



EXPLORING SECONDARY SCHOOL STUDENTS' BELIEF AND ATTITUDE ABOUT WASTE MANAGEMENT IN NORTHERN PENINSULAR MALAYSIA

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ABSTRACT

The purpose of this study is to examine the pattern of students' belief about waste management in three dimensions which is belief about what to do with waste, belief about composting and belief about vermicomposting and its effect on students' attitude towards waste management. A total of 272 students aged 14 to 16 years were involved in this study. They are from five different schools which categorized as a rural and urban. Data was collected by using questionnaire consisted 51 items divided into 3 subscales of belief: that is, Belief about what to do with waste (7 items), belief about composting (6 items), belief about vermicomposting (8 items) and attitude towards waste management (30 items). The data was analysed by using percentage, t-test, one way ANOVA and regression. Findings revealed that students have a medium level of belief about waste, composting and vermicomposting. A significant difference was found between belief about composting with the types of school and belief about waste with the types of house. Belief about composting and vermicomposting were significant contributors to the students' attitude towards waste management. There are different patterns of belief between boys and girls.

Key words: waste management, belief, attitude

INTRODUCTION

Waste can be defined as materials considered as unwanted goods or seen as materials for which there are no further use (Peavy et al., 1986; Anderson, 1999). Many countries in this world faced problems with solid waste disposal such as in 2004, The United States produced more than 509 million tonnes per year (Mc Cornkey, 2006), India, 960 million tonnes per year (Aorara and Agarwal, 2011), in Gigiri, Kenya, between 200-250 tonnes per year were produced (Waste Management Report, 2004). The reason of this is the modern 'culture of consumerism' has aggravated the waste problem (Aorara and Agarwal, 2011). In Malaysia, the country is producing waste more than 15,000 tonnes per day (Anon, 2001) and by the year 2020, it will reach the weight of 30,000 tonnes per day (CAP, 2010) and this figure will increase if not addressed and are able to reach the height of the PETRONAS twin towers (the highest tower in Malaysia). The most widely produced waste is domestic waste and 45% of the waste is food waste (CAP, 2010). Although the government has provided various facilities in the waste disposal system but the problem remains unresolved. The critical issue will rise is the environmental problems which have impacts primarily on human health (Yildiz, 2011; Mohd Badaruddin, 2003). Thus, a proper waste management is needed to ensure the protection of the environment and human health.

From this perspective, it is necessary for the government to take action by increasing public awareness especially young generations towards proper waste management through education as it is a key to promote sustainable development (Blanchard, 1995). Most Asian countries have made efforts to introduce environmental education at primary, secondary and tertiary levels (Sharmin, 2003). Therefore, in 1994, the Malaysian Ministry of Education has introduced the



environmental education across the curriculum by integrating relevant activities on every single subject. However, this implementation was not successful (Abdul Ghani and Aziah, 2007) on the density of existing syllabus and teachers focused on students' academic performance. This situation will not change, if it is too dependent on the system and teachers in an effort to increase students' awareness on waste management. A way that can be done is to change students' behaviour by changing their belief since belief is one element that influenced the attitude change (Fishben & Ajzen, 1975).

Belief is considered as individual's hold that lead that individual has an intension to perform certain behaviour. It also referred to mental representation either consciously or unconsciously in one's minds that will influence the individual's behaviour (Markic, et.al., 2008). It is forms of knowledge that enable a person met his/her goal (Tobin, et.al., 1994) and the best indicator in making decision and describe why a person behaves (Bandura, 1986). Thus, for each individual that has a specific belief, s/he will enable to decide what behaviour to be performed to achieve a desired goal. Actually, personal belief can be influenced by the experience what they went through, the knowledge that they have and by daily practiced of acquired hereditary. Therefore, belief is an abstract principle or perception that can be observed through the action of individual behaviour.

BELIEF ABOUT WASTE MANAGEMENT

Belief about waste management is the principle/perception that students' have on how they deal with the waste that they produced. This belief can predict the potential behaviour that students want to perform. Belief plays an important role in pro-environmental behaviour (Cary, 1993). However, this belief can be positive or negative. If the students hold a positive belief on waste management, it will help students to have a good behavior on waste management and vice versa. They will care about the environment cleanliness and realize on how to manage the waste in a proper way.

However, most of the research in waste management focused on the perception, awareness, knowledge, attitude, practices and effect of SES on waste management (Sudamardi, et.al., 2001; Waranusantikule, 2003; Mohd Badaruddin, 2004, Watson, 2009; Ifegbesan, 2009; Herrero, et.al., 2010; Arora & Agarwed, 2011). These researches are focusing on the waste end only and it is not a right approach in many cases (Bergman, 2009) to solve problems in reducing waste production. Ojeda-Benitez (2008), most studies focused on belief about environment and between belief in the ability of science and technology to solve environmental problem (Nasser and Nasser, 2006). Hence, belief about waste management is needed since there is a relationship between belief, attitude and intension that lead to the production of environmental citizenship (Jenkins, 2006) and limited studies were done in this area.

The concept of belief is used because human behaviour is guided by three kinds of belief: behavioural belief, normative belief and control belief (Ajzen, 2006) which has been discussed in the Theory of Planned Behavior (TPB) and has been widely used in environmental behaviour (Gamba & Oskamp, 1994; Scott & Willets, 1994; Kuhlemier, Van den Berg, & Lagerweij, 1999; Grodzinska-Jurczak, Agata, & Agata, 2003). It provides a useful framework to explain why people perform a certain behaviour. TPB indicates that person's intension is a good predictor of their behaviour. Those intensions were influenced by three determinants, namely:



- Behaviour beliefs refer to the link between the behaviour with the outcome to be attained. It depends on the person's evaluation on the outcome. If a person has a positively evaluation on the outcome, the belief to perform that certain behaviour will be higher.
- Salient referents refer to a group of individuals that will support / refuse a person to perform certain behaviour. If a person gets a full support to do a certain behavior, s/he will motivate to have that behaviour.
- Perceived behavioural control refer to a person's perceived ease or difficulty of performing certain behaviour. If s/he has a greater perceived behaviour control, s/he has a stronger intension to perform that behaviour.

Although those three determinants are very important in enhancing students' awareness towards a proper waste management, this study only focused on behaviour belief. We believe that the most important determinants is the behaviour belief since it has a link between behaviour and the outcome. If the students know the impact of having improper waste disposal especially on health problems as the outcome to be attained, they will evaluate that outcome positively. In this study, students already have the pre-knowledge about the impact of improper waste disposal on health problems. We assume that this pre-knowledge will trigger students' behaviour belief and will influence their attitude toward behaviour on having a proper waste disposal. As a result, they will have a good intension to perform high-quality behaviour towards waste disposal. From this view, the outcome will act as a catalyst to promote the behaviour belief. Refer to Figure 1.

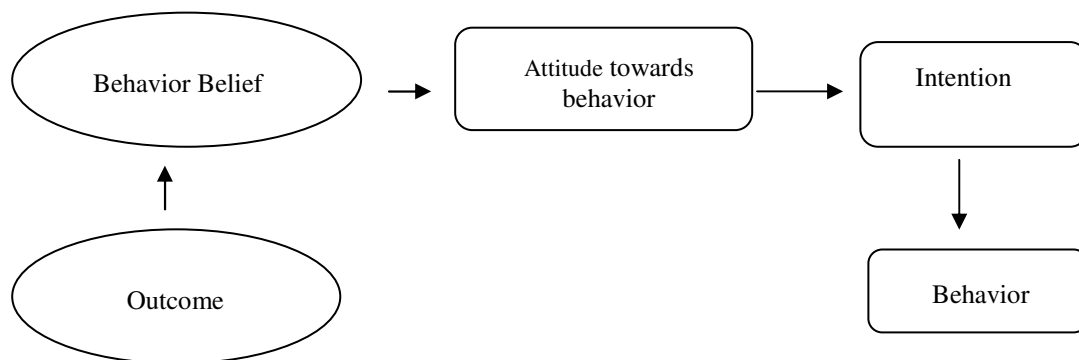


Figure 1: Adaptation from Ajzen (1988)

By having this point of view, there is a need to identify students' belief behaviour which is belief about waste management. This belief is divided into three dimension of belief: belief about what to do with waste, belief about composting and belief about vermicomposting. These three dimensions of belief are important as a predictor to determine students' belief behaviour towards waste management and be able to predict the intension behaviour that they will perform as an environmental citizen in future. Thus, the purposes of this study are:

- To identify the level of each dimension of belief.
- To identify the level of each dimensions of belief based on gender.
- To compare the mean score between types of housing and dimension of belief.



- iv. To compare the mean score between types of schools and dimension of belief.
- v. To identify which dimension of belief influence the attitude towards waste management.

METHODOLOGY

This survey research and for this reason, a questionnaire was developed to measure students' belief behaviour that is belief about waste management. The questionnaire was divided into three parts:

Part I: Demography

Part II: Belief about waste management 21 items and divided into 3 dimension of belief:

- i. Belief about what to do with waste – 7 items
- ii. Belief about composting – 6 items
- iii. Belief about vermicomposting – 8 items

Part III: Attitude towards waste management consisted 30 item.

The cronbach's alpha for each dimension of belief is between 0.649 - 0.842 and for part III is 0.769. All value is acceptable because the 0.6 is the minimum value for reliability. Thus, it can be concluded that all items in this questionnaire are reliable to measure the construct in this study. Items in this questionnaire used a four point Likert scale – 1: strongly disagree, 2: disagree, 3: agree and 4: strongly agree.

A total of 257 students (120 boys; 137 girls) aged 14 to 16 years were involved in this study. They are from four different schools: 121 from two urban schools and 136 from rural schools. Those schools were categorized by Education Department in Penang, Malaysia based on the location of the school. Students also came from different social economic status (SES) based on their types of housing. They were 100 students from village house, 84 students from terrace house and 73 students flat.

For data analysis, the statistical methods used in this study were descriptive statistics such as frequency, percentage, mean and standard deviation. Inferential statistics used were t-test, one way ANOVA and simple regression. One way Anova were used to identify the significant difference between the dimension of belief and types of housing. While, in order to identify the significant difference between dimension of belief and gender; between dimension of belief and types of school, independent t-test was used. Simple regression was used to identify which dimension of belief has an effect on the attitude towards waste management.

In order to statistically determine the level of dimension of belief (low, medium and high), quartile, mean and standard deviation value were used. The mean value for each dimension of belief was added to one standard deviation to represent the higher level of belief. While for the lower belief, the mean value minus to one standard deviation and the range between those two value (high and low) represent the medium belief. Thus the higher level for belief about what to do with waste was 42.13 and the lower level was 33.93. For belief about composting, the higher level was 28.38 and the lower level was 21.04. While for belief about vermicomposting, the higher level was 31.11 and the lower level was 24.23.



FINDINGS AND DISCUSSION

Level of Each Dimension of Belief

From the finding, belief about what to do with waste, 20.6% students were in a low level, 78.4% students were in a medium level and 0% students in a high level. For dimension belief about composting, 7.93% students had a low level, 51.9% students had a medium level and 42.1% were in a high level. While for belief about vermicomposting, 12.3% students were in a low level, 69.8% students were in a medium level and 15.9% students were in a high level. By comparing all dimensions of belief, overall students were in the medium level for those three dimensions of belief (belief about what to do- 78.4%; belief about composting- 51.9%; and belief about vermicomposting- 69.8%). Figure 2 showed the pattern for each dimension of belief.

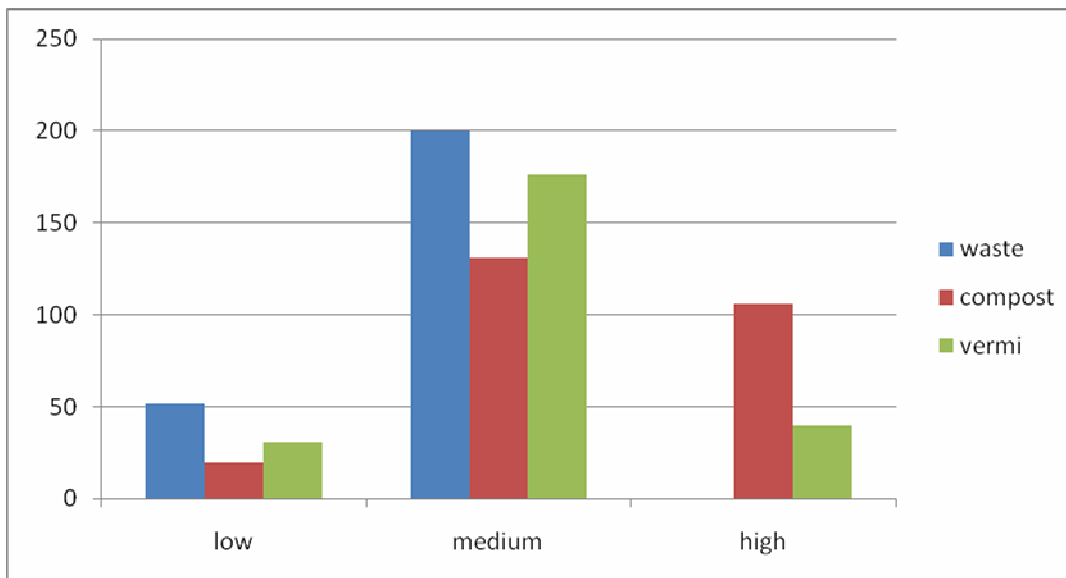


Figure 2: Pattern for each dimension of belief

This finding showed that with pre-knowledge on the impact of improper waste disposal, students knew what they should do with waste. This situation is a good indicator that students had the potential to change their attitude towards behaviour in order to have a good intention and high-quality behaviour on waste management. Thus, to increase the level of students' belief on those three dimensions, students should be exposed to a variety ways in waste management. To achieve this, teachers played an important role to disseminate the knowledge about waste management. Teachers also should be able to integrate activities related to waste management creatively to ensure students have a good understanding and appreciation related to waste management issues.

Belief about What to Do with Waste and Gender

Based on gender, 10.3% boys and 37.7% girls had a low level of belief about what to do with waste. While 10.3 % boys and 41.7% girls had a medium level of belief about what to do with



waste. However, none of them in a high level of this belief. Refer to Figure 3. The finding revealed that girls' belief in what to do with waste are higher than boys. They have a high medium level of belief compared to boys. By knowing the effect of improper waste disposal, girls are thinking that all activities in the questionnaires needed to be done. Girls had a great maturity than boys (Nari, 2008) and enable them to make a decision on a certain issue. They have a different level of serotonin and oxytocin compared to boys that lead them to slow down and make them think about what could happen if they did something (Gurian and Stevens, 2004). Therefore, they feel that they have a responsibility to do something good to the waste.

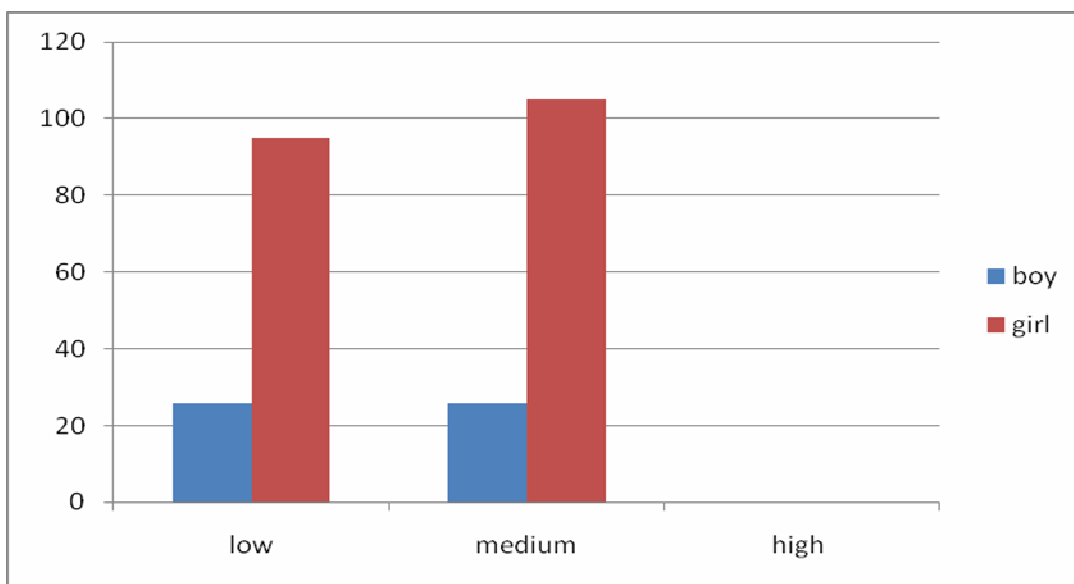


Figure 3: The pattern of belief about what to do with waste and gender

Belief about Composting and Gender

Findings showed those 3.50% boys and 4.28% girls in the low level; 26.1% boys and 24.9% girls in a medium level; 17.1% boys and 24.1% girls in a high level of belief about composting. The pattern of this belief showed in Figure 4. Compared to boys, it can be concluded that girls have a high level of belief about composting. It showed that girls preferred in doing composting activities since it was related to the household task. We believed that this finding is closely related to Malay culture that girls needed to help their mothers in doing household task compared to boys. Actually, the household task is traditionally linked to women (Evertson, 2006) while boys usually linked to outdoor activities (Fenstermaker, 1985; McHale et.al., 1990). They had a positive attitude towards physical activities (Chung and Phillips, 2002; Mowatt et al., 1988) compared to girls. For this reason, have made girls did their part as the daughter in the family and they have a responsibility in doing composting activities.

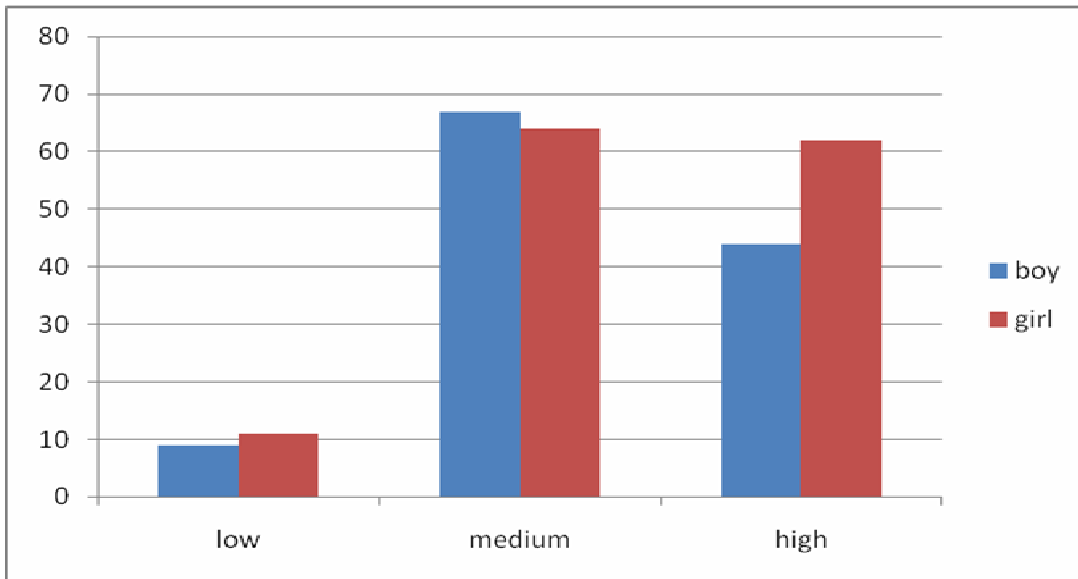


Figure 4: The pattern of belief about composting and gender

Belief about Vermicomposting and Gender

The result showed those 4.45% boys and 8.10% girls in a low level; 34.4% boys and 36.8% girls in a medium level; 9.31% boys and 6.88% girls in a high level of belief about vermicomposting. It can be concluded that both boys and girls were in the medium level of belief about vermicomposting and girls' belief were higher than boys. However, a different pattern appeared when comparing boys' belief and girls' belief in a high level. Refer to Figure 5.

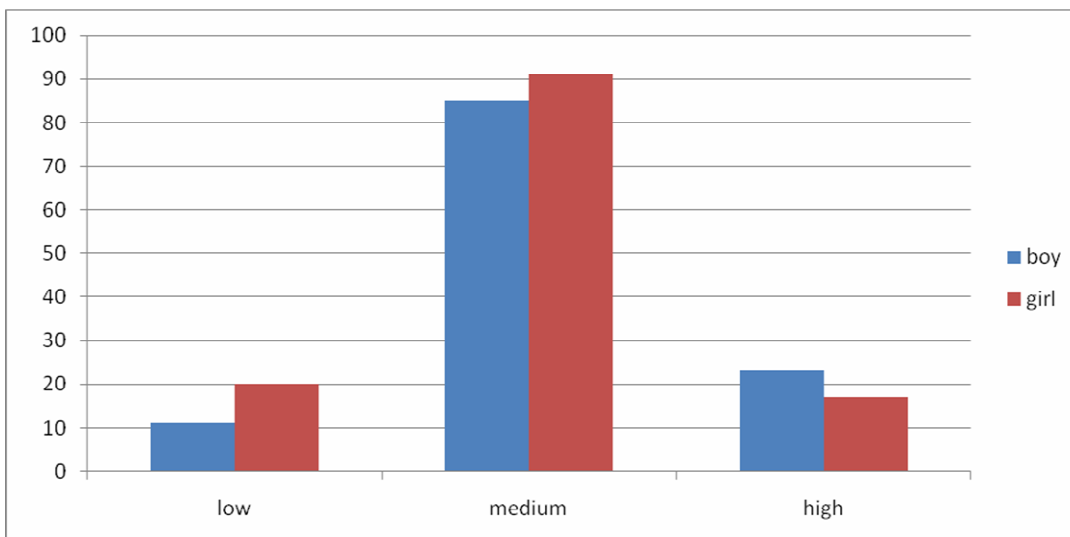


Figure 5: The pattern of belief about vermicomposting and gender



This finding showed that boys' belief is higher than girls' belief. This situation happened because boys preferred something that can challenge them. They have more challenging behaviour than girls (ATL, 2011). Because of this, boys were more daring to do something than girls. Thus, in vermicomposting method, earthworms were involved as agents in composting. With pre-knowledge that students' have, boys were more ready in handling the earthworms. They felt that earthworms would challenge them in order to keep those earthworms alive. These characteristics gave boys the advantage and confidence to do vermicomposting. However, girls were afraid and felt uneasy to hold the earthworms because of its physical characteristics. They lacked of confidence in doing vermicomposting.

Types of housing and dimension of belief

Students who lived in a village house means that their parents own the house and have a land area to do some planting. Planting culture was traditionally linked to a life of villagers. While for students lived in terrace or flat house, their parents either rent the house or buy the house with a limited land area. In order to do planting, they used plant pots and have to arrange it properly.

To compare the means score between types of housing and dimension of belief, one way ANOVA was conducted. The findings showed that the mean difference was significant at the 0.05 level ($p=0.040$) between types of housing and belief about what to do with waste. However, for belief about composting and vermicomposting, the mean difference was not significant at the level 0.05 level. Refer to Table 1.

Table 1: One way ANOVA analysis : Dimension of Belief and Types of Housing

Dimension of belief		Sum of Squares	df	Mean Square	F	Sig
Belief about what to do with waste	Between Groups	35.933	2	17.966	3.269	0.040*
	Within Groups	1330.092	242	5.496		
	Total	1366.024	244			
Belief about composting	Between Groups	20.937	2	10.468	1.003	0.368
	Within Groups	2558.027	245	10.441		
	Total	2578.964	247			
Belief about vermicomposting	Between Groups	8.812	2	4.406	0.478	0.621
	Within Groups	2165.612	235	9.215		
	Total	2174.424	237			

*significant at the level 0.05

Because of this significant, LSD test was conducted. The findings indicated that those difference was significant between students from village house and students from flat house. Refer to Table 2.

Table 2: LSD analysis

Dimension of belief	Group (I)	Group (J)	Sig
Belief about what to do with waste	Village house	Flat house	0.011*
		Terrace house	0.236

*significant at the level 0.05

It can be concluded that students from village were more concerned about the waste. In village, the infrastructure of waste management was limited compared for those who lived in terrace and



flat house. Moreover, villagers were concerned about improper waste disposal as to avoid odour and flies in their neighbourhood. They were local people and have a responsibility to take care the cleanliness of their surroundings. While for those who were lived in flat and terrace house, they were the people who emigrate from other places/districts looking for jobs. They have the same responsibility about taking care of the waste but not as much as the local people.

Types of schools and dimension of belief

Schools will be categorized based on the location of the schools. Both types of schools in urban and rural area usually have a good infrastructure and facilities. However, those in urban area have lots of opportunity to have cooperation with various organizations. This cooperation will benefit the students’ development in terms of knowledge and skills in doing practical activity on the waste management.

Results from the analysis of independent *t*-test showed there was statistically mean difference between belief about composting and types of school; rural schools ($M = 22.2982, SD = 3.4766$) and urban schools ($M = 23.1049, SD = 2.91358$); $t(255) = -1.983, p = 0.049$ at a significant level of 0.05. While for belief about what to do with waste and vermicomposting, the mean difference was not significant at the level of 0.05 level. Refer to Table 3.

Table 3: Independet t-test Analysis

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Interval Lower	Confidence of the Upper
Waste :	.602	.439	-1.963	250	.051	-.5780	.29451	-1.1581	.00195
Equal variances assumed									
Equal variances not assumed			-1.929	218.9	.055	-.5780	.29975	-1.1688	.01268
Composting :	.808	.370	-2.023	255	.044	-.8066	.39870	-1.5918	-.0214
Equal variances assumed									
Equal variances not assumed			-1.983	220.061	.049*	-.8066	.40668	-1.6081	-.0051
Vcomposting :	.218	.641	.671	245	.503	.25906	.38589	-.50103	1.0191
Equal variances assumed									
Equal variances not assumed			.671	236.108	.503	.25906	.38612	-.50162	1.0197

*significat at the level 0.05



This finding showed that students from urban schools have a high belief about composting compared to students in rural schools. Actually, students in urban schools already have been exposed to a variety technique of waste management especially on composting by a non-government organization such as Consumer Association of Penang (CAP). However, this cooperation was limited to urban schools. Students in rural schools should be given the same opportunities as those in urban schools. They should not be marginalized in the acquisition of knowledge related to waste management. Thus the cooperation between CAP and schools should be widening to all schools regardless of school's location.

Identify which Dimension of Belief Influence the Attitude towards Waste Management

Data was analysed by using a simple regression. The analysis showed that the dimensions of belief were significant influence the students' attitude towards waste management ($F = 38.395$, $p = 0.000$) at a significant level of 0.05. Findings indicated that dimension about composting ($t = 2.700$, $p = 0.007$) and vermicomposting ($t = 7.754$, $p = 0.000$) were affect a significant influence on the attitude towards waste management at a significant level of 0.05. However, belief about what to do with waste was not significant influence the attitude towards waste management at a significant level of 0.05 ($t = 0.273$, $p = 0.785$). Form this findings, by using beta value, belief about vermicomposting ($\beta = 0.476$) was affect the most significant influence on the attitude towards waste management compared to belief about compost ($\beta = 0.179$). Refer to Table 4.

Table 4: Regression Analysis of dimensions of belief

Dimensions of belief	B value	t value	Sig
Belief about composting	0.179	2.700	0.007*
Belief about vermicompostion	0.476	7.754	0.000*

*significant at the level 0.05

Students already had pre-knowledge about vermicomposting. They knew that in vermicomposting, earthworms are involved. This situation would excite the students in doing vermicomposting. They believed that they need to take care of earthworms well as worms are living thing. They have a responsibility in ensuring that worms alive by providing food and comfortable shelter for worms. This activity gave students new experiences in waste management. For composting, we believed that students liked to do composting as another way of waste management but the excitement in doing composting was not as high as in doing vermicomposting. The activity in composting was simple when the main component is waste.

CONCLUSION

Waste management is an important issue to be discussed because at present, the world is facing a critical problem in waste disposal. Hence, in making each citizens has a good attitude towards waste management, they should have a high level of belief in waste management since in TPB theory, belief is a determinant that could influence a person's behaviour. As students are the next generation, they need to be educated in waste management. Their belief about waste management should be high to ensure that they have a good attitude to waste management. The findings clearly showed that students had a medium level in three dimensions of belief in waste management (that is belief about what to do with waste, belief about composting and belief



about vermicomposting) and it is a good sign that their belief has a potential to increase. Based on the TPB theory, this level can be increased when teachers or related organizations such as CAP can act as a “salient referents” in providing input related to waste management. The “salient referents” especially CAP must widen their program to the rural schools to ensure all students get benefits from the program as to increase their knowledge and understanding about various waste management techniques. When this situation takes place, students’ attitude towards waste management will be better and the desired behaviour can be achieved. They will become responsible citizens of a clean environment with zero waste.

REFERENCE

1. Abdul Ghani and Aziah Ismail. (2007). *Kesediaan Memperkasa Pendidikan Pembangunan Lestari oleh Pengurus Pendidikan Sekolah : Satu Kajian Kes*. Universiti Sains Malaysia. <http://www.iab.edu.my/jurnal>. [10 November 2009]
2. Ajzen, I. (1988). *Attitudes, Personality and Behaviour*. Bungkham : Open University Press.
3. Ajzen, I. (2006). *Constructing A Theory of Planned Behaviour Questionnaire*. TPB Questionnaire Construction.
4. Anderson, G.K. (1999). “Waste Minimization.” Unpublished Report. Seminar in Advanced Wastewater Treatment, Faculty of Civil Engineering. UTM-Skudai. 27-29January.
5. Anon (2001). “MPP Wajar Tambah Program Kitar Semula.” *Harian Metro*. March.,22.
6. Aorara and Agarwal, 2011. Knowledge, Attitude and Practices regarding Waste Management in Selected Hostel Students of University of Rajasthan, JaipurInternational. *Journal of Chemical, Environmental and Pharmaceutical Research*, Vol. 2, No.1, 40-43, January-April, 2011.
7. ATL Annual Conference. (2011). *Boys’ behaviour at school is still more challenging than that of girls, but the behaviour of both is getting worse*. April 2011
8. Bandura, A. (1986). *Social Foundation of Thought and Action. A Social Cognitive Theory*. Englewood Cliffs, New Jersey : Orentice Hall
9. Bergman, H. (2009). *Waste Management Report*. International Solid Waste Association.
10. Blanchard A. K. (1995) . *Seabird conservation on the North Shore of the Gulf of St. Lawrence, Canada: the effects of education on attitudes and behaviour towards a marine resource. Planning education to care for the earth .IUCN- Commission on education and communication*. IUCN : Glad, Switzerland and Cambridge, UK.
11. Consumer Association of Penang (CAP). (2010). *Sampah*. Jilid 34 Bil 1 Jan-Feb 2010.
12. Cary, J. (1993). The nature of symbolic beliefs and environmental behavior in a rural setting. *Environment & Behavior*, 25, 555-576.
13. Chung and Phillips. (2002). *The relationship between attitude toward physical education and leisure-time exercise in high school students*. <http://www.thefreelibrary.com/The+relationship+between+attitude+toward> [29 September 2011]
14. Evertson, M. (2006). The reproduction of gender: housework and attitudes towards gender equality in the home among Swedish boys and girls. *The British Journal of Sociology*. 57(3), 415-436.
15. Fenstermaker Berk, S. 1985 *The Gender Factory. The Apportionment of Work in American Households*, New York: Plenum Press.
16. Fishben & Ajzen, 1975 Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behaviour: An introduction to theory andresearch*. London: Addison-Wesley.
17. Gamba, R., & Oskamp, S. (1994). Factors influencing community residents’ participation in coming led curbside recycling programs. *Environment and Behavior*, 26, 587-612.
18. Grodzinska-Jurczak, M., Agata, B., & Agata, T. (2003). Evaluating the impact of a school waste education programme upon students’, parents’ and teachers’ environmental knowledge, attitudes and behaviour *International Research in Geographical and Environmental Education*, 12(2), 106-122.
19. Gurian, M and Stevens, K. (2004). With Boys and Girls in Mind. *Educational Leadership*. Emotional Differences Between Girls And Boys, Psychology 1. http://pcy_emotional difference. [20 October 2011]



20. Herrero M. A., Sardi G. M., Rebuelto M., Gil S. B., Flores M. C. (2010). Changes In Environmental Perception And Knowledge In Stakeholders After Waste Management, *Courses Innovation and technology Transfer*.
21. Ifegbesan, A. (2009). Exploring secondary school students' understanding and practices of waste management in Ogun State, Nigeria. *International Journal of Environmental & Science Education* Vol. 5, No. 2, April 2010, 201-215.
22. Jenkins, E. W. (2006). School science and citizenship: Whose science and whose citizenship? *The Curriculum Journal*, 17(3), 197-211.
23. Kuhlemeier, H., Van den Bergh, H., & Lagerweij, N (1999) Environmental knowledge, attitudes and behaviour in Dutch secondary education. *The Journal of Environmental Education*, 30(2), 4-14.
24. Marki, S., Eilks, I. and Valinides, N. (2008). Developing a Tool to Evaluate Differences in Beliefs about Science Teaching and Learning among Freshman Science Student Teachers from Different Science Teaching Domains: A Case Study. *Eurasia Journal of Mathematics, Science & Technology Education*, 4(2), 109-120
25. Mc Coskey, L. A. (2006). Barriers To Recycling In Athens, Ohio. Unpublished Master Thesis. College of Arts and Sciences, Ohio University
26. McHale, S.M., Crouter, A.C. and Tucker, C.J. 1999 'Family Context and Gender Role Socialization in Middle Childhood: Comparing Girls to Boys and Sisters to Brothers', *Child Development* 70(4): 990-1004.
27. Mohd Badaruddin, 2003the Effects Of Socio-Economic Characteristics On Household Wastes In Johor Bahru District. Unpublish PHD Thesis, Universiti Teknologi Mara, Malaysia.
28. Mowatt, M., DePauw, K. P., & Hulac, G. M. (1988). Attitude toward physical activity among college students. *The Physical Educator*, 45, 103-108.
29. Nari (2008). *Psychology of girls*. <http://saching.com>. [25 October 2011]
30. Nasser, A and Nasser, Fadia. (2006). *Predictors Of Pro-Environmental Behavior: Comparison Between Pre-Service Teachers And 9th Graders* . http://abed_nasser
31. Ojeda-Benitez (2008) Pro-environmental behavior regarding solid waste management in students from the Mexico-United States border region. A Report.
32. Peavy, H.S., Rowe, D.R., and Tchobanoglous, G. (1986). *Environmental Engineering*. McGraw-Hill. International Addition.
33. Scott, D., & Willets, F. K. (1994). Environmental attitudes and behaviour. *Environment and Behaviour*, 26(2), 239-261.
34. Sharmin, L. (2003). *Assessment of Environmental Awareness of the Students with Primary Education*. Research and Evaluation Division, BRAC BRAC Center 75 Mohakhali, Dhaka 1212 Bangladesh.
35. Sudarmadi C, Suzuki S, Kawadal T, Netti H, Soemantri S, Tugaswati T. (2001). A survey of perception, knowledge, awareness, and attitude in regard to environmental problems in a sample of two different social groups in Jakarta, Indonesia. *Environment, Development and Sustainability*, 3, 169-183.
36. Tobin, K., Tippins, D., and Gallard, A.J. (1994). *Research on Instructional Strategies for Teaching Science*. In D.L. Gabel (Ed) : Handbook of Research on Science Teaching and Learning, New York : National Science Teachers Association.
37. Waranusantikule, T. (2003). *Waste Management in a Private Kindergarten School*. Thailand Environment Institute (TEI). APFED : Good Practices Database.
38. Waste Management Report –Step By Step (Sbs) Group. (2004). *Waste Management (Including The Unon Sustainable Procurement Policy) On The United Nations Compound, Gigiri, Kenya*.
39. Watson, A. (2009). *An Examination Of Vietnam's Urban Waste Management Capacity*. Unpublished Master Thesis Graduate Department of Geography & Institute for Environmental Studies, University of Toronto . USA.
40. Yildiz, N. D., Yilmaz,H., Demir, M. and Süleyman, T. (2011). Toy Effects of personal characteristics on environmental awareness; a questionnaire survey with university campus people in a developing country, *Turkey Scientific Research and Essays*, Vol. 6(2), pp. 332-340. <http://www.academicjournals.org/SRE>. [5 November 2011]