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THE CHALLENGES OF REDUCING SOLID WASTE PRODUCTION AMONG UNIVERSITY STUDENT : MYTH OR REALITY

Siti Nur Amirah Syarafana Mat Sim@ Mat Hussin[1], Noorazlina Kamarulzaman[1*]

[1] Department of Built Environment Studies and Technology, College of Built Environment, Universiti Teknologi MARA Perak Branch, Seri Iskandar Campus, 32610, Seri Iskandar Perak, Malaysia

amirahsyarafana123@gmail.com
nooraz376@uitm.edu.my

ABSTRACT

Producing solid waste is a major environmental problem that is getting worse as urbanisation and population increase take root. In Malaysia, it is getting tougher to find places for proper waste disposal, and the vast majority of those that are already there are virtually out of their useful lives. The poor recycling rate in Malaysia which is currently only about 31% is one of the key factors contributing to disposal sites' hastened demise. In order to increase the rate of waste reduction, collaboration between the community, the informal sector, the official waste collectors, and the government is required. People's awareness of this issue needs to be taken into consideration, so this article will present data on the investigation of awareness of the importance in reducing solid waste production in the nation among college students and explore the difficulties faced by college students at UiTM Seri Iskandar, Perak, to do so. The preparation and distribution of a survey form for data collecting utilising online methods and applying quantitative and qualitative method. The research reveals the level of awareness and the actual difficulty college students encountered in not putting waste reduction into practise. College management play an important role to reduce the obstacles including implement educational programmeand improve the waste facilities.

Keywords: *Waste Reduction, Challenges, Waste Disposal, Awareness and Education, Sustainable Practices*

INTRODUCTION

SCENARIO OF SOLID WASTE IN MALAYSIA

Municipal solid waste makes up 64% of Malaysia's total waste, with industrial waste making up 25%, commercial waste making up 8%, and construction waste making up 3% (EU- SWMC, 2009). In landfills, recyclable materials make up about 80% of municipal solid wastes (MHLG, 2006), and household waste contributes the most to this category of wastes, with recyclable materials making up no more than 70% to 80% of the total solid waste composition (Sumiani et al., 2009). One of the major sources of municipal solid waste in Malaysia, along with institutional and commercial waste, is the residential sector (Tariq and Mostafizur, 2007). The roughly 20 categories of municipal solid waste, which can be classified as organic or inorganic, include food waste, paper (mixed), cardboard, plastics (rigid, film, and foam), textile, wood waste, metals (ferrous or non-ferrous), diapers, newsprint, high grade and fine paper, fruit waste, green waste, batteries, construction waste, and glass (Amin & Go, 2012). Without any attempt to recover or recycle the waste, it is simply dumped in a field, regardless of its composition or type (Syifaa et al., 2023)

Sustainable solid waste management is the main purposes of integrated solid waste management. Since early 1988, Malaysian government has introduced Action Plan for a Beautiful and Clean Malaysia (ABC) (Ministry of Housing and Local Government Malaysia, 1988; Sreenivasan et al., 2012). The proposed policy under this ABC plan is to produce an integrated national municipal solid waste system which is environmentally sounds and socially acceptable (Ministry of Housing and Local Government Malaysia, 1988). Unfortunately, this policy was not officially endorsed by national council of local government. In the 3rd outline perspective plan (OPP3), Malaysian government has considered to adopt incinerators for efficient solid waste disposal (Agamuthu et al., 2009). Besides, 3R policy has been re-launched by Ministry of Housing and Local Government as an initiative for solid waste reduction. At that time, the recycling rate among Malaysian is too low which is below 5% (Abas & Wee, n.d.)

Professionalism in Malaysia solid waste industry is relatively weak and poorly represented. Skills and knowledge among practitioner in solid waste management at all levels still need to be improved. Malaysia is still not capable to planning, designing, constructing and managing of solid waste management facilities and services due to insufficient number of personnel and technical capabilities. As the result, the lack of solid waste planning and financial investment in recent years has led to inadequate and poorly operated facilities(Samsudin & Don, 2013)

National Development Policy of the Second Outline Perspective Plan (1991-2000) unequivocally stipulates that "sufficient attention will be given to the protection of the environment and ecology so as to maintain the long-term sustainability of the country's development." In accordance with the foregoing, Malaysian government, through the Department of the Environment (DOE), has developed its vision, which is to contribute to nation-building by achieving a better level of health, safety, and quality of life through conservation and preservation efforts, prevention and control of pollution, protection and promotion of wise use of natural resources toward sustainable development for present and future generations (Badgie et al., 2012).

Solid waste treatment

The goal of current treatment procedures is to recover and use as many of the components found in the discarded wastes as a resource as feasible while lowering the amount of solid waste that needs to be landfilled. Different techniques are used to handle solid waste, and the

correct technique to apply relies on the qualities of the trash, the amount of land that is available, and the cost of disposal are as follows.

a) Incineration

When land filling is not a possibility and the trash's composition is highly flammable, incineration the controlled burning of wastes at a high temperature can be utilised as a disposal alternative. It also reduces their potential for harm and frequently transforms them into energy (Badgie et al., 2012).

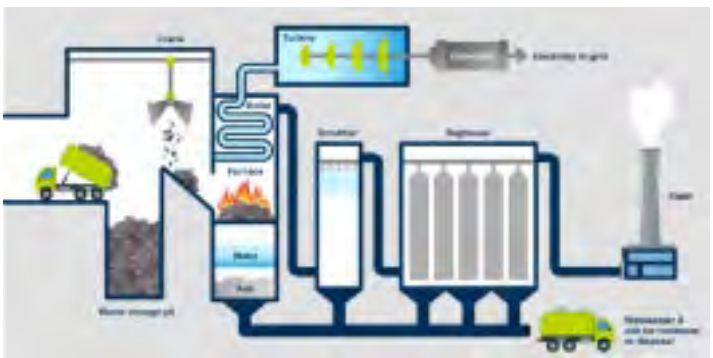

Figure 1: Incineration Process

b) Gasification

Waste gasification is a chemical process where trash is heated in a low-oxygen environment to the point that it breaks down into its constituent molecules. This reaction has two products, a combustible gas called syngas and inert slag or char. It can be used directly for electricity generation, or refined into a variety of valuable products including diesel, hydrogen, and useful chemicals (Admin, 2020).

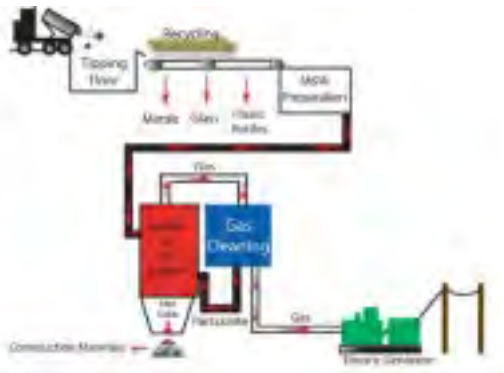

Figure 2: Gasification Process

c) Landfills

The only waste disposal technique that can handle all waste stream components is landfilling. When solid trash is dumped in a landfill, it often goes through a number of intricate biochemical and physical processes that result in the generation of both liquid and gaseous emissions. This method appropriate when the land is accessible for a reasonable cost and there is an adequate manpower and technical support to operate and manage the site (Badgie et al., 2012).

Figure 3: Landfills Process

RESEARCH METHODOLOGY

Figure 4: Research Methodology Flow Chart

This research explores the challenges faced by college's students at UiTM Perak, Kampus Seri Iskandar, Perak, Malaysia in reducing solid waste.

Figure 5: Location of Case Study

Figure 6: Case Study

It also to know the awareness of importance of reducing solid waste production in country. This research starts with quantitative method which helps to gained numeric data from respondent experience about the study.

Questionnaire survey that relates to research objective had been create and shared to potential respondents. The questionnaire through google form is used as it was found effective because it is the fastest and easiest way to get respondents. Google Form surveys were used because they are widely used as a means gaining data online in wide range. To obtain primary data, a google form was prepared with few questions. The data include contributes to new knowledge because it will collect the numeric obstacles that respondents faced. The method chosen suits with the research objective as it eases the respondent in delivering the experience.

Then, secondary data is obtained by information that has already been collected by other researchers which is by previous studies from journal.

Scope and limitation of research

The main purpose of this study is to determine the challenge faced by college's students at UiTM Seri Iskandar in implementing ways in reducing solid waste production. It is limited to respondents from college's students at UiTM Seri Iskandar and in semester March 2023 until August 2023. Respondents were given Google Form to be fulfil to get the data.

Data collection

Survey form questions divided into two sections which are to know the awareness level of respondents about solid waste production and to know the challenges faced by them in reducing solid waste production.

Awareness level about the importance of reducing solid waste production

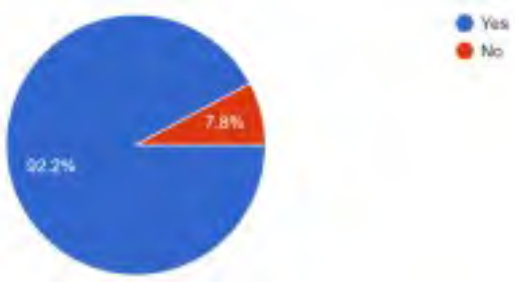

Figure 7: Percentage of Respondents that Know the Definition of Solid Waste.

92.2% of respondents know what is solid waste and there are 7.8% from respondents did not know what is solid waste.

QUESTIONS	TOTAL OF RESPONDENTS				
	1	2	3	4	5
I already know Malaysia is almost running out of waste disposal sites.	31	57	18	4	5
Current solid waste management in Malaysia are controllable.	11	37	42	21	4
I know the importance of reducing solid waste production.	34	48	26	2	5
Solid waste production affecting earth's temperature.	51	39	18	1	6
Total (Total %)	127 (27.6)	181 (39.3)	104 (22.6)	28 (6.09)	20 (4.35)

Table 1: Awareness Level Analysis

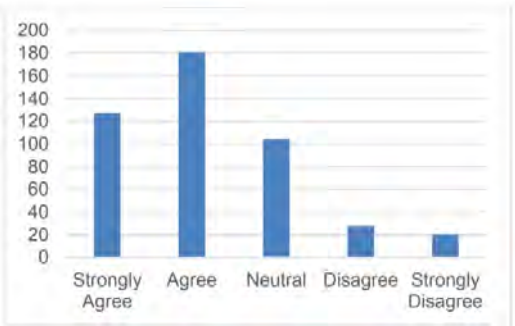

Figure 8 Bar Chart of Total Respondents

Table 1 and figure 8 above shows awareness level of college's student about solid waste production in Malaysia. From thet can be seen that majority of respondents agree about it, 104 respondents felt neutral about their awareness and 48 responds said they are not aware about it.

Table 2: College's Student Daily Routine Analysis.

QUESTIONS	TOTAL OF RESPONDENTS		
	1	2	3
I use my own water bottle to buy drinks at college.	32	62	21
I did not use plastic bag when shopping in college.	18	6	29
I did not use plastic straw to drink.	17	60	38
I use my own food container when buying meals in college.	10	44	61
I separate types of waste before throw it.	18	68	29
I encourage people surround me to reduce solid waste production.	27	72	16
Total (Total %)	122 (19.4)	312 (49.7)	194 (30.9)

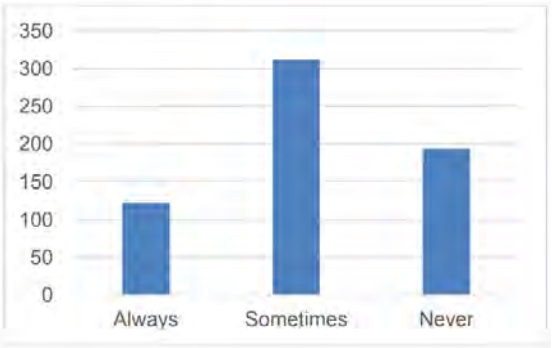

Figure 9: Bar Chart of Total Respondents Table 2

Table 2 and figure 9 shows college's student routine in reducing solid waste production. The data shows students that always practice it recorded the lowest amount and most of them sometimes practice it and number of respondents that never practice it also higher than who always practice it.

Table 3: College's Student Awareness about Solid Waste Production in College.

QUESTIONS	TOTAL OF RESPONDENTS	
	Yes	No
I know there is 3R cage in college.	109	6
I support 'no plastic bag ' campaign in college.	109	6
I am interested to know more information or participating in educational programs related to waste reduction?	101	14
Total (Total %)	339 (92.8)	26 (7.1)

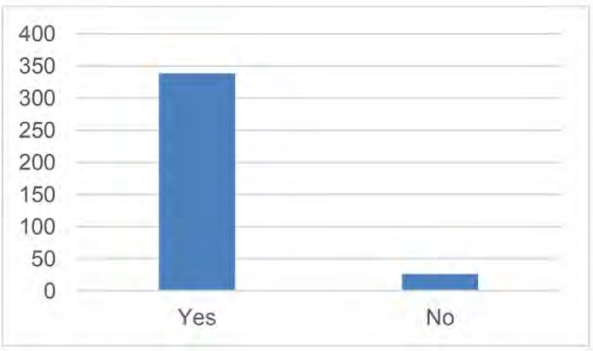

Figure 10: Bar Chart of Total Respondents Table 2

Table 3 and figure 10 shows college's student awareness about facilities and programme in college. Can be seen from the data that majority of respondents aware about the facilities and support towards program related to solid waste reduction.

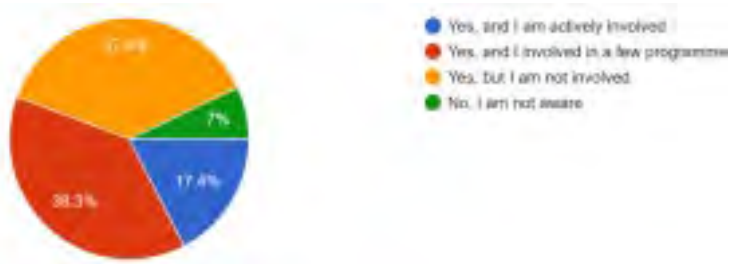

Figure 11: Percentage of Respondents that Aware with College Programme.

Pie chart above shows result about awareness of college's student on any college's programme that aimed at reducing solid waste production. From the chart can be analyse that 93% which is 107 respondents aware about the programme however there are 20 respondents said that they are actively involved, 44 respondents involve in few programme, and 43 respondents that aware but not involved. There are eight out of 115 respondents not aware about the programme held by college.

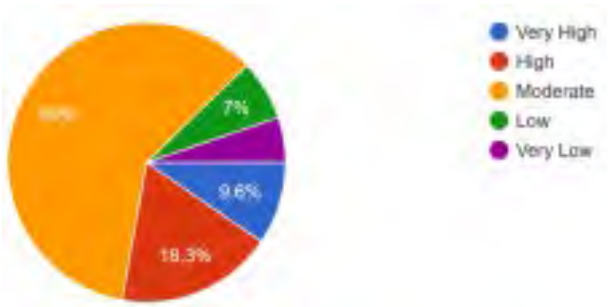

Figure 12: Percentage of Respondents Personal Effort in Reducing Solid Waste Production.

Pie chart above shows personal effort of respondents in reducing solid waste production. 9.6% (11) respondents said that they have very high effort on it and 18.3% (21) respondents said they have high effort towards it. 60% (69) which is majority of respondents gives moderate effort on it. 7% (8) respondents give low effort and 5.2% (6) respondents said that they contribute very low effort on it.

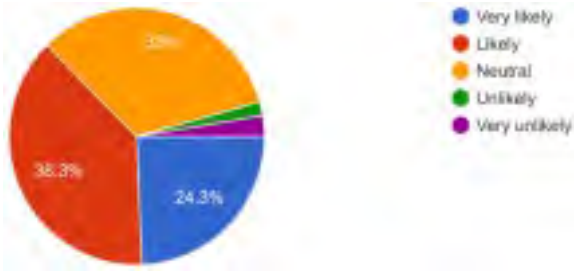

Figure 13: Percentage of Respondents to Change Behaviour in Solid Waste Production.

Figure 13 shows percentage of respondents that likely to change their behaviour in reducing solid waste production. 24.3% (28) respondents very likely to change it and majority of them with 38.3% (44) respondents likely to change it. There are 33% (38) respondents have neutral feelings to change it. Respondents that do not want to change it record the lowest percentage which is two out of 115 respondents unlikely to change it and three of total respondents very unlikely to change their behaviour in reducing solid waste production.

Challenge faced in reducing solid waste production

CHALLENGES	RESPONDENT'S CONSENT (%)
Lack of awareness or education.	47.8
Convenience of single-use products like plastic water bottles, disposable cutlery.	61.7
Limited access to recycling facilities.	24.3
Insufficient college support or incentives.	28.7
Lack of personal motivation.	46.1
Lack of idea to recycle waste.	40.0
Limited availability of recycling bins.	31.3
College did not provide adequate resources and facilities to support waste reduction efforts.	31.3

Table 4: Challenge Faced by College's Student.

Most of respondents said that challenges they faced because of convenience of single-use products than followed by because of lack of awareness education and lack of personal motivation. There are 46 respondents can't do the solid waste reduction because they lack of idea to recycle it and limited availability of recycle bins and no adequate resources and facilities to support them also chosen by 36 respondents each. Next, 33 respondents said because of insufficient college support and initiatives and 28 respondents said because of limited access to recycling activities.

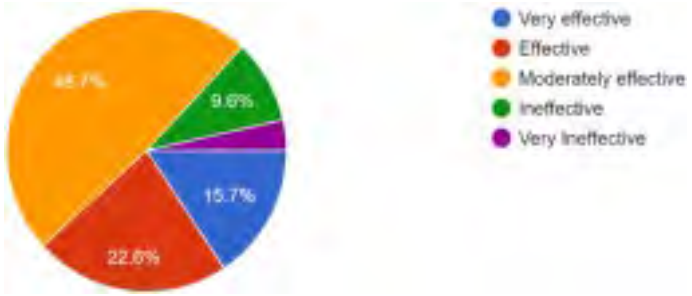

Figure 14: Percentage of College Effectiveness in Communicate about Reducing Solid Waste Production.

Figure above shows the effectiveness of college communication with students in practicing waste reduction. Majority of respondents said that it is moderate effective. 18 respondents said it is very effective and 26 respondents said it is effective to them. There are also a few respondents said it is not effective which is 22 respondents.

CONCLUSION

In conclusion, this paper has explored the awareness level and obstacles faced by college's students at UiTM Seri Iskandar in implementing ways to reduce solid waste production. This research have fulfilled two objectives of research which are to investigate the awareness about the importance of reducing solid waste production in country among college's student, and to explore the challenges faced by college's students at UiTM Seri Iskandar to reduce solid waste production.

Through an in-depth analysis of data collected from a sample of 115 participants, 66.9% of respondents familiar with solid waste production but only 19.4% of them that always implement ways to reduce solid waste production in their daily routine at college and 92.8% of them aware about college information about solid waste awareness.

61.7% respondents said that the convenience of single-use products like plastic water bottles, disposable cutlery is the main challenge for the in reducing solid waste production. Then followed by because of lack of awareness or education, lack of personal motivation, lack of idea to recycle, limited availability of recycle bin, inadequate resources by college, insufficient college support, and limited access to recycling facilities.

Future research could expand on this paper by investigating the awareness level and challenge faced in reducing solid waste production on different consumer segments, and incorporating qualitative research methods to gain deeper insights into others experiences and perceptions.

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Saya yang menjalankan amanah,

SITI BASRIYAH SHAIK BAHARUDIN
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