

## **Environmental Awareness Level amongst Secondary School Students in Terengganu, Malaysia Based on Different Variables**

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### **Abstract**

The level of environmental awareness of secondary school students is quite embracing. The purpose of this paper is to identify the level of environmental awareness among secondary school students. The sample consists of 600 students including both boys and girls. Questionnaire developed by the researcher is the technique used to collect the data. Descriptive statistics, t-test, ANOVA, and Pearson coefficient of correlation are the techniques used to analyze the data. The result shows that the level of environmental awareness among students is low. No significance difference is found with respect to age and settlement in the environmental awareness level of the students. Conversely, significance difference was found in the environmental awareness of secondary school students belonging to different age group.

**Key words:** *environmental education; environmental awareness; age; gender*

### **Introduction**

Environmental education is a process of recognizing values and classifying concepts in order to develop skills and added tools necessary to understand and appreciate the interrelationship amongst man, his culture and his bio-physical surrounding (Madhumala, 2010). It is through the environmental education that people will be aware of the needs for improving the environment. Environmental education is also refers to organized efforts to teach about how natural environments function and, particularly, how human beings can manage their behavior and ecosystems in order to live sustainably. It is also define by UNESCO, through Tbilisi Declaration 1978 as “a learning process that increases people’s knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action”. Therefore, environmental education touches every aspect of mankind in his intermediate surrounding.

Environmental awareness on the other hand is “to understand the fragility of our environment and the importance of its protection” (Pachamama, 2014). Environmental awareness is all about being conscious of the environment around us.

Environmental awareness is classified into two aspects: perception of environmental problems and behavioral inclination to protect the environment. The perception is the peoples should have knowledge of environment and their issues. The behavior inclination

is to protect the environment includes two major aspects; firstly, the value of environmental protection in peoples mind which is indicated by the balance between environmental protection and economic development and also the willingness to pay for the protection of the environment; secondly, attitudes about participating in environmental protection, (Xietal, 1998).

Considering the importance strategies of environmental awareness in attaining sustainable environment, especially environmental pollution which is caused normally by environmental pollutants such as pollutants from a point source e.g. factory, industry and those from a non-point source which include market and agriculture. These pollutants may result into environmental degradation. Promoting environmental awareness is an easy way to become an environmental steward and participate in creating a brighter future for our future children.

Mankind encounter with the environment is about as old as the man himself. Man has been dependent upon the environment since from his evolution. During that time activities of mankind are relatively small and limited; therefore, did not affect much of the environment. But slowly human being settled down and civilized himself and learnt to cultivate. Over recent decades, global problems relating to degradation of natural resources and pollution have increased dramatically, this is made possible by excessive use of natural resources by man in agriculture, construction, urbanization and industrialization, and since then the natural resources are being depleted by excessive use. The environment consist of the physical conditions of the organism; the social and cultural conditions affecting the nature of an individual or community, and the surrounding of an inanimate object of intrinsic social value. Therefore, the environment itself includes all the conditions, circumstances and influences surrounding and affecting an organism or group of organisms (Trivedi and Raj, 1992).

Environmental education is the main interests of school organizations, local communities, the private sector and local governments for over the last 50 years. These organizations ask to the government to put the EE under curriculum of education. Many authors name the 1960s as the decade when EE started to develop in response to the world's growing awareness about environmental problems. Others believe that EE grew up from the movement that already existed from the beginning of the last century such as study of nature, conservation of natural resources and outdoor education (NACD, 1998). Therefore, environmental education is considered as a life-long process that is interdisciplinary and holistic in nature and application. It concerns the relationship between human and natural ecosystem and encourages the development of environmental protection e.g. environmental ethic awareness, understanding of environmental problems, development of critical thinking and problem solving skills. Moreover, environmental awareness is the initial step ultimately leading to the ability to carry on responsible citizenship behavior (Sengupta, et al., 2010).

A number of research works have been taken up in this respect. But being a location of specific issue, research on environmental education should be familiar in different parts of the world in order to develop a clear understanding of all the perspective of the issue involved. Rajput et al. (1980) made attempts to identify the awareness of children at

primary level, towards the scientific and social environment. The study revealed that only one of the four groups (2schools X 2classes) were significantly different on environmental awareness at pretest stage (control group), whereas at the post test stage two experimental groups were significantly better than the control group.

Paramjeet, (1993) conducted a study on "Environmental Awareness among the Students in Different Socio-economic Status". In 2005, Sabastian and Nima showed that science students have more awareness of biodiversity and its conservation than other students' discipline. The local environmental awareness found only among students whom living in high socio-economic neighborhoods, (Fisman, 2005). In another study by Hossan (2013) suggested that middle and high school students are more knowledgeable on many of the environmental issues while female students having higher knowledge than male students. In the case of this research, the researcher would focus on identifying the environmental awareness level amongst secondary schools with Terengganu as the study area.

### ***Significance of the research***

The identification of any problem acts as a fundamental spring board for its solution, it is hoped that this study would generate a greater significance to the area of study as well the nation to boosting the students environmental awareness level, and also to attain the international priority of sustainable development as emphasized by the United Nation Decade of Education for Sustainable Development (DESD 2005-2014). This can be attain by the integration of principles, values, and practices of sustainable development in all aspects of education and learning, in order to address the social, economic, cultural and environmental problems for the 21st century (UNESCO, 2010).

It is also hoped that the study will equally serve as a reference material for other researchers who may want to carry out similar research in the future.

### ***Research questions***

The study is aimed at finding out answers to the following questions for the students;

- 1) What is the level of environmental awareness, environmental attitude, and attitude of students towards environmental education among secondary school students?
- 2) What is the relationship between environmental awareness and environmental attitude?
- 3) What is the significance difference in the environmental awareness between male and female students?
- 4) What is the significance difference in the environmental awareness between students of different age group?

### ***Limitation of the study***

Despite its important issue, the study is limited only to 6 selected secondary school in Terengganu District including both boys and girls schools. The study is limited to above schools due to some contributable factors which are beyond the researcher's control such as space and time, and there is also no adequate fund to cover the whole secondary schools in Terengganu.

### **Objectives of the study**

The objectives of this study are;

- 1) To determine the environmental awareness level, attitude towards environment, and attitude of students toward environmental education among secondary school students in Terengganu.
- 2) To find out the relationship between environmental awareness and environmental attitudes of secondary school students.
- 3) To compare the significance difference in the environmental awareness level of students of different age and gender.

### **Hypotheses of the research**

The hypotheses formulated for the present study are as follows:

- 1) The level of environmental awareness of students is low.
- 2) The students have low attitude towards environment.
- 3) The attitude of students towards environmental education is low.
- 4) There is no relationship between environmental awareness mean scores and environmental attitude mean scores.
- 5) There is no significance difference in the environmental awareness mean scores between male and female students.
- 6) There is no significant difference in the environmental awareness of secondary school students belonging to different age groups.

### **Methodology**

#### **Study area**

Malaysia is a federal constitutional monarchy located in the south east of Asia, has a geographical coordinate at position 2°30'North and 112°30'East with Kuala Lumpur as its capital city. The weather is tropical, influenced by monsoon climate because of its latitude and longitude. Figure 1, 2, and 3 are the maps of Malaysia, Terengganu and Kuala Terengganu as the study area.



Figure 1: Map of Malaysia



Figure 2: Map of Terengganu

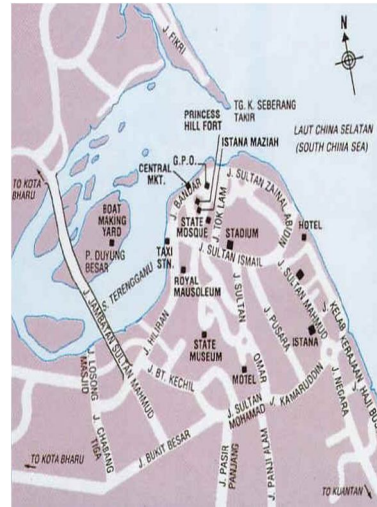


Figure 3: Map of Kuala Terengganu

Terengganu is situated in north-eastern Peninsular Malaysia, and is bordered in the northwest by Kelantan, the southwest by Pahang, and the east by the South China Sea. Several outlying islands, including Pulau Perhentian, Pulau Kapas and Pulau Redang, are also part of the state.

The state has a total area of 13,035km<sup>2</sup> (5,033sq mi), Laporan (2010). It also has a total population of 1,015,776 as of 2010. As of 2010 census the population of Terengganu is 96.9% Muslims, 2.5% Buddhist, 0.2% Christian, and 0.2% follower of other religions or non-religions.

The location of Kuala Terengganu is on latitude 05°20' North and 108°08' East. The South China Sea which is located east coast of Terengganu ensured that it was on trade routes since ancient times. In the early 6<sup>th</sup> century A.D., Chinese merchants and seafarers were the people who did the earliest written reports on the area that is known Terengganu. Terengganu traded extensively with the Majapahit Empire, the Khmer Empire and especially the Chinese under the influence of Srivijaya. Like other Malay states Terengganu practiced a Hindu-Buddhist culture combined with animist traditional beliefs for hundreds of years before the arrival of Islam. It was the first Malay state to receive Islam, as attested to by a stone monument dated 1303 with Arabic inscriptions found in Kuala Berang, the capital of the district of Hulu Terengganu. It emerge as an independent sultanate in 1724, later it became a member of the Federation of Malay in 1948, and a state of independent Malaya in 1957 (Sofea A. Ghani, 2010).

### **Research design**

Survey method is preferred by this study in order to have direct contact with the population of its study and because of its relevance in terms of efficiency and usefulness and wide range of data collection. The research is designed to find the views and opinions of people about the environmental awareness level amongst secondary schools students.

### **Population of the study**

The selected schools in this study comprises of three (3) secondary schools from the urban area and the other three (3) secondary schools from the rural area. The aim is to

make the study comparison and provide reliable and valid information to have a clear representation of the targeted schools. Also to have a good representation of the subject of the study, six hundred (600) respondents were drawn. Each school was allocated with one hundred (100) questionnaires respectively.

### **Sampling size**

As earlier stated before, a total number of six hundred (600) respondents were randomly selected from the 6 selected secondary schools. Simple random sampling is heavenly preferred because it is evident that among the elements that make up the total population. There may be similarities as such a study of a few of these elements will provide sufficient knowledge of what is obtained in the entire population. It is obviously more economical to study the samples because it save time, energy and cost. Random sampling technique also enables the researcher to have a clear representation of the total population of the study area, so also the respondents selected in each school. The selected schools for this research work are represented in Table 1 below:

TABLE 1  
Description of the schools selected and the questionnaire allocation for the study

School location		Schools selected	Questionnaire allocated
Urban area	1	SM Sultan Mahmud	100
	2	SM Chung Hwa	100
	3	SM Teknik Terengganu	100
Rural area	1	SBP Intergrasi Batu Rakit	100
	2	SMK Tembila	100
	3	SMK Belara	100
Total		6	600

Three of the selected schools are selected from the urban area and the remaining schools are selected from the rural area. Each school was allocated with one hundred (100) questionnaires to the students respectively.

### **Data analyses**

Data were analyzed using Data editor of SPSS version 16. Basic data were taken into consideration. Mean; SD; t-test; ANOVA; and Pearson coefficient of correlation are the statistical techniques used in the analyses of the data. Figure 4 below is the flow of the data gathered and method of analysis.

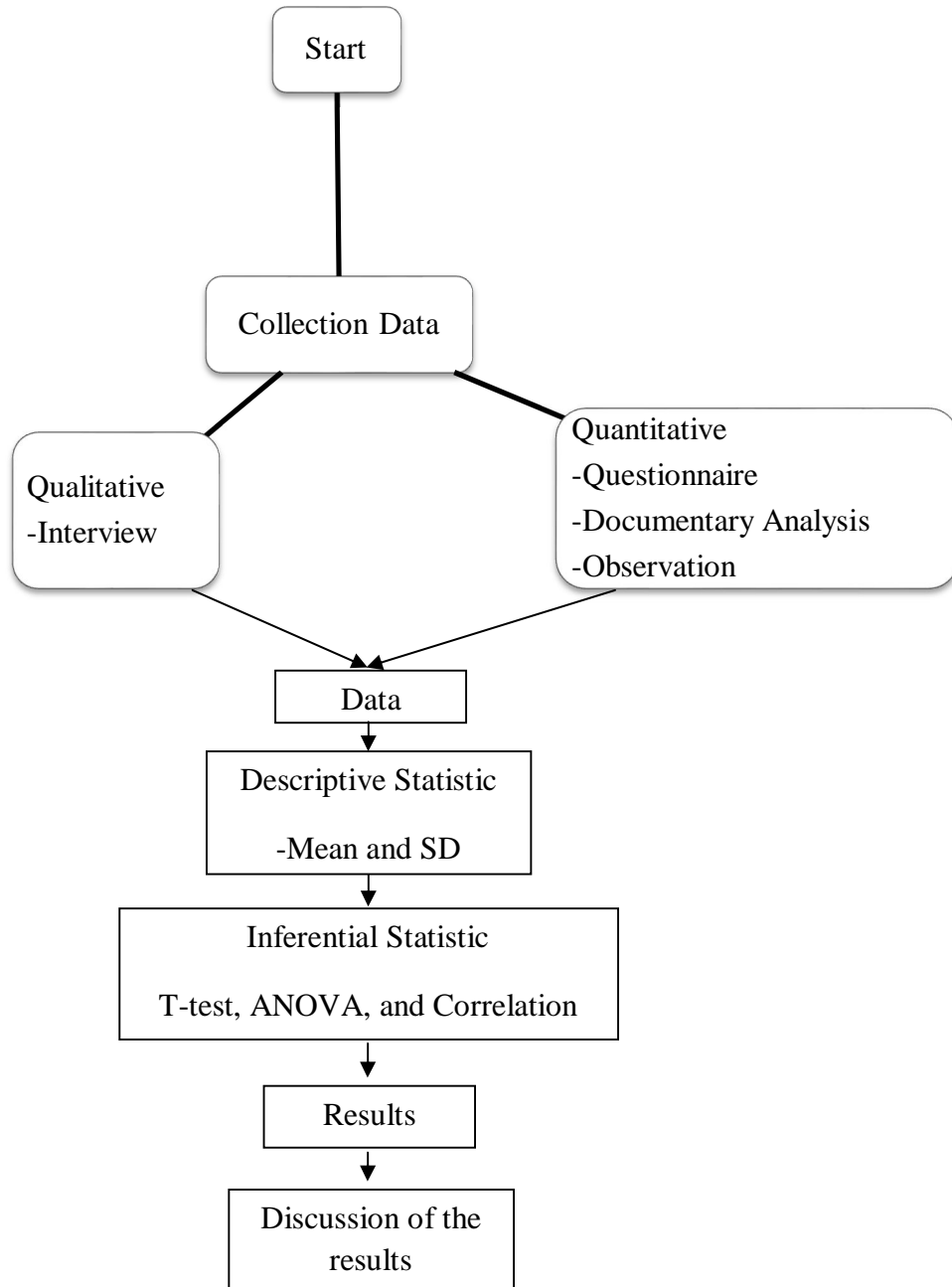


Figure 4: Flow chart showing collection and analysis of the data



## Results

### **Environmental awareness level among secondary school students**

The students' environmental awareness level was measured in this section using a descriptive statistics method. There were ten (10) items used to measure the awareness level. The awareness level was indicated by a "Level Indicator Mean of 0.10-0.49 as low awareness and 0.50-1.00 as higher awareness level". The result of descriptive statistics as shown in the Table 2 below shows that the level of environmental awareness of the secondary school students is low with a mean value of .40 which is not up to average level. Therefore, hypothesis 1 (Ho1) is accepted.

TABLE 2  
Environmental awareness means scores and total percentage base on "correct answer (CA)" and "wrong answer (RA)"

Item	Statement	Mean	Total percentages (%)	
			CA	RA
1	In order to conserve natural resources, we should...	.09	8.8	91.2
2	Natural resources are exhausted faster because of...	.16	15.9	84.1
3	Fuels should not be wasted because they are...	.75	74.9	25.1
4	World Environmental Day is celebrated every year on...	.41	40.7	59.3
5	The best way of disposing the domestic waste would be to...	.46	45.8	54.2
6	Oil spills are highly dangerous because...	.82	82.0	18.0
7	Excessive use of pesticides will...	.15	15.4	84.6
8	Which of the following is the non-renewable source of energy?	.71	71.0	29.0
9	Loss of biodiversity may be due to...	.46	46.1	53.9
10	Which of the following is true statement related to pollution?	.03	2.9	97.1
<b>Overall level of awareness</b>		<b>0.40</b>		

\*Level indicators: Means: 0.1-0.49 low; 0.5-1.00 high

**Attitude of students towards environment**

In this study, attitudes among respondents were investigated by the responses of 10 questions on attitude towards environment. It can be observed from Table 3 below that, the overall mean score of respondents with regards to student's attitudes towards environment was found to be 2.41 which is moderate. This shows that the students having moderate attitude towards environmental issues. Therefore, hypothesis 2 (Ho2) is rejected.

TABLE 3  
Environmental attitude mean scores and total percentage "agree (A)" and "strongly agree (SA)"

Item	Statement	Mean	Total (%) A+SA
1	Over pollution of the environment can cause misery and sufferings to human beings.	1.28	97.3
2	Environmental pollution leads to health hazards.	1.21	97.3
3	It is not wrong to hunt animals for food.	2.50	55.8
4	Participation in afforestation programs is a mere waste of time and energy.	3.59	8.5
5	The government should increase its revenue by clearing the forests.	2.18	66.1
6	Destruction of ozone layer will hardly affect the near future.	2.90	34.6
7	Water pollution is not a serious problem because 80% of the world's surface is water.	3.24	16.9
8	Environment is least affected though domestic garbage is dumped on the roadsides.	3.43	10.8
9	Over population leads to poverty.	2.43	55.8
10	One should participate in campaigns on 'Stop Pollution'	1.38	94.7
<b>Overall attitude of students towards environment</b>		<b>2.41</b>	

\*Level indicators: Means: 0.10-2.00 low; 2.10-3.00 medium; 3.10-4.00 high

**Attitude of students towards environmental education**

Attitude of students towards environmental education was investigated among respondents with 10 questions. The level indicator of attitudes was measured base on 'low', 'medium', and 'high'. Table 4 describes the result of the average environmental attitude mean scores of respondents, and it was observed that the students have low

attitude towards environmental education with cumulative mean value of 1.93 and standard deviation (SD) of .753 which is not significant. Hence, hypothesis 3 (Ho3) is accepted.

TABLE 4  
Environmental attitude mean score for secondary school students, SD, and total percentages "agree (A)" and "strongly agree (SA)"

Item	Statement	Mean	SD	Total A+SA (%)
1	Protection of environment is every individual's first priority.	1.19	.491	98.1
2	Environmental Education can be infused as an independent subject in the school curriculum.	1.81	.676	89.0
3	Environment related concepts can only be infused in Biology and Geography.	2.50	.870	45.9
4	Infusion environmental concepts can leads to the deviation of students' concentration from the subject on hand.	3.01	.913	24.4
5	Organizing environmental field trips should be an integral part of the school activities.	1.52	.671	94.4
6	School should provide for setting up a school garden	1.49	.676	94.1
7	Internets do more in modifying the students' attitudes towards environmental education.	1.94	.828	78.6
8	Students learn how to protect environment from the books they read.	1.79	.729	87.1
9	It is seldom possible to learn anything serious about environment through nature games.	2.40	.878	57.3
10	Students would understand the beauty of nature more when Environmental Education is taught as an independent subject in the school.	1.66	.798	89.7
<b>Overall mean and SD of attitude toward environmental education</b>		<b>1.93</b>	<b>.753</b>	

\*Level indicators: Means: 0.10-2.00 low; 2.10-3.00 medium; 3.10-4.00 high

**Relationship between environmental awareness and environmental attitude**

From Table 5 below, a bivariate correlation was undertaken between students environmental awareness mean scores and environmental attitude mean scores. It was hypothesized that a low positive relationship exists between these two variables but is less significant. Result of the correlation indicates that higher environmental awareness scores are less associated with higher environmental attitudes scores ( $r=0.172$ ,  $p<0.01$ ) for the sample of 590 secondary school students. Thus, it can be concluded that there exist relationship between environmental awareness and environmental attitude among secondary school students, but the correlation is very low. Hence,  $H_04$  is rejected

TABLE 5  
Relationship between environmental awareness and environmental attitude for secondary school students

Sample (N)	Relationship between	Coefficient of correlation ('r')	Degree of freedom	p-value	Significance
All students (590)	Awareness and attitude	.172	588	$P<0.01$	Significant

The level of relationship between the two variables that is environmental awareness and environmental attitude can be clearly seen in Figure 5 below using scatter dot plot chart.

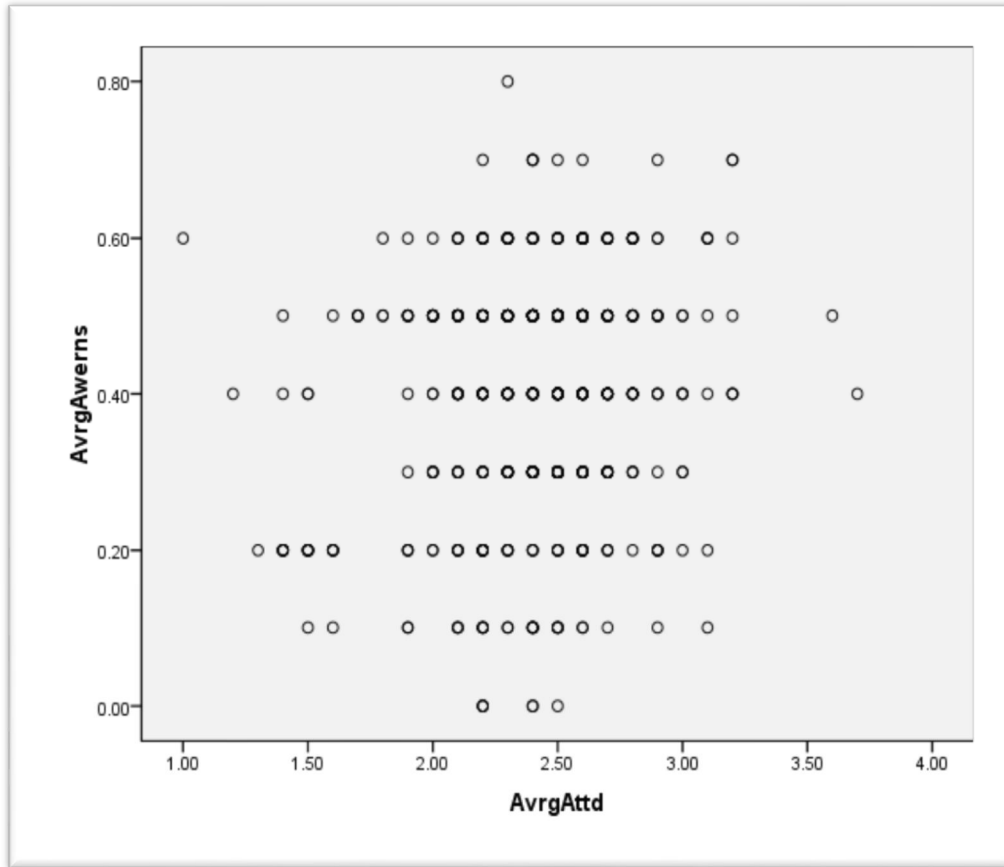


Figure 5: Scatter dot plot (bivariate) between environmental awareness and attitude

**Environmental awareness means scores between male and female**

In order to check the null hypothesis with respect to gender, the t-test was employed. The mean score of male secondary school students (N=275) is found to be .4069 with a SD of 0.1432. The mean score of female secondary school students (N=315) is found to be .4006 with a SD of 0.1476. The calculated t-value is 0.522 which is not significant at 0.05 levels. Therefore, since the computed t-value is lesser than the table value, the null hypothesis 5 is accepted. The below Table 6 summarizes the result of t-test.

TABLE 6  
Significance difference in the environmental awareness of male and female

Variables	Gender	Sample (N)	Mean	SD	t	p-value	CI	
							Lower	Upper
Environmental awareness	Male	275	.4069	.1432	.522	.602	-.0173	.0299
	Female	315	.4006	.1476				

\*significant at 5% level

### **Environmental awareness level of secondary school students with respect to different age groups**

The environmental awareness of secondary school students belonging to different age groups shows a remarkable difference as shown in Table 7 below. The mean score of students belonging to 12-13years age group (N=113) is found to be 0.3150 with SD of 0.1713. The mean score of the other category of students of age 15-17years (N=477) is found to be 0.4245 with SD of 0.1303. The calculated t-value is 7.526 which is greater than the table value at  $p=0.000 < 0.05$ . Hence, the null hypothesis  $H_0$  is hereby rejected.

TABLE 7  
Significance difference in the environmental awareness of secondary students with respect to age group

Variables	Age group	Sample (N)	Mean	SD	t	p-value	CI	
							Lower	Upper
Environmental awareness	12-13 years	113	.3150	.1713	7.526	.000	-.1381	-.0809
	15-17 years	477	.4245	.1303				

\*significant at 5% level

### **Discussion of the results**

From the far going analysis of the result, it can be observed from Table 2 above that the level of environmental awareness among secondary school students is low. Four options were given for this category to measure the awareness level were 8.8% of students responds correctly on the right way to conserve natural resources because 15.9% of them knows that these natural resources can be exhausted faster though 74.9% agreed that the fuel should not be wasted. This shows a low achievement in the level of awareness of students. Furthermore, majority of the respondents (84.6%) did not know the effect of excessive use pesticides. The students (97.1%) were also reported to have poor knowledge about pollution. This is disappointing and signifies a low level of awareness among secondary students. The result is contradicted with the result of Aminrad et al., (2010) in his study on Environmental awareness of Iranian students in Malaysian universities. He found that environmental awareness of students is moderate. Mathivanan and Pazhanivelu (2013) found that secondary school students have high environmental awareness. Romana and Bipasha (2013) suggested that environmental education should be incorporated as a subject in the B.Ed. curriculum, so that future teachers can instill in their students environmental sensibilities.

The second finding of the study shows that secondary school students have moderate (2.41/4) attitudes towards environment. In this regards, four options were given to students to express their opinion. Agree (A) and Strongly Agree (SA) were recorded together as seen in Table 3 above. Majority of the respondents (97.3%) are in the view that over pollution of the environment can cause misery and sufferings to human beings. 97.3% opined that environmental pollution may lead to health hazards and 94.7% suggests that they should all participated in campaigns to tackle pollution. This is confirmed by the responded were 8.5% responds that participation in reforestation program is a mere waste of time. On the other hand, 34.6 of the respondents agreed that destruction of ozone layer will hardly affect our climate in the near future. On the environmental pollution issues, only 16.9% of the respondents agreed that water pollution is not a serious problem because of

the fact that they believed 80% of the world's surface is water. On the other hand, 10.8% believe that dumping of garbage by the road side will least affects the environment. This is enough to say that 88.2% ignore the habit of dumping refuse by the road side. Little percentage of students responded positively on the attitudes toward environment. This result was in contrast with the result of Aminrad et al., (2010) where he found that environmental attitude of students was high.

Form Table 5, the relationship between environmental awareness and environmental attitude is quite low ( $N=590$ ,  $r=0.172$ ,  $p<0.01$ ). This may be due to the fact that secondary school students were found to have low awareness regarding environmental awareness because it is when you know then you will practice. Never do what you don't know. The students may be when they are aware of the environment, and then they will act upon it. Kumud (2014) and Zarrintaj (2013) found that the relationship between environmental awareness and attitude of students towards environmental education were positive and strong.

The secondary school students were also reported to have low attitudes toward environmental education. From Table 4 above, 98.1% of the respondents agree that environmental protection belongs to individuals as first priority. 89.0% of the respondents agree that Environmental education to be taught as an independent subject in the school. In this study, students were not engage in environmental field trips; in this research work 94.4% students agreed Environmental Education aims can best be achieve when organization of field trips became an integral part of the school activities. It will give students chance to see and observe environmental issues by theme selves, not only be taught in classes because what you hear you forget and what you see you will remember. School garden was agreed to be set up in schools because it provides hands on materials for students. Internet would really help in modifying the students' attitudes towards environmental education as supported by 78.6% of the students in this research work though there are other ways by which students would learn how to protect environment as suggested by 87.1% of the respondents that students learn how to protect environment from the book they read, 57.3% agreed that it can be learn through nature games. Nevertheless, 89.7% says students would understand the beauty of nature more when Environmental Education is taught as an independent subject in the school.

Furthermore, from the result of Table 6 above, no significance difference was found between sex groups. The result is in line with the result of Aminrad et al., (2011) where he concluded that age is not significant in determining the environmental awareness level among students. Bhim and Jayanta (2010) in their study "A comparative study on environmental awareness among secondary school students in relation to gender and residential background" indicated that no significance difference was found between boys and girls students. Kumud (2014) also found that there is no significance difference in the environmental awareness and attitudes towards environmental education between male and female. The result is the same with the result of Sengupta et al., (2010) that gender is not a significant factor in the environmental awareness of students. Shobeiri et al, (2007) and Arba'at (2010) also found that gender is significant in environmental awareness of the students. Jayanta (2010) conducted a study on a comparative study of environmental awareness among secondary school students in relation to gender and residential

background. They found that urban boys have higher environmental awareness than that of its rural counterpart, but no significant difference was upon environmental awareness was found for boys and girl students

In another finding, it was found that there is significance difference in the environmental awareness of secondary school students of different age groups, the higher the age, the higher the environmental awareness of students. This result is supported with the finding of Aminrad et al., (2010 and 2011). Maryam (2010) in her study on assessment of environmental awareness among higher primary school teachers found that age has impact on the level of environmental awareness of students. This means that when age increase, it will result in the increase in the environmental awareness of the students.

### **Conclusions**

From the results obtained in the analyses of the data above, it can be concluded that the level of environmental awareness of secondary school students is low. No significance difference is seen between gender and different locations of the schools. Age was reported to have a relatively low significance in the environmental awareness of secondary school students. The attitude of students towards environment and environmental education was quite low.

### **Recommendations**

It is recommended that qualified teachers must be enrolled into our secondary schools in order to give students what is expected. School garden has a great deal in creating environmental awareness among secondary school students, because it will bring to the students the different varieties of plants and animals which need to be conserved. Environmental awareness programs should be encouraged in our secondary schools. This is what will motivate the students to develop environmental awareness skills and also to have solutions to different environmental treats. More researches are encouraged to be carried out at different parts of Malaysia.

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