MUNICIPAL SOLID WASTE (MSW) RECYCLING BEHAVIOUR AMONG FORM THREE STUDENTS IN PUTRAJAYA

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ABSTRACT

Students whom are the future leader of the country were assessed to study their behaviour towards Municipal Solid Waste (MSW) recycling. A total of 302 form three students were randomly chosen from nine secondary schools in Putrajaya. An instrument namely Students Behaviour on Recycling (SBoR) that consist of Theory of Planned Behaviour (TPB) (attitude, subjective norm, and perceived behaviour control) and Others Determinant Factors (ODF), (awareness, knowledge of issue, motivation, preferences scheme, recycling practice, and situational factors) were administered to the respondents. The data was analysed using descriptive analysis, Spearman correlation, and standard multiple regression. 77.5% and 22.5% of the students possess excellent and good behaviour towards MSW recycling, respectively. There is weak-positive correlation between TPB and students behaviour with r=0.450 (p=0.000), and strong-positive correlation between ODF and students behaviour with r=0.691 (p=0.000). 20.4% of R^2 shows that attitude, subjective norms, and perceived behaviour control of TPB had influence students behaviour with standardised *beta* weights 0.265, 0.189, and 0.166, respectively. 43.9% of R^2 explained that awareness, recycling practice, and situational factors of ODF are the contributor influencer of students MSW recycling behaviour with standardised *beta* weights 0.341, 0.296, and 0.269, respectively. In conclusion, students have high potential as MSW recycling practitioner and the data obtained also reflects solid waste management measures that shall be strengthen to ensure a sustainable environment in Malaysia.

TINGKAHLAKU KITAR SEMULA SISA PEPEJAL PERBANDARAN DALAM KALANGAN PELAJAR TINGKATAN TIGA DI PUTRAJAYA

ABSTRAK

Bakal pemimpin negara iaitu pelajar dinilai bagi mengkaji tingkahlaku mereka terhadap kitar semula Sisa Pepejal Bandaran (SPB). Seramai 302 pelajar tingkatan tiga dipilih secara rawak dari sembilan buah sekolah menengah di Putrajaya. Instrumen Tingkahlaku Pelajar Terhadap Kitar Semula (SBoR) yang mengandungi Teori Tingkahlaku Terancang (TTT) (sikap, norma subjektif, kawalan tingkahlaku) dan Faktor Penentu Lain (FPL) (kesedaran, pengetahuan terhadap isu, motivasi, skema pilihan, amalan kitar semula, dan faktor situasi) ditadbirkan kepada responden Data dianalisis menggunakan analisis deskriptif, korelasi Spearman, dan regressi. 77.5% dan 22.5% pelajar masing-masing mempunyai tingkahlaku sangat baik dan baik terhadap pengitaran SPB. Terdapat hubungan positif yang lemah di antara TTT dan tingkah laku pelajar dengan r=0.450 (p=0.000), dan korelasi positif yang kuat di antara FPL dan tingkahlaku pelajar dengan r=0.691 (p=0.000). 20.4% daripada R^2 menunjukkkan sikap, norma subjektif, kawalan tingkah laku TTT mempengaruhi tingkah laku pelajar dengan pemberat *beta* seragam masing-masing 0.265, 0.189, dan 0.166. 43.9% daripada R^2 pula menerangkan bahawa kesedaran, amalan kitar semula, dan faktor situasi FPT, faktor mempengaruhi tingkahlaku kitar semula SPB dengan pemberat *beta* seragam masing-masing 0.341, 0.296, dan 0.269. Kesimpulannya, pelajar mempunyai potensi tinggi sebagai pengamal kitar semula SPB dan dapatan kajian juga menunjukkan langkah-langkah pengurusan sisa pepejal yang perlu diperkukuh bagi memastikan persekitaran yang mampan di Malaysia.

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JPWPP	Jabatan Pendidikan Wilayah Persekutuan Putrajaya
PBT	Local Authorities
MoE	Ministry of Education
MHLG	Ministry of Housing and Local Government
MSW	Municipal Solid Waste
NGO	Non-Government Organization
ODF	Other Determinant Factors
PT3	Penilaian Tahap 3
PPSPPA	Perbadanan Pengurusan Sisa Pepejal dan Pembersihan Awam
PPJ	Perbadanan Putrajaya
BKS	Recycling Bank
3R	Reduce, Reuse, Recycle
SWPCM	Solid Waste and Public Cleansing Management
SWM	Solid Waste Management
SBoR	Student Behaviour on Recycling
TPB	Theory of Planned Behaviour
WTE	Waste to Energy

CHAPTER 1

INTRODUCTION

1.1 Introduction

Industrialization and urbanization may appear the promising elements in this 21st century way of life. However, the lack management in use of resource and environmental problems have been reflected in environmental condition. Each one in the society is highly responsible in marshal the issue of environmental pollution. Therefore, it is crucial to upsurge the awareness in taking care of the Mother Nature for future generation (Ugulu, 2014).

One of the approach that globally been promoting to protect the environment is on recycling (Omran, Mahmood, Abdul Aziz and Robinson, 2009). According to Frank (2011) recycling is "*the process, through which materials previously used are collected, processed, remanufactured and reused*". The highlighted value of recycling are (1) counter or minimize waste production, (2) waste recycling and reuse, and (3) safe disposal of non-recoverable residues. Minimize waste production by means is recycling enable to reduce or combating the waste problems. Malaysia Act 672 of Solid Waste Management and Public Cleansing Act highlighted recycling as collecting and sorting solid waste by means for new production (Commissioners Law Malaysia, 2007a).

The practice of Solid Waste Management, (SWM) in Malaysia is different from the other countries. In Malaysia, SWM is managed by the local government or also known as state government. As Malaysia have thirteen state, thus the SWM are varies. Therefore, to synchronize the management, Solid Waste and Public Cleansing Management (SWPCM) Act 2007 is enforced on 1 September 2011 in eight states and Federal Territories in Peninsular Malaysia. This clause provides an executive authority to federal government on SWPCM. Two federal institutions had employing the policy which are National Solid Waste Management Department, and Solid Waste Management and Public Cleansing Corporation (Omran et al., 2009; Papargyropoulou, 2011). Municipal solid waste (MSW) is waste that includes predominantly domestic waste such as household waste, commercial waste, and institution waste such as. waste from school, government office, universities, and college.

Recycling is been seen able to enhance the awareness of students towards protecting the environment. Besides that, it enables the students to link between science and their environment. In Malaysia, neither MSW recycling or environmental education is specifically emphasize in core syllabus in core syllabus of any subjects (Curriculum Development Centre, 2005). It is an integrated subject been taught with various subjects such as in Science, Geography, Life Skills (*Kemahiran Hidup*), Civic and Moral. Thus, extra-curriculum provides a platform in engaging students with recycling awareness. Clubs, school programs and others related association is revolving the students by levering them into protecting the environment.

Putrajaya is one of the urban cities that managing MSW recycling programmes systematically through collaboration between Alam Flora Sdn. Bhd. and Perbadanan Putrajaya, PPJ. A recycling group known as 'Recycle Team' is established to inculcate and disseminate information on MSW recycling among Putrajaya community. The idea of recycling of MSW among Malaysian and the importance to educate the community on waste minimization has been visualized by former Prime Minister, Tun Mahathir Mohamad in 2004. Therefore, through years, students in Putrajaya regardless either they are in kindergarten, primary or secondary school, most of them had been exposed to recycling programme. The Recycle Team with cooperation from school, carry out talks and activities on recycling of MSW. The 3Rs module for the school is known as KitS which stand for Recycling at School (*Kitar Semula di Sekolah*). This programme aims to educate the students on the importance of recycling of MSW. Alam Flora Sdn. Bhd. assists the recycling programme in school through collection of the recyclable materials. Incentives based

on the volume of recyclable materials collected are provided to the schools in the form of cash and gifts (Fazliyatul, 2015).

Theory of Planned Behaviour (TPB) was one of the widely use theory in assessing ones behaviour towards recycling. Many studies that employed this theory have been reported (Ahmad, Bazmi, Bhutto, Shahzadi and Buhkari 2014; Ugulu 2014; Frank 2011; Omran et al., 2009). The TPB modulated by Icek (1991) suggest that behaviour was consequences of one's intentions, which influence by three factors; (1) attitudes, (2) subjective norms, and (3) perceived behavioural control. In order to improve recycling performance more engagement from public are required. This study aims to assess the MSW recycling attitude and behaviour among Putrajaya school students.

1.2 Research background

Generally, SWM is identified as one of the important environmental issue at municipalities' level. SWM is defined as control of waste generations, storage, collection, transfer and transport, processing and disposal of solid waste in accordance to public health practice, economics and financial, engineering, administrative and legal and environmental considerations (Omran et al., 2009).

The government of Malaysia had promoting the 3R programs; Reduce, Reuse, and Recycle since it official launched in October, 1991 (Agamuthu and Fauziah 2006). The concern of 3Rs is to reduce MSW generation and waste dispose to landfill. Malaysia targeted to achieve 22% of recycling rate by the year 2020 (MHLG, 2015). However, many efforts still need to be done to increase public participation and to ensure the recycling targets met.

As the federal administrative centre of Malaysia, Putrajaya pioneers in promoting sustainable SWM through 3R programmes. The municipality of Putrajaya known as Municipality of Putrajaya (*Perbadanan Putrajaya, PPJ)* collaborates with Alam Flora Sdn Bhd in managing the 3Rs programs since 2001. Alam Flora Sdn Bhd is a private contractor serves SWM operation in central eastern regions Malaysia. Other players involved in the recycling programme includes federal authorities, local authorities, concessionary companies, collectors and manufactures, non-governmental organizations (NGOs), household, and educational institutions. Therefore, by focussing on the MSW recycling awareness, PPJ and Alam Flora is organizing outreach programme to the students. The Recycle Team formed visits schools to educate and increase student awareness and behaviour on MSW recycling. In each visit, they provide talks and carry out recycling activities. According to PPJ, each educational institutions in Putrajaya; kindergarten, primary school, and secondary school, had been exposed to recycling programme.

This study focuses on the MSW recycling behaviour of students in Putrajaya using TBP with three variable (attitude, subjective norm, perceived behavioural control) and Other Determinant Factor, (ODF), that influence ones behaviour towards recycling. By considering students had been exposed to the MSW recycling awareness programmes, this research mainly seeks the students' behaviours towards MSW recycling that revolved on TPB and ODF from nine secondary schools in Putrajaya selected as respondents using random sampling method.

1.3 Problems statement

As number of population keep rising over year, one of the main concern leads to environmental issue particularly in Malaysia is the MSW (Saeed, Hassan, and Mujeebu, 2009; Badgie, Mohd, Latifah and Azizi 2012). The national target for MSW recycling has been presented during the Ninth Malaysia Plan (*Rancangan Malaysia ke-9, RMK-9*), by 2020, the recycling rate shall at the par of 22%. Withal, the waste generation by Malaysian if uncontrolled, could fulfil Kuala Lumpur City Centre tower (KLCC) just in nine days. If there is no action takes place to address this issue, it is estimated that by 2020 Malaysian will produced 30,000 tonnes of waste daily. To date, the most common practice in waste disposal is through the landfill (Badgie et al., 2012). Increased in generation of MSW are seems happening throughout the world (Zia and Devadas, 2007). According to Hassan et al. (2000), the MSW highly in financial constrain as its budget was depending on the size of municipalities. As far

for this concern, recycle is yet being habitual to Malaysian. Since 1993, the Ministry of Housing and Local Government had launched recycling campaign. However, the campaign did not receive a well support by the public. The reasons of this failure are less commitment from top management and no serious awareness on recycling campaign. Re-launch campaign was held in 2001, but still failed to inspire the public. The major responsible for this failure project from less understanding and respect on the MSW collection schedule, as well as lack of cooperation among household. It was reported that in 2007, Malaysian produced 17, 000 tonne and in 2008, 23,000 tonne of waste daily. Less than 1,150 tonnes of waste in 2008 had been recycled (Omran et al., 2009). To worst, often, Malaysian expresses less concern towards the environment such as trash been thrown away outside the window of vehicle, waste dumping by the road side, and those habit had led to negative impact to the environment.

Coherent with the environmental policy, Ministry of Education had targeted students as the core pillar to be educated with respective moral norm in conserving the Mother Nature (Adenan, 2004). Various informal programs had been implemented since then such as the formation of Environmental Club (*Kelab Alam Sekitar*). A study by Ridener (1997) reflects that students possess well awareness towards protecting the Mother Nature, however, their behaviour towards the issue is still limited. This been supported by the finding of Azizan (2008), that even though students are aware on the importance in manage healthy environment, yet there a loophole in the practices. Nevertheless, in Malaysia Curriculum Education syllabus, there are no any clauses that stress on the mandatory for teachers to teach on Environmental Education particularly on recycling.

As Putrajaya had become the role model for city in Malaysia as City in the Garden, the PPJ together with Alam Flora Sdn Bhd had initiated the MSW recycling program in 2001. It is then take it aggressive practice in 2004. Since then, PPJ and Alam Flora Sdn Bhd actively collaborate, going from school to school to talk about recycling and did some activities regarding it. Therefore, it is well-said that students in Putrajaya, regardless in the kindergarten, primary or secondary study had received and been nurtured well in MSW recycling. However, it still in vast difference to achieve 22% recycling rate by 2020. Thus, it is importance for the researcher to conduct a study on students' MSW recycling behaviour in Putrajaya who has been exposed with various recycling activities initiated by the federal and local governments as well as Alam Flora Sdn. Bhd.

1.4 Conceptual framework

The conceptual framework of this study is outlined in *Figure* 1.1. The TPB introduced by Icek (1991) was applied as the conceptual framework in this research. Meanwhile, awareness, knowledge of issue, situational factors, motivation, preferences scheme, and recycling practices were chosen as Other Determinant Factor, (ODF). TPB and ODF leads as independent variables, while the dependent variable is the behaviour.

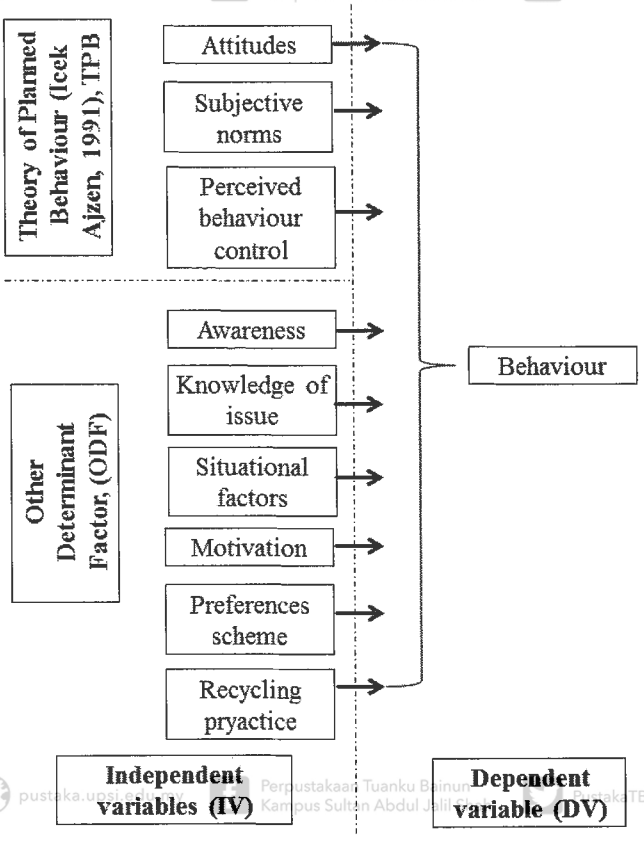

Figure 1.1: Conceptual framework of research

1.5 Objectives

The objectives of this study are:

1. To assess the MSW recycling behaviour among secondary school students in Putrajaya.
2. To determine the correlation between TPB and ODF towards students behaviour in MSW recycling.
3. To determine the influence of TPB and ODF on students MSW recycling behaviour.

1.6 Research questions

The research questions for this study based on the above objectives. Therefore, the research questions are as follows;

1. What is the MSW recycling behaviour among secondary school students in Putrajaya?
2. What is the correlation between TPB and students behaviour towards MSW recycling?

3. What is the correlation between ODF and students behaviour towards MSW recycling?

4. What are the factors in TPB that influences the behaviour of students towards MSW recycling?

5. What are the factors in the ODF that influence the behaviour of students towards MSW recycling?

1.7 Reserch hypotheses

Hypothesis of this study are correspond with objective numbered 2 and 3;

1. Objective numbered 2;

   Null hypothesis (Ho): There is no significant correlation between TPB variables and students behaviour towards MSW recycling

   Alternative hypothesis (H_A): There is significant correlation between TPB variables and students behaviour towards MSW recycling.

Null hypothesis (Ho): There is no significant correlation between ODF variables and students behaviour towards MSW recycling

Alternative hypothesis (H_A): There is significant correlation between ODF variables and students behaviour towards MSW recycling.

2. Objective numbered 3;

Null hypothesis (Ho): Students behaviour towards MSW recycling is not influenced by TPB's variables.

Alternative hypothesis (H_A): Students behaviour towards MSW recycling is influenced by TPB's variables.

Null hypothesis (Ho): Students behaviour towards MSW recycling is not influenced by ODF's variables.

Alternative hypothesis (H_A): Students behaviour towards MSW recycling is influenced by ODF's variables.

1.8 Significance of research

Results from this study will give insight of secondary students from selected school behaviour towards MSW recycling. In a nutshell, this research may give a valuable insight particularly to teachers, Province Education Department, Putrajaya, (JPWPP), (*Jabatan Pendidikan Wilayah Persekutuan Putrajaya*) and Ministry of Education to take concern on the current student behaviour towards recycling. Alam Flora Sdn Bhd as the implementer of the initiatives is also able to have the insight idea on the current progress of their programmes. This study might also reflect the impact of 3R programme implemented at Putrajaya on students' MSW recycling behaviour.

Maria (2009) has reported that there is no specific Environmental Education syllabus embedded in the curriculum specifications. However, topic on environment is curved in various subjects such as Science, Biology, and Geography. Thus, this study can contribute as a revision on the importance on having Environmental Education (Recycling) individually, and not embedded in any other subjects. On the other hands, the result of this study will be a map to plan strategies to be taken by parties involved in order to strengthen 3R's programme in Malaysia.

As far to researcher concern, recycling studies are well been conducted in others countries. It contributes to identify subsequent factors that influence ones behaviour towards recycling. Thus information obtained from this study might help

the authorities such as the government to plan a strategic way in MSW recycling. It is hoped that the result from may also assist teachers to put extra concern on educating the students for MSW recycling. Not just focussing in learning MSW recycling formally in a class, this research man enable to enhance both students and teachers behaviour towards MSW recycling by creating various extra curriculum activities. Teachers might also change and create networking with others school in order to enhance MSW recycling awareness among students. In addition, teacher plays significant role to promote MSW recycling as way of life.

1.9 Research limitations

This research is also limited to Form Three school students in Putrajaya, Malaysia. To date, PPJ is the only active local authority that practices MSW recycling systematically. Therefore, results from this study will only reflected the chosen samples and not the whole populations.

On the other hands, this research is only focuses on TPB (attitudes, subjective norm, perceived behavioural control) and ODF that had been stated (awareness, knowledge of issue, situational factors, motivation, preferences scheme, and recycling practices) towards students behaviour in MSW recycling. Therefore, there is potential of others determinant factors that may influence MSW recycling practice.