RECYCLING BEHAVIOUR AMONG MALAYSIAN TERTIARY STUDENTS

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ABSTRACT

Tertiary institutions are considered as "small cities" and the enculturation of sustainable practices are vital due to its size and the impact that campus activities have on the environment and society. The sustainable practices such as recycling and reduction of carbon footprint are one of the examples that may lead to greening the tertiary institution and sustainable quest for UI Green Metric achievement. The tertiary campus is seen as offering an ideal setting for exploring and practicing sustainability. This study explored the current recycling behaviour in a tertiary setting; using a survey design to address the research questions and objectives. Study found that the tertiary students are prone to recycling due to the situational factors which are convenience and incentive as well as personal factors which included knowledge and social norm. Study concluded that in achieving the UI Green Metric, tertiary institutions should offer a convenience setting that indirectly enculturates the sustainable practices among the campus community.

Key words*: recycling, personal factor, situational factor, UI Green Metric*

INTRODUCTION

Recycling waste is considered a voluntary action in contributing to minimal impact on the environment (Gould, Ardoin, Biggar, Craven & Wojcik 2016). The effects of situational factors such as reverse logistics (RL) attributes (accessibility and availability and convenience) occur at temporal and geographic scales detectable to people provides provide immediate, local, or visual evidence of environmental impact (Uzzel, 2000). Much work has been done on reverse logistics or product recovery management concepts since the late 1990s (Carter and Ellram, 1998). In particular, the studies suggested there are two main streams discussing handling end-of-life products or outbound flows, commercial management and local authority (LA) management particularly MSW management (Zhang, Huang & He, 2011). These streams or channels can also be sub-divided as having inbound flows from commercial and domestic origins (Belien, De Boeck, & Van Ackere, 2014). In the latter classification, there are situations where end-users (actors from the waste source) form a key stage in the RL system as both a recipient of inbound flows and initiator of outbound flows. Recycling can be defined as "A method of recovering waste as resources that include the collection, and often involving the treatment, of waste products for use as a replacement of all or part of the raw material in a manufacturing process (European Environment Agency, 2013" in (Garechana, Rio-Belver, Cilleruelo, & Gavilanes-Trapote, 2014).
Recycling is basically a reverse logistic option for retrieving product returns and

waste to the forward channel by 'reuse, recycle and reduce' in managing the returnable, recyclates and waste (Stock, 1998). Guiltinan and Nwokoye's research had discovered that recycling played a major role in RL processes and there were three key areas (legislation, operation capabilities and marketing) with significant influences on the key performance of sustainable practices (1974). The aim of the study to investigate the recycling behaviour among university student and in particular, in respect to knowledge and social norms of the student sustainable behaviour. In addition, this study included situational factors that comprised of convenience and incentive as a pre-cursor factor for the recycling behaviour to manifest.

LITERATURE REVIEW

Recycling Behaviour (RB)
Recycling behaviour is influenced by situational and personal factors. The projection (elicitation/ manifestation) of the recycling behaviour is derived mainly within the households' (do Paço, Alves, Shiel, & Filho, 2013; Thøgersen, 2006) personal state of mind. There are many factors that contribute to RB including: Reverse logistics (types of disposals, accessibility, method of disposals, the level of difficulty, the level of separation or sorting) (Cherret, Maynard, McLeod, & Hickford, 2010); Marketing (awareness , information, advertising, household engagement) (Biswas, Licata, Mckee, Pullig, & Daughtridge, 2000; Shrum, Lowrey, & McCarty, 1994); Social Norms (Values) (perceived pressure such as neighboring householders are avid recyclers, community intervention, local interest group, public pressure) (Biel and Thøgersen, 2007); Individual [Demographic Background (age, education, income, location), Knowledge (product, package, environmental impact, product life cycle, recycling method) and Self Efficacy] (Swami, Chamorro-Premuzic, Snelgar, & Furnham, 2011; Shrum et al., 1994); and Policy Instruments (directives and economic incentives or benefits) (Stewart, 2011).

The situational factors are related to reverse logistics system and the facilitation of the situational factors impact on recycling behaviour. On the contrary, social norms and individual are designated as personal factors (in the following the general term "personal factors" will be used) and are considered as another influencing factor affecting RB. In which this study uses personal factors as a representation of RB. In a recent study, household recycling behaviour is significantly influenced by both factors interactively (A.Jalil, Grant, Deutz & Nicholson, 2016) whereby, both factors are equally important to enculturate sustainable practices (Gould et al., 2016). Hence, university students recycling behaviour also was influenced by situational factor and personal factor (Md Isa, Othman, Jaganathan, & Osman, 2015). The personal factors that investigated by few studies included attitude, knowledge, demographic, social norm, and personality variables (Haron and Mutang, 2012). Situational factors included time, space, money, and convenience which became a motivating factor for recycling behaviors (Zahari, 2012). Next section, the discussion focuses on personal factors first than follows by situational factors.

Personal Factors

Social Norms: Vicente & Reis stated that social norms have been found to play an important role and have a strongest positive effect on recycling participation (2008, Zahari, 2012). It is found that social norms are considered as a moderating role in improving recycling behaviour (Bissing-Olson, Fielding & Iyer, 2016) consistently with A. Jalil et al, uncovered that some respondents who were exposed to a moral obligation to recycle originated from informal settings spawn at work, school and social gathering (2016).
Social influences are an important aspect to be examined in order to understand student attitudes with regard to the environment. Busteed and colleagues stated that adolescent spent most of their time after school with friends and they appeared to be heavily influenced by their peers cognitively and behaviorally (2009, Zahari, 2012). Furthermore, social norm relates to how favorable other people think about the behaviour and whether their opinion influences the individual to behave in a certain way (Philippsen, 2015). Hence, when recycling is perceived as a norm in particular setting, therefore, the acculturation of sustainable practices have taken place (Gould et al., 2016).

Knowledge: Knowledge is recognized in consumer research as a characteristic that influence all phases in the decision process (Ahmad, Juhdi & Awadz, 2010). Knowledge is a critical component in creating awareness about recycling. The knowledge of sort and select from the source has significant changes in RB (Philippsen, 2015). Some authors argued the notion that recycling rates have a positive correlation with informational campaigns (McDonald & Ball, 1998; Scott, 1999; Thomas, 2001) underscoring the possibility that knowledge on how to recycle is positively correlated with RB. Recycling knowledge should be examined to explore the potential of waste minimization as well as improving the recycling rates (Singhirunnusorn, Donalkorn, & Kaewhanin, 2012).

Situational Factors

Convenience: Recyclers or even a non- recyclers require the convenience of the recycling provisions in order to follow effectively such as (going to drop-in centres, bring out to curbside and attending the awareness programs from customer services centres) (Williams and Cole, 2013) and the responsiveness of the operators on the availability of the scheme provisions ((bin bags, additional bin, pick-up services and collection times) (Abbott et al., 2011) have an influence on RB. A convenience recycling practices are considered as the time, space and the perceived ease of an individual in sorting and separating waste from the source (Wan, Cheung, & Shen, 2012). Sidiqueet and colleagues argued the number of expected recycling site visits increases when recycling was considered a convenient activity (2010, Wan, Cheung, & Shen, 2012).

Incentive: The incentive is a type of extrinsic incentives given to activate the desired behaviour. Hornik and some authors argued several studies have emphasized external incentives such as monetary rewards, and recognize external incentives themselves can initiate and sustain RB (1995). Harder and Woodard argued monetary incentive using the trial voucher system to promote RB in six chosen districts in the UK and the

results clearly showed RB as being positively higher when the incentive is injected as a positive reinforcement (2007). Hence, this study suggested further assessment on different types of incentives that are usable and the involvement from retailers in incentive contribution as well as incentive promotion campaign (Harder and Woodard, 2007). Incentives are used to encourage RB in student's participation in recycling programs (Zahari, 2012). Incentives may also refer to the rewards for the return of bottles for deposit and the convenience costs of recycling (Viscusi, 2010). A study by Heinen (1995) stated that many recycling activities are most affected by policies that concern financial costs and benefits to the individual which are incentives. In addition, incentives have often been used to promote sustainable consumer behaviour (Bolderdijk and Steg, 2014).
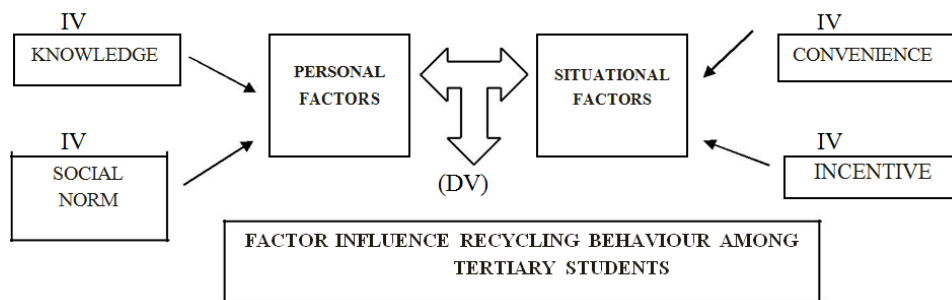

Figure 1: Research Framework of Recycling Behaviour among Tertiary Students Adopted from A.Jalil (2014)

To sum up, for personal factors in the form of social norm and knowledge were considered important in enculturating RB as well as for situational factors in the form of convenience and incentive were considered the pre-cursors for RB to establish. Hence, some attributes from personal and situational factors are found inconclusive in some studies (A.Jalil et al., 2016), therefore this study only focuses in two attributes for each factors in in which these attributes were considered significant in previous studies (Biel and Thøgersen, 2007; Harder and Woodard, 2007; Wan, Cheung, & Shen, 2012; Bissing-Olson, Bolderdijk and Steg, 2014; Fielding & Iyer, 2016).

RESEARCH METHODOLOGY

Sampling and data collection

Population in this research involves students in Universiti Utara Malaysia (UUM) to find out the factors that may influence their behaviour in recycling. Factors that are independent variables in this study are dividing into two that are personal factors and situational factors. In 2015, according to Department Students Affairs UUM is total overall students in UUM were 28, 870 students. The questionnaire was used to gather information from UUM students about their behaviour towards recycling activities. The size of usable sample was 200 samples. The instrument has been developed to investigate the factor that influencing recycling behaviour among UUM students. Seven Likert Scale was used in this study to demonstrate the level of agreement for each criterion in the questionnaire. In which, 7 (strongly agree) as the maximum and 1 (strongly disagree) as a minimum.

Research Design

In this study, a qualitative based research has been applied. Descriptive studies are often designed to collect data that describe the characteristic of person, events or situation (Sekaran & Bougie, 2013). Whereby, a quantitative approach is considered relevant to address the research objectives and the quantitative approach can compute the problem by the way of generically numerical data and then the data can be transformed into a relevant statistic (Madrigal & McClain, 2012). Respondent were randomly selected consisted of male and female students studying in UUM. Table 1 provides a socio-demographic profile of respondents.

ITEM	N	%
AGE		
19-21	49	24.5
22-24	143	71.5
25 and above	8	4.0
GENDER		
Female	122	61
Male	78	39
DEPARTMENT		
College of Business (COB)	126	63
College of Art and Science(CAS)	38	19
College of Government and International Studies (COLGIS)		
NUMBER OF HOUSEHOLD		
0-5	108	54
6-10	91	45.5
11-15	1	0.5

Table 1: Demographic Background (*n*=200)

Based on Table 1, it is shown that the majority in this sample consists of female students (61 percent) and dominated by students aged between 22 and 24 years; that are 143 students. Most of the respondents comprised of students who took the business program (from College of Business) that is 126 students (63 percent); and the number of households for each student among only child or siblings of 5 individual in their family (54 percent).

Data Analysis

Firstly, the analyses have to go through the reliability test and is assessed using Cronbach's Alpha score analysis. According to Table 2 below, Cronbach's Alpha Score of the variable in this study demonstrates the value between of 0.83 to 0.90.

Table 2: Cronbach's Alpha Score for Variables (*n*=200)

Variables	No. of Items	Cronbach's Alpha
Views of Recycling	11	0.886
Convenience	8	0.839
Incentive	4	0.844
Knowledge	21	0.91
Social Norm	9	0.883

According to Tavakol and Dennick (2011), a low alpha value is due to poor interrelatedness between variables while the maximum alpha value of 0.90 has been recommended for the correlation of each test item. Hence, the value of Cronbach's alpha in Table 2 shows that value between of 0.83 to 0.91 and this value are considered that variables are reliable and highest interrelatedness between variables. In order to answer the hypothesis, the correlation and regression method were applied. Correlation analysis refers to a process for establishing whether or not relationships exist between two variables (Higgins, 2005). In correlation analysis, will show the person correlation, two-tailed test and a number of cases that will measure the strength and direction of the linear relationship between the two variables (UCLA, 2015). In addition, regression is the statistical tool for investigation of the relationship between variables. In regression, there are six assumptions which are continuous level, linear relationship, no significant outlier, independence of observation, homoscedasticity, and lastly is residuals or errors. These assumptions were applied to investigate the variables to ensure the validity of the result (Laerd, 2013). In this study, dependent variables are factor influencing recycling behaviour among UUM students, while independent variables are the personal factor that consists of knowledge and social norms, and the situational factors that consist of convenience and incentive.

RESULTS

A person correlation was used to analyze factors that influence recycling behaviour among UUM students that is the situational factor and personal factor. Furthermore, situational factors are the combination of convenience and incentive factors, while the personal factors are a combination of knowledge and social norms factors. Thus, personal and situational factors were formed into relevant factors and then were tested for statistical correlation between both factors with demography items. However, for items that do not represent the values of significant ($p < 0.01$) have been omitted. This is because as Lind et al. (2010) in Garcia (2011) stated that the correlations are strong when the value is *r (person correlation)* = 0.50 to 1.0 or *r* = – 0.50 to –1.0. Table 3 demonstrates the correlation between these relevant factors. It shows that personal factors have a significant relationship with situational factors ($p < 0.01$) and vice versa with a positive correlation (*r (200)* = 0.62). Also, situational factors have a positive correlation with the perception of UUM students towards recycling (*r (200)* = 0.59), and similar with personal factor (*r (200)* = 0.69) to the perception of UUM students.

Based on Table 3, demographic items were also found to have positive relation with both factors (r (200) > + 0.07) and the correlation between situational factors with those four demographic items has a significant relation ($p < 0.01$). However, four demography items have almost the same value correlation (r (200) = 0.1), but still, has a positive relationship between the demographic items with situational factors. In personal factors, number of household has a significant influence at ($p < 0.01$) with positive correlation (*r (200)* = 0.16). The analyses indicate that a socio-demography profile of a UUM student has a positive correlation with factor contributing to recycling.

Table 3: Correlation Table (*n*=200)

Factors	PEARSON CORRELATION					Sig. (2-Tailed)
	Gender	Semester	Num.HH	Situational	Perception	
Situational	0.1	0.12	0.1	1	0.59	0.00
Personal	0.16	0.09	0.16	0.62	0.69	0.00

*Both factors are form into relevant factors (i.e. Item1+Item2…..)

In order to examine whether personal factors interacted with situational factors, the study applied multiple regression analysis to understand these assumptions. According to Green (1991) and Field (2005), this analysis is relevant as it addresses assessment of various relationships, using the information from independent variable to improve the accuracy in predicting values for the dependent variable (A. Jalil, 2014).

Table 4: Coefficient Table (*n*=200)

Model 1	Unstandardized Coefficients		Standard Coefficients	t	Sig.
	B	STD.ERROR	BETA		
(Constant)	1.071	0.243		4.411	0.000
Convenience	0.492	0.058	0.507	8.484	0.000
Knowledge	0.157	0.078	0.154	2.011	0.000
Social Norm	0.229	0.056	0.279	4.061	0.000

a. Dependent Variable: Perception

The situational factor, convenience for beta is 0.507 with significant alpha of 0.000. It is shown that the data is significant. (p=0.000, p<0.05). Convenience has significant and positive relationship with the perception. Thus, when personal factors were predicted, it was found that knowledge (β=+0.154, p =0.046), and social norm (β=+0.279, p=0.000) were significant predictors of the perception. The above model is a good descriptor of the relation between the dependent and predictor variable because $R^2 = 0.629$. The R-Square of 0.629 implies that three predictor variables explain about 62.9% of the variance in the perception. Thus, the model is reliable to explain perception of students' attitude for recycling.

DISCUSSION

The study was conducted to test the relationship of the four variables which are the convenience, incentive, social norm and knowledge with the recycling behaviour of UUM students. This study provided finding on the relationship between the independent variables which are the convenience, incentive, social norm and knowledge with the dependent variables which is RB of UUM students. A conceptual model was used to show how this two factors which are personal factors and situational factors affecting the recycling behaviour of UUM students. Education enhances powers of conduct within a social and physical world, enabling development of general knowledge and consequently, increasing responsible towards the environment. So, educated people have knowledge about the benefit of recycling and they are more willing to recycle. This study has found a positive relationship between knowledge and recycling behaviour. In line with this study, Afroz (2008) also found a positive association between recyclers and their education level. Knowledge is a prerequisite for responsible environmental behaviour (Zelezny, 1999;

Hwang et al., 2000). In other attribute of personal factors, social norms became paradox for the recycling behaviour. This study showed that social norms have a positive relationship with the recycling behaviour. Czajkowski (2014) in a study of stated intentions to participate in "bring" recycling schemes in Glasgow, Scotland found that 29% of the variation in intentions was explained by measures of attitudes, opportunities and what they refer to as social norms, in this case, the degree of which respondents felt that their families and friends thought that recycling was a good thing.

Relatively, situational factors such as convenience also play an important role to affect RB. This study showed that the convenience has a positive relationship with the RB. The findings showed that inconvenience will decrease the intention to recycle (Fritz, 2010). Many preferred an easy to follow routine in recycling from the source (Bel & Gradus, 2014). The other attribute of the situational factors is the incentive also has the positive relationship with the recycling behaviour. For instance, introducing incentives in the form of a differentiated garbage fee is meant to encourage recycling but may also crowd out morally motivated behaviour. Different types of incentives seem to have a different effect on the crowding out of intrinsically motivated behaviour. Differences across countries in the use of policy measures, such as introducing incentives in the form of differentiated garbage fees or increased supply of recycling facilities, also have a significant effect on household recycling (Halvorsen, 2010). The study reveals the important roles played by administrator or operator in tertiary level in inculcating RB among its students whilst the incentive is a form of a positive reinforcement in getting students to recycle from the source. This study only focused on certain tertiary institution in Malaysia hence, for future research should be taking into consideration of public and private institution as well as the characteristic of the campus (central, satellite or non-centric) which may influence the planning for sustainable activities for its students and staffs.

CONCLUSION

This study has revealed the significant role of situational factors affecting tertiary students in regards to in-campus recycling. There were positive correlations between the situational factors such as conveniences as well as incentive to inculcate a recycling behaviour among tertiary students. Therefore, to attain UI Green Metric achievement for a tertiary institution, there should be a greater facilitation of recycling initiatives on the physical infrastructures as well as engagement among its students in order to enculturate the recycling habit among its students.

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