Assessing students perceptions to sustainability practices at National University of Malaysia (UKM)

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Abstract: The paper investigated student's perceptions of sustainability at the National University of Malaysia. Result of the questionnaire administered on 228 students showed that perceptions to sustainability practice based on Likert is 3.19/5.0 with 54.2% on sustainability tracking assessment and rating systems which implies that students have fair sustainability assessment of the school. To maintain the tempo, move to gold or platinum status, students positive attitude to sustainability needs to be upheld. Because students play important roles in reducing energy, water, waste and help lower operating cost in the school now and in the society after graduating. The study therefore concluded that in order to mitigate future negative foot print on campus hostels, positive attitude to sustainability practices should be a priority since designing and specifying the best facility does not necessarily guarantee optimal operational performance without a positive user attitude.

Keywords: attitude; culture of sustainability; environment; sustainability; sustainable university.

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1 Introduction

Sustainability is an overhyped word because there exists different views, understanding and therefore defined from different perspectives. Generally, it referred to eco-friendly issues by exploring the symbiotic relationship between the triple bottom line components of social, environmental and economic factors in the developmental growth of organisations. Sustainability or sustainable development is said to be the one that meets the needs of the present without compromising the demand of the future generations to meet their own requirements (Brundtland Report, 1987). The objective is to; support, keep alive, sustain the human species, and keep going. The triple bottom line concept of sustainability or sustainable development consist of the planet, people, and profit, abbreviated as TBL, 3BL, PPP, 3P, 3PS, etc, people relates to social development, planet deals with ecological protection, and prosperity is about economic development (Plessis, 2002).

A sustainable university according to Velaquez et al. (2006) is a higher educational institution that addresses partially or wholly the minimisation of the negative socio-economic, environmental and health effects at global or regional levels as generated in the use of resources in fulfilling its functions of teaching, research, outreach and partnership so as to help societal transition to sustainable lifestyles. On the other hand, Alshuwaikhat and Abubakar (2008) proposed an integrated approach for achieving campus sustainability, which consists of three elements:

1 university environmental management systems

2 public participation and social responsibility

3 sustainability teaching and research.

In Universities, sustainability issues are faced with many problems as stated by Craighton (1999), that campus greening barriers are due to lack of positive attitude, financial resources, and environmental education among the community. Riera (1996) stated that finance aside, lack of tradition and expertise are other barriers. In order to stress the importance of building and attitude in the sustainability derive of the university, Joseph and Francis (2006) have stated that "sustainable development is said to be unsustainable without sustainable buildings and that you can only achieve your aspiration of green building through people". Therefore sustainability activities in the Universities cannot be successful without the positive attitudinal change on the part of the community members because even if the best facility and equipment is designed and specified, if the operators have no positive user attitude, it will be a futile effort.

Integrated sustainable design strategy in employing day lighting has debunked the belief by school administrators that sustainable buildings take longer to build and cost more. This assertion is supported by Olson and Kellum (2003) that the upfront costs remain relatively the same, operational costs are reduced for years, while the learning environment is substantially improved. In this time of ever-tightening budget deficits, this is vital especially in providing optimally comfortable, healthy, safe, pleasant working and productive learning environments for the students, faculty and staff. According to Legacy (2004) students who learn and practice a sustainable lifestyle (attitude) while in school may be inclined to transfer these practices into their daily life after graduating.

The university community tend to benefit if their attitude is positive because they will behave sustainably by using green materials, renewable energy, efficient water and energy management fittings to the fullest. This will ultimately benefit both the outdoor and indoor environment invariably by reducing pollution and landfill waste. It is in line with the above that this paper tried to assess the attitudinal perception of the students towards sustainability practice in Universiti Kebangsaan student's hall of residence. Students are the central focus of this study because they have decision-making power but have no financial incentive for conserving resources, no input on decision about energy or water efficiency, building or campus operations (Tammy et al., 2007). In the dorm room, they can recycle plastic grocery bags as garbage bags for small trash cans. The main bulk of total expenditure in many Universities is often attributed to the consumption of energy and water in the hostel buildings and things like pizza boxes, cans and plastic bottles are items commonly found scattered in hostels; instead of throwing them away, students try to recycle them (Singh, 2012).

2 Attitude

In order to fill the missing literature gap and lend credence to this study, an understanding of the basic terms related to attitude is very important. Attitude is an important issue which helps people understand their social world on how we perceive and think about others. It is an evaluative statement, a psychological tendency we express when we evaluate objects, people, or events (Eagly and Chaiken, 1998). One's attitude towards something can be positive, neutral or negative. Attitude development can be seen from,

1 changing the attitude

2 changing the environment.

Changing the attitude is to change their behaviour pattern, while changing the environment has to do with arranging people to behave in certain order (Kulatanga et al., 2006). The three components of attitude includes; cognition, behaviour and affect. Cognition is the opinion or belief segment of an attitude, behaviour is an intention to behave in a certain way toward something or someone, while affect is the emotional feeling segment of an attitude.

3 Culture of sustainability

When individuals are aware of key environmental challenges, committed to a sustainable lifestyle by behaving in a sustainable manner they are said to have a culture of sustainability (Marans et al., 2010). In order to develop a culture of sustainability in the hostels, this study presents the three (3) R's tenets of reduce, reuse and recycle (RRR). The objective of this is to reduce the environmental footprint effects from people and building through reduced water and energy use as well as material and waste consumption, encourage recycling thereby improving sustainability practice.

Other strategies for improving attitude for a sustainable living practices are or environmentally relevant behaviour (ERB); reduction, reusing, recycling and maintenance of a healthy lifestyle. Some of the positive habits of reduction for a sustainable life includes,

1 consumption (watching what you eat and how you eat it, going for need not want, minimising impulse purchase)

2 transport (car-pooling, biking, walking, use of efficient vehicles)

3 waste minimisation (use both sides of paper, editing on screed, storing information electronically)

4 energy foot print (use natural lighting, being bright about light, turn off power when not in use

5 water wastes (use efficient fittings, turn off tap when brushing, use of rain and grey water for gardening).

Positive habits for reuse for a sustainable habits are,

1 reuse of product (scrap paper for printing, buy and use recycled materials, use organic containers).

While the recycle habits for sustainable strategies are, recycle materials (recycling everything and providing bins).

Maintaining a healthy lifestyle and environment entails periodic maintenance of the environment, use of free volatile organic compounds materials, regular exercising etc (Sierra Club, 2007).

4 Methods

In all, 228 sampled students from the university, ten hostels, 13 faculties, 81 male and 147 female as well as 172 undergraduate and 56 post graduates was used for the study. The questionnaire items sought to solicit for responses on a variety of issues relating to attitudinal perceptions that are geared towards promoting and implementation of ERB among the students.

For the purpose of this survey, a five point closed ended Likert (1932) was used to measure all the items in the research questionnaire. Each statement has five options for the respondents to choose the one that best suit their perceptions on sustainability for any 'N' number of questionnaire items. Mean respondents scores are collapsed into three groups as low level of sustainability with a 1.0–2.4 mean score, medium level of sustainability with a 2.5–3.4 mean score, and high level sustainability with a 3.5–5.0 mean score. In order to score the respondents degree of perception of, a maximum of $N \times 5 = 5N\%$ score points or a minimum of $N \times 1 = 1N\%$ score points is obtained for each questionnaire item. STARS was used to score and rate the sustainability levels with a 0–24% score as not rated or termed as reporter status just for public submission (AASHE, 2010). A 25–43% score is Bronze; a 45–64% score is Silver; a 65-84% score is Gold and a score of 85%+ is a Platinum score rating as shown in Tables 1 and 4.

Table 1 Scales used to assess attitude to sustainability practice: Likert five-point scale format STARS 2010 rating assessment

Lower limit		*Upper limit*	*Mean score level*	*Lower limit %*		*Upper limit %*	*Rating level*
				0	to	24	Reporter
1,0	to	2.4	Low	25	to	44	Bronze
2.5	to	3.4	Medium	45	to	64	Silver
3.5	to	5.0	High	65	to	84	Gold
				85	to	100	Platinum

Source: Likert five-point scale and Sustainability Tracking Assessment and Rating Systems technical manual 1.0, STARS 2010

The authors used Excel, SPSS to get the mean, standard deviation, t-test and ANOVA because it is easy to analyse large number of respondents statistically. A questionnaire is said to be conclusive in purpose (Amora, 2010). The five-point Likert has a rating scale of strongly disagreed (1 point) to strongly agreed (5 points) (Bryman, 2008). The questionnaire comprised of 17 items all trying to explore ways of identifying components of sustainability attitude from the respondents. The study set up a null hypothesis Ho "there is no significant difference in the mean response of students as regards their attitude to sustainability practice in the hostels based on their various groups". This enabled the researchers test for any significant difference among the students groups. A

t-test was used to test the hypothesis among the students based on their gender and level of education, while ANOVA was used to test if there exist any significant difference among the students across the 10 hostels and the 13 faculties.

Table 2 *Respondents (students) distribution characteristics* hostels wise

Name of hostel	*Frequency response*	*Response*		*Response*		*% of sample*
		M	*FM*	*UG*	*PG*	
Dato' Onn	14	5	9	9	5	6.1
Aminudin Baki	15	6	9	11	4	6.6
Ung Umar	16	6	10	12	4	7.0
Burhanudin Helmi	19	8	11	12	7	8.3
Ibrahim Yakub	16	6	10	14	2	7.0
Rahim Kajal	20	8	12	14	6	8.8
Ibn Zain	20	14	6	11	9	8.8
Keris Mas	44	16	28	32	12	19.3
Pendeta Zaaba	43	12	31	40	3	18.9
Tun Hussin Onn	21	9	12	17	4	9.2
Total	228	81	147	172	56	100.0

Table 3 Respondents distribution characteristics faculty wise

Faculty of students in the ten hostels	*Frequency response*	*Response %*	*Cumulative %*
Economics and management (FEP)	33	14.5	14.5
Engineering and built. env. (FKAB)	39	17.1	31.6
Education (FPEND)	19	8.3	39.9
Islamic studies (FPI)	25	11.0	50.9
Dentistry (FD)	2	.9	51.8
Medicine (FM)	1	.4	68.4
Science and Technology (FST)	35	15.4	67.5
Health science (FHS)	2	.9	68.4
Social sc. and humanities (FSSK)	32	14.0	82.5
Information sci. and tech. (FIST)	18	7.9	90.4
Law (FUU)	17	7.5	97.8
Grad. school of business (GSB)	5	2.2	100
Total	228	100.0	

Out of 228 students in Table 2, Keris Mas and Pendeta Zaaba have 44 (19.3%) and 43 (18.9%) with higher population while Dato Onn has the lowest of 14 respondents (6.1%) of the respondents. Female population, 147 (64%) and undergraduate 172 (75%) response are roughly twice that of the male 81 (36%) and postgraduate 56 (25%) respectively.

Table 3 shows that FKAB (39)17.1%, FST (33)15%, ECOMS (32) 14.5%, FSSK (32) 14% and FIS 11%, have higher students responses possibly due to the closeness of these hostels to the faculties.

5 Analysis and results

Tables 4 through 6 are the analysis and the results of the data used for this research. The student's respondents were grouped according to their level of education as undergraduate or post graduate, as males or females, based on their dormitories and according to their faculties.

Table 4 Descriptive analysis and scoring of student's attitudinal perceptions to sustainability

S/no.	*Item statement for students attitude to sustainability practice (228 respondents)*	*Mean*	*Remark*	*Score%*
1	Informed about making campus hostel more sustainable	2.62	Med.	44.5
2	Concern about sustainable practice improved now due to UKM enlightenment	2.65	Med.	45.1
3	Participation in green campus sustainability in hostel	3.00	Med.	51.0
4	Observes rules that reduce campus carbon footprint	3.12	Med.	53.0
5	Carry out sustainability practice in every day's life	3.10	Med.	52.7
6	Reduced my unsustainable consumption habit	3.33	Med.	56.6
7	Practices waste generation reduction habit	3.61	High	61.4
8	Practices power saving Energy consumption habit	3.75	High	63.8
9	Reduced habit of petroleum usage by walking, biking	3.00	Med.	51.0
10	Uses recycled materials in hostel	3.19	Med.	54.2
11	Uses certified energy saving appliances, e.g., computer	3.73	Med.	63.4
12	Uses smart printing habit by recycled sides of paper	3.46	Med.	58.8
13	Reduced water consumption habit on plumbing fittings	3.06	Med.	52.0
14	Have green positive user attitude towards heating and cooling appliances	3.31	Med.	56.3
15	Keeps healthy working and living environment	3.97	High	67.5
16	Turn on appliances only when needed, e.g., AC, FAN	3.40	Med.	57.8
17	Sustainability model block exist in hostel	1.97	Low	33.5
Aggregate mean score, level of sustainability and rating		*3.19*	*Med.*	*54.2*

Out of the 17 questionnaire items in Table 4, only number 17, pertaining to provision of a model block for demonstrating sustainability practice to sustainability practice as rated low. The table shows that high level commitment to sustainability has three out of the 17 items while medium has 13. Those items scoring high are in practice of waste generation reduction habit, power saving Energy consumption habit and keeping a healthy working and living environment. The items that scored medium are 13 and includes; well-informed about campus sustainability, have more concern due to UKM enlightenment, participation in green campus activities, observe rules that reduce campus carbon footprint, practice in every days life, reduced unsustainable consumption habit, reduced habit of petroleum usage, uses recycled materials, uses certified energy saving appliances, developed smart printing habit, developed reduced water consumption habit, positive user attitude towards heating and cooling appliances, on appliances only when needed. The aggregate mean for the student's responses is 3.19 which is a medium level

with 54.2% score thus placing UKM student's attitudinal perception to a Silver grade ranting.

5.1 T-test

The t-test of two independent samples in Table 5 was used to test the hypothesis that there exist no significant difference between the mean response of students base on their gender and level of education, the P-value was used to reject the null hypothesis if found to be less than 0.05. The table shows that the P-value of (0.556) is greater than 0.05, therefore do not reject H0 and concludes that the mean responses of students' base on their gender is insignificant. For the level of education of the students, the P-value of (0.079) is greater than 0.05, we therefore do not reject H0 and concludes that the mean responses of students' base on their level of education is also insignificant.

Table 5 t-test gender and level of education

Gender	*Levene's test for equality of variances*		*t-test for equality of means*				
	F	*Sig.*	*t*	*df*	*Sig. (two-tailed)*	*Mean difference*	*Std. error difference*
Equal variances assumed	4.962	.027	.608	226	.544	.03383	.05564
Equal variances not assumed			.590	176.184	.556	.03383	.05734
Level of education	*Levene's test for equality of variances*		*t-test for equality of means*				
	F	*Sig.*	*t*	*df*	*Sig. (two-tailed)*	*Mean difference*	*Std. error difference*
Equal variances assumed	2.419	.121	1.712	226	.088	.09565	.05585
Equal variances not assumed			1.764	202.393	.079	.09565	.05423

5.2 ANOVA

The analysis of variance is used to test the hypothesis that there is no significant difference between the mean response of two or more groups of students perceptions in attitude towards sustainability practice based on their hostels and faculties, the P-value is also used to reject the null hypothesis if found to be less than 0.05.

Table 6 ANOVA test for dormitories and faculties

Hostels	*Sum of squares*	*df*	*Mean square*	*F*	*Sig.*
Between groups	4.368	9	.485	3.099	.002
Within groups	33.986	217	.157		
Total	38.354	226			

Table 6 ANOVA test for dormitories and faculties (continued)

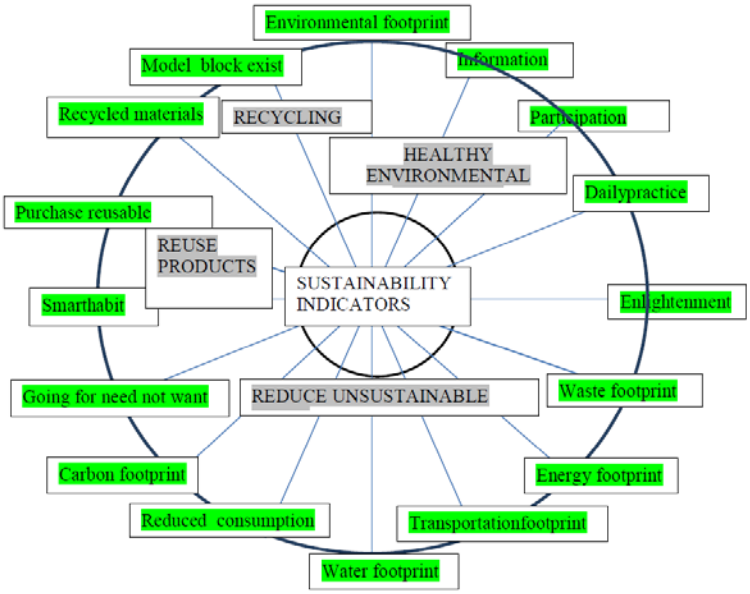
Hostels	*Sum of squares*	*df*	*Mean square*	*F*	*Sig.*
Between groups	4.000	11	.364	2.271	.012
Within groups	34.592	216	.160		
Total	38.593	227			

Table 6 shows that the P-value of (0.002) of the ANOVA is less than 0.05, therefore rejects H0 and concludes that there is a significant difference between the mean responses of students' base on their dormitories/hostels. The result for the faculties also shows that the P-value (0.012) of the ANOVA is also less than 0.05, therefore rejects H0 and concludes that there is also a significant difference between the mean responses of students' base on their faculties.

6 Analytical framework

The analytical framework of attitudinal perception of the students in the hostel shown in Figure 1 will help to promote better understanding of the key factors that affect sustainability education in the hostels. It is based on 17 indicators that highlight key elements of behaviour to sustainable lifestyle in the hostels which was grouped into reduce, reuse, recycle and healthy environment.

Figure 1 Attitudinal development for sustainability indicators framework (see online version for colours)



7 Discussion

The result of this study shows that the student's respondents have positive attitude to sustainability living principles in the hostels, with a mean score of 3.19/5.00 and a 54.2% rating. The 3.19 mean medium level is closer to the high sustainability, while the 54.2% rating is at a mid-section between the bronze and the gold rating. This is a confirmation of Marans et al. (2010) assertion on the definition of sustainability culture as it relates to the 3Rs. The result of the study therefore upheld the postulated hypothesis that there is no significant difference in the mean response of the students attitudes to sustainability practice based on their level of Education and gender but rejected it based on their various dormitories and faculties. It is hoped that this validated sustainability perception will serve as a data source reference guide to students, researchers and policy makers on campus attitudinal assessment in UKM and other Universities in Malaysia.

However, the study found out that the student's perception did not score a gold or platinum rating because of lack of enabling environment due to poor motivation, knowledge, and access to eco-friendly conditions from the university. The implication of this is that it will kill the moral of the students towards learning and practising sustainability lifestyle in the school and even after their graduation if not addressed early by the university. The scored silver validated rating also implies that there is the need to put more effort to move the rating to gold and platinum levels if UKM is to compete for global rating and ranking.

8 Conclusions

The study concluded that UKM is fairly rated as far as attitudinal perception of the students to sustainability is concerned. With a medium level, silver rating, the university has the potential to not only maintain the status quo but, move up the ladder to a gold or platinum. The study also concluded that students as future leaders and as important component of the university system need to be involved in sustainability activities and be properly oriented so that they will be committed to ERB issues. This can be achieved by encouraging them to sustain a positive change in their attitude to sustainability activities thereby facilitating the creation of a culture of sustainability initiatives, encouraging and assisting the hostel administrators, activities, operations as well as faculties in planning sustainability curriculum for students, encouraging the formation of green organisations such as green clubs, green competition for energy, water and waste management and conservation in the hostels and by extension the university community.

Disclaimer

The authors declare that there is no conflict of interest regarding the publication of this paper.

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