



UNIVERSITI PUTRA MALAYSIA

***MODERATING EFFECT OF ENVIRONMENTAL EDUCATION IN
RELATIONSHIP BETWEEN ATTITUDE, PERCEIVED BEHAVIOURAL
CONTROL AND SUBJECTIVE NORM WITH WASTE SEGREGATION-
ATSOURCE
BEHAVIOUR IN PUTRAJAYA, MALAYSIA***

CHENG KAI WAH

FEM 2017 25



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By

CHENG KAI WAH

**Thesis Submitted to the School of Graduate Studies, Universiti Putra
Malaysia, in Fulfilment of the Requirements for the Degree of Master of
Science**

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in
fulfilment of the requirement for the degree of Master of Science

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By

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April 2017

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Fast population growth, rapid changing lifestyle, great urbanisation along with aggressive economic development and the rapid changes in consumption rate have accelerated the daily generation and volume rate of municipal solid wastes. Efficient solid waste management has become one of the daunting national challenges, typically in the developing countries, including Malaysia, in order to cope with the solutions for many serious environmental problems. The main purpose of this research was to explore the current scenarios of waste segregation-at-source behaviour in Putrajaya; to evaluate the levels of attitude, perceived behavioural control and subjective norm with waste segregation-at-source behaviour; to investigate the relationship between households' attitude, perceived behavioural control and subjective norm with waste segregation-at-source behaviour; and to examine the moderating effect of environmental education in relationship between households' attitude, perceived behavioural control and subjective norm with waste segregation-at-source behaviour. The subject of this research is households who are living in Putrajaya and the sample was selected via multistage sampling method and systematic sampling method. It is a quantitative research by distributing self-administrative questionnaire. The measurements were adapted from different sources to examine participants' attitude, perceived behavioural control, subjective norm and environmental education with waste segregation-at-source behaviour. The results reveal that attitude ($B = 0.005$, $p = 0.783$), perceived behavioural control ($B = 0.121$, $p = 0.000$) and subjective norm ($B = 0.003$, $p = 0.907$) have positive relationship with waste segregation-at-source behaviour. Besides that, environmental education does moderate relationship between perceived behavioural control ($B = -0.010$, $p = 0.026$) but does not moderate relationship between attitude ($B = 0.003$, $p > 0.05$) and subjective norm ($B = 0.005$, $p > 0.05$) with waste segregation-at-source behaviour positively. The findings provide an insight particularly for the individual, government, educator and non-governmental organisations in Malaysia on factors

that they should consider in developing pro-environmental policies. Furthermore, future research recommended to increase the area coverage of research location in a bid to obtain a more reliable data and provide greater generalisation.



Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
sebagai memenuhi keperluan untuk ijazah Master Sains

**KESAN PERANTARAAN PENDIDIKAN ALAM SEKITAR DALAM PERKAITAN
ANTARA SIKAP, TANGGAPAN KAWALAN TINGKAH LAKU DAN NORMA
SUBJEKTIF DENGAN GELAGAT PENGASINGAN SISA PEPEJAL DI PUNCA
DI PUTRAJAYA, MALAYSIA**

Oleh

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April 2017

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Pertumbuhan populasi yang cepat, perubahan gaya hidup, kepesatan urbanisasi bersama-sama dengan pembangunan ekonomi yang agresif dan perubahan kadar penggunaan telah meningkatkan jumlah penjana serta penghasilan sisa pepejal harian. Kecekapan pengurusan sisa pepejal telah menjadi salah satu cabaran nasional, terutamanya di negara-negara membangun seperti Malaysia untuk mencari penyelesaian kepada banyak masalah pencemaran alam sekitar yang serius. Tujuan kajian ini adalah untuk meneroka senario semasa gelagat pengasingan sisa pepejal di punca di Putrajaya; untuk menilai tahap sikap, tanggapan kawalan tingkah laku dan norma subjektif dengan gelagat pengasingan sisa pepejal di punca; untuk menyiasat hubungan antara sikap, tanggapan kawalan tingkah laku dan norma subjektif dengan gelagat pengasingan sisa pepejal di punca; dan untuk memeriksa kesan perantaraan pendidikan alam sekitar dalam hubungan antara sikap, tanggapan kawalan tingkah laku dan norma subjektif dengan gelagat pengasingan sisa pepejal di punca. Subjek kajian ini adalah isi rumah yang tinggal di Putrajaya dan sampel telah dipilih melalui kaedah persampelan rawak berlapis dan kaedah persampelan sistematik. Ia adalah satu kajian kuantitatif dengan mengedarkan soal selidik. Pengukuran dalam kajian ini telah disesuaikan daripada sumber-sumber yang berbeza untuk memeriksa sikap, tanggapan kawalan tingkah laku, norma subjektif dan pendidikan alam sekitar dengan gelagat pengasingan sisa pepejal di punca. Kajian ini mendedahkan sikap ($B = 0.005, p = 0.783$), tanggapan kawalan tingkah laku ($B = 0.121, p = 0.000$) dan norma subjektif ($B = 0.003, p = 0.907$) mempunyai hubungan positif terhadap gelagat pengasingan sisa pepejal di punca. Selain itu, pendidikan alam sekitar mengantara hubungan antara tanggapan kawalan tingkah laku ($B = -0.010, p = 0.026$) tetapi tidak mengantara hubungan antara sikap ($B = 0.003, p > 0.05$) dan norma subjektif ($B = 0.005, p > 0.05$) dengan gelagat pengasingan sisa pepejal secara positif. Hasil kajian ini memberi gambaran tentang faktor-faktor yang perlu diambil kira dalam pembentukan dasar-dasar pro-alam sekitar terutamanya bagi

individu, kerajaan, pendidik dan pertubuhan-pertubuhan bukan kerajaan di Malaysia. Tambahan pula, kajian masa hadapan dicadangkan untuk meningkatkan liputan bagi kawasan lokasi kajian dalam usaha untuk mendapatkan data yang lebih dipercayai dan memberikan generalisasi yang lebih besar.



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I certify that a Thesis Examination Committee has met on 14 April 2017 to conduct the final examination of Cheng Kai Wah on his thesis entitled "Moderating Effect of Environmental Education in Relationship between Attitude, Perceived Behavioural Control and Subjective Norm with Waste Segregation-At-Source Behaviour in Putrajaya, Malaysia" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Master of Science.

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LIST OF ABBREVIATIONS

ATT	Attitude
AVE	Average Variance Extracted
CAP	Consumers Association of Penang
DV	Waste Segregation-at-Source Behaviour
EE	Environmental Education
ICT	Information, communication, and technology
KLIA	Kuala Lumpur International Airport
MASCO-2013	Malaysia Standard Classification of Occupations 2013
MHLG	Ministry of Urban Wellbeing, Housing and Local Government
MOF	Ministry of Finance
MSC	Multimedia Super Corridor
NGO	Non-governmental Organisation
PBC	Perceived Behavioural Control
PCA	Principal Components Analysis
PLI	Poverty Line Income
PLS-SEM	Partial Least Squares - Structural Equation Modelling
SN	Subjective Norm
SPSS	Statistical Package for Social Science
SWCorp	Solid Waste Management and Public Cleansing Corporation
TOT	Total
VIF	Variance Inflation Factor

CHAPTER 1

INTRODUCTION

1.1 Research Background

Efficient solid waste management has become one of the daunting national challenges nowadays (Otitoju and Seng, 2014), typically in the cities of developing countries (Wang and Wang, 2013), including Malaysia. Fast population growth (Begum, Siwar, Pereira and Jaafar, 2007), rapid changing lifestyle (Sakawi, 2010), great urbanisation (Manaf, Samah and Zukki, 2009) along with aggressive economic development (Iwan Budhiarta, Siwar and Hassan Basri, 2012) and changes in consumption rate (Abas and Wee, 2014) have accelerated the daily generation and volume rate of municipal solid wastes in Malaysia.

Solid waste collection in an urban area also becomes more complex in terms of fuel, logistic and labour cost and air pollutants emission because of the volume of waste generation become more diffuse (Malakahmad, Md Bakri, Md Mokhtar and Khalil, 2014). According to the statistics released by Ministry of Urban Wellbeing, Housing and Local Government (MHLG) in 2011, there are 23 289 tonnes of garbage produced in Malaysia every day. Among all the states and federal territories in Malaysia, Selangor was ahead of other states with the generation of 4055 tonnes of garbage every day. It was then followed by Kuala Lumpur (3734 tonnes/day), Johor (3102 tonnes/day), Perak (2696 tonnes/day) and Kedah (2483 tonnes/day) (Abdullah, Rahman and Azis, 2010). On average, each Malaysian produces 0.8 kg of waste every day. This amount is getting larger for those who are living in the urban area because they are estimated to produce 1.5 kg of waste every day (Fatimah, Osmi, Mokhtar, Romali and Che, 2013).

Consequently, the increases in the quantity of municipal solid waste have led to many negative environmental issues in Malaysia (Saeed, Hassan and Mujeebu, 2009). For that reason, a proper way of handling municipal solid waste is significance in order to reduce the negative impacts towards the environment, economic and social. Hence, the best way in managing the waste generation is started from waste reduction at source (Boyle, 1998), that is, eliminate the generation of waste at source and carry out recycling for recovery or reuse a waste material.

Wastes are generated from three main sources. They are industrial, domestic and commercial. It shows that there is an increasing trend of waste generation throughout the world (Harir, Kasim and Ishiyaku, 2015). This is also true that the highest solid waste generated in Malaysia is from domestic sector. Individual households produce a lot of garbage especially in urban areas with the well-increasing income as the time passes by (Kamaruddin, Mohammad, Mahbub and Ahmad, 2013). It is further estimated that the daily generation of waste has escalated from 13 000 tonnes in 1998 to 19 100 tonnes in 2014 (Sivakumar and Lakshmikanthan, 2015).

The characteristics of waste in Malaysia are described as a very high content of organic components. They are also very high in moisture content (Lim, 2012). In addition to that, cookery waste or organic vegetable is the largest waste component and it is followed by plastic and paper. Wood, glass, and metals are relatively large waste components as well. There are several studies which indicate that there is more inorganic waste generated now such as paper, glass, and plastic even though a number of organic wastes still remained as the largest fractions (Saeed, Hassan and Mujeebu, 2009).

Waste generation is an intrinsic part of human existence (Coker, Achi, Sridhar and Donnett, 2016). Thus, the problem which associated with municipal solid waste management should be over-emphasised because solid waste management is an important public health service (Addo-Yobo and Ali, 2003). In general, municipal solid waste management is handled by several government agencies from Federal to State and to Local Authorities. More recent, the government has made it mandatory to all premises to separate solid waste at the source for their next collection and dumping of the process beginning 1 September 2015 (MHLG, 2015).

Datuk Abdul Rahman Dahlan, former Minister of MHLG announced that all Malaysian households must practise solid waste separation at source according to solid waste compositions, namely cardboard, plastic, paper, food waste, glass, metal, farm waste and lump waste. It is also fully implemented to Johor, Melaka, Negeri Sembilan, Putrajaya, Kuala Lumpur, Kedah, Perlis and Kuantan under Solid Waste Management and Public Cleansing Act 2007 (Act 672). Likewise, it is an offense under the law for not separating solid waste at source (MHLG, 2015).

1.2 Problem Statement

Municipal solid waste management has emerged as a big challenge not only because of the environmental hygiene and human health concerns but also due to huge quantities of waste generated (Shaw, 2008). Generally, most of the wastes in Malaysia are disposed in landfills or they are illegally dumped (Vivian, 2011). Some of the wastes have been processed prior disposal or recycled as recycling is also an option to manage the waste instead of landfilling (Miafodzyeva, Brandt and Andersson, 2013).

Waste dumping and landfilling may cause many negative harmful environmental impacts and serious environmental degradation (Shaw, 2008). It is approximately 75.0 percent of the waste is disposed of in landfills and dump (Agamuthu, Fauziah and Khidzir, 2009). An estimated 20.0 percent is burned or dumped into rivers or at illegal sites which include open dump sites where illegal dumping takes place or the place where has accumulated a large quantity of garbage. However, it is only around 5.0 percent of waste is recycled (Mamat and Chong, 2007). Even though the government has promoted recycling programmes in Malaysia since 1993 but it cannot be considered as a very successful programme because of the lukewarm attitudes and lack of households' participation in it (Knussen, Yule, MacKenzie and Wells, 2004).

It can be said that many of the environmental problems today are actually caused by attitudes rather than by technical problems (Ifegbesan, 2008) because it takes a long time to break the old traditions and alter the current attitudes and practises (Bacinschi, 2010). However, research, education, and public participation are some of the useful tools for long-term improvement and changes in the ethics and attitude of public towards proper waste management (Pappu, Saxena and Asolekar, 2007).

It is important to know that, non-governmental organisations are seeking to change the attitudes of the businessman, young people, and household so as they will appreciate that waste and its environmental effects are relevant to them (Moh and Abd Manaf, 2014). In addition to that, they have a significant role to play in bringing about community benefits via reuse, recycling and waste minimisation (Athanassiou and Zabaniotou, 2008) for a better and ideal living environment in the future (Eusuf, Ibrahim, Shamzani and Affendy, 2011).

The existing literature of perceived behavioural control variable is still scarce on understanding the waste segregation-at-source behaviour. Hence, similar research which is related to sustainable management, recycling and solid waste management (Hurlimann, 2009; Koc and Kuvac, 2016; Lewis, 2009) have been adopted in this research. Agamuthu and Fauziah (2011) justified that most of the residents in Petaling Jaya knew about the importance and meaning of recycling but there is only 22.0 percent of them practise it every day. This statement shows

that there are still very few people who perceived that they are actually able to perform the recycling behaviour in their daily life. The given reasons were that waste collection infrastructure, for instance, recycling bin and the location to dispose of their household waste were not easily available. Hence, it has limited the willingness of public and community to perform the recycling behaviour (Agamuthu, Khidzir and Hamid, 2009).

The current research also offers some important insights into the perspective of subjective norm. This research is designed in order to highlight the influences of subjective norm on waste segregation-at-source behaviour among households because many previous researchers are only explaining its role on general pro-environmental behaviour (Adejoke, Mji and Mukhola, 2014; Ioannou, Zampetakis and Lasaridi, 2013; Tan and Azman, 2011; Tesfai, Nagothu, Simek and Fucik, 2016) but still not mainly emphasising it on waste segregation-at-source behaviour yet. This can be seen that many scholars have identified that household's attitude which related to recycling activities are affected by active support and the involvement of community residential committees for public participation (Zhuang, Wu, Wang, Wu and Chen, 2008). Trudel, Argo, and Meng (2015) also contended that altruistic, regulatory factors and social influences are some of the factors why certain groups of the community can develop strong recycling habits.

In term of research, there is still lacking the information on waste segregation-at-source behaviour. Most of them are focusing on recycling and environmental protection. For instance, Iwan Budhiarta et al. (2012) argued that the lack of knowledge and expertise which related to recycling on the part of authorities have made the programmes ineffectively in educating the general public. Low knowledge level about solid waste management among citizens is one of the obstacles to reach the goal of environmental protection (Saeed et al., 2009). Likewise, it is essential for households to gain knowledge and know more about waste segregation-at-source so as they are able to perform the behaviour in the right way. Hence, this research is aimed to provide an exciting opportunity to fill up the research gap in literature so as to advance the knowledge about waste segregation-at-source behaviour.

Ultimately, the present research, for the first time, explores and fills a gap in existing literature by treating the environmental education variable as a moderating variable between attitude, perceived behavioural control and subjective norm on waste segregation-at-source behaviour instead of an independent variable. The environmental education is a set of processes. It should be given a serious attention to producing who are knowledgeable about biophysical and the environmental problems around us (Meligrana and Andrew, 2003). Having knowledge about the environment by means of education reveals that lecturers, professors, and instructors are responsible to give applied skill and theoretical understanding to the students about environmental science (Hunter, Laursen and Seymour, 2007). However, waste segregation-at-source behaviour is a very new policy which is just launched by the Malaysian government in 2015. Hence, there is still lack of reading articles regards to waste

segregation-at-source behaviour in the context of Malaysia. By realising the scarce knowledge and research within this field, this research provided an important opportunity to investigate the knowledge gap and its literature.

1.3 Research Questions

This research is aimed to explore the moderating effect of environmental education in relationship between attitude, perceived behavioural control and subjective norm with waste segregation-at-source behaviour among households in Putrajaya. Thereby, based on the issues discussed above, the following questions are of interest and aimed to be addressed in this research:

1. What are the current scenarios of waste segregation-at-source behaviour among households in Putrajaya?
2. What are the levels of attitude, perceived behavioural control and subjective norm with waste segregation-at-source behaviour among households?
3. Is there any significant relationship between household's attitude, perceived behavioural control and subjective norm with waste segregation-at-source behaviour?
4. To what extent environmental education moderates the significant relationship between household's attitude, perceived behavioural control and subjective norm with waste segregation-at-source behaviour?

1.4 Research Objectives

The above research questions after being investigated and analysed would be able to answer the following objectives.

1. To explore the current scenarios of waste segregation-at-source behaviour among households in Putrajaya.
2. To evaluate the levels of attitude, perceived behavioural control and subjective norm with waste segregation-at-source behaviour among households.
3. To investigate the relationship between household's attitude, perceived behavioural control and subjective norm with waste segregation-at-source behaviour.
4. To examine the moderating effect of environmental education in relationship between household's attitude, perceived behavioural control and subjective norm with waste segregation-at-source behaviour.

1.5 Research Hypotheses

The current research proposed that the following hypotheses are tested based on research objectives 3 and 4.

H₀1: There is no significant relationship between household's attitude and waste segregation-at-source behaviour.

H₀2: There is no significant relationship between household's perceived behavioural control and waste segregation-at-source behaviour.

H₀3: There is no significant relationship between household's subjective norm and waste segregation-at-source behaviour.

H₀4: Environmental education does not moderate the relationship between attitude and waste segregation-at-source behaviour positively.

H₀5: Environmental education does not moderate the relationship between perceived behavioural control and waste segregation-at-source behaviour positively.

H₀6: Environmental education does not moderate the relationship between subjective norms and waste segregation-at-source behaviour positively.

1.6 Scope of Research

The respondents of this research were focused on a total of 400 male and female households who are living in the housing areas of Putrajaya namely; Precinct 5, Precinct 8, Precinct 9, Precinct 10, Precinct 11, Precinct 14, Precinct 15, Precinct 16, Precinct 17 and Precinct 18. The sample size of respondents was calculated by using sample size determination equation which proposed by Yamane (1967) in order to obtain a reliable and valid representative for this research. The systematic sampling method was employed in selecting the respondents to engage in this present research.

This research aimed at analysing the levels of attitude, perceived behavioural control and subjective norm on waste segregation-at-source behaviour and exploring the relationship between household's attitude, perceived behavioural control and subjective norm with waste segregation-at-source behaviour. This research also attempts to explore the moderating effect of environmental education on the relationship between household's attitude, perceived behavioural control and subjective norm with waste segregation-at-source behaviour in Putrajaya. Consequently, a self-administered bilingual questionnaire was distributed to respondents regardless of their age, sex, and religion.

1.7 Significance of Research

The significance of this present research's findings can be expressed in terms of few perspectives, including the literature, Malaysian government, theoretical, consumers and non-governmental organisations (NGO).

Firstly, this research can be viewed as one of the few preliminary types of research that mainly focus on waste segregation-at-source behaviour after this particular policy has been lately launched and implemented by Malaysian government since 2015. Hence, in terms of contribution to the literature, this present research is significant to academicians because it can provide concrete references for future research in order to further establish and enlarge the picture of the behaviour of waste segregation-at-source in a local context.

The results of this research should be beneficial to the Malaysian governmental bodies which are involved in playing a significant role in municipal solid waste management in this country. For instance, National Solid Waste Management Department, Solid Waste Management and Public Cleansing Corporation and Ministry of Urban Wellbeing, Housing and Local Government. The findings also will contribute to building a good data set with respect to waste segregation-at-source for these relevant bodies in Malaysia in order to enlighten the understanding and recognising the sources of problem and improve their planning for the policies and regulations in the future.

More importantly, in terms of theoretical aspect, this research has integrated the Fietkau-Kessel Model and Theory of Planned Behaviour in predicting the dependent variable of waste segregation-at-source behaviour. This can be the contribution to the body of knowledge because there is no existing literature which has integrated Fietkau-Kessel Model and Theory of Planned Behaviour in this specific perspective. Furthermore, environmental education is also introduced as a moderator in this research instead of independence variable as been used in many previous studies.

Consumers also can gain benefits via this research's findings because they can learn about the environmental knowledge who in turn to become a knowledgeable consumer and improve their ability in order to empower themselves to protect the environment for future generations. This is because environmental knowledge can create, increase and enhance the public awareness, knowledge, and participation on waste segregation-at-source within the local communities, school children and the general public.

Lastly, in the perspective of NGO, Waste Management Association of Malaysia can potentially gain benefits from these research's findings by formulating workable community activities. They can organise some related programmes in order to enhance the awareness level and inculcate the sense of responsibility to protect the cleanliness of environment among households in Putrajaya. This research also encourages the cooperation and collaboration between all those concerned and interested people with waste management. As such, workshops, seminars, training and relevant courses on waste management can be regularly held for the welfare and benefit of the stakeholders.

1.8 Limitations of Research

In general, there are several limitations that will potentially affect the quality of results. Firstly, although the households who engaged in this research were assumed to be sufficient for a research that conducted in Putrajaya, however, the generalisation of this particular research's results as a whole population in Malaysia is still not warranted. In addition to that, this research was prominence only in Putrajaya, which excludes all the other states and Federal Territories in Malaysia. Hence, this present research can only generalise to the population of Putrajaya which is seen as one of the limitations of this research.

Last but not least, the respondents assessed may be dishonest when answering the questions in the questionnaires given. In order to present themselves in a more favourable way, they may prefer to give positive answers. Respondents may attempt to inflate their perceived image by completing instruments in such a way that is incompletely accurate. Thus, the data collected may not be reliable and accurate since the accuracy of this research may depend on the honesty of respondents while answering the questionnaires submitted.

1.9 Research Framework

The aim of this current research is to explore the moderating effect of environmental education in relationship between attitude, perceived behavioural control and subjective norm with waste segregation-at-source behaviour among households in Putrajaya. Thus, the following research framework is created for the purpose of this research. As shown in Figure 1.1, there are three independent variables, namely attitude, perceived behavioural control and subjective norm. The moderating variable identified is environmental education whereas the dependent variable is waste segregation-at-source behaviour.

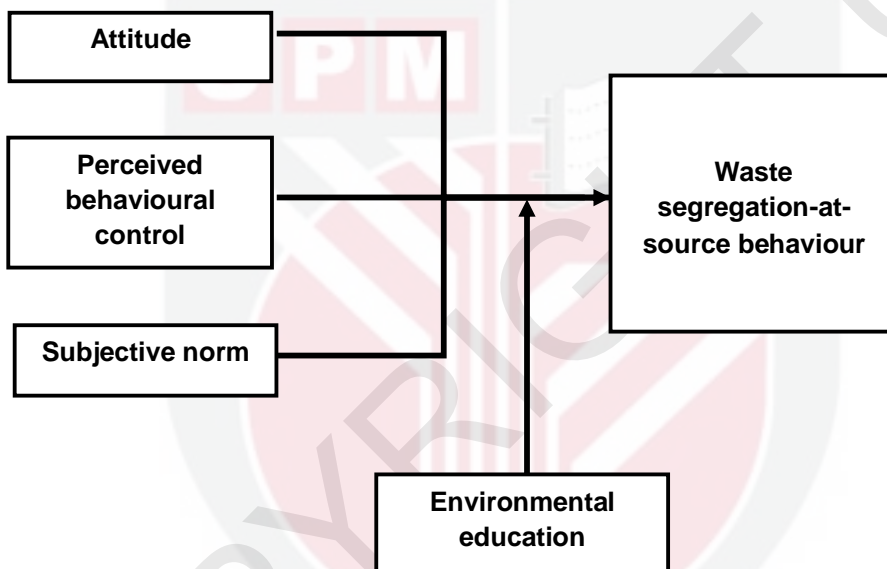


Figure 1.1: Research Framework for Moderating Effect of Environmental Education in Relationship between Attitude, Perceived Behavioural Control and Subjective Norm with Waste Segregation-at-Source Behaviour among Households in Putrajaya, Malaysia

1.10 Definition of Terminologies

1.10.1 Attitude towards Waste Segregation-at-Source Behaviour

Conceptual : A negative or positive feeling about separating the waste according to their different properties which in turn highly able to create an influencing effect on the behaviour of a population (Perrin and Barton, 2001).

Operational : In this present research, it was measured by adapting the instruments applied in previous research (Babaei, Alavi, Goudarzi, Teymouri, Ahmadi and Rafiee, 2015; Tonglet et al., 2004; Zhang, Huang, Yin and Gong, 2015) based on respondents' tendency to respond positively or negatively towards the behaviour through five scales of Strongly Disagree (1), Disagree (2), Not Sure (3), Agree (4), and Strongly Agree (5).

1.10.2 Perceived Behavioural Control towards Waste Segregation-at-Source Behaviour

Conceptual : The extent to which a person feels whether she or he is able to actually perform sorting of unwanted matter at the place of waste produced based on their beliefs and perceived power of the factors that may facilitate or impede their performance of that behaviour (Ajzen, 1991).

Operational : In the context of this research, it was measured through the items from Cabaniss (2015) that tested on households' response that varies from Strongly Disagree (1) to Strongly Agree (5) with regards to their self-control beliefs on the ability or effort to portray certain daily waste sorting procedures in life.

1.10.3 Subjective Norm towards Waste Segregation-at-Source Behaviour

Conceptual : It refers to the normative belief in one's referents which is then multiplied by motivation in a bid to comply with one's referents. It is also the perceived social pressure that will lead to performing or not to perform certain repeated actions of sorting the unwanted material (Ajzen, 1991).

Operational : In this research, an adaption of the measuring items from Apinpath (2014) and Lutui (2001) has been made in order to match with the current context about the social pressure from their key referents that drive them to carry out the targeted behaviour.

1.10.4 Waste Segregation-at-Source Behaviour

Conceptual : A typical and repeated action of separating the unwanted matter or material effectively into different elements according to their recycling potential (Charuvichaipong and Sajor, 2006).

Operational : This is the expression used for the sorting of waste into the required fractions at the place of waste production – at the source.

1.10.5 Environmental Education

Conceptual : It is an interdisciplinary search for the knowledge and understanding of natural systems and their dynamic interaction between humankind's cultural and social systems (Hausbeck, Milbrath and Enright, 1992; Hungerford and Volk, 1990).

Operational : The extent to which instructing or educating the public about skills of performing waste segregation-at-source is assessed in this research.

1.11 Organisation of Thesis

This thesis is composed of five themed chapters. This section will define the organisation of thesis in details.

Chapter One delivers an introduction to the research and provides an overview of the relevant research background and problem statement. Next, research questions, research objectives as well as research hypotheses are pointed out in the subsequent sections. As for the scope, limitations of this research display the focus of current research. The contributions of research have emerged via the significance of research. A research framework which created specifically for this research is also displayed. This chapter ends with the definition of terminologies that applied in the research.

Chapter Two demonstrates in details about the research variables and its relation between the variables. Moreover, this chapter explains the identified moderating effect which can be found in the proposed research framework consequently. This chapter also presents the theoretical view of this research. The basis of theoretical is established in order to develop the research framework of this current research.

Chapter Three presents the methodology employed in this research. This chapter primarily discusses the research design, research location, sampling procedure, research instrumentation, pre-test assessment and data collection technique. This chapter ends with the discussion of the data analysis techniques which applied according to the research objectives of the current research.

Chapter Four begins with the findings and discussions of this research. The discussion of results which comprises of the analysis of surveyed respondents' demographic characteristics, current patterns of waste segregation-at-source behaviour, construct descriptive analysis and inferential statistics utilised according to the research objectives proposed in this research. The discussion of the research findings is followed in each section. This chapter ends with hypotheses testing and its summary.

Chapter Five outlines the research summary, conclusions, implications and recommendations for future research direction. This chapter starts with the summarisation of major findings in this research. Moreover, this chapter discloses about the conclusions according to the proposed research objectives that reflect the discussions in this research. The theoretical implications, as well as managerial implications, are emphasised in the subsequent section. The finales for this chapter are the limitations and recommendation for the future research.

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