF CORRELATION ANALYSIS

Correlations

		Behavior	Attitude	SubNorm	Intention	PBC
Behavior	Pearson Correlation	1	.423**	.448**	.569**	.359**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	370	370	370	370	370
Attitude	Pearson Correlation	.423**	1	.425**	.465**	.284**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	370	370	370	370	370
SubNorm	Pearson Correlation	.448**	.425**	1	.388**	.343**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	370	370	370	370	370
Intention	Pearson Correlation	.569**	.465**	.388**	1	.237**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	370	370	370	370	370
PBC	Pearson Correlation	.359**	.284**	.343**	.237**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	370	370	370	370	370

**. Correlation is significant at the 0.01 level (2-tailed).

APPENDIX K:

RESULTS OF REGRESSION ANALYSIS OF INDEPENDENT VARIABLES TOWARDS MEDIATING VARIABLE

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.513[a]	.264	.257	.96716

a. Predictors: (Constant), SubNorm, PBC, Attitude

b. Dependent Variable: Intention

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	122.498	3	40.833	43.653	.000[b]
	Residual	342.354	366	.935		
	Total	464.852	369			

a. Dependent Variable: Intention

b. Predictors: (Constant), SubNorm, PBC, Attitude

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.587	.338		4.692	.000
	Attitude	.390	.055	.355	7.075	.000
	PBC	.040	.031	.061	1.270	.205
	SubNorm	.240	.057	.216	4.218	.000

a. Dependent Variable: Intention

APPENDIX L:
RESULTS OF REGRESSION ANALYSIS OF INDEPENDENT VARIABLES TOWARDS DEPENDENT VARIABLE

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.546[a]	.299	.293	.78468

a. Predictors: (Constant), SubNorm, PBC, Attitude

b. Dependent Variable: Behavior

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	95.927	3	31.976	51.932	.000[b]
	Residual	225.357	366	.616		
	Total	321.285	369			

a. Dependent Variable: Behavior

b. Predictors: (Constant), SubNorm, PBC, Attitude

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.458	.274		5.312	.000
	Attitude	.229	.045	.251	5.119	.000
	PBC	.105	.026	.194	4.100	.000
	SubNorm	.253	.046	.275	5.492	.000

a. Dependent Variable: Behavior

APPENDIX M:
RESULTS OF REGRESSION ANALYSIS OF MEDIATING VARIABLE TOWARDS DEPENDENT VARIABLE

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.569[a]	.324	.322	.76808

a. Predictors: (Constant), Intention

b. Dependent Variable: Behavior

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	104.182	1	104.182	176.595	.000[b]
	Residual	217.102	368	.590		
	Total	321.285	369			

a. Dependent Variable: Behavior

b. Predictors: (Constant), Intention

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.302	.194		11.866	.000
	Intention	.473	.036	.569	13.289	.000

a. Dependent Variable: Behavior

APPENDIX N:
RESULTS OF HIERARCHICAL REGRESSION ANALYSIS

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Stati				
					R Square Change	F Change	df1	df2	Sig. F
1	.523[a]	.274	.270	.82298	.274	72.568	2	385	.000
2	.624[b]	.390	.385	.75542	.116	72.940	1	384	.000

a. Predictors: (Constant), SubNorm, Attitude

b. Predictors: (Constant), SubNorm, Attitude, Intention

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	98.301	2	49.150	72.568	.000[b]
	Residual	260.760	385	.677		
	Total	359.060	387			
2	Regression	139.925	3	46.642	81.732	.000[c]
	Residual	219.136	384	.571		
	Total	359.060	387			

a. Dependent Variable: Behavior

b. Predictors: (Constant), SubNorm, Attitude

c. Predictors: (Constant), SubNorm, Attitude, Intention

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Inte	
		B	Std. Error	Beta			Lower Bound	Uppe
1	(Constant)	1.868	.247		7.568	.000	1.383	
	Attitude	.306	.042	.346	7.269	.000	.224	
	SubNorm	.237	.041	.276	5.791	.000	.156	
2	(Constant)	1.270	.237		5.352	.000	.803	
	Attitude	.167	.042	.189	3.987	.000	.085	
	SubNorm	.157	.039	.182	4.050	.000	.081	
	Intention	.337	.039	.402	8.540	.000	.259	

a. Dependent Variable: Behavior

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Intention	.402[b]	8.540	.000	.400	.719

a. Dependent Variable: Behavior

b. Predictors in the Model: (Constant), SubNorm, Attitude

APPENDIX O:

ANALYSIS OF RECYCLING BEHAVIOUR OF UNDERGRADUTE BUSINESS STUDENT

Test of Homogeneity of Variances

Recycling Behavior

Levene Statistic	df1	df2	Sig.
2.915	2	367	.055

ANOVA

Recycling Behavior

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	34.198	2	17.099	13.545	.000
Within Groups	463.293	367	1.262		
Total	497.491	369			

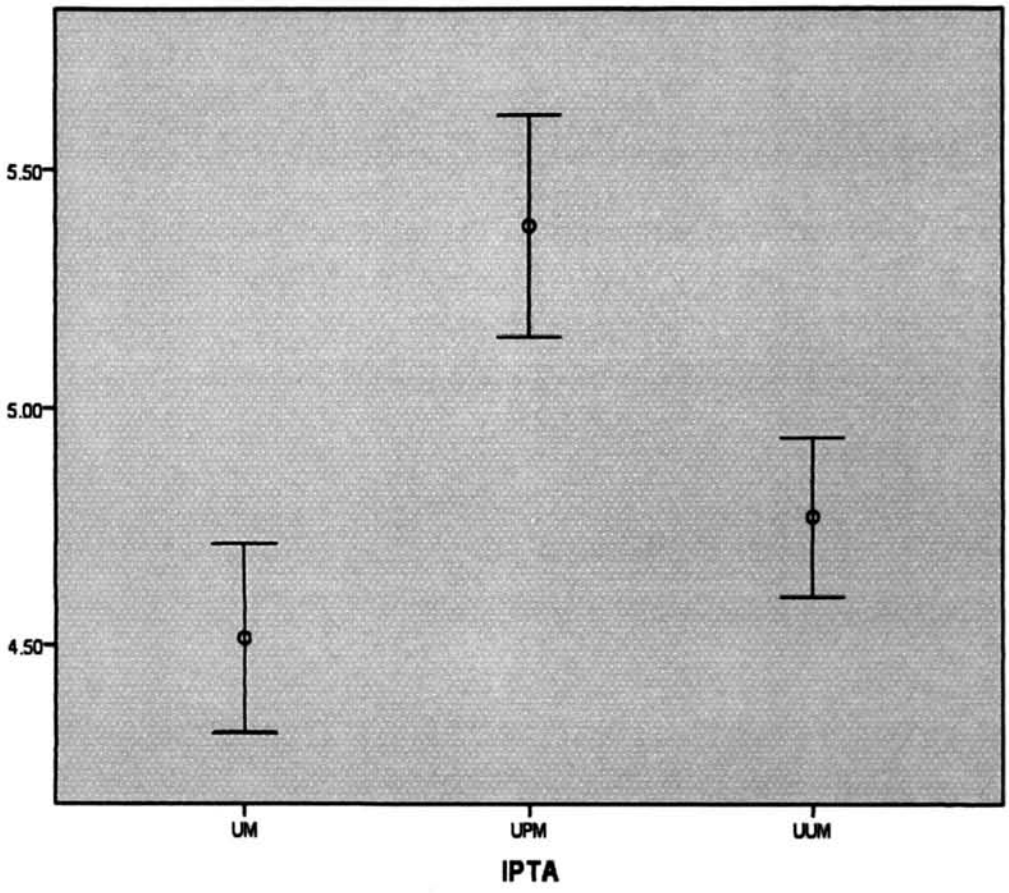
Post Hoc Tests

Multiple Comparisons

Recycling Behavior
Tukey HSD

(I) IPTA	(J) IPTA	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
UM	UPM	-.86655*	.17497	.000	-1.2783	-.4548
	UUM	-.25308	.14745	.200	-.6001	.0939
UPM	UM	.86655*	.17497	.000	.4548	1.2783
	UUM	.61347*	.14555	.000	.2709	.9560
UUM	UM	.25308	.14745	.200	-.0939	.6001
	UPM	-.61347*	.14555	.000	-.9560	-.2709

*. The mean difference is significant at the 0.05 level.


5.50
5.00
4.50
UM
UPM
UUM
IPTA