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Developing a waste minimization awareness model through community based movement: A case study of the I I U M Green Team

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Abstract

Waste management issues are encountered in almost every nation. Reports and discussion papers retrieved in developed and developing countries alike show that wastes and their management solutions are a common concern and challenge. One of the solutions is implementing the Waste Management Hierarchy. The aim of a Waste Management Hierarchy is to minimize the amount of waste from entering the landfill/dump sites. Three top initiatives in the waste management hierarchy is the 3Rs initiative, i.e. Reduce, Reuse and Recycle. To cultivate a 3R culture in a society, an important start is to educate people with environmental literacy, in particular, university students. This paper aims at exploring the possibility of using a Community Based Movement and Message Learning Approach to develop a Conceptual Waste Minimization Awareness Model (WMAM). The Green Team, a student's association of the International Islamic University Malaysia (IIUM) was utilized as the case in point.

Keywords: 3Rs initiative, community based movement, environmental awareness, environmental literacy, message learning approach, waste management

Introduction

Waste issues have been discussed in many countries. Reports and discussion papers have been written in developed, developing and third world countries, which show that waste management is a common issue and problem globally.

Today, waste and waste management has given rise to many pressing issues (Björklund, 1998; Japan International Cooperation Agency, 2006) such as expensive land prices, strict environmental regulations (Fullerton & Kinnaman, 1995), health and safety issues, improper management of waste disposal sites (Ministry of Housing and Local Government Malaysia, 2005), landfill spaces becoming limited (Bartelings & Sterner, 1999), policy problems (Choe & Fraser, 1999), and the unwillingness of local communities to accept new technologies and facilities in 'their own back yards' (Petts, 1995).

Failing in managing solid waste, means failing in managing resources which then risen the operation cost and damaging the environment (Agamuthu, 2001; United Nations Development Programme Malaysia, 2008; Weitz, Thorneloe, Nishtala, Yarkosky, & Zannes, 2002).

There are a multi-solution to solve the waste issues and problems. The solutions can be in term of technology (i.e. high-tech), which rich countries can develop and buy. Meanwhile the low-tech solutions (i.e. changing behavior through the usage of human as a collector or *waste pickers*) are being applied by most of the third world countries (Zurbrugg, 2002).

Waste problems and issues urgently need to be managed. There are various methods of management; either using technology (i.e. incinerators, sanitary landfill, etc.) or by using management tools (i.e.

planning, etc.). In researching the suitable solutions, either using technology or management tools, first we should focus on the principle of what is actually happening in the real world.

Waste management

Each country tries to minimize the amount of waste going to the landfill. For that reason a 'waste hierarchy' has being established to help the government manage their waste according to a sustainable agenda.

Waste management hierarchy is 'a concept that promotes a cyclical approach to waste management' (Challenger, 2007, p. 2). The main objective of the waste management hierarchy is to minimize the environmental effects of waste disposal (Rasmussen et al., 2005; Wolf, 1988). This hierarchy is used as a main framework to develop waste management policies.

Waste hierarchy which has been developed in the 1970s (Challenger, 2007; Rasmussen et al., 2005), was placed in the following order (Challenger, 2007; Kirkpatrick, 1993; Rasmussen et al., 2005): (1) waste minimization/prevention/reduction, (2) reusing, (3) recycling, (4) incineration and (5) disposal. Meanwhile Barr (2007) defines waste hierarchy order as a *waste management behavior* which relates to recycling, reusing and reduction.

The methods of waste management, which are depicted through the waste management hierarchy, are being ordered according to the level of desirability which can be shown through Table 1 below.

Table 1. Waste management hierarchy (Gertsakis & Lewis, 2003)

Goal	Attribute	Outcomes
Reduce	Preventative	Most desirable
Reuse	Predominantly ameliorative part preventative	↕
Recycle	Predominantly ameliorative, part preventative	
Treatment	Predominantly assimilative, partially ameliorative	
Disposal	Assimilative	Least desirable

Waste management hierarchy has being going through several changes and evolutions according to some changes of the hierarchy. Incineration, which has been in the hierarchy in the first stage of the evolution, has being criticized due to the cost (Rasmussen et al., 2005) and impact to the environment (Connett & Sheehan, 2001). Therefore, in the recent hierarchy, incineration has been pulled out from the hierarchy and replaced by treatment (Gertsakis & Lewis, 2003); or thermal treatment (Sarifah Yaacob, 2009); or recovery (Pongrácz, Phillips, & Keiski, 2004); or waste to energy (Ministry of Housing and Local Government Malaysia, 2005).

3Rs initiative

From the Table 1 above, 3Rs are described as Reduce, Reuse and Recycle. The concept of 3Rs is being actively promoted in every country, started from the Agenda 21 (through Chapter 21 in the Agenda 21). Meanwhile, 3Rs initiatives in Asian regions were officially launched at the 3R Ministerial Conference hosted by the Government of Japan in April 2005 (Visvanathan, Adhikari, & Ananth, 2007).

Issues in universities

Universities are a vital place to educate and prepare the nation with future leaders and decision makers. The readiness of its students and staff towards new innovations and ideas make it a suitable place as a 'nest of improvement'.

In doing so, Table 2 shows the chronology of some declarations which are related to the effort of higher education institutes around the world to embrace sustainable development in their education system and management.

Table 2. Chronology of some declarations related to sustainability in higher education (Wright, 2002)

Year	Declaration
1972	*The Stockholm Declaration on the Human Environment* (UNESCO, 1972)
1977	*Tbilisi Declaration* (UNESCO-UNEP, 1977)
1990	*The Tallories Declaration* (UNESCO, 1990)
1991	*The Halifax Declaration* (Lester Pearson Institute for International Development, 1992)
1992	*Report of the United Nations Conference on Environment and Development* – Chapter 36: Promoting Education, Public Awareness and Training (UNESCO, 1992)
1993	Ninth International Association of Universities Round Table: *The Kyoto Declaration* (International Association of Universities, 1993)
1993	Association of Commonwealth Universities' 15th Quinquennial Conference: *Swanse Declaration* (UNESCO, 1993)
1994	*CRE Copernicus Charter* (CRE-Copernicus, 1994)
1997	International Conference on Environment and Society – Education and Public Awareness for Sustainability: *Declaration of Thessaloniki* (UNESCO, 1997)

Table 3 clearly shows lack of awareness - interest and involvement are the most critical factors affecting effectiveness of sustainability initiatives in Higher Education Institutions. Literature research also revealed that 'lack of awareness' is the main problem when managing waste.

Table 3: Factors affecting effectiveness of sustainability initiatives in Higher Education Institutions (Velazquez, Munguia, & Sanchez, 2005)

Lack of awareness, interest and involvement
Organizational structure
Lack of funding
Lack of support from university administrators
Lack of time
Lack of data access
Lack of training
Lack of opportune communication and information
Resistance to change
Profits mentality
Lack of more rigorous regulations
Lack of interdisciplinary research
Lack of performance indicators
Lack of policies to promote sustainability on campus
Lack of standard definitions of concepts
Technical problems
Lack of designated workplace
The 'Machismo'

As to embrace the culture of sustainable waste management, universities are one of the right places to begin with, but with regard to the real situation, knowledge of sustainability remains as a secondary priority (McIntosh, Cacciola, Clermont, & Keniry, 2001).

Even though universities are producing knowledgeable future leaders and decision makers, universities' role in promoting sustainable waste management is still in early stage to become a real place in embracing sustainable education. As stated by Cortese (2003) "Indeed, it is the people coming out of the world's best colleges and universities that are leading us down the current unhealthy, inequitable, and unsustainable path".

Therefore, it is important for the universities to create innovative activities among their students with aims of spreading the good practice of sustainable waste management, by referring to the 3Rs initiative as the main subject. Thus, the establishment of a Students' Association is likely to be more effective in the creation of 3Rs awareness among university's students. The following section is focused on the case study of this paper.

Case study: Green Team IIUM

The International Islamic University Malaysia (IIUM) is one of the public universities in Malaysia, with the total of 26,561 undergraduate students (Kementerian Pengajian Tinggi Malaysia, 2008). It has four campuses: main campus at Gombak, matriculation center at Petaling Jaya, matriculation center at Nilai, and medicine campus at Kuantan. Green Team IIUM is one of the students' associations available in IIUM. The Green Team was formed in late 2008 by a group of amateur but passionate environmentalists.

History of establishment

Throughout three years of the formation, Green Team has gone through three stages of development:

a. Formation stage (2008)

During the formation stage, Green Team has established itself with the formation of objectives and goals, setting up committee and advisors, formation of bureaus (Human and animal rights, recycling and waste management, art and culture), creating channels of communication through the establishment the Green Gazette (official newsletter for the Green Team) and the official Green Team' blog.

The earliest Greent Team activities include *Teh Tarik* session, picnics, recycling projects, art-environment workshop with children (i.e. orphans), Kulliyyah of Architecture and Environmental Design (KAED) Festival (or known as KAED FEST) (handmade art, drum circle, recycling booth, shoe donation booth), and fund-raising and other activities, such as making art out of recycled materials for an art bazaar; all were aimed to create the awareness among IIUM students toward 3Rs.

b. Exploration stage (2009)

During the exploration stage in 2009, Green Team has conducted more awareness related activities, such as KAED Festival by holding two events, i.e. Scrap Art and Shoes 4 Africa. Apart from these two programs, the booth was also used as a registration counter for new members to sign up for Green Team. Forms were made for students and on both days a number of students were seen filling these forms as well as asking questions about Green Team.

Following the month which KAED Festival was held, Green Team participated in the first off-campus programme of the club, *Arts for Grabs.* The event was held in conjunction with the upcoming Eidulfitri celebration which is celebrated every year.

Arts for Grabs is an independent art festival held at the Central Market in Kuala Lumpur which combines together independent artists, musicians and poets in a single venue to sell and exhibit their works and services. The event is held regularly by the organizers, and has an active participation of independent or freelance artists in all fields of arts, as well as students of the arts. Apart from sales and exhibitions, other smaller programs are conducted as well, for example independent movie screenings and performances like poetry recitation or musical performances.

With the success of *Scrap Art,* Green Team decided to join this event to promote the use of recycled materials to be made into art. The Green Team's participation in the program garnered an extremely positive response and a profitable outcome for the club.

Also in the same month (September) was the program Art Workshop, which was a workshop held for underprivileged children. Held in conjunction with the KAED Iftar (fast-breaking ceremony for Muslims), the event brought a total of 30 children from the Rohingya Orphanage Centre in Selayang, to the Architecture Faculty in IIUM. There, the event started out with the workshop, followed by the breaking of the fast of all participants. The workshop included an ice-breaking session and an arts and crafts session. At the end of the workshop, the children were asked to present their collage and explain what they learned about the environment.

One of the most important aspects of a public event is the opportunity to network. Green Team has experienced this first hand, when the club was contacted by a representative of Cloth and Clef, an upcoming spot for music and fashion located in Bukit Bintang, Kuala Lumpur. Green Team was invited to open a booth to both exhibit the now famous "scrap art" as well as spread the message of environmental awareness. The event was entitled Green Trashcan and displayed an array of programs such as musical performances and booth sales. The event was held in mid October 2009.

c. Setting direction stage (2010)

In the year 2010, Green Team was at a setting direction stage. During this stage, Green Team continues creating innovative programmes such as Green team River Clean Up, which was a community service program held at a nearby village, Kampung Bandar Dalam with the participation of not only the Architecture students, but also the residents of the village. A total of 100 students alongside 50 village residents (from neighboring villages as well) came on location to Sungai Gombak to clean up the river. The event was officiated and joined by the Dean and lasted from morning to evening, which started out with the river clean-up and ended with a short multimedia presentation for the village children.

In August of 2010, Green Team was again asked for their services, when the Urban and Regional Planning students, or as the club is called: PLANMIC, for their nationwide event called the Planning Students Assembly. Green Team was required to conduct a slot for the students on the importance of environmental awareness through simple games and discussion. Among the participating universities were UKM, UTM and USM.

News of the club was spread by verbal means, as well as printed materials such as leaflets or handbills, posters and official newsletter the Green Gazette. By the end of the first president's tenure ship the club had also formed its own Facebook group. Updates and announcements are posted before, during or after the club's events.

One of the newest methods of promotions for Green Team was the formation of a Twitter account in June of 2010. In the period of 9 months Green Team has had a total of nearly 50 followers to the Twitter account which includes organizations such as UNEP, Raleigh and members from organizations such as the Malaysian Youth Climate Justice Network.

Message learning approach

To analyze the effect of the creation of awareness by using Students' Association such as the Green Team, a 'Message Learning Approach' is used. Figure 1 depicts the message learning approach. Cameron

(2009) stated that this approach 'was never formalized as a theory', even though most of persuasion theories are referring to the same attributes; as it starts with the Source, which is described as 'the originator of the message' (Cameron, 2009, p. 310); then the Message, which contains the important information or knowledge to be distributed to the receiver; through Channels, i.e. medium to deliver messages to the Receivers, in order to change the Receivers' Behavior.

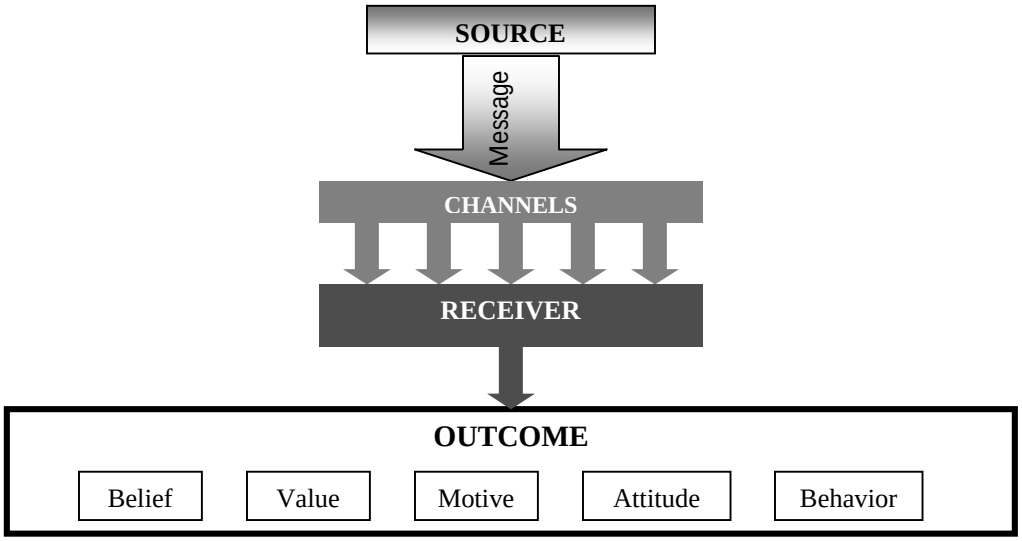

Figure 1. *Message learning approach (Bator & Cialdini, 2000; Cameron, 2009; McGaan, 2010)*

The following sections describe in detail each components of the Message Learning Approach with reference to the case study of this research:

Source

Source is defined by Cameron (2009) as 'the originator of the message'. Factors of the Source should comprise of *age, gender, socioeconomic status, ethnicity, credibility* and *attractiveness* (Bator & Cialdini, 2000).

The originator of the message for this case study is Green Team. From the researchers' observation, Green Team has the following criteria as to be the effective originator for distributing the 3Rs initiatives among IIUM's students: Credibility and Attractiveness.

Message

Message is the most important ingredient to persuade others. 'A persuasive message' must gain a receiver's attention, be comprehended by the receiver; and the receiver must yield to the message and be able to retain the information in the message for persuasion to occur (Cameron, 2009, p. 310). Factors affecting message include *delivery style, length, repetition, speed of speech* and *vividness* (Bator & Cialdini, 2000).

As the vision of Green Team is to educate its members on the matters of sustainability with the focus of implementing the 3Rs initiative, thus the main message for the Green Team's activities is spreading the 3Rs initiative among IIUM students.

Channel

Channels are defined as 'the mediums through which the message was delivered' (Cameron, 2009). Table 4 below depicts the channels to raise awareness, which can be grouped into 12 groups; i.e. (1) Information Technology and Communication, (2) Lecture, (3) Printed material, (4) Event, (5) Performing arts, (6)

Multimedia, (7) Extra curricular, (8) Communication, (9) Visits, (10) Display material, (11) Community outreach and (12) Community.

Table 4. Improved table of channels to raise awareness

Kreft-Burman 2002	Choong Weng Wai (2008)	Proposed group
Internet		Information Technology and Communication
Intranet		
Networking		
CD-Roms		
Multimedia		
Electronic forums		
Seminars	Lecture	Lecture + talk + workshop
Congresses		
Trainings		
	Role play	
	Demonstration	
Newspapers		Printed material
Magazines		
Publications		
Letters		
Customers vile		
Instructions		
	Booklet	
	Pamphlet	
	Leaflet	
	Newsletter	
	Handout	
Fairs		Event + arts
Exhibitions		
Shows		Performing arts
Theater		
Films		Multimedia
TV, Music		
Radio		
	Video	
	Audio	
	Transparency	
	Slide	
	Computer assisted presentation	
Competitions		Extra curricular
Phone		Communication
On-site visits		Visits
Excursions		
	Sign	Display material
	Poster	
	Banner	
	Notice board	
		Community outreach
		Community Based Movement

Green Team has used channels of electronic forums (through Facebook, blog and Twitter), lectures and talks, demonstrations, Newsletters (Green Gazette), Events (exhibition and art event) and

Community outreach (such as river cleanup) to raise 3Rs awareness among the university (i.e. IIUM) students.

Receiver

Receivers are defined as 'the person or persons to whom the message was said' (Cameron, 2009). Receiver factors include *age, education, gender* and *lifestyle* (Bator & Cialdini, 2000). With the reference to the focus of this paper, receivers can be grouped into two: (1) positive environmental attitude, and (2) negative environmental attitude. Receivers with the positive environmental attitude can be grouped into two: (1) anthropocentric and (2) ecocentric (Gagnon Thompson & Barton, 1994). The receivers for the Green Team's activities are the IIUM's undergraduate students.

Outcome

There are five outcomes from the persuasion, i.e. Belief, Value, Motive, Attitude and Behavior (Cameron, 2009; McGaan, 2010). The ultimate aim of the outcome for this paper is to embrace the 3Rs behavior among university's students. Concrete and Abstract Knowledge have been utilized by the Green Team in creating awareness programme among members. Schahn & Holzer (1990) termed concrete knowledge as *knowledge for action*.

To discuss in detail the outcome from Green Team's activities, a survey among Green Team's members has been conducted. The section bellows discuss the outcome of the survey:

Analysis

From the total of 39 members (N=39) of Green Team, the individual waste management behaviors are being accessed.

Figure 2 show that 100% of respondents knew the concept of 3Rs. It shows that the message delivered through Green Team's activities was successfully received by the members (i.e. respondents).

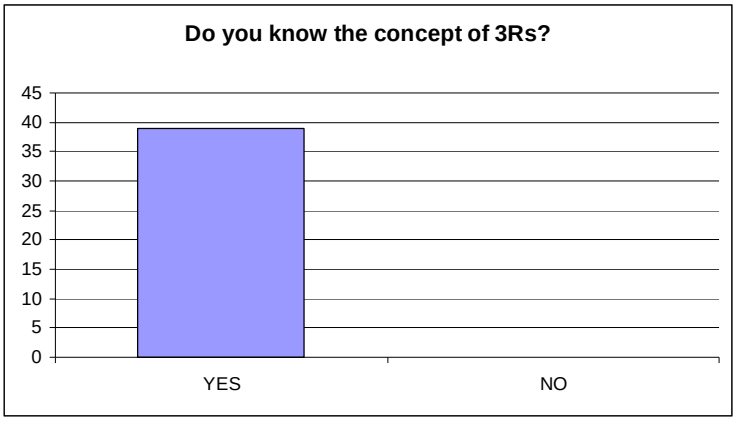

Figure 2. *Knowledge on the concepts of 3Rs among GT members*

Meanwhile, in elaborating in detail the respondents' received message, Figure 3 shows the knowledge rate among the respondents. Only 10% of the respondents rate their knowledge on 3Rs as excellent, and the highest rate was moderate, i.e. 44%. This may be due to several assumptions. The moderate scale may give an opportunity to the respondents as the safe spot in rating their knowledge. Or the quality of messages delivered still need to be enhanced.

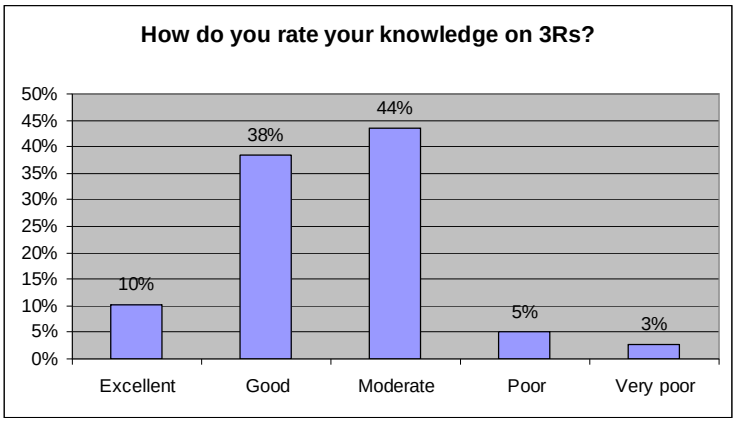

Figure 3. *Level of knowledge on 3Rs Initiatives among GT members*

67% of respondents said the areas of their individual study (i.e. in the classrooms) did not teach them the concept of 3Rs, and only 33% of them said otherwise. Figure 4 depicts the graph.

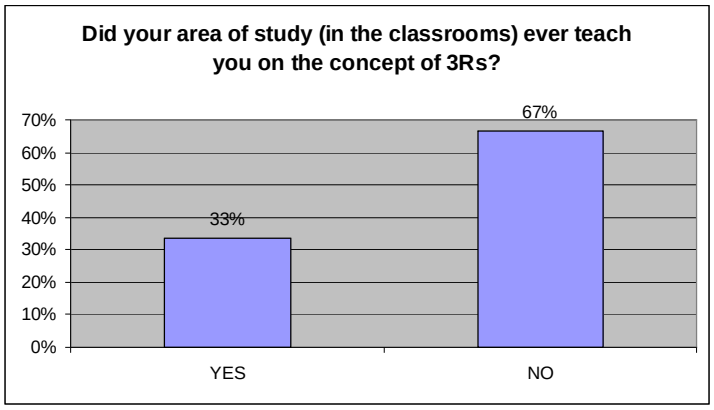

Figure 4. *Knowledge on the concept of 3Rs initiatives in classroom*

Figure 5 shows the detail of each Waste Behavior practiced by the respondents. The Waste Behavior are referred to (1) Segregating waste into different bins, (2) Recycling paper, (3) Recycling plastic bottles, (4) Recycling metals, (5) Reusing and (6) Composting kitchen waste.

Frequencies being accessed are based on 0 case (i.e. never practiced the behavior), once every 6 months, 3 months, every month and every week. Most of the respondents were practicing the behavior of segregating waste into different bins, recycling papers and plastic bottles, respondents for once every 3 months, but if it is compared with recycling metals, most of the respondents were not practicing it (38% for 0 case). 49% of the respondents were reusing their waste every month. Meanwhile 31% of the respondents were not composting their kitchen waste.

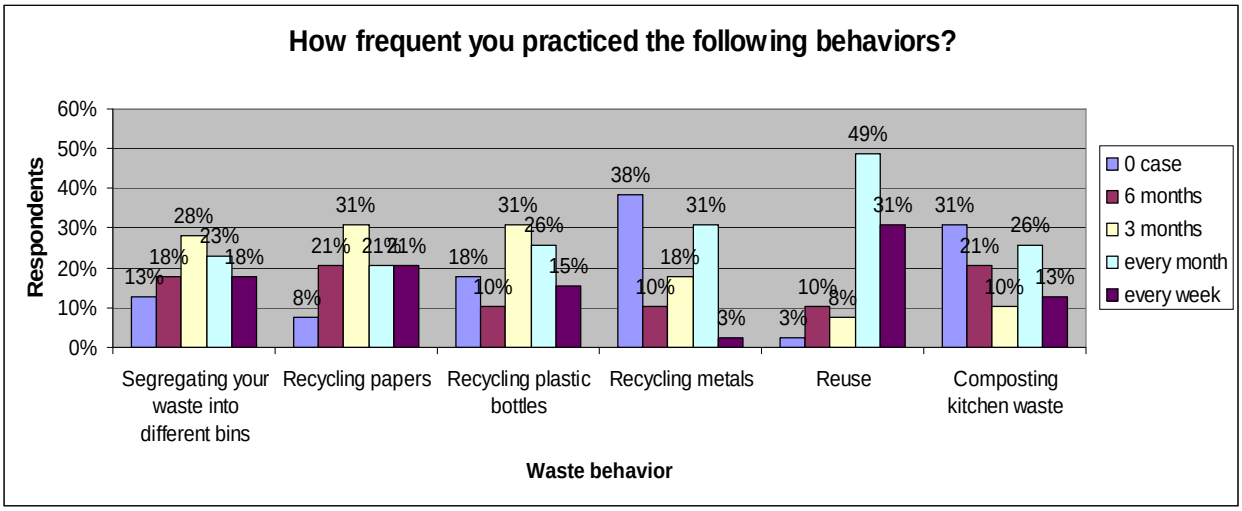

Figure 5. *GT members' practicing waste behavior*

Conclusion

As far as this paper is concerned, to initiate the 3Rs initiative in a university within the context of facilities management, it is a need to start with the awareness programme. Green Team IIUM is one of the available means in the creation of the 3Rs initiative awareness programme in a university. Creativity among students in creating variety of awareness programmes is the key success towards implementing 3Rs initiative in a university. The usage of Message Learning Approach as depicted through Figure 1 in this study can be enhanced and used later for the next step in creating the Conceptual Waste Minimization Awareness Model (CWMAM).

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