

REDUCE REUSE RECYCLE BEHAVIOURAL INTENTION MODEL IN
HIGHER EDUCATION INSTITUTION ACCOMMODATION

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DEDICATION

To my beloved parent.

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ABSTRACT

The issues of solid waste management in Higher Education Institutions (HEIs) has become more problematic to facilities management units, thus the potential adverse effect has forced a total shift to deal with the situations in our academic environment, as such it needs the potentials to predict the students' behavioral intentions to engage in the reduce reuse and recycle (3Rs) practice within HEIs accommodations. For this reasons, three related objectives were prompted: To assess the 3Rs behavioral intentions indicators based on Theory of Planned Behaviour (TPB) conceptual model. To analyze the relationship between TPB construct and 3Rs behavioral intentions indicators. To develop and validate 3Rs behavioral intentions model for higher educational institution's hostel accommodation. To achieve these objectives, two methodologies were employed which involved literature review, and questionnaire survey. The underpinning theory used in this study is the theory of planned behavior (TPB) which possess the three predictors: attitude, subjective norms and perceived behavioral control to predict the 3Rs behavioral intentions. The survey method was used to collect data from the HEIs hostel accommodations within Universiti Teknologi Malaysia (UTM), 544 questionnaires was successfully collected from the student respondents in 13 residential colleges. Subsequently, after validating the data, AMOS 22.0 was used to analyze the TPB constructs, for more parsimonious structural equation model (SEM) fit using confirmatory factor analysis (CFA). Multiple regression analysis (MRA) was later run using SPSS 22.0. The results indicates that all the three predictors are significantly positive and influential thus it affects the students' behavioral intentions to engage in the 3Rs practice. The behavioral intentions which was influenced by these three TPB predictors, has become the important factors for students to actively engage in 3Rs practice. The study clearly showed that there was a potential for significantly improving the 3Rs behavioral intentions amongst the HEIs students, to engage in the reduce reuse and recycle (3Rs) practice within HEIs accommodations.

ABSTRAK

Isu-isu berkenaan dengan pengurusan sisa pepejal di Institusi Pendidikan Tinggi (IPT) telah menjadi lebih bermasalah kepada unit pengurusan fasiliti. Masaalah tersebut boleh ditangani dengan melakukan perubahan dalam persekitaran akademik iaitu dengan membuat ramalan keatas niat tingkah laku pelajar untuk melibatkan diri dalam amalan mengurangkan penggunaan, penggunaan semula dan kitar semula (3R) di penginapan IPT. Untuk itu, tiga objektif berkaitan telah dikenalpasti: (1) Untuk mengkaji 3R indikator niat tingkah laku pelajar berasaskan model konseptual teori tingkah laku terancang (TPB) (2) Untuk menganalisa hubungan antara TPB konstruk dan 3R indikator. (3) Untuk membangunkan dan mengesahkan model tingkah laku 3R bagi penginapan di IPT. Untuk mencapai objektif tersebut metodologi yang digunakan melibatkan kajian literatur dan kajian soal selidik. Teori yang digunakan dalam kajian ini adalah teori tingkah laku terancang (TPB) yang mewakili tiga faktor peramal iaitu sikap, norma subjektif dan kawalan tingkah laku untuk meramalkan niat tingkah laku 3R. Kaedah tinjauan digunakan untuk mengumpul data daripada penginapan IPT di Universiti Teknologi Malaysia (UTM), 544 soal selidik telah berjaya dikumpulkan daripada responden pelajar di 13 kolej asrama. Selepas mengesahkan data, AMOS 22.0 telah digunakan untuk menganalisa konstruk TPB bagi membangunkan model persamaan struktur (SEM) menggunakan analisis faktor pengesahan (CFA). Kemudiannya, analisis regresi berganda (MRA) dijalankan menggunakan SPSS 22.0. Keputusan MRA menunjukkan bahawa ketiga-tiga peramal adalah signifikan dan ia memberi kesan positif kepada niat tingkah laku pelajar untuk melibatkan diri dalam amalan 3R ini. Kesimpulannya niat tingkah laku yang dipengaruhi oleh tiga peramal TPB tersebut, telah menjadi faktor penting untuk pelajar-pelajar melibatkan diri secara aktif dalam amalan 3Rs. Kajian ini jelas menunjukkan bahawa terdapat potensi yang signifikan untuk meningkatkan 3Rs niat tingkah laku di kalangan pelajar IPT.

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LIST OF ABBREVIATIONS

AMOS	-	Analysis of Moment Structures
ATT	-	Attitude
BI	-	Behavioural Intentions
CFA	-	Confirmatory Factor Analysis
FM	-	Facilities Management
HEIs	-	Higher Educational Institutions
ISWM	-	Integrated Solid Waste Management
MRA	-	Multiple Regression Analysis
PBC	-	Perceived Behavioural Control
SN	-	Subjective Norms
SWM	-	Solid Waste Management
SPSS	-	Statistical Package for Social Sciences
TPB	-	Theory of Planned Behaviour
UTM	-	Universiti Teknologi Malaysia
3Rs	-	Reduce Reuse Recycle

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CHAPTER 1

INTRODUCTION TO RESEARCH

1.1 General Background

In recent years, surprisingly the participation of facilities managers become increasingly interested in solid waste management related issues, and the need to develop an integrated solid waste management (ISWM) programs. Marans and Lee (1993) suggested better options for reducing consumption as an important mechanism to address the generation of solid waste and its disposal issues. Thus the ISWM option varies within the educational programs, which encourage individuals and organizations to voluntarily reducing individual's waste to regulations that mandate waste management behaviour, including reduction, reuse and recycling (3Rs) practice. In this context, facilities managers needs to understand the ISWM options that are likely to influence these individuals' behavioural intentions in different settings. Although there is a growing body of research covering some factors, which influence the reduce reuse and recycling practice amongst households, the determinants of these 3Rs in the workplace are largely unknown (Marans and Lee, 1993).

In general, buildings are pivotal to business success, and in particular, the operational management of their facilities (Tucker, 2007). Therefore, within the context of facilities management (FM), although "the incorporation of waste management in general within the day-to-day activities is not new" one may contend that it has not always been the priority matter of FM strategy, perhaps it is certainly prevailing, thus waste management practice to predict the students' behavioural

intentions to engage in the 3Rs practice is therefore required. This is in line with the FM operation within the higher education institution (HEI) accommodation, as such is a testament to the increasing importance of FM strategies. Notwithstanding, Tucker (2007) fortified the idea in providing a functional and concise “hands-on” insight into its evolving role. Although primarily focused as a practical guide for facilities managers and practitioners alike, its vibrancy and depth firmly ensures its value within the academic arena.

Since the time immemorial, human existence and struggle of survival has been a phenomenon as they are bound to produce waste. Solid Waste Management (SWM) turns to be a global issue as a challenge to the whole world in terms of cost effectiveness, effects on human and other living organism as well as environmental impacts around the countries, developing or developed. The waste generation of waste increase as the world’s population increased especially in the urban areas. By the year 2020 the world’s urban population is expected to rise up to about 4.2 billion almost twice compared to that of year 2000 that was 2.9 billion (UN-Habitat, 2003), as such it will lead to a faster generation of solid waste within the municipalities.

Managing this huge volume of waste effectively is a challenging problem. Looking at the above argument, HEIs are also considered to be similar to small towns because of their large size, population, and the various complex activities taking place on campuses (Alshuwaikhat and Abubakar, 2008). As such, they not only need to maintain an appropriate physical infrastructure, they require similar services to small towns, including accommodation, transport, retail, leisure and, waste management. As a consequence, the overall production of waste at HEIs throughout the world is very large and presents significant challenges as the associated legislative, economic and environmental pressures can be difficult to control and manage. This gives rise to so many questions why ISWM has become a key issue for the worldwide HEIs sector, this is to address and describes some of the benefits, barriers, practical and logistical problems (Zhang *et-al.*, 2011).

In HEIs, there is an increasing enrollment of students and staff. Most of the students are residing in the accommodation, and are surrounded by several activities

that result in the waste generation. Most of these generated wastes from HEIs include plastics, paper and cardboard, electronics, broken glasses, aluminum and rusty metals, food residue and rags, where if not well managed, will endanger human lives.

To tackle the above solid waste issues, large amount of money and a high strategic skills and knowledge acquisition is needed for its effective management. It is therefore noticed that, the accumulation of uncollected solid waste from the streets and open spaces leads to serious health problems and degradation of the environments. These wastes generally add greatly to water pollution as when it rains, a lot of this waste ends up being swept into water bodies. The solid waste needs to be properly managed which means proper storage, accumulation, transportation and disposal in a fashion that minimizes risk to the environment and human wellness. Today, the society is more concerned about the environment and more mindful about its activities and the impact resulting from these activities on the surroundings. Discussions on research background shows the detrimental effects caused by the nonchalant attitudes of waste generators, therefore, the theory of planned behaviour (Ajzen, 1991) will be used to predict the behaviour of waste generators within the higher educational institutions accommodation.

By ignoring the end cycle, individuals' lose sight of the fact that the natural resources that have gone into making products are not infinite, and that on a worldwide basis the rate at which individuals' consume products with a throw away culture is unacceptable, thus it leads to a long-term pollution and even irreparable damage to the environment. In addition, most human activities create waste and it is the way this waste is handled, stored, collected and disposed of, that can pose risks to the environment and to public health. (Zhu *et al.*, 2008). Thus, the achievements of 3Rs practices rely largely on the dynamic involvement of individuals (Ittiravivongs, 2012). In the other hand, it becomes important to understand the factors that induce individuals to engage in 3Rs practice, therefore the need for this study arises to examine the moderating factors that determine the 3Rs behaviour amongst the students in the HEIs accommodation.

Consequently, the issue of HEIs students' behaviour in solid waste generation with respect to 3Rs can positively affect the entire SWM system. Activities in solid waste management from its generation in the household to waste storage, segregation, recycling, frequent collection, indiscriminate littering and willingness to participate in the waste services, up to the disposal stage were all depend upon the extent of public behavioural intentions and participation. It happens that the term "behaviour" concerning solid waste management is a crucial issue, which determines the failure or success of any SWM system within the HEIs.

1.2 Research Gap

Higher Educational Institutions (HEIs) are a major feature in the landscape of this study. HEIs are therefore considered to be a small city at this time, because of their size and the large number of people that are enrolled in them, and the various complex activities taking place within the campus. (Alshuwaikhat and Abubakar, 2008), however, Most of the students resides within the HEIs accommodations, were they became the major waste generators. In this context, if the generated solid waste is not managed properly, thus consequently it will have some negative impacts to the HEIs environment. Nevertheless, Daniel and Ibok (2013) affirmed that, the routine monitoring of the university environment revealed a poor sanitary situation. As such this was largely blamed on unwholesome waste disposal behaviour of the students. Even though, the individual waste are categorized as small-quantity generators, nevertheless if mismanaged it has the same potential for harm as it does fully regulated waste does from larger sources (LaGrega *et al.*, 2010), thus there is the need for this research to be carried out.

Although most studies in 3Rs behavioural intentions have only been carried out in urban areas, the researches to date have tended to focus on recycling behaviour rather than the, 3Rs behaviour, which have been emerging within urban areas. However, far too little attention has been paid for the studies on 3Rs behavioural intentions in the academic environment. Evidence on researches related to the behavioural intentions in the context of higher educational institutions is scarce. Several studies have been conducted related on solid waste management in HEIs,

these studies include; reducing solid waste in higher education (Smyth *et al.*, 2010), 3Rs practices for solid waste management in Asian municipalities (Visvanathan *et al.*, 2007), characteristic of most waste generators in HEIs (Chung, 2008), campus recycling studies (Pike *et al.*, 2003) and resource conservation recycling and waste reduction at universities (Taillories Declaration, 1999).

However, to date, there have been no comprehensive studies which compare differences of waste management behaviour from facilities management literature where it specifically focus on students' behavioural intentions to practice reduce reuse and recycle in the accommodations. Although extensive research has been carried out on recycling behavioural intentions, no single study exists which adequately covers the 3R's behavioural intentions of students in HEIs accommodations. This suggests that the link between the determinants of predicting the students' behavioural intentions to engage in 3R's practice was observed to be a gap found in the literature as such it needs to be investigated. One of the key challenges is whether students' attitude, subjective norm and perceived behavioural control would influence their behavioural intentions. Hence, this study was designed to address this gap.

1.3 Statement of the problem

The issue of solid waste generation is growing all over the world, especially in cities (e.g., Boadi and Kuitunen, 2003; Idris *et al.*, 2004; UN-HABITAT, 2007). Uncontrolled waste disposal poses problems to both human beings and the environment (UNEP, 2009). Whereas, the amount of solid waste is increasing at a surprising speed in various countries around the world (Chen and Tung, 2010). Consequently, if the amount of these waste continues to increase due to the growing population and increasing development, then the modern lifestyle has led to more acute waste problems (Desa *et al.*, 2012).

In Malaysia for example, Desa *et al.* (2012) reported that, in 1992 the World Bank has identified that, solid waste is one of the three major environmental problems faced by most municipalities in Malaysia. The amount of solid waste

generated went up from 17,000 tons per day in 2002 to 19,100 tons in 2005, an average of 0.8 kilogram per capita per day. In this context, each Malaysian generates an average of 1.7kg of solid waste that were collected every day. Thus it is estimated to be more than 15000 tones, this could be said to be the same height of four times Kuala Lumpur Tower, (Syed and Adam, 2009).

Whereas in HEIs, the indiscriminate generation and disposal of municipal solid waste becomes a major issue to the HEIs. This is because of the indiscriminate generation and improper disposal of the said solid waste, were it becomes alarming to a high-risk of contracting infectious diseases such as diarrhea, typhoid, food poisoning, and infant mortality etc (Murad and Siwad, 2007). In University Teknologi Malaysia (UTM) the problem of solid waste generation is still perceived as an unresolved problem. This is due to the reason that, the waste generation falls between 14 to 15 tons per day (Jibril *et al.*, 2012), thus the issue is still prevalent among the students as such it requires appropriate actions, and additional steps to be taken by the respective authorities in order to resolve the indiscriminate waste generation and disposal.

Nevertheless, solid waste and their means of disposal pose an enormous challenge to the facilities managers in Malaysia. A day lost in collection leads to a piling up of the waste, whereas under hot humid conditions the waste decomposes very rapidly, producing obnoxious odour and attracting flies and vermin. The inadequate or traditional system of waste management, yet is not only affecting the local environment and health, but it also affects the environment in neighbouring areas (Murad and Siwad, 2007). Although, many ISWM studies related to 3Rs have been carried out in municipalities, it has concentrated on the public in general rather than focusing on specific social group, particularly transient population such as university students (Amutenya *et al.*, 2009, Robertson and Walkington, 2009, Williams and Gunton, 2007).

To date, landfilling becomes the traditional solution for solid waste in some municipalities and HEIs, nevertheless, such a practice can pose an obvious and immediate danger to the earth thus, and its appeal continues to erode (Iyer and

Kashyap, 2007). Two basic operations (source reduction and recycling) were proposed by (Hopper *et al.*, 1993) to manage the waste generation. Although the study into individuals' ISWM, has primarily focused on recycling behaviour. Conversely, there should be the need to carryout a study on reuse and reduction of solid waste. Therefore the diversity of waste management behaviour and its antecedents is emphasized, as such the 3Rs behavioural intentions was declared for these reason. The representative of these waste behaviours are reduce reuse and recycle (Barr et al., 2001). As a rule, environmental psychologists tackle these kinds of problems by applying intervention programs that are aimed at examining an individual behavioural intention (Tobias *et al.*, 2009). Particularly in solid waste management, several intervention strategies have been developed, tested, and evaluated (Abrahamse *et al.*, 2005).

Although few studies related to 3Rs were carried out in the context of HEIs, which is the focus of this study. Nevertheless, these study attempts to assess and analyze the 3Rs behavioural intentions constructs that significantly influence the students' engagement in 3Rs practice within the HEIs accommodation. It has come to attention that, students' social and academic activities increase a tendency of degrading the environment by practicing improper methods of waste management. Although, past studies shows several factors affecting the waste generation that includes, facilities, policy, awareness and practice as well as attitude and behaviour. Yet few studies were carried out to determine the individuals' 3Rs behavioural intentions. Therefore this study is designed to investigate whether or not such a widely behavioural intentions, which had traditionally been a criticism of students as a major waste generator in HEIs, does really bear any merit.

To achieve effective and persistent behavioural intentions, several researchers propose combining different intervention strategies (e.g. Staats *et al.*, 2004). Furthermore, in a review of the literature it is clear that, to date the conceptual behavioural intentions model of 3Rs have not been fully developed. There is no consensus about the key elements that capture this concept, particularly in relation to different organization or groups such as schools, businesses, and hospitals to understand the different 3Rs behavioural intentions among the different groups.

More specifically, few studies have focused on testing and examining the individuals' intentions to recycle (Chen and Tung, 2010). Though the behavioural intentions models have received robust support in numerous behavioural domains (Ajzen, 2001; Eagly and Chaiken, 1993). Caution must be kept in mind that actual behaviour is not always equally well predicted by individual attitudes and even stated behavioural intentions (Belk, 1985). Therefore in this study, TPB conceptual model were systematically used to predict the students' behavioural intentions, to engage in the 3Rs practice within the HEIs accommodations. This is consistent with the previous studies, which found TPB conceptual model as important determinant of recycling behavioural intentions (Davies *et al.*, 2002; Terry *et al.*, 1999; Tonglet *et al.*, 2004; Chen and Chung, 2010).

The results were of great interest as the facilities managers, policy makers, private and public sector, to use the models in future to to predict the individuals' behavioural intention to engage in the 3Rs practice. It will also be used to help improve solid waste management service through 3Rs practice within institutions and community environment. It's therefore expected that through this research, additional knowledge on the field of integrated solid waste management will be obtained.

1.4 Research questions

The research question portrays out "How the theory of planned behaviour (TPB) conceptual model, could predict the student's behavioural intentions to engage in 3Rs practice within HEIs accommodations? The basic constructs of TPB consist of attitude, subjective norms and perceived behavioural control as indicators, which influence students' 3Rs behavioural intentions. These determinants of TPB constructs, was used to develop the 3Rs behavioural intention conceptual model. In addition the study seek to answer the following research questions:

- i. What are the determinants of 3Rs indicators that influence TPB constructs?
- ii. What is the relationship between TPB and the students' behavioural intention to engage in the 3Rs?

- iii. How to determine the students' 3Rs behavioural intentions in HEIs accommodation?

1.5 Aims of the Study

The aim of this study is to predict the students' behavioural intentions to engage in 3R's practice within HEIs accommodations, by examining the three major constructs of TPB (attitude, subjective norms, and perceived behaviour control) and their most important factors. This will be expected to predict the individuals intentions towards the reduce reuse and recycle practice of waste generators within HEIs accommodations.

1.6 Research Objectives

- i. To assess the 3Rs behavioural intention indicators based on TPB conceptual model.
- ii. To analyze the relationship between TPB construct and 3Rs behavioural intentions indicators.
- iii. To develop and validate 3Rs behavioural intentions model for higher educational institution's accommodation.

1.7 Research Hypothesis

i. Hypothesis 1

Research Hypothesis H1: Attitude will positively influence the students' behavioural intentions to engage in the 3Rs practice within HEIs accommodations.

ii. Hypothesis 2

Research Hypothesis H2: Subjective norms will positively influence students' behavioural intentions, to engage in the 3Rs practice within HEIs accommodations.

iii. Hypothesis 3

Research Hypothesis H3: Perceived behavioural control will positively influence the students' behavioural intentions towards the 3Rs practice within HEIs accommodations.

1.8 Scope of Research

The study explored the literature review related to FM, ISWM and TPB constructs which includes; attitude, subjective norms and perceived behavioural control. The research further to examine the indicators, which influence the students' behavioural intentions to engage in 3Rs practice within HEIs accommodation. The indicators are therefore explored using concept of the theory of planned behaviour, this is to merge and predict the behavioural intentions of students towards 3Rs in HEIs accommodation. Therefore, the application of developed 3Rs behavioural intentions model was established using the students residing within the HEIs accommodation. This is due the reason that, the major constructs used in the study are to be measured, through the students who resides in HEIs accommodation. Notwithstanding, this process was carried out using the questionnaire survey instrument. The analysis was later conducted using Analysis of moment structure (AMOS).

1.9 Significance of the study

Part of the responsibilities of facilities manager in any organization is to determine and provide a conducive and suitable workplace for building users. The outcome of this study will provide to the FM unit in HEIs with a comprehensive understanding and strategies on the students' behavioural intentions to engage in the reduce reuse recycle practice within their accommodations, as such it will improve the potentials in individuals to engage in the integrated solid waste management activities related to 3Rs, it will also reduce and manage the amount of the waste generations and disposal in HEIs as a whole. The guiding principles extracted from the findings will be useful for researchers, policy-makers, practitioners and other

countries interested in the Malaysia's Higher Educational Institutions Integrated Solid Waste Management system particularly the 3Rs program.

1.10 Research Methodology Overview

Based on the flowchart for research methodology in Figure 1.1, the data used in this study was collected using a quantitative survey-based approach. This approach is employed to examine and predict causal relationships among the underlying theoretical constructs. The most appropriate tool used in this study is face to face self-administered questionnaires, of importance, the method is fast, efficient and in expensive to be administered to a large population sample (Sekaran, 2000; Zikmund, 2003). Five - point Likert Scaling questionnaire was developed, ranging from (1 to 5) with different scale interpretation statement. With exclusion of demographic background questions items, the questionnaire instrument consists of 41 indicators, whereas these indicators are the replicas of past studies, reflecting the construct of interest base on the TPB approach (i.e. 12 indicators for attitude, 13 for subjective norms, 10 indicators for perceived behavioural control, and 6 indicators for behavioural intentions). Pre-test study was conducted to certify that the questions are clearly understood and free from any unforeseen ambiguity among them.

In regards to the sample of this study, 13 HEIs accommodation within the HEI was purposively chosen. To predict the students' behavioural intentions to engage in the 3Rs practice, this study choose the HEIs accommodations where the students resides, this is because the previous studies indicates that, waste can be prevented by changing people's attitudes (Skoyles and Skoyles, 1987). While interdisciplinary approaches between all researchers and stakeholders are essential for successful waste management practices (Graham and Smithers, 1996). Desa *et al.* (2012) reported that, the theory of reasoned action (TRA) and theory of planned behaviour (TPB) have been used in the solid waste management program as a framework in understanding, explaining and predicting behaviour.

UTM was chosen as the sample location of this study. At present, there are 13 residential colleges provided within the UTM in Johor Bahru main campus, it is a

sufficient number of accommodations to accommodate more than 15,958 students. This is because it admits a large number of students from both local and international. Face to face questionnaire distribution were carried out in each of the 13 accommodation. The completed questionnaires were returned to the box provided at the entrance of each selected hostel building. Utilizing this procedure, 600 questionnaires were distributed in the said thirteen hostels colleges, which is 46 to 47 questionnaires per hostel. The data analysis include descriptive analysis, structural equation modelling (SEM) and multiple regression analysis (MRA) using SPSS-AMOS version 22.0.

Descriptive analysis was held out for the entire sample using SPSS (Statistical Package for the Social Sciences) version 22. SPSS was used to sort the collected data prior to performing structural equation modeling. To prove the theories of this study, structural equation modeling (SEM) using AMOS 22 (Analysis of Moment Structures) was employed. SEM is a multivariate statistical technique often applied to support the causal relationships among latent constructs. SEM was conducted using the two-stage approach recommended by Anderson and Gerbing (1988). The aim of the first stage (measurement model) is to define the causal relationships between the observed variables (indicators) and the underlying theoretical constructs (composite and latent factors), and provides reliable and valid constructs. The aim of the second stage is to test the hypotheses that reflect the relationships between these theoretical constructs. Goodness-of-fit indices were used to determine the model fit and the significance of paths, using coefficient parameter estimates. For this reason, MRA was used to develop 3Rs behavioural intentions model to predict students' behavioural intentions to engage in 3Rs practice.

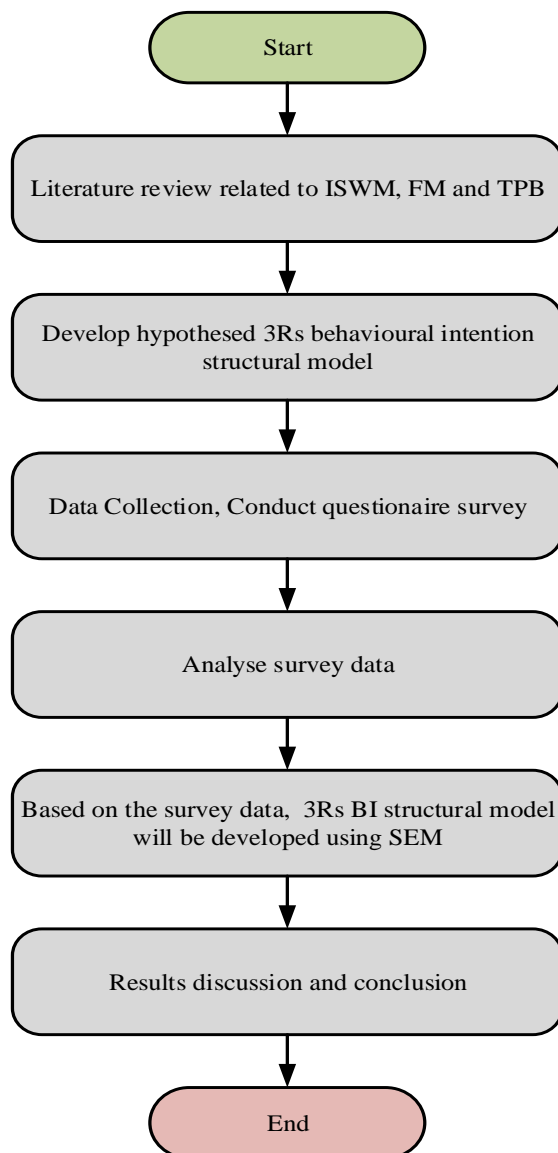


Figure 1.1 Flowchart of the research methodology developed by the author for this study (2014)

1.11 Thesis Chapters Layout

This thesis has been categorized into seven chapters that include:

Chapter 1, presents the fundamental elements of this study which includes; general background, research gap, statement of the problem, research questions, aims of the study, research objectives, research hypothesis, scope of research, significance of the study, research methodology overview, and summary of study chapters. However, the ideas and information portrays by each section addressed the study in

general. The research study were meant to study the students behavioural intentions to engage in the reduce reuse recycle practice in HEIs accommodations, taking into consideration an empirical statistical investigation and by adopting the concept of the theory of planned behaviour of (Ajzen, 1991).

Chapter 2, the literature review studied the evolution of facilities management (FM) and its linkages with solid waste management. It also identifies the constructs of integrated waste management as a whole. It clearly highlight the knowledge of using 3R's in integrated solid waste management system for Higher Educational Institutions (HEIs), the involvement of the system and the reasons for being involved. It summarizes and examines studies conducted by various researchers concerning the 3R's in integrated solid waste management, and how it can be used to develop the constructs in the study hypothesized model, using theory of planned behaviour for higher educational institutions accommodations.

Chapter 3, the chapter reviews the study of environmental and social sciences, focusing on the importance and contribution of the integrated solid waste management, specifically from 3Rs perspective, and the theory of plan behaviour and its influence on the students' behavioural intentions, has the capability of fostering the need of shaping the individuals waste management behaviour. The importance of the TPB concept and application in this chapter, it also explain the TPB construct as well as the 3Rs BI indicators which will be used to predicts the students behavioural intentions to engage in the reduce reuse and recycling practice within HEIs accommodations.

Chapter 4: Explained the research methods employed for this study and provide the influence of the potential for the research to be carried out positively. A routine of data collection and analysis is discussed and eventually appropriate research methods in conjunction with the conditions and environments around the selected research area.

Chapter 5: This chapter developed TPB constructs for 3Rs behavioural intention, it reports the statistical demographic analysis of the collected data obtained

from questionnaires and field survey exercise. Confirmatory factor analysis (CFA) is therefore conducted to measure the individuals' construct that will be used to develop the structural equation modeling (SEM) for 3Rs behavioural intentions model and multiple regression analysis (MRA). These underlying constructs, include attitude, subjective norms and perceived behavioural control which are considered to be exogenous constructs (independent variables), whereas behavioural intentions constructs have been labeled as endogenous (dependent variables).

Chapter 6: This chapter developed the 3Rs behavioural intentions model to predict students' behavioural intentions to engage in the 3Rs practice within the HEIs accommodations. The chapter also validate 3Rs behavioural intentions model for higher educational institution's accommodation. The analysis was conducted to predict students' behavioural intentions to engage in the 3Rs practice based on the respondent socio-demographic study as well as different constructs which influence the respondents' 3Rs behavioural intention. Finally multiple regression analysis (MRA) was used to examine the relationships between the theory of planned behaviour (TPB) constructs and behavioural intentions. The model will be used to predict and explain the students' behavioural intentions to engage in the 3Rs practice in HEIs accommodation.

Chapter 7: Highlights the main conclusion, research techniques, results summary, the research findings, research contribution, implication of the research, limitations of the research, recommendation of future research, reflection on the learning and conclusions of the research. However, several points for further investigation are also highlighted.

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