

UTM Student Awareness Towards Solid Waste Segregation in Residential College

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ABSTRACT

Universiti Teknologi Malaysia (UTM) is a local university which practices sustainable campus concept. One of the criteria highlighted in a sustainable campus is good solid waste management. In this regard, UTM under the management of UTM Campus Sustainability Unit has organized a solid waste segregation program which its aim was to measure the level of UTM student awareness towards solid waste segregation. The target group of this study was the undergraduate students who regularly use the food arcade. Data source in this study was based on questionnaires distributed among the participants (n=375). The data obtained was analyzed using Statistical Package for Social Science (SPSS) software quantitative method, and presented in the form of tables and graphs. The results of the study revealed that the student awareness towards solid waste management in UTM, in particular solid waste segregation was very moderate. In order to improve this situation, initiatives such as increasing the number of sustainable food arcade and equipping the campus with solid waste separation infrastructure are just some to start with. In conclusion, this survey conducted has provided UTM Campus Sustainability Unit with an insight into the current student awareness level on solid waste segregation and so that further steps can be taken to promote this green approach.

Keyword: University Solid Waste Segregation, Sustainable Campus, UTM Campus Sustainability, Student Awareness

INTRODUCTION

The Malaysia Education and Awareness Policy introduced in 2002 was part of the Malaysia National Green Strategy Policy which was set up by the government in order to achieve environmental sustainability. As supported by previous study (McNamara, 2008), universities are ideal places to educate and practice sustainable culture. In line with the previous policy, the Universiti Teknologi Malaysia Sustainability Unit (UTMCS) was formed so that sustainable culture can be inculcated amongst its residents.

UTMCS in its attempt to minimize the total amount of waste production by UTM has organized several programs which aimed at increasing the awareness on the importance of solid waste segregation to our environment. One of the approaches includes a food waste segregation which was conducted at a UTM arcade.

According to Landscape Unit, Office of Asset and Development UTM (2017), the statistics shows that solid waste recorded in 2011 was 3520.42 tons decreased to 2074 tons in 2016. In spite of this decrement, the amount of waste which was not divided could not be

completely ignored. One of the biggest waste generators in UTM is its own students. As for the academic year 2017 the total number of students recorded at UTM was 21,677 (UTM, 2017). This study was performed in order to measure, it can be said that one of the factor that generate waste is student. There for this study was conducted to measure the level of UTM student awareness towards solid waste segregation.

OBJECTIVES OF STUDY

There are 2 objectives of this study.

- i. To identify the importance of solid waste segregation.
- ii. To examine the UTM student awareness level on solid waste segregation.

IMPORTANCE OF SOLID WASTE SEGREGATION IN UNIVERTITY

Based on the objectives, the importance of solid waste segregation in university can be subdivided into major three viewpoints such as follows:

i. Environmental

Solid waste segregation is one of the ways to reduce waste (Ramachandra T.V, 2009). According to Ramachandra T.V (2009), if the wastes are decreased it can create a better environment. Matthew J. F (2009) also supported the opinion that decreasing waste makes our environment healthier.

ii. Economical

Solid waste segregation may reduce the cost of solid waste management (Stephen S. et. al., 2013). Based on Ramachandra T.V., (2009), solid waste segregation preserves the natural source as renewable sources can be used to make a new products.

iii. Social

Matthew J. F (2009) mentioned that solid waste segregation may improve human's health due to the condusive environment. It also promotes people to be more aware of the importance taking care of the environment.

METHODOLOGY

Case Study

UTM is a university which implements sustainable practices. One of its objectives is solid waste reduction which was attempted by means of its solid waste segregation program. The endeavor was further broken down into three main focuses such as follows:

- i. Sustainable Food Arcade
- ii. Bio Recycling Center
- iii. Product that been produced from wastes

This study focused at probing the level of awareness amongst undergraduate students on solid waste segregation activities in UTM as the number undergraduate students was

12,042, more than fifty percent of UTM overall number of students, which was 21,677. This reports focuses on the findings from a study conducted by the UTMCS at the Sustainable Food Arcade.

Data Collection

Primary data is the data collection by the source from the case study which is in UTM. The instrument of this study was the questionnaire, designed to collect data for analysis based on the sample of the study. Therefore, the questionnaire was developed to determine the level of student awareness on solid waste segregation at UTM. Likert scale was applied in the questionnaire design. The sample of this study was according to Krejcie and Morgan (1970), and the sampling size determination used in this study was 375.

Data Analysis Methodology

The data collected was analyzed using the Statistical Package for Social Science (SPSS) software, through its frequency analysis method. In addition, the mean score was calculated to determine the awareness level of student on solid waste segregation

N	S	N	S	N	S
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3200	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	100000	384

*N = saiz populasi S= saiz persampelan

Figure 1: Table to Determinine Sample Size from a Given Population
 Source : Krejcie and Morgan (1970)

Table 1 : Likert Scale

Scale	Indicator Scale
1	Strongly disagree
2	Do not agree
3	Agreed
4	Strongly Agree

In addition, in order to measure the level of awareness of the "Likert" scale, Table 1 was be evaluated based on the Perceptual Awareness Scale (PAS). Measurement scale 1 in Table 1 represents "no description", measurement scale 2 represents "brief description", measurement scale 3 represents "almost clear description" and measurement scale 4 represents a very clear picture

Mean Score Formula

Total score = Σ (score (x) frequency score)

Mean Score = $\frac{\text{Total Score}}{\text{Total Respondent}}$

RESULTS AND DISCUSSION

This section illustrates the analysis of UTM students' awareness of Solid Waste in general. The items mentioned in this section are based on student awareness about solid waste segregation.

Table 2: Solid Waste Segregation Step

No	Statement	Frequency and Percentage				Total
		1	2	3	4	
1	I am aware that solid waste segregation is a good way to reduce the dumping of solid waste	0 0.0	0 0.0	220 58.7	155 41.3	375 100
mean						3.41
2	I know the solid waste segregation steps that waste should be isolated according to the residual composition	21 5.6	69 18.4	155 41.3	130 34.7	375 100
mean						3.05
3	I know the waste can be divided into Biodegradable or Non-biodegradable	34 9.1	102 27.2	165 44.0	74 19.7	375 100
mean						2.74
4	I know the composition of the waste in the institution	42 11.2	118 31.5	144 38.4	71 18.9	375 100
mean						2.65
5	I realize there are different trash cans in solid waste segregation	21 5.6	69 18.4	164 43.7	121 32.3	375 100
mean						3.03
Overall mean						2.97

Table 3: Recycle

No	Statement	Frequency and Percentage%				Total
		1	2	3	4	
1	I am aware that solid waste segregation is a good way to reduce the dumping of solid waste	0 0.0	0 0.0	220 58.7	155 41.3	375 100
mean						3.00
2	I know the solid waste segregation steps that waste should be isolated according to the residual composition	21 5.6	69 18.4	155 41.3	130 34.7	375 100
mean						2.99
Overall mean						2.99

For the general awareness part the two questions asked about the steps involved in solid waste segregation and recycle. It shows that generally student were not totally aware of the steps in the said process. The mean value calculated for the awareness level is on the mean score 2.97. Almost the same mean value for recycle 2.99 was computed. Meanwhile Table 4, 5, 6 and 7 show the more detailed breakdown information revolving the solid waste segregation program conducted in this study.

Table 4: The Existence of The Program

No	Statement	Frequency and Percentage%				Total
		1	2	3	4	
1	Analysis awareness on the existence of solid waste segregation programs in UTM	0 0.0	13 3.5	191 50.9	171 45.6	375 100
mean						3.42
2	I am aware of the type of solid waste segregation programs	0 0.0	23 6.1	230 61.3	122 32.5	375 100
mean						3.26
Overall mean						3.34

Table 5: Solid Waste Segregation Program

No	Statement	Frequency and Percentage%				Total
		1	2	3	4	
1	I know that there are three arcades at UTM practicing solid waste segregation: i. Arcade Meranti ii. Arcade Lestari iii. Cafeteria R02	0	2	193	180	375
		0.0	0.5	51.5	48.0	100
mean						3.47
2	I am aware that I need to isolate solid waste if I want to throw solid waste at those three arcades.	0	7	206	162	375
		0.0	1.9	54.9	43.2	100
mean						3.41
3	I realized there were solid waste segregation bins in the three arcades	0	2	193	180	375
		0.0	0.5	51.5	48.0	100
mean						3.35
4	I noticed the kind of bins provided in the three arcades are: i. Food waste bin ii. Not a waste of food bin	9	2	212	152	375
		2.4	0.5	56.5	40.5	100
mean						3.35
5	I realized that my actions isolating solid waste can help in managing solid waste in UTM	0	2	193	180	375
		0.0	0.5	51.5	48.0	100
mean						3.47
Overall mean						3.41

Table 6: Solid Waste Segregation Product

No	Statement	Frequency and Percentage%				Total
		1	2	3	4	
1	I realized the solid waste segregation program at UTM could open up research opportunities	14 3.7	19 5.1	100 26.7	242 64.5	375 100
mean						3.52
2	I know the rest of the landscape can be used for new products	50 13.3	82 21.9	138 36.8	105 28.0	375 100
mean						2.79
3	I know that UTM produces fuel such as charcoals using landscape leftover	50 13.3	82 21.9	138 36.8	108 28.0	375 100
mean						2.38
4	I know segregation of solid waste can give a lot of interest in UTM	9 2.4	17 4.5	100 26.7	249 66.4	375 100
mean						3.57
5	I know that UTM produces animal bran products from solid waste segregation programs in arcades	9 2.4	17 4.5	100 26.7	249 66.4	375 100
mean						2.94
6	I know that UTM produces compost products from solid waste segregation programs in arcades	10 2.7	87 23.2	194 51.7	84 22.4	375 100
mean						2.94
Overall mean						3.02

Table 7: Importance of Solid Waste Segregation

no	Statement	Frequency and Percentage%				Total
		1	2	3	4	
1	I realized that solid waste segregation program at UTM can reduce the cost of solid waste management	13	62	185	115	375
		3.5	16.5	49.3	30.7	100
mean						3.07
2	I am aware that solid waste segregation program at UTM can provide a cleaner environment	7	20	118	230	375
		1.9	5.3	31.5	61.3	100
mean						3.52
3	I am aware that solid waste segregation program at UTM can increase students' sense of responsibility towards the environment	9	37	114	215	375
		2.4	9.9	30.4	57.3	100
mean						3.43
Overall mean						3.34

Table 5 shows that based on the above data collection student in majority of UTM students are aware of the existence of solid waste segregation program. They are also aware of how to segregate solid waste at the sustainable arcades. The overall mean for the category from Table 6 is 3.41 which indicates that students are well informed and noticed of the segregation product. Besides that Table 7 shows that students are aware of the importance of solid waste segregation. The overall mean value of 3.34 reflected its significance.

The results from Figure 2 shows that students in general were aware of the solid waste segregation program organized by UTMCS did participate in the event. However, based on the results in Figure 3, in can be clearly seen that in terms of the overall awareness level on why solid waste should be segregated is still below par. As such, UTMCS as the official unit appointed accountable for educating and instilling the sustainable culture amongst its students may need to propose other approaches so as to accomplish this green mission.

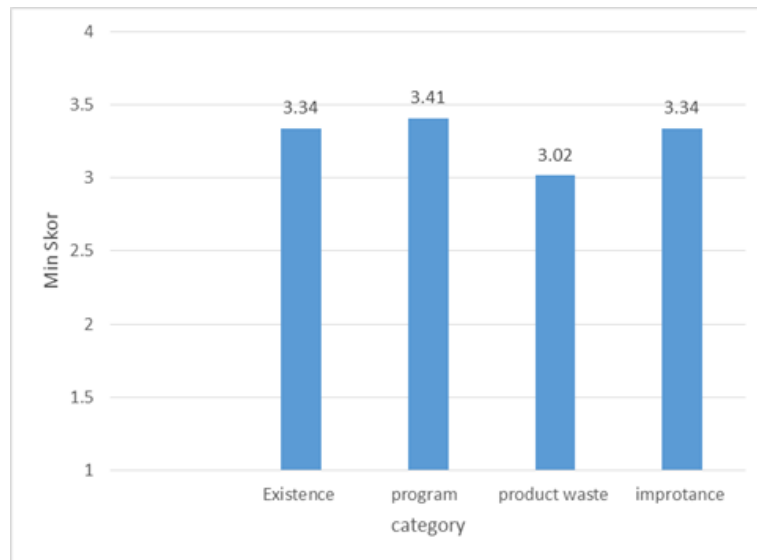


Figure 2: Program Awareness

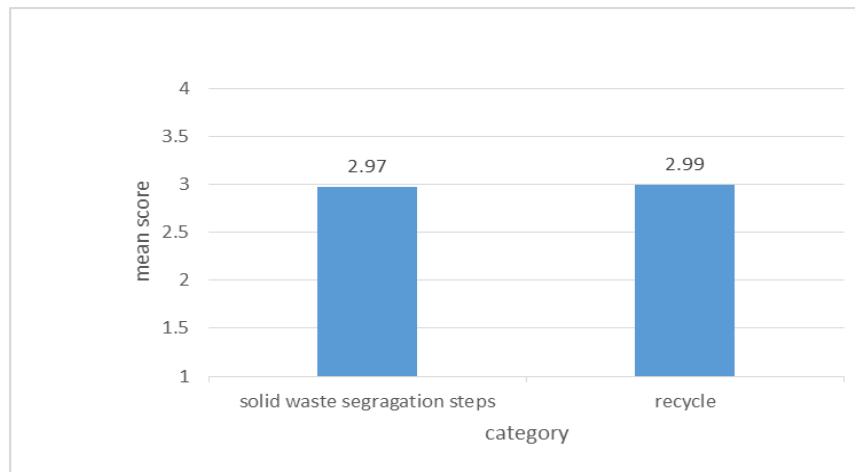


Figure 3: Solid Waste Segregation General Awareness

CONCLUSION

In conclusion, the awareness level of solid waste segregation amongst students in UTM could be seen from the data in this study. However, In order to improve the program, more activities and approaches can be introduced such as increasing the number of sustainable food arcade which implement sustainable practices so that enhancement of the current state can be performed. In overall, this program has given an insight to the UTM Campus Conservation Unit by measuring the level of awareness on solid waste segregation in UTM amongst its students.

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