

Development of Environmental Education Model for Primary School Pupils in Malaysia

Norazilawati Abdullah*

Universiti Pendidikan Sultan Idris, UPSI, Malaysia

Kung-Teck Wong

Universiti Pendidikan Sultan Idris, UPSI, Malaysia

Rosnidar Mansor

Universiti Pendidikan Sultan Idris, UPSI, Malaysia

Lilia Halim

Universiti Kebangsaan Malaysia, UKM, Malaysia

Haryanti Mohd Affandi

Universiti Kebangsaan Malaysia, UKM, Malaysia

Abstract

The research was conducted to develop an Environmental Education Model and to identify the level of awareness, knowledge, attitude and skill of primary school pupils in Malaysia towards the environment using the model. The research was conducted through a survey using a questionnaire. The sample was randomly selected, involving 1000 pupils of Year 5 from Peninsular Malaysia divided into four zones, north zone (Kedah), east zone (Kelantan), west zone (Kuala Lumpur) and south zone (Melaka). The findings showed that the level of awareness, knowledge, attitude and skill of pupil were at a high level. The model had been developed by looking at direct impact testing through Evaluation Assessment Structural Equation Modeling (SEM) which suggested that awareness and skill factors were factors that significantly influenced pupils' attitudes toward environmental education. Both relationships were positive. However, the relationship between knowledge and attitude was not significant. The findings also revealed that the awareness factor was the factor that most strongly influenced pupil's attitudes. It can be concluded that the awareness variable was the main predictor of this structure model in predicting pupils' appreciation toward environmental education.

Keywords: Environment education model; Environment; Science; Primary school pupil.



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1. Introduction

The Malaysian Ministry of Education (MOE) has taken a wise step by introducing Environmental Education at the primary school level. The application of pure values involves the process of teaching and learning in the classroom and outside of the classroom through the school's co-curriculum activities. According to Bahaman (2013), environmental education is an important element for improving the quality of the environment by inculcating the importance of environmental preservation and conservation. This situation can ensure that the environment is maintained in addition to improving the quality of life of mankind.

The environmental education subject was introduced by the MOE and it has been included in formal education since 1986 through the Nature and Human subjects for pupils of level 2 including Year 4, Year 5 and Year 6. The implementation of environmental education in Malaysia was prompted by the Conference of Human and Environment at Stockholm in 1972 to discuss environmental education to increase knowledge, the formation of human positive values and attitudes towards the environment. Education has become the most appropriate way to control environment and sustainable development as well as the importance of education for environment and education for sustainability after the Tbilisi Conference in 1977 (Fien, 1993; Huckle, 1983).

Many researchers have found that educational institutions such as schools are the most effective way to spread environmental education and resolve environmental issues at an early stage. Education is one of the most appropriate and important areas for introducing and exposing the environment to primary school pupils. Environmental education has been introduced in the science subject and this indicates the importance for environmental education to be exposed at an early stage. According to Nurul *et al.* (2012a), environmental education is an area that is important and appropriate to generate a society which is aware of the knowledge of the environment, the skills of caring for the environment, values and the correct action to care for the environment through educational institutions such as schools.

In the context of the environment, environmental education is an appropriate area for presenting and exposing knowledge of the environment to humans in order to produce a sensitive and environmentally conscious human

being. Education plays an important role in protecting the environment (Rohana, 2013). Environmental education is a process of education about the environment, through the environment and for the environment. According to (Palmer and Neal, 1998), The World Conservation Strategy states that environmental education is a way to transform the attitudes and behaviour of the society to establish environmental ethics. Environmental education can realize the goal of the country to produce a sensitive, educated, knowledgeable and skilled society with good values regarding environmental issues. The knowledge acquired by the country's citizens is able to reduce and solve the problem of environmental pollution (Mohd Zohir and Nordin, 2007).

2. Problem Statement

The issue of environmental awareness is still an issue that cannot be solved thoroughly. This is because of pollution and environmental degradation that is increasingly day by day and worrying. This situation is clearly proven through news and reports in the mass media and also in research by researchers.

The environmental problems which we face nowadays demand an increased effort to establish relevant policy, theory, research, curriculum, teaching and learning as well as more coherent and holistic assessment and planning (Marcinkowski, 2009). According to Ballantyne *et al.* (2006), this environmental problem needs to be restored and therefore, environmental education for youths and adults is seen to be part of the solution to the problem of environmental pollution.

Education is the best medium to spread the concept of sustainable development education to the general public. Most environment awareness programs nowadays focus on the awareness in environmental, economic and social aspects towards a more sustainable life. In Malaysia, for example the Sustainable School Award Program Environment (SLAAS) has been introduced for that purpose. According to Habibah and Punitha (2012), the existence of an awareness relationship between parents and pupils can provide a positive influence in the education of sustainable development. Environmental awareness needs to be introduced from a young age by parents because the parents are the ones who are the closest to the children. Although levels of understanding towards behaviour is influenced by experience at school, the experience at home brings more impact in the growth and development of children (Musser and Diamond, 1999).

Therefore, this research is conducted to determine the level of knowledge and awareness and to determine the attitudes and skill practised by primary school pupils regarding environmental protection. Through this research, it is also hoped that an environmental education model for primary school pupils in Malaysia can be developed.

3. Research Objective

- 1) Determining the level of knowledge and awareness of primary school pupils about the environment
- 2) Determining the level of attitudes and skill practised by primary school pupils regarding environmental protection.
- 3) Developing an Environmental Education Model to improve the knowledge, awareness, attitudes and skill of primary school pupils towards good environmental care.

4. Research Methodology

The research utilised the quantitative design using the survey method. The research instrument was a questionnaire adapted from the New Environmental Paradigm (NEP) version of 1978 and 2000. It had been translated and modified according to the suitability of primary school pupils and situation in the country. A pilot study was also conducted to ascertain the reliability of this research instrument. 1000 pupils from Year 5 of national schools in Kelantan (east zone - interior), Kedah (north zone-fishing area), Kuala Lumpur (west zone - city area) and Melaka (zone south-tourism area) were taken as research samples representing primary school pupils in peninsular Malaysia. The sampling technique used in this study was simple random sampling. The data of this research had been analyzed using descriptive analysis. The IBM SPSS Amos software in SEM analysis had been used for the production of the Environment Education Model.

5. Research Findings

5.1. Descriptive Findings

Table 1 shows the analysis of the findings for research objectives 1, 2 and 3 of the mean level of knowledge, awareness, skills and attitudes toward the environment. The analysis showed that the level of knowledge primary school pupil about the environment was high as shown by the mean value ($M=3.69$). The level of attitudes primary school pupil towards environmental care was high ($M = 4.04$) while the level of skill was also high ($M = 3.70$). This showed that all elements of knowledge, awareness, attitudes and skills towards the environment were high among the primary school pupils.

Table-1. Descriptive findings level of knowledge, awareness, attitudes / values and skills towards environmental education

Variable	Mean Value (level)
Knowledge	3.69 (high)
Awareness	3.83 (high)
Attitudes	4.04 (high)
Skills	3.70 (high)

5.2. Validation Measurement Model

The CFA validation factor analysis process on the measurement model for this research was carried out using the IBM SPSS Amos version 22 software. Table 2 shows the Goodness-of-fit index for the measurement model in this study.

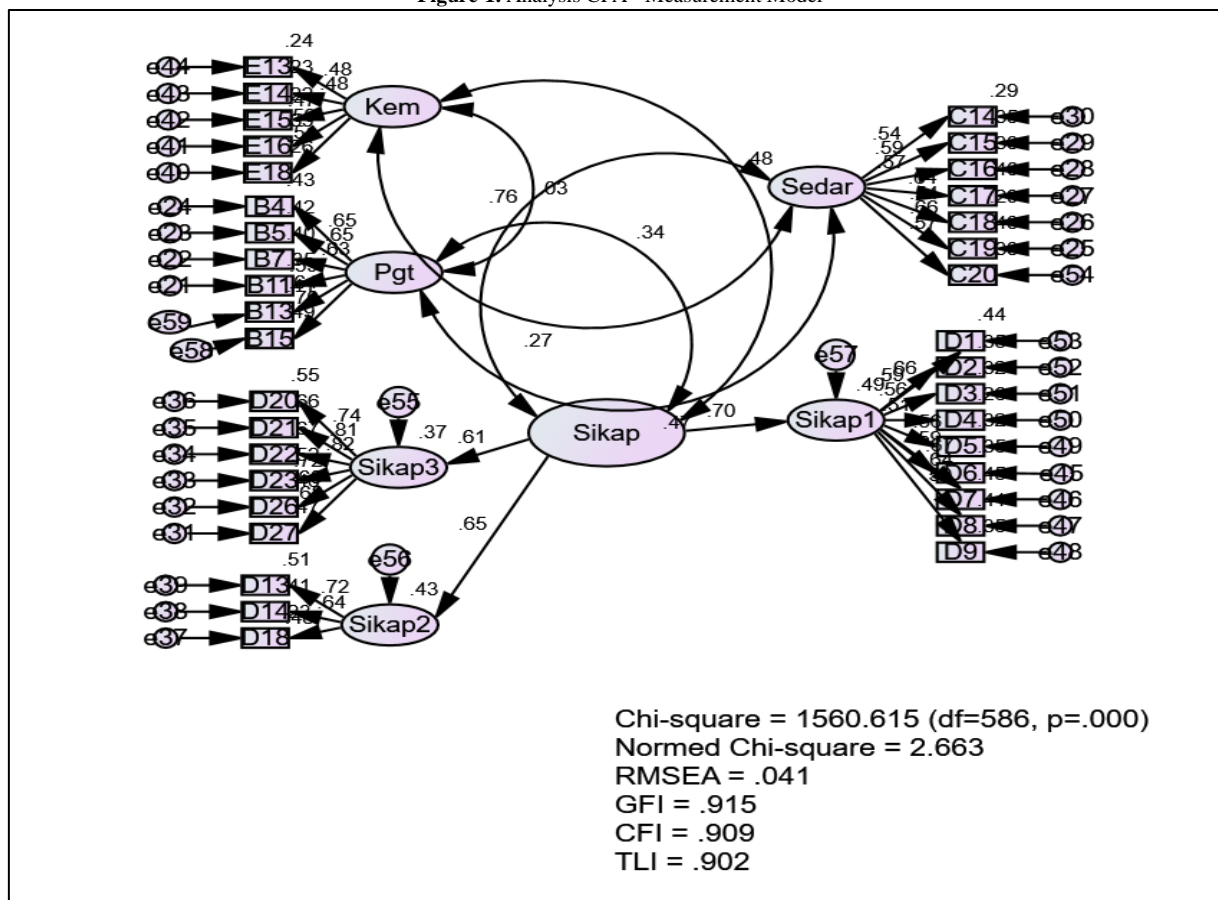
Table-2. Goodness-of-fit Index for the measurement model

Index Goodness-of-fit	Criteria (Acceptance level)	Model Fit (Model Pengukuran)
Chi-square (χ^2)	Sig. $\alpha=0.05$	1560.615 (586,.000)
Normed Chi-square (χ^2/df)	1 - 5	2.663
RMSEA	< 0.08	0.041
GFI	> 0.8	0.915
CFI	≥ 0.9	0.909
TLI	≥ 0.9	0.902
SRMR	< 0.08	0.053

Note: Sig. for the value of Chi-square (χ^2) is expected. Hair *et al.* (2014); ignore the absolute fit index of minimum Chi Square Discrepancy, if the sample size exceeds 200 people.

The findings of the analysis showed that the fit model for the measurement model was acceptable and had a qualified Goodness-of-fit level of acceptance. Therefore, the data model of this research was appropriate for the next level of analysis process. Figure 1 shows the results of CFA measurement model analysis for this research model.

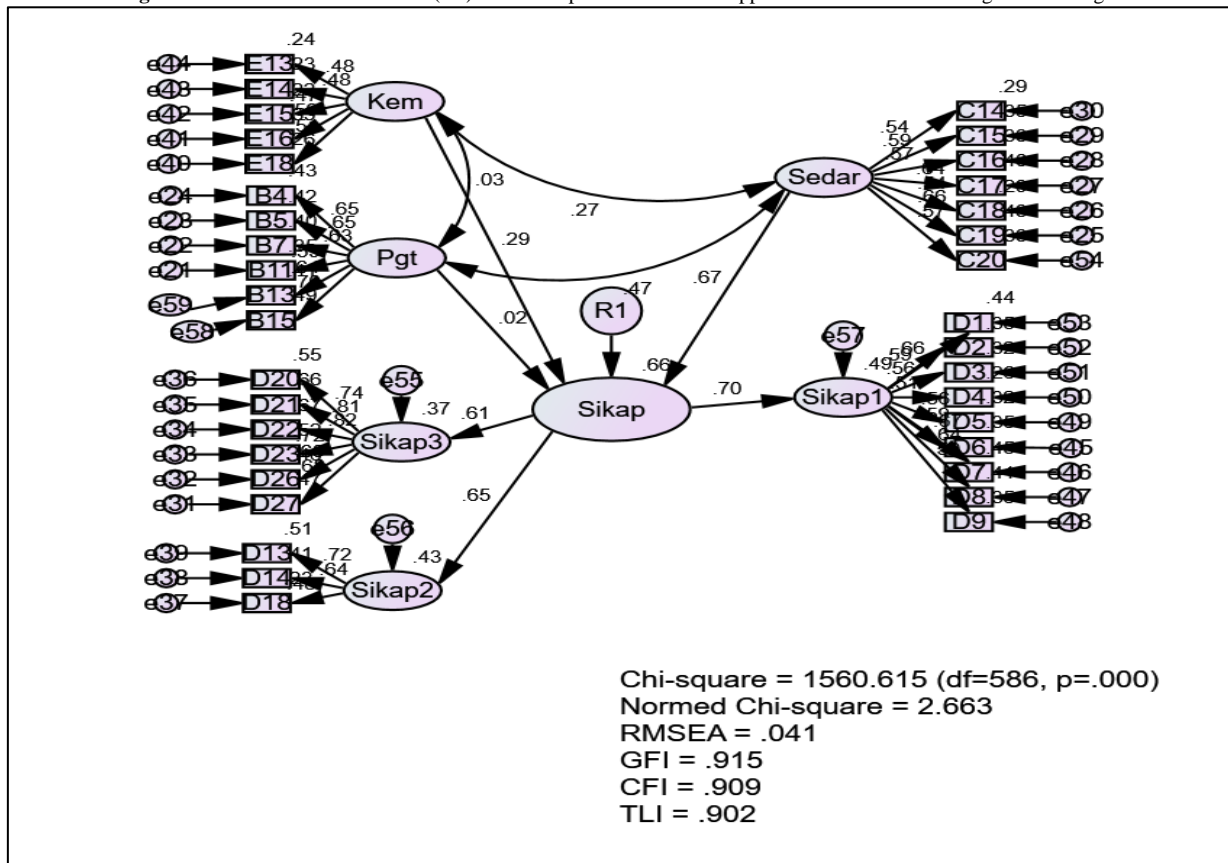
Figure-1. Analysis CFA - Measurement Model



5.3. Structure Model Assessment - Structure Equation Modeling (SEM)

Structural Equation Modeling Assessment or Structural equation modeling (SEM) was also performed. There existed an endogenous variable influenced by three exogenous variables in this model research (Figure 2). The endogenous variables were attitude, which was formed from the second stage factor (Attitude1, Attitude2 and Attitude3), while the three exogenous variables were skill, awareness and knowledge.

Figure-2. Environmental Education (EE) Model Proposed with Value Approximate Standardized Regression Weights



The parameter approximation method had also been implemented in the SEM analysis to test and prove the proposed environmental education model based on the findings of this research. Table 3 shows a summary of the findings of the direct effects of the research model.

Table-3. Summary of Direct Impact Test (Direct effect)

Relationship hypothesis	Research Model		
	Standardized estimate (β)	value-t	value-p
Awareness--->Attitude	0.670	9.872	***
Knowledge--->Attitude	0.019	0.418	0.676 ^{ns}
Skill--->Attitude	0.295	5.622	***
R ² (ATTITUDE) = 0.657			
Statistic Goodness-of-fit; $\chi^2=1560.615$ (df=586,p=0.000), $\chi^2/df=2.663$, CFI=0.909, TLI=0.902, GFI=0.915, RMSEA=0.041, SRMR=0.053.			

Note: Adequacy value-Significant χ^2 , χ^2/df between 1 - 5, CFI >0.90, TLI >0.90, GFI >=0.90, RMSEA <0.08, SRMR <0.08. ***p<0.001, **p<0.05, *p<0.1, ^{ns} not significant

Overall, the fit index for model structure study had been fulfilled, so the estimated value of the coefficient lines (standardized estimated - β value) for all relationship had been evaluated for the direct impact relationship assessment in the study model.

The SEM analysis results showed that the estimated coefficient of pathways from awareness to attitude (awareness ---> attitude) was significant with relation (β = 0.670, t = 9.872; p = 0.000). the p-value was lower than 0.05, therefore the research concluded that awareness significantly influenced attitude in environmental education. the results of the study showed that there was high awareness in encouraging the attitude of pupil to understand environment education. An estimation of the route coefficients from knowledge to attitude (knowledge->>attitude) showed insignificant findings with weak relationships (β = 0.019, t = 0.418; p = 0.676). the p-value was higher than 0.05, therefore the findings proved that there was no relationship between knowledge and attitude. the study concluded that the pupils' knowledge had no influence towards their attitude. the findings indicated that any change in the pupils' knowledge did not contribute to the improvement of their attitude to appreciate and practise the education of the environment. The sem analysis showed estimated coefficients from skill to attitude as significant shown by the relationship (β = 0.295, t = 5.622; p = 0.000). The p-value was lower than 0.05. the study concluded that skill significantly influenced attitude in environmental education. the findings showed that the students' skills should be able to influence their attitude to understand environmental education. The squared multiple correlations analysis (r2) showed that the variance of the attitude construct as predicted by exogenous variables was 0657 (r2 for attitude = 0657). This indicated that 65.7% of the total variance in the attitude construct can be predicted by the

variance in awareness, knowledge and skill. These results illustrate that there were only 34.3% of the change in attitude due to other factors not predicted by this research model.

Overall, the direct impact of testing through the sem analysis suggested the factors of awareness and skill as significant factors in influencing the pupils' attitude in understanding environmental education. both relationships were positive with values of $\beta \leq 0.295$ (beta value for awareness ---> attitude = 0.670, skill ---> attitude = 0.295). meanwhile, the relationship between knowledge and attitude was not significant. the results of the analysis also revealed that awareness was the strongest factor influencing pupil's attitude. Therefore it could be concluded that the awareness variable was the main predictor in this research structure model in predicting the pupils' appreciation of environmental education.

6. Discussion

According to Rodzli (2013), and Rohana *et al.* (2013), the level of environment awareness was lower among pupils in rural areas compared to pupils in urban areas. As stated by Lim (2005), the level of environmental awareness of pupils was still at a low level and this was supported by Md Rofiki (2013). The findings of this study were very different from the previous study findings which showed that the level of awareness was high. This indicates a positive progress and shows that the level of pupils' awareness has currently increased.

However, the findings are in line with the findings from Mohd *et al.* (2003), and Siti (2012), which state that the knowledge and attitude of pupil were at a high level but the practice of the environment was still at a low level. The findings are in line with Zurida (2013), study that pupils had good awareness of environmental problems but the awareness had not been transformed to practice. This statement was also supported by Wahida *et al.* (2004), who stated that the awareness of the preservation of the environment had increased in the community, but the level of individual involvement in environmental preservation activities was still at a low level.

The findings also support the study of Daniel and Niklas (2017), which stated that there were differences in sustainable awareness and sustainable development between male and female pupils. It was found that female pupils were more concerned and sensitive about sustainable awareness. The findings support the studies conducted by Boeve-de *et al.* (2014), Oerke and Bogner (2010), Zelezny *et al.* (2000), which found that there were differences in environmental education between males and females, and it was found that female students had more knowledge, were more positive and showed more awareness towards the environment. Daniel and Niklas (2017), also found that the levels of awareness were different according to the pupils' age whereby the pupils' knowledge about the environment increased in line with age: the higher the age, the higher the levels of sustainable awareness. Additionally, the research also found that the levels of sustainable awareness of primary school pupils in Sweden were different according to the settlement areas and the families' social economic status.

According to Nurul (2013), environmental education did not seem to achieve the desired goal in learning and the teaching in environmental education was only concerned with giving information and influencing attitudes without encouraging more environmentally responsible actions. The findings of the study by Mukoni (2013), found that students had high environmental awareness; however, as seen from the aspect of behaviour and the involvement of students in handling environmental problems, the levels shown were moderate and low. Knowledge will increase awareness and concern (attitude) will produce individuals with more positive behaviour towards the environment (Kollmuss and Agyemann, 2002).

Research by Biedinger and Klein (2010), found that the home environment and parental education played a key role in improving the child's cognition in shaping better behaviour. Parental attitudes will determine the family environment and influence the development of children. Therefore, families play an important role in educating children to take care of the environment. Villacorta (2003), who developed the Motivation Towards the Environment Scale (MTES) instrument, found that individuals were more likely to engage in environmental behaviour if their parents had shown such interest; therefore, parents need to nurture and inculcate a sense of responsibility as the environment begins at home.

7. Summary

Overall, this research had produced a model of environmental education (EE) for primary school pupil in Malaysia. The awareness factor was the most powerful factor influencing the pupils' attitudes. Therefore, it can be concluded that awareness was the main element in the formation of an environmental model for this study. As indicated by this study, Year 5 pupils in Malaysia had a high level of knowledge, awareness, attitude and skill about the environment. This situation needs to be maintained so that stability and sustainability environment can be preserved for future generations.

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