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Making a Difference to the Environment: Understanding Undergraduates Environmental Behaviour

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Abstract

Understanding undergraduates' environmental behaviour is important as they will be the leaders of the country in the near future. They play an important role in protecting and conserving the environment. This paper investigates the undergraduates' behaviours towards the environment after completing the Environment Economics course. Theory of Planned Behaviour (TPB) together with some other factors such as academic performance, government regulations and perceived importance of nature are employed. Multiple regression analysis shows undergraduates' behaviours is positively affected by attitude and perceived importance of nature, and negatively influenced by government regulations. Although academic performance is very important to provide an understanding of basic principles of environmental sustainability, it however does not significantly influence their environmental behaviour. The finding hopes to assist the policy makers to plan future strategies so that the undergraduates behaviours can make a difference to nature and the environment.

Keywords: environment economics, behaviour, undergraduates, theory of planned behaviour, academic perfomance

Introduction

Malaysia, one of the 'Asian tiger' economies, has enjoyed significant growth for the last few decades from agriculture, industrialization and the services especially tourism. Unfortunately, Malaysia today faces problems of deforestation, air pollutions, water pollutions, soil and coastal erosion, overfishing and coral reef destruction as well as the problem of waste disposal. The government has to solve these issues. A clean, safe, healthy and productive environment is important.

To overcome the problem, individual participation in sustainable initiatives is very important. Researchers found that it could reduce harm to the environment by contributing to reduction of CO2 emissions, decreased fuel dependency and reduced energy consumption (Graedel, 2002; Berke and Conroy, 2000; Owens and Halfacre-Hitchcock, 2006; Claudy et al., 2010). Universities can serve as important bases in providing and educating individuals associated with such environmental issues.

Environmental education provides an understanding of basic principles of environmental sustainability. Students develop perceptions of their environmental concern through the stages of education from primary to secondary schools. Teaching environmental economic subject to the students in the university provide a knowledge foundation that help them to develop their attitudes and opinions about

nature and the environment. The knowledge they gain from environmental subjects make them value nature more. Thus, this paper is keen to investigate what is the undergraduates' behaviours towards the environment after completing the Environment Economics course. Understanding the factors that influence the environmental behaviours may assist the policy makers to promote pro-environmental actions to sustain the environment among those living in developing country like Malaysia.

Education would be one of the bridges to connect those influences to environmental behaviour. The key question of the study is: Along side with the attitude as a main motivator to the model, what are the determinants of undergraduates' environmental behaviour after completing the environmental economic course? Environmental education is to provide ecological knowledge and conceptual awareness to the individuals. In this Environmental Economic course, students gain knowledge on how the environmental issues arise. They will also be well informed of the effects and consequence of the environmental issues. The question is do they learn to conserve, preserve, and love mother's nature? What are the determinants that actually influence their behaviours? Is their attitude that affects the undergraduates' behaviour? Are they applying their knowledge learnt in the class to take action towards conserving the environment and sustain it? Are the existing laws and enforcement pertaining to nature and environment affecting their behaviours? Or it is the undergraduates' perceptions on the importance of nature that regulate their behaviours?

Many studies had been carried out regarding undergraduates environmental behaviours. Among them were Mamatand Mokhtar (2012) on environmental education, Asmuni et al. (2012) on sustainable consumption practices; Ahmad et al. (2010) and Idros (2006) on environmental behaviours, attitudes and knowledge; and Haron et al. (2005) on knowledge and sustainable consumption. Studies on environmental issues in Malaysia included: Jayaraman et al. (2011) on usage of plastic bags; RamayahandRahbar (2013) on attitude towards recycling; But knowledge in terms of academic performance couple with the Theory of Planned Behaviour (TPB) were rather limited.

Most of the researchers assessed respondents' knowledge based on environmental facts and concepts by answering some questions related to the environment. This study, however, assesses the respondents' knowledge by identifying the grade they obtained in the environment subject i.e. based on the academic performance of Environmental Economic subject. Thus, the objectives of the study are to determine the undergraduates' importance level towards the environment, the descriptive analysis, Pearson Correlations as well as the relationship between major factors and environmental behaviour among the undergraduates.

This paper hopes to shed some light on how tertiary students behave towards the environment with relation to their academic performance, government regulations and perceptions. The next sections of the paper will discuss on literature review, methodology, findings, conclusion and implication.

Literature Review

Theoretical Underpinning and Hypothesis

Theory of Reasoned Action (TRA) by Fishbein and Ajzen (1975) showed the relationship between attitudes and subjective norms led to behavioural intention and the later might result in actual behaviour. Extension of the TRA was the Theory of Planned Behaviour (TPB) by Ajzen (1991) where one additional variable i.e. perceived behaviour control was included in the model. Schiffman and Kanuk (1997) found attitude a good influence of behaviour. Besides, it is also crucial to determine the values and beliefs that influence the attitude that shape the undergraduates minds that lead them to behave in such a way. Thus, in this context, attitude, subjective norms and perceived behavioural control are equally important and they are combined as one and renamed as environmental attitude construct (as shown in Figure 1).

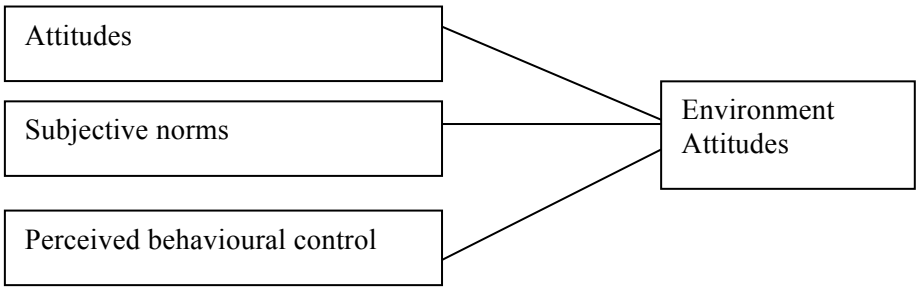

Figure 1: The 3 elements are combined to be renamed as Environment attitudes

External factors to TRA, according to Ajzen and Fishbein (1980), were personality, past experience and demographic characteristics that might influence behaviour. Ajzen (1991) also allowed for the use of additional variables to beef up the ability of the TPB model to explain certain behaviours. According to Zabel (2005) and Kaiser and Gutscher (2003), when determining the factors that affected behaviour, a person's performance might engage natural, cultural, situational impulses and internal determinants or motivations. A student's behaviour was formed not only by his attitudes, but it might also shaped by other influences. Based on the research gap mentioned above, the main concern of the study is to incorporate TPB and other influences highlighted in this paper. The framework of this research is illustrated in Figure 2. With regards to this, the study explores the influences of environmental attitude, academic performance, regulations and perceived importance of nature to environment behaviour of undergraduates.

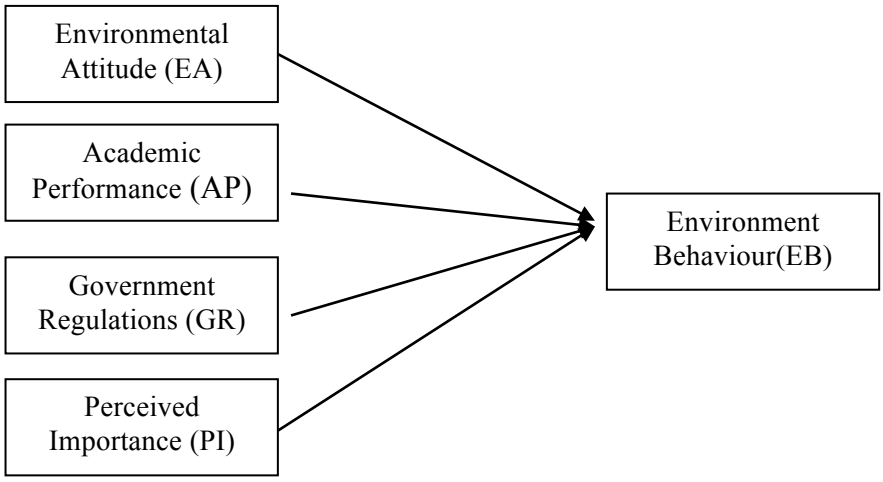

Figure 2: Framework of the study

Behaviour

Behaviour refers to any active responsiveness to current environment issues. Behaviour was often a response to an attitude (Bruno, 1986) or attitude was found to be a good predictor of behaviour (Schiffman and Kanuk, 1997). Environmental awareness and behaviours were found to be influenced by values, attitudes and knowledge (Laroche, 2001).

Environmental Attitude

Environmental attitude in this context referred to the motivational, emotional, and cognitive process with respect to some aspect of the environment (Krechand Crutchfield, 1948). Fishbein (1967) explained that attitudes helped individuals adjust to their surroundings and provide certainty in their behaviour and understanding of others' behaviour. Hines, Hungerford and Tomera (1987), in line with

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Ajzen and Fishbein's theory of Planned Behaviour found that individuals with favourable attitudes toward the environment had a higher tendency to engage in pro-environmental behaviour. Several models as well as studies suggested that attitude was an important element in behaviour (Ajzen, 1985; Stern andDeitz, 1994). Understanding young people's environmental attitudes was important because eventually they would face environmental problems and would need the skills to solve the problems (Bradley et al., 1999). Thus, it is hypothesis that,H1: Environment attitude is positively related to environmental behaviour.

Academic Performance (AP)

Academic performance refers to the environmental subject that has been taught in the class as the requirement in the course programme. Many studies were conducted to look into learners' environmental behaviours such as McKenzie-Mohr and Smith (1999); Newhouse (1991); Hungerford and Volk (1990); Marcinkowski (1989); and Ramsey and Hungerford (1989). In the psychology aspect, education had consistently been shown to be an important demographic factor that positively affected environmental consciousness (Arbuthnot andLingg, 1975). Several other researchers that exhibited the relationship between education and environment performance were: Ofsthun (1986) found that individuals who took courses in ethics tend to have higher levels of moral sensitivity; Early studies of environmental behaviours focused on cognitively driven behaviours and suggested that increasing environmental knowledge and skills resulted in pro-environmental behaviours (Hungerford andVolk, 1990); Bebeau (1994) indicated that individuals in professional areas that required higher education inclined to demonstrate higher levels of ethical sensitivity; while Swenson-Lepper (2005) found that level of education was positively correlated with moral sensitivity.Thus, it is hypothesis that,H2: Academic performance is positively related to environmental behaviour.

Government Regulations

Government regulations refer to laws and enforcement pertaining to the nature and environment. Lynes and Andrachuk (2008) stated that regulations and awareness were crucial in conducing firms to involve in green activities. Henriques and Sadosky (1999) indicated that a firm's formulation of its environmental plan was positively influenced by pressure from customers, shareholders, government regulations, neighbourhood and community groups. What about the individual? Jayaramanetal.s' (2011) findings showed that regulations had not influenced Malaysia's consumers to stop using plastic bags for hot edible items. Thus, it is hypothesis that,H3: Government regulations are positively related to environmental behaviour.

Perceived importance of nature

This construct is to look at the undergraduates perception based on the important of nature with the notion that if a person perceives nature to be important, he or she should care for it and be committed to protecting it. The 2002 World Summit for Sustainable Development debates provided further evidence of the importance of understanding people's perceptions on the environment. Consistent with this, social scientists had produced a couple of significant research to explore perceptions of, as well as concern regarding, environmental issues in developed countries (e.g., Kempton, Boster and Hartley 1995; Stern and Dietz 1994). These studies showed that young, political liberal and educated individuals exhibited relatively stronger environmental concern than others. (Dunlap, Xiao and McCright 2001; Jones and Dunlap 1992; Klineberg, McKeever and Rothenbach 1998; Marshall, Picou and Bevc 2005; Van Liere and Dunlap 1980). Dunlap, Gallup and Gallup (1993) explored public perception of a variety of environmental issues (e.g., air/water pollution, species loss, global warming) among many countries, including Mexico, Brazil and Russia. They found that even where knowledge levels were low, concern for environmental issues was often still high. Thus, it is hypothesis that,H4: Perceived importance of nature is positively related to environmental behaviour.

A quick view at some of the empirical studies on environmental issues found in Malaysia:

Adopting Theory of Reasoned Action, RamayahandRahbar (2013) assessed the recycling behaviour of 775 USM students by employing SEM technique. They found that the attitude towards recycling was significantly influenced by perceived value, awareness and actual gains perceived by the consumers while recycling behaviour was significantly influenced by resistance to change and attitude towards recycling.

Meanwhile Mamatand Mokhtar (2012) assessed the impact of learning environmental course among muslim students in Malaysian public universities by adopting Hadhari Environmental Attitude Test (HEAT). Their results showed that they had good behaviour towards environment but there was no committed pro-environmental student found, although they learnt environmental courses from primary till tertiary level. Some of them even had got excellent grades in their examinations.

Asmuni et al. (2012) analysed conservation behaviour in relation to specific socio demographic characteristics of 248 full time university students from various fields of study. Their results showed that there was significant relationship between students' conservation behaviour and rural background as well as students' conservation behaviour and parents' education level.

Idros (2006) conducted a survey on a local university to find out the students' knowledge of environmental issues and their willingness to engage in pro-environmental behaviours. A total of 313 samples were collected from the pre service teachers who were to be the future environmental sustainability educators in Malaysia Secondary Schools. Her findings showed that students with strong pro-environmental attitudes were more likely to show greater ecological disposition even though their communicated willingness to take action might actually be less than their actual actions.

Curious about the environmental knowledge among households in Selangor, Malaysia, Haron et al. (2005) examined the sources of their environmental knowledge, determined factors that led to different levels of knowledge and analysed the relationship between knowledge and environmental attitude, behaviour and participation. They found that in general, respondents' basic or general environmental knowledge was high. The main sources of environmental knowledge and information were newspapers, television and radio. The study also found that knowledge correlated positively with environmental attitudes, behaviours and participation.

Ahmad et al. (2010) accessed 225 Universiti Tun Abdul Razak, Selangor students on environmental issues and their perceived pro-environmental behaviour. The findings showed that they were still unfamiliar with certain environmental terms and concepts. However,the relationship between respondents' environmental knowledge and their perceived pro-environmental behaviour were found to be positive.

Based on the discussion above, the aim of the study is to design an instrument to measure students' environmental behaviour where attitude is the major motivator, follow by knowledge, regulations and perceive importance of nature.

Methodology

Instruments

Questionnaires are designed in such a way that section A- profile of respondents; Section B- importance of nature; Section C- environmental attitude (which consists of 3 conceptual independent determinants such as attitude, subjective norm and perceived behaviour control); Section D- information sources; Section E- regulations; and Section F- environmental behaviour. Section B is measured in 5-point Likert Scale ranging from '1' (not important at all) to '5' (very important), section C and E are measured in 5-point Likert Scale with 1 being strongly disagree while 5 being strongly

agree. Section D is measured by selecting the most appropriate media source accordingly and section F is measured by scaling from '1' (never) to '5' (always).

The questionnaires designed are based on the reference in the environmental literature as shown in the Table 1 below:

Table 1: Major variables of the study and the sources

Variables	Sources
Importance of nature	Judith (2008)
Attitude	Hamilton (1983); Shepard andSpeelman (1983); Fortner and Lyon (1985) ; Thompson andGasteiger (1985); Hicks (1993);
Information source	Bun Lee (2008)
regulations	Jayaraman (2011)
Environmental behaviour	Hicks (1993); Detroit Area Study (2002); Schuett (2011)

Samples

A quantitative method is used in the study. The sample sources are from the surveys of 2 groups of semester 5 students who took up this paper and sat for the examination at the end of the semester September 2013 –January 2014 and March-July 2014 respectively. A total of 208 students registered for the course ECO646 – Environmental Economics in the two mentioned semesters. Both groups were taught in the same university over a 15 week period of two contact sessions of four hours per week. 200 questionnaires are distributed to the undergraduates, 75% (150) questionnaires are returned and 8 of them are incomplete. A total of 142 usable questionnaires are analyzed.

Data Analysis

Data is analysed using SPSS: Descriptive analysis is carried out for each of the variable considered in the study, correlations is run to check the association among dependent and independent variables, and last but not least multiple regressions is conducted to determine the factor affecting the environmental behaviour.

Findings

This section explains the findings of the study. It begins with the demographic file of the respondents.

Table 2: Demographic profile of respondents

		Frequency	Percentage (%)
Gender	Male	32	22.5
	Female	110	77.5
Age	20-22 years old	44	31
	23 - 24 years old	92	64.8
	25 - 26 years old	4	2.8
	Above 27 years old	2	1.4
Semester	5	42	29.6
	6	99	69.1
	7	1	.7
Year taken	2013	94	66.2
	2014	48	33.8

Grade obtained	A	70	49.3
	B	57	40.1
	C	15	10.6
Hometown	City	44	31
	Town	62	43.7
	subdivision	11	7.7
	Rural area	25	17.6

As reported in Table 2, almost 22.5% of respondents are male and 77.5% are female. 31% are of age 20-22, 64.8% are of age 23-24, 2.8% are of age 25-26 and 1.4% is above 27 years of age. 29.6% respondents are in semester 5, 69.1% are in semester 6 and 0.7 are in semester 7. The majority of the respondents take this subject in 2013 (66.2%) and the remaining in 2014. Based on the grade obtained, almost half of them scored A i.e. 49.3%, 40.1% scored B while 10.6% scored C. 31% of them stay in cities, 43.7% in towns, 7.7% in subdivision and 17.6% in rural areas.

The Cronbach's Alpha value is used to test the reliability of the items measuring each variable of the study as shown in Table 3. It is a reliability measure coefficient that reflects how well the items in a set are positively correlated to one another. The results show that all the values are greater than 0.70 – indicating consistency of items. 4 and 2 items are dropped in environmental behaviour and government regulations variables respectively.

Table 3: Summary of reliability Analyses

Variables	Number Of Items	Items Deleted	Cronbach's Alpha
Environmental behaviour	27	4	0.923
Environmental attitude	34	-	0.827
Regulations	4	2	0.776
Perceived Importance of nature	9	-	0.874

Table 4 reflects the opinions of the undergraduates towards the important of nature. The first four items are activities to reduce the earth's burden while the remaining two show the connection with nature. The undergraduates show a significant amount of certainty for all the items above. They are either important or very important to them. For instance, more than 90% of the undergraduates rate saving energy, learning about the environment, biodiversity of rainforest and learning about the environment as either important or very important. While 80-90% of the students rates the remaining items such as using less water, recycling and spend time to help the environment either important or very important. Even though the frequency is different by a few points, it can be concluded that the majority of the students see the following items significantly important to them. Understanding their views on environmental issues is crucial as it indirectly reflect their actions towards nature.

Table 4: Frequency distribution (%) of undergraduates on their views on environment

Items	1	2	3	4	5
Saving energy	0.7	0.7	3.5	33.8	61.3
Using less water	-	2.8	14.1	38.7	44.4
Recycling	0.7	0.7	10.6	33.1	54.9
Biodiversity of rainforests	0.7	-	8.5	32.4	58.5
Learning about the environment	0.7	0.7	6.3	31	61.3
Spending time helping the environment	0.7	0.7	13.4	40.8	44.4

Note: 1= not important at all; 2= slightly not important; 3=neutral; 4=important; 5= very important.

The summary of the descriptive statistics for the major variables are explained in Table 5. All variables are measured in 5-point Likert Scale except for grade which is based on the scores obtained in the

examination. The mean and standard deviations for environmental behaviour and attitude is around 3.3-3.5 – suggesting that the students have positive characteristics with the environment. For government regulations and perception of the importance of nature, the mean scores are 4.3 and 4.4 respectively, indicating that they agree on the need of regulations and importance of nature. Of 142 students, the mean scored for academic performance is 3.33 – which is equivalent to B+. However, according to Sharpely (2001), many people had good perception on the environmental issues but their behaviour could be threatening to it. Thus, this paper moves a step further to investigate the determinants of undergraduates' environmental behaviour.

Table 5: Descriptive Analysis and Pearson Correlation Analysis of the major variables

	Mean	SD	1	2	3	4	5
1. Environmental behaviour	3.3637	0.62161	-				
2. Environmental attitude	3.5628	0.37804	0.497*	-			
3. Academic Performance	3.3330	0.62280	0.014	-0.016	-		
4. Regulations	4.2641	0.65961	-0.016	0.273*	-0.084	-	
5. Perceive Importance of Nature	4.4030	0.51620	0.321*	0.356*	-0.067	0.305*	-

* Significant at 1% level

Thus regression analysis is conducted to investigate the factors that influence the environmental behaviour of the undergraduates. Referring to Table 6, F test is significant at 0.01 which means that the model is meaningful to explain the relationship between environmental behaviour and its four determinants. When each of the single variables is regressed against the environmental behaviour, environmental attitude, importance of nature and academic performance show positive relationship. However, only the former two are significant at 1 % level. Technically, this implies that when there is 1% increase in environmental attitude and perceived importance of nature, environmental behaviour is also increased by 79% and 26% respectively. Interestingly, government regulations are also significant in the model, but it shows the negative relationship to environmental behaviour. Technically, the result may be interpreted as when there is 1% difference in government regulations, environmental behaviour is decreased by 20%. Unexpectedly, academic performance shows positive but insignificant relationship to environmental behaviour. R^2 indicates that 31% of variation in environmental behaviour can be explained by environmental attitude, academic performance, regulations and perceived importance of nature. It is also clear that there are some other factors that affect the environmental behaviour that are not being tested in this study (more discussions on next section). The adjusted R^2value is 29%. The value in Durbin-Watson shows 1.739 and this is confined to the acceptable range (1.5 to 2.5). Multicollinearity among the variables are also examined and it is found that the study has no problem of multicollearity where tolerance values are greater than 0.20, and all VIFs are less than 5 (Allison, 1999).

Table 6: Regression Results

Variable	Coefficient (Beta)	Standard Error	t-value	Sig.	VIF
Constant	0.163	0.570	0.285	0.776	
Environmental Attitude	0.787	0.127	6.199*	0.00	1.186
Academic Performance	0.029	0.71	0.405	0.686	1.009
Regulations	-0.199	0.072	-2.776*	0.006	1.147
Importance of Nature	0.261	0.094	2.773*	0.006	1.212
R	0.558				
R^2	0.311				
Adjusted R^2	0.291				
F-Test	15.148*				
D-W	1.735				

*Significant at 0.01% significant level

Discussion And Conclusion

With the scarcity in natural resource, firms strive to utilize it to produce goods and services to fulfill the needs and wants of demanding consumers. Within the production stages up to the consumption of finished goods by the end users, these processes will directly or indirectly lead to rapid environmental degradation and eventually affect the well being of living creatures on earth. To reduce and slow down the environmental damages as a result of human economic activities, individual environmental behaviour is conducted to find out its determinants. The study focuses on the undergraduates who had signed up and completed the Environmental Economics subject in Semester 5 in one of the local universities in Kota Bharu, Kelantan. To understand the relationship between environmental behaviours among undergraduates and the factors affecting it, Theory of Planned Behaviour (TPB) is employed, couple with some external factors such as academic performance, government regulations and perceived importance of nature. The results show that there is positive and significant association of environmental attitude and perceived importance with environmental behaviour. When conducting the multiple regression analysis, environmental attitude and perceived importance of nature show positive and significant relationships while government regulation shows negative and significant relationship to environmental behaviour. Academic performance however does not significantly influence the environmental behaviour.

Attitude does play an important role in shaping the behaviour of individuals. The result on environmental attitude is consistent with the findings from Wan et al. (2012),MüderrisoğluandAltanlar (2011). Education can be considered as a mechanism to support the process. Education is evitable to establish sustainable quality of life, which means to improve the quality of life now without damaging the environment for the future. This is very important since environmental resources in many developing countries are seriously depleting while economic growth is necessary and crucial at the same time. This could be done through inculcating continuous good habits from university level by introducing a couple of environmental courses in the university syllabus. Besides, government should also inculcate children and youngsters from the primary and secondary schools respectively by making environmental subject compulsory so that they can internalize the concepts and show concern to mother earth and the need to sustain it.

The study also explores undergraduates' perceptions on a variety of environmental issues and finds the relationships significant and positively related. This is consistent with the findings from Dunlap, Xiao and McCright (2001); Jones and Dunlap (1992); Klineberg, McKeever and Rothenbach (1998); Marshall, Picou and Bevc (2005); Van Liere and Dunlap (1980). As for academic performance, the finding shows that the environmental courses did not produce graduates with pro environmental commitment. The result is supported by Mamat et al (2012), Henning andKarlsson (2011), and Hasyim (2013) who found no significant effect of ecological knowledge on ecological intentions. Though the undergraduates might be aware of the importance of nature through education, it might be quite hard for them to turn the theories into normal practices as they are already used to the existing attitude. A sudden change of lifestyle might be difficult for them. However, besides the formal education programmes, other informal education programmes are proposed, too to enhance the knowledge, understanding of the environment and its impacts to ecosystem by involving the undergraduates with nature. This can be done by encouraging students to participate in environmental activities and associations such as WWF, Malaysia Nature Society (MNS), Malaysia Environment NGOs (MENGO), etc. If effective environmental programmes are to be carried out, the messages sent out should be clearly defined so that they can be correctly interpreted. The activities and knowledge from the right channels would enable the graduates to further share their experiences and environmental knowledge with their family members, relatives and friends, who can then pass it on to others.

In terms of government regulations, the result is uniformed with the research done by Jayaraman et al. (2011) where regulation is not influencing the respondents to stop behaving in such a manner. The authority has to play an important role too. Universities should emphasize on the correct attitudes in practising environment care within their campus. For this to be effective, more facilities or drop off

points needed to be provided within the campus. Those who do not adhere to the campus environmental rules will get their credit deducted or they may receive a reasonable fine.

Legislation can raise the general environmental awareness that might affect the involved firms. However, this may not be the case for the individual especially undergraduates. The negative relationship between environmental behaviour and regulations due to the rules and policies are neither affecting nor strict enough to give impact to the individuals. The rules are there but it is just a matter of enforcing them. Thus government should encourage sustainable behaviour among children and youth especially in the primary and secondary schools as well as in the universities. Stringent law and regulations should be enforced.

As for future research, for those who are interested in conducting the research in this field should look into other determinants that influence the behaviour of the individuals such as experiences, socio demographic factors (age, gender, ethnicity, education, marital status, employment, job positions, income, locality, etc), external factors (climate change, federal and state regulations, technology, etc), etc. They can even widen the scope of study to target the respondents from school children to the different level of employees both in the public and private organizations. Comparison can also be made between the behaviour of the groups who had taken up the environment subjects in school with those who had not.

It is hope that the findings and implication of the studies, could shed some light to the government, universities and policy makers about the determinants of undergraduates' environmental behaviour. They can then formulate suitable policies to further enhance it. As for undergraduates or individuals, they need to know that they can play an important role to protect and conserve the environment.

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