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# The Impact of Environmental Education (EE) on the Society's Awareness, Responsibility, and Attitude towards the Development of a Lifelong Attitude of Pro-Conservation Behaviour in Kota Kinabalu, Sabah

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**Abstract.** The deterioration of our environmental conditions is caused by human behaviour. It is a fact that our environment and ecosystem suffered a tremendous amount of exploitation and extinction due to human's greed and ignorance. This research aims to identify the impacts of Environmental Education (EE) among Kota Kinabalu, Sabah, and to identify the significant difference and significance correlation on their awareness, responsibility, and attitude to a lifelong attitude of pro-conservation behaviour. The questionnaire is used as a research instrument and SPSS analyses the data. Mean; SD; t-test and Pearson coefficient of correlation was the statistical techniques used to analyze the data and Leximancer software used for the content analysis. A total of 500 respondents participated in the survey, and 20 respondents were interviewed. In this study, EE has effectively raised the student's environmental awareness, but relatively ineffective in changing their behaviour. The results revealed that there was a significant difference based on demographic aspects from the data collected. The results via statistical package for the social sciences (SPSS) revealed that there was a significant positive correlation on society's awareness ( $r = .351$ ), responsibility ( $r = .484$ ) and attitude ( $r = .552$ ) with pro-conservation behaviour from the data collected. The society's awareness, responsibility, attitude, and behaviour towards conservation are essential and needed more attention from various parties to develop a lifelong attitude towards environment and biodiversity conservation. It is hoped that this study's findings will be beneficial in providing information and guidelines for more effective planning of EE programmes in the future.

## 1. Introduction

The environment has influenced and shaped our lives since the time immemorial. Through the environment, we get all the necessities of the day to day life. We get our food to eat, water to drink, and air to breathe from the environment. Natural selection and elimination are the environments only, which has caused the evolution of the biological spectrum, the biosphere, as it exists today. We need to protect



our environment from being damaged and destroyed. For instance, the increase of CO<sub>2</sub>, CO, and other by-product gases harm our environment and affect our ecosystem's balance. The greenhouse effect and a slowly warming planet is the result of global warming. According to The World Health Organization, global warming is responsible for 154,000 deaths worldwide by creating conditions more favourable for spreading diseases such as malaria, dengue fever, and diarrhoea [1].

Environmental knowledge and environmental education play an essential role in protecting and conserving the environment as knowledge is a process of understanding and relating to our ecological system. We can learn through teaching, but through application and context, it would hit home. Concepts are both situated and progressively developed through activity means to say that it is a tool [2]. According to the United States Environmental Protection Agency, Environmental Education (EE) is defined as "the process that allows individuals to explore environmental issues, engage in problem-solving, and take necessary actions to improve the environment" [3]. Environmental Education is a lifelong process and should be integrated with other education [4]. It is not a particular viewpoint or course of action, and indeed it is more than just information about the environment. According to [5], they stated that "EE was established to generate individuals' who are sensitive and aware of the environmental problems. They make an effort to gather knowledge, equip oneself with appropriate skills and attitude sincerely to become individual or group that can solve environmental issues".

Environmental education identifies values and organizing concepts to reinforce skills and added tools necessary to understand and recognize the interrelationship between man, culture, and biophysical surroundings [6]. The importance of environmental education and environmental awareness in our society is recognized worldwide. Environmental education is highly promoted as a tool for managing our environment [7]. Environmental Education helps to achieve awareness, knowledge, attitude, and responsible behaviour towards the environment to create an environmentally sustainable future [8, 9]. Awareness and knowledge of how environmental processes and system works is an essential part of Environmental Education. However, just environmental awareness on its own will not be enough to bring about changes in attitudes and respect for the environment [10]. It all depends on the individual's intention and willingness to positively impact environmental knowledge they possess to impact environmental sustainability positively. Therefore, in this research, EE's impact on society's awareness, responsibility, attitude, and behaviour is assessed to identify the significant difference and the correlation it has towards developing the lifelong attitude of pro-conservation behaviour.

## 2. Research Objectives

This research was carried out with the following objectives:

- RO1 : To study the environmental awareness, responsibility, attitude and behaviour of Kota Kinabalu, Sabah.
- RO2 : To identify and explore the significant difference in society's awareness, responsibility, attitude, and behaviour based on the demographic aspect (gender).
- RO3 : To identify and explore the significant correlation on society's awareness, responsibility, attitude, and behaviour with a lifelong attitude of pro-conservation behaviour.

## 3. Research Hypotheses

The following hypotheses were formulated to answer the research questions:

- H<sub>1</sub><sup>a</sup> : There is a significant difference in society's awareness based on the demographic aspect (gender).
- H<sub>1</sub><sup>b</sup> : There is a significant difference in society's responsibility based on the demographic aspect (gender).
- H<sub>1</sub><sup>c</sup> : There is a significant difference in society's attitude based on the demographic aspect (gender).
- H<sub>1</sub><sup>d</sup> : There is a significance difference of society's behaviour based on demographic aspect (gender).

H<sub>2</sub> : There is a significant correlation between society's awareness, responsibility, and attitude with a lifelong attitude of pro-conservation behaviour.

#### 4. Methodology

The research took place in Kota Kinabalu, Sabah, Malaysia. The survey method is used in this research study because it is systematic and the questionnaire was used as a research instrument to collect the data. The questionnaire is defined as "a method of gathering information from respondents about attitudes, knowledge, beliefs, and feelings" [11]. The questionnaire was designed and used in this research as the research instrument to identify the impact of environmental education on society's awareness, responsibility, attitude, and behaviour towards developing a lifelong attitude of pro-conservation behaviour. The questionnaire used an ordinal level with Likert ranking scale from 1 until 5 with 1 for strongly disagree, 2 for disagree, 3 for neutral or moderately agree, 4 for agree, and 5 for strongly agree to measure the variables.

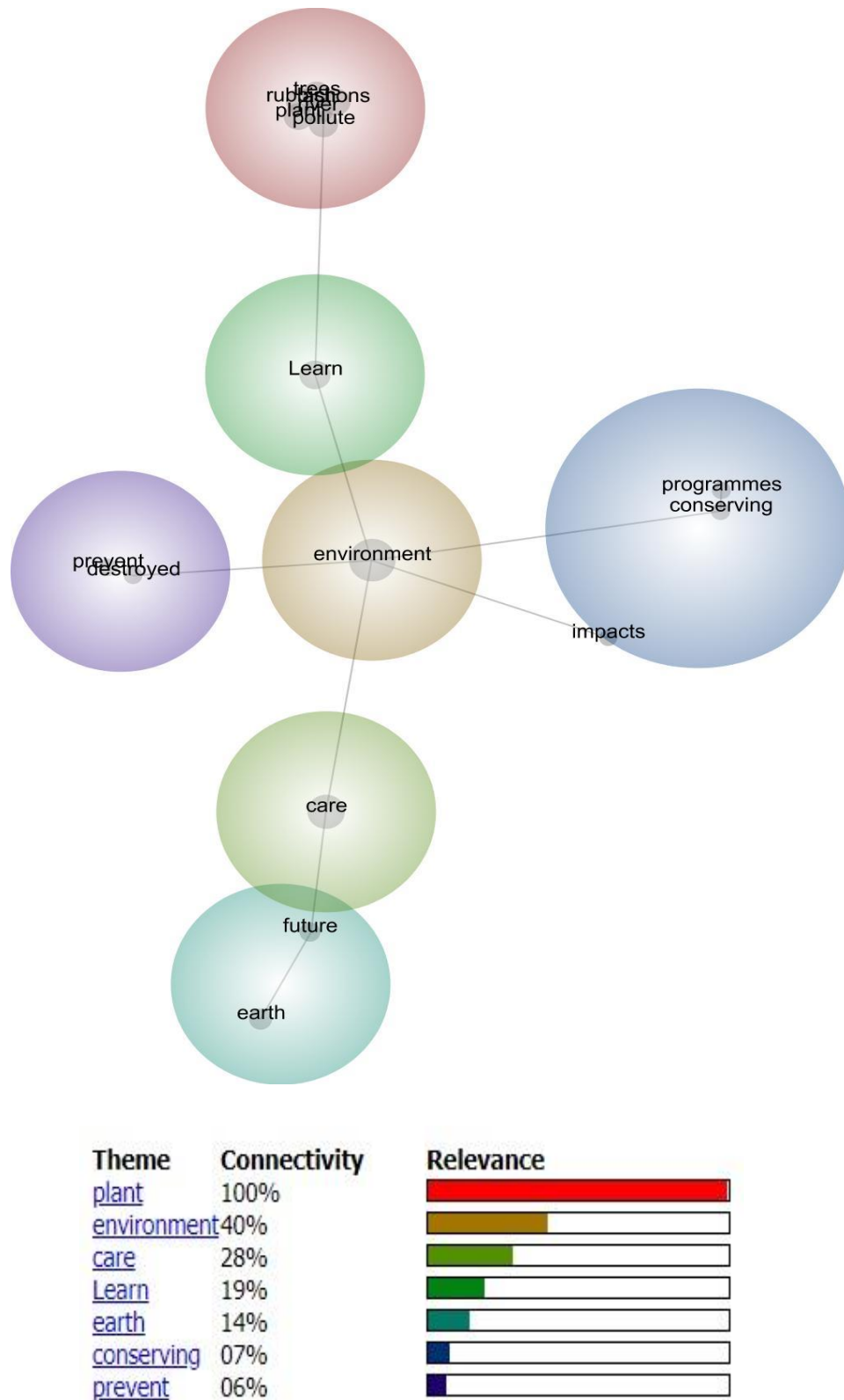
There were 500 respondents involved in this research. The data were analyzed using the Statistical Package for the Social Sciences (SPSS). SPSS computer programme is a software package for manipulating, analyzing, and presenting the data. It performs data entry and analysis and to create tables and graphs. This package is widely used in social and behavioural science [12]. Besides that, SPSS can handle large amounts of data and perform all of the analyses covered in the text and other forms. Mean; SD; t-test, and Pearson coefficient of correlation is the statistical techniques used in the data analyses. For demographic data collected in Kota Kinabalu, the statistical analysis displayed that 500 respondents participated in total, whereby females came in the highest number of groups, 60.6%, and male with 39.4%.

For the qualitative data, a qualitative computer program was utilised. Qualitative data is collected through the interview conducted with 20 respondents. The data sets were subject to analysis via Leximancer, a software that conducts qualitative content analysis to show a thematic analysis and the relational analysis of the interview data [13]. It provides the framework for discussing the identified themes and concepts of the qualitative research analysis. Through text mining and text analytic tools, the text is identified and visualized for easier understanding [14]. Concept maps were displayed from the analysis represented in circles and the different themes [15].

#### 5. Results and Discussion

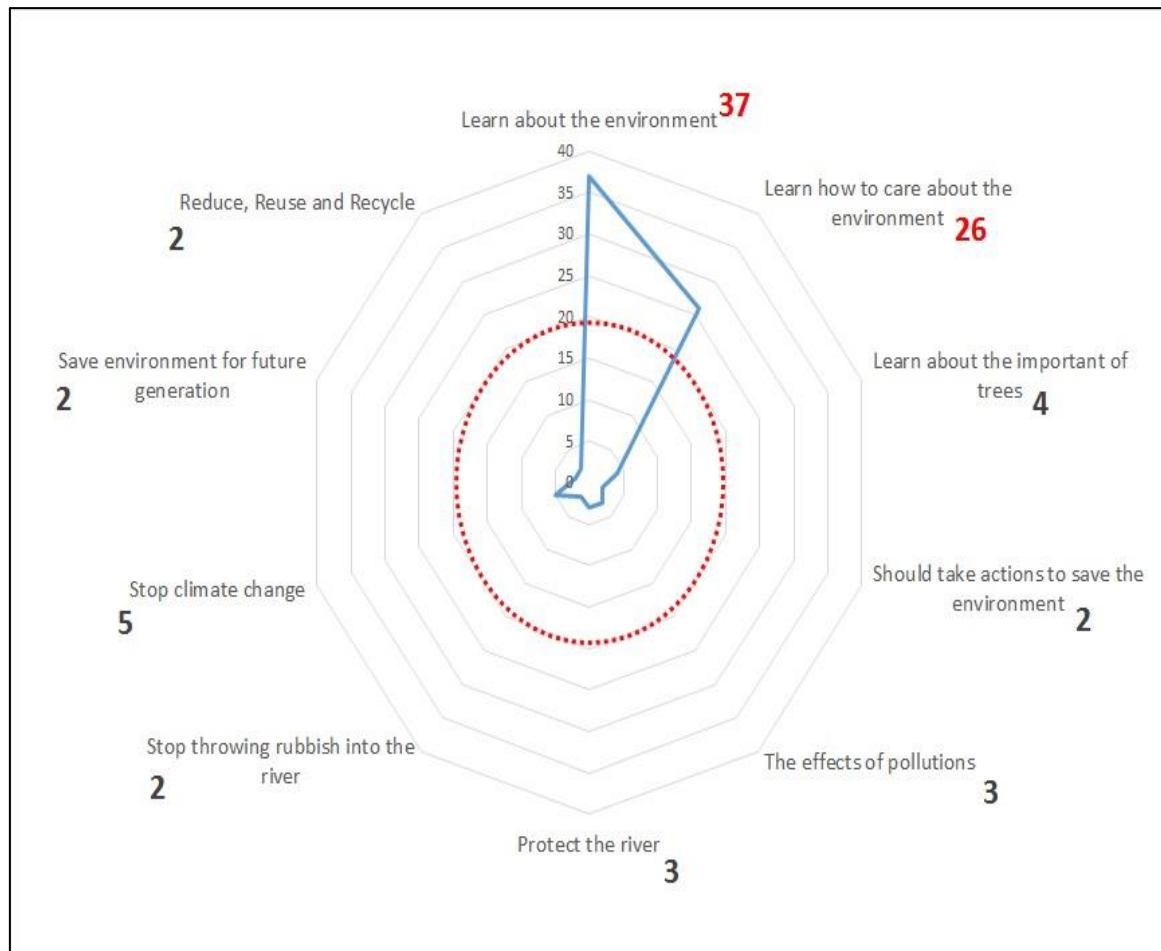
##### 5.1. Data analysis via Leximancer

One of the survey's open-ended questions was regarding the societies' things through the formal and informal learning of Environmental Education (EE). Leximancer groups together the results into related concepts that appeared with other concepts in the map. As a result, similar concepts are clustered together, as illustrated in figure 1. The concept is further analyzed by frequency and illustrated in the spider-web diagram, as in figure 2.



**Figure 1.** Conceptual map derived from Leximancer for the knowledge acquired from the formal and informal learning of environmental education.

Figure 1 above revealed the themes that emerged from the content analysis. Based on the figure, there are seven themes appeared; “plant”, “environment”, “care”, “learn”, “earth”, “conserving”, and “prevent”. The themes on the Leximancer conceptual map are heat-mapped, meaning, hot colours such as red and orange denote the most important themes while the cool colours like blue and green symbolize those that are less important. The connectivity score is to indicate the relative importance of the themes and the most important theme is at the top with 100% connectivity. Based on figure 1, the three most prevalent themes in the dataset were plant, environment and care.



**Figure 2.** Spider-web diagram showing the society environmental knowledge based on environmental education.

The spider-web diagram revealed that most of the societies in Kota Kinabalu possessed environmental knowledge where they have learned about the environment and the methods to take care of it. These were the two strong themes according to the results. It is good feedback as this reflects the impact of Environmental Education programmes in fostering an environmentally aware society. As mentioned in the previous literature, through real-life experiences, such as participation in an activity, an individual will learn more [16]. Results also showed that the societies learned about their responsibilities to stop climate change and that the trees are essential in sustaining life on earth. The other domains, such as the effects of pollutions, protecting the river, are least mentioned. The next part of the questionnaire is to identify and determine society's environmental behaviour in Kota Kinabalu, Sabah.

### 5.2. Significance difference between variables based on the demographic aspect (gender)

The significant difference between variables based on gender from the data collected in Kota Kinabalu, Sabah is measured by using the independent samples t-test. As shown in Table 1 below, the research results revealed that for each variable measured, there was a significant difference between society's awareness, responsibility, attitude, and behaviour based on the respondents' gender. The significance value for each variable is less than 0.05. Therefore, the hypotheses  $H_1^a$ ,  $H_1^b$ ,  $H_1^c$ , and  $H_1^d$  are failed to reject. This result supported the previous research findings by [7, 17]. With a significant difference and based on the mean score, it revealed that female respondents' had a higher awareness, responsibility, attitude, and behaviour towards environmental conservation and sustainability than the male respondents with a slight difference. It is one of the initial steps that lead to the ability to carry on responsible citizenship behaviour. This finding is therefore supported by the findings by [7, 18, 19, 20, 21]. It revealed that both genders possessed their responsibility towards the environment with females showed a more responsible environmental behaviour and actively involved in environmental programmes than the male.

**Table 1.** Mean score difference (awareness, responsibility, attitude, behaviour) based on gender.

	Gender	N	Mean	Std. Deviation	Sig.(2-tailed)
AWRE	Male	197	4.2250	.28052	.01999
	Female	303	4.2649	.28388	.01631
RESP	Male	197	4.3953	.23604	.01682
	Female	303	4.4312	.24943	.01433
ATTI	Male	197	3.9530	.39849	.02839
	Female	303	4.0763	.38914	.02236
BVOR	Male	197	3.9530	.39849	.02839
	Female	303	4.0763	.38914	.02236

### 5.3. Correlation analysis on the society's awareness, responsibility, and attitude with a lifelong attitude of pro-conservation behaviour

Table 2 below showed the correlation analysis between variables. The Pearson correlation, the significance value, and the ( $r$ ) value were used because of their ability to identify and measure the investigated variable's relationship. The result revealed a significant positive correlation and a weak correlation to society's awareness ( $r = .351$ ,  $p = .000$ ) with a lifelong pro-conservation behaviour attitude. The results also revealed that society's responsibility had a significant positive correlation and a weak correlation ( $r = .484$ ,  $p = .000$ ) with a lifelong pro-conservation behaviour attitude. There was also a significant positive correlation and a medium correlation on society's attitude ( $r = .552$ ,  $p = .000$ ) with a lifelong pro-conservation behaviour attitude. The result of this research study is supported by the previous research findings conducted by [7, 9, 22, 23, 24, 25, 26]. Therefore, the hypothesis  $H_2$  is failed to reject when there was a significant correlation between society's awareness, responsibility, and attitude with a lifelong attitude of pro-conservation behaviour. The research findings revealed that the society possessed a positive awareness, responsibility, and attitude towards environmental conservation. Positive results produced positive impacts from environmental education towards developing a lifelong attitude of pro-conservation behaviour among society. The results also showed that societies had the information and understanding of the environment and knew its current states or conditions. The awareness and responsibility they possess will generate positive behaviour and produce more significant efforts to conserve and protect the environment.

**Table 2.** Correlations on the Society's Awareness, Responsibility and Attitude with the Lifelong Attitude of Pro-Conservation Behavior

Variables	AWRE	RESP	ATTI	BVOR
Pearson Correlation	1	.482**	.365**	.347**
AWRE Sig. (2-tailed)		.000	.000	.000
N	500	500	500	500
Pearson Correlation	.482**	1	.515**	.486**
RESP Sig. (2-tailed)	.000		.000	.000
N	500	500	500	500
Pearson Correlation	.528**	.515**	1	.545**
ATTI Sig. (2-tailed)	.000	.000		.000
N	500	500	500	500
Pearson Correlation	.351**	.484**	.552**	1
BVOR Sig. (2-tailed)	.000	.000	.000	
N	500	500	500	500

\*\* . Correlation is significant at the 0.01 level (2-tailed).

## 6. Conclusion

The data analysis through Leximancer revealed that most societies in Kota Kinabalu possessed environmental knowledge regarding the environment through the formal and informal learning of Environmental Education. The data also identified a significant difference in social awareness, responsibility, attitude, and behaviour based on gender, with females demonstrating more environmentally responsible behaviour. The data identified that society possessed a positive correlation with their awareness, responsibility, and attitude with a lifelong pro-conservation behaviour attitude. Environmental Education (EE) is a long-term process that attempts to understand the environment and encourage pro-environmental values. Many works of literature have suggested a variety of techniques in carrying out environmental education programmes. It is fundamental for environmental educators to consider using a more holistic approach in their teaching [27]. EE should be fundamental and integral parts of education for all levels of society as it generates various impacts on environmental and ecosystem sustainability.

## 7. Recommendations

It is recommended that Environmental Education (EE) programmes involving the conservation of the environment and biodiversity should be organized in Sabah, Malaysia. EE should also be promoted to other parts of the world. Conservation issues can positively impact society's behaviour towards conservation, encourage innovative and effective ways to conserve and preserve the environment to maintain environmental sustainability. More research studies are encouraged to be carried out at different parts of Malaysia to identify and explore society's awareness, responsibility, attitude, and behaviour towards environmental conservation. It is suggested for a research design that has a better evaluation method and used a bigger sample size to represent the population. Many factors drive environmental behaviour in society; thus, further studies to understand the barriers and motivations behind pro-environmental behaviour are undertaken in Malaysia to better plan and implement EE.

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