



***EFFECTIVENESS OF A CITY COUNCIL'S ENVIRONMENTAL EDUCATION
MODULE IN ENHANCING PUPILS' KNOWLEDGE,
ATTITUDE, BEHAVIOUR INTENTION AND BEHAVIOUR TOWARDS
ENVIRONMENT***

KARTINI BINTI MOHD ISMAIL

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By

KARTINI BINTI MOHD ISMAIL

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in
Fulfilment of the Requirements for the Degree of Master of Science**

December 2019

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science.

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December 2019

Chairperson : Associate Professor Rosta binti Harun
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Due to numerous environmental problems in Malaysia, education has been identified as one of the best methods to create the generation equipped with the knowledge, awareness, and strong implementation of sustainability. This study was undertaken in responsible to evaluate an instructional method of Environmental Education Module. This module had been used for more than 20 years as the main teaching and learning tool in Awareness Camp as one of the initiatives in informal education. One group pre and post-quasi-experimental study was conducted involves 32 primary five pupils from two identified school in the area under the supervision of MBPJ via purposive sampling. The sample undergoes the intervention for three days and two nights in a camp in Bagan Lalang. Four series of test were conducted namely pre-test (to access initial level of knowledge, attitude, behaviour intention and behaviour before intervention), post-test (to access immediate effects of intervention), one month post-delayed test (to access continuous effects of intervention) and six months post-delayed test (to access continuous and long term effects of intervention).

Based on the analysis of Repeated Measure ANOVA it is found that there is a significant different in knowledge Wilks' Lambda = .409, $F(3, 29) = 13.951$, $p = .00 < 0.005$, $\eta^2 = .591$ and in behaviour intention Wilks' Lambda = .60, $F(3, 29) = 1.193$, $p = 0.002 < 0.005$, $\eta^2 = .04$. Thus, hypothesis H_{01} and H_{03} were rejected. Further analysis by pairwise comparison, Post Hoc with Bonferroni adjustment found that there is a statistically difference found in knowledge in the pair of post-test ($M = 15.53$, $SD = 2.94$) compare to the pre-test ($M = 11.50$, $SD = 3.50$), one month post-delayed test ($M = 15.28$, $SD = 2.79$) compare to the pre-test ($M = 11.50$, $SD = 3.50$) and six months post-delayed test ($M = 14.75$, $SD = 2.90$) compare to the pre-test ($M = 11.50$, $SD = 3.50$). This indicates that the module able to give positive impacts to enhance pupils' knowledge towards the

environment and persist it until six months upon completion of the intervention. On the other hand, a similar result was also found in behaviour intention in the pair of post-test ($M = 4.12, SD = 0.31$) when compared pre-test ($M = 3.88, SD = 3.041$). This indicates that the module able to trigger and enhance the behaviour intention towards the environment for a very short period of time. This suggested that the usage of the module as the main teaching and learning tool in Awareness Camp conducted by MBPJ capable of enhancing knowledge and behaviour intention. Perhaps, the cultivation of domains studied might be more efficient if the effort involves a long term and continuous initiatives with add on elements to enhance the module for further usage in the future.



Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

**KEBERKESANAN MODUL PENDIDIKAN ALAM SEKITAR MAJLIS
PERBANDARAN DALAM MENINGKATKAN PENGETAHUAN, SIKAP,
HASRAT PERLAKUAN DAN TINGKAH LAKU MURID TERHADAP ALAM
SEKITAR**

Oleh

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Berikutan pelbagai masalah alam sekitar yang melanda Malaysia, pendidikan alam sekitar di kenalpasti sebagai satu salah satu cara yang mampu menghasilkan generasi yang berpengetahuan, mempunyai kesedaran yang tinggi dan juga mampu melestarikan alam sekitar. Kajian ini dijalankan untuk menilai kaedah instruksional modul Pendidikan Alam Sekitar. Modul ini telah digunakan selama lebih dari 20 tahun sebagai bahan utama dan pengajaran dan pembelajaran di Kem Kesedaran Alam Sekitar (KeKAS) sebagai salah satu inisiatif Pendidikan secara informal. Kaedah kuasi eksperimental ujian pra dan pasca satu kumpulan dengan pengukuran berulang telah dijalankan dan melibatkan seramai 32 orang murid tahun lima dari dua buah sekolah yang telah dikenalpasti yang berada di bawah seliaan MBPJ telah dipilih melalui kaedah persampelan bertujuan. Sampel telah menjalani intervensi selama tiga hari dua malam di satu kem di Bagan Lalang. Empat siri ujian telah dijalankan iaitu ujian pra (untuk menilai pengetahuan, sikap, hasrat perlakuan dan tingkahlaku alam sekitar sebelum diberi intervensi), ujian pasca pertama (untuk menilai kesan segera dari intervensi), ujian pasca selepas satu bulan (untuk menilai kesan berterusan dari intervensi) dan ujian pasca selepas enam bulan (untuk menilai kesan jangka panjang dan berterusan dari intervensi).

Berdasarkan ujian ANOVA dengan pengukuran berulang, didapati terdapat perbezaan yang signifikan bagi pengetahuan terhadap alam sekitar Wilks' Lambda = .409, $F(3, 29) = 13.951$, $p = .00 < .005$, $\eta^2 = .591$ dan bagi hasrat perlakuan Wilks' Lambda = .60, $F(3, 29) = 1.193$, $p = .002 < .005$, $\eta^2 = .04$. Justeru itu, H_{01} dan H_{03} telah ditolak. Dapatan kajian melalui ujian perbandingan berpasangan (*pairwise comparison*) melalui *Post Hoc* menggunakan prosedur *Bonferroni* mendapati bahawa terdapat perbezaan yang signifikan bagi pengetahuan di antara pasangan ujian pasca ($M = 15.53$, $SD = 2.94$) berbanding ujian pra ($M = 11.50$, $SD = 3.50$), ujian pasca selepas sebulan ($M = 15.28$, $SD =$

2.79) berbanding ujian pra ($M = 11.50, SD = 3.50$) and ujian pasca selepas enam bulan ($M = 14.75, SD = 2.90$) berbanding ujian pra ($M = 11.50, SD = 3.50$). Dapatan kajian ini menunjukkan bahawa, modul alam sekitar yang digunakan memberi impak yang positif dan mampu meningkatkan pengetahuan terhadap alam sekitar dan ia juga mampu memberikan kesan jangka panjang (sekurang-kurangnya enam bulan) selepas penggunaannya. Selain itu, dapatan yang hampir sama juga diperoleh bagi hasrat perlakuan terhadap alam sekitar di mana terdapat perbezaan yang signifikan di antara ujian pasca ($M = 4.12, SD = 0.31$) apabila dibandingkan dengan ujian pra ($M = 3.88, SD = 3.041$). Dapatan ini menunjukkan bahawa penggunaan modul alam sekitar tersebut mampu mencetuskan perubahan yang positif. Namun begitu, kesannya adalah untuk jangka masa yang sangat pendek. Kajian ini mencadangkan bahawa penggunaan modul alam sekitar sebagai bahan utama dalam proses pengajaran dan pembelajaran di Kem Kesedaran Alam Sekitar yang dianjurkan oleh MBPJ mampu meningkatkan pengetahuan dan hasrat perlakuan terhadap alam sekitar. Adalah dicadangkan bahawa untuk mendapatkan kesan yang lebih baik terhadap penerapan domain-domain dalam kajian ini, usaha yang berbentuk jangka panjang dan berterusan dengan diselitkan dengan elemen-elemen tambahan mampu menaik taraf modul untuk kegunaan pada masa hadapan.

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Science. The members of the Supervisory Committee were as follows:

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TABLE OF CONTENTS

	Page
ABSTRACT	i
ABSTRAK	iii
ACKNOWLEDGEMENTS	v
APPROVAL	vi
DECLARATION	viii
LIST OF TABLES	xiv
LIST OF FIGURES	xviii
LIST OF SYMBOLS AND ABBREVIATIONS	xx
CHAPTER	
1 INTRODUCTION	1
1.1 Preface	1
1.2 Background of the Study	1
1.3 Statements of Problem	3
1.4 Objective of the Study	5
1.5 Research Question	6
1.6 Research Hypothesis	6
1.7 Scope and Limitation of the Study	7
1.8 Significance of the Study	7
1.9 Operational Definition of Terms	9
1.10 Thesis Organization	11
2 LITERATURE REVIEW	13
2.1 Introduction	13
2.2 Definition of Environment Education	13
2.3 Goals and Objectives of Environment Education	14
2.4 The Principles of Environmental Education	16
2.5 The History of Environmental Education	17
2.6 Environmental Education in Malaysia	17
2.7 Model and Theory Related to Environmental Education	20
2.7.1 Model of Environmental Education Learning Approach	20
2.7.2 Early Models of Pro-Environmental Behaviour	21
2.7.3 Model of Responsible Behaviour, ERB	21
2.7.4 Theory of Reasoned Action, TRA	22
2.7.5 Theory of Planned Behaviour, TBP	23
2.7.6 Summary of Model and Theory Related to Environmental Education	24
2.8 Module in Teaching and Learning	25
2.8.1 The Concept and Types of Module	25
2.8.2 Benefit of Module in Teaching and Learning	25
2.9 Studies Pertaining Environmental Education Module	26
2.9.1 An Evaluation of the Risk Environment Education Module	26

	2.9.2	The Effectiveness of the Tropical Forest Ecosystem Teaching Module in Improving Students' Knowledge and Attitude	28
	2.9.3	Effect of Project-based Learning on Environmental Literacy of Pre-Service Teachers at an Institute of Teacher Education in Malaysia	30
3		METHODOLOGY	33
	3.1	Introduction	33
	3.2	Research Design	33
	3.3	Research Framework	37
	3.4	Research Population and Sampling Procedure	38
	3.4.1	Research Sampling	39
	3.5	Research Procedure	40
	3.6	Instrumentation	43
	3.7	Validity of the Questionnaire	44
	3.8	The Pilot Study	45
	3.9	Reliability of Instrument	46
	3.10	Item Analysis	47
	3.11	Data Analysis	49
	3.11.1	Preliminary Analysis	49
	3.11.2	Descriptive Data Analysis, EDA	50
	3.11.3	Inferential Analysis	50
4		RESULTS AND DISCUSSION	52
	4.1	Introduction	52
	4.2	Demographic Profile	52
	4.3	Explanatory Data Analysis	53
	4.3.1	Assessing Normality on Knowledge Towards Environment in the Pre-Test, Post-Test, One Month Post Delayed Test and Six Months Post Delayed Test	54
	4.3.2	Assessing Normality on Attitude Towards Environment in the Pre-Test, Post-Test, One Month Post Delayed Test and Six Months Post Delayed Test	59
	4.3.3	Assessing Normality on Behaviour Intention Towards Environment in the Pre-Test, Post-Test, One Month Post Delayed Test and Six Months Post Delayed Test	64
	4.3.4	Assessing Normality on Behaviour Towards Environment in the Pre-Test, Post-Test, One Month Post Delayed Test and Six Months Post Delayed Test	69
	4.4	Descriptive Data Analysis	76
	4.4.1	Level of Knowledge Towards Environment in the Pre-Test, Post-Test, One Month Post Delayed Test and Six Months Post Delayed Test	76

4.4.2	Level of Attitude Towards Environment in the Pre-Test, Post-Test, One Month Post Delayed Test and Six Months Post Delayed Test	79
4.4.3	Level of Behaviour Intention Towards Environment in the Pre-Test, Post-Test, One Month Post Delayed Test and Six Months Post Delayed Test	81
4.4.4	Level of Behaviour Towards Environment in the Pre-Test, Post-Test, One Month Post Delayed Test and Six Months Post Delayed Test	83
4.5	Inferential Analysis	86
4.5.1	The Effectiveness of Environmental Education (EE) in Enhancing Pupils' Knowledge in Pre-Test, Post-Test, One Month Post Delayed Test and Six Months Post Delayed Test	86
4.5.2	The Effectiveness of Environmental Education (EE) in Enhancing Pupils' Attitude in Pre-Test, Post-Test, One Month Post Delayed Test and Six Months Post Delayed Test	89
4.5.3	The Effectiveness of Environmental Education (EE) in Enhancing Pupils' Behaviour Intention in Pre-Test, Post-Test, One Month Post Delayed Test and Six Months Post Delayed Test	91
4.5.4	The Effectiveness of Environmental Education (EE) in Enhancing Pupils' Behaviour in Pre-Test, Post-Test, One Month Post Delayed Test and Six Months Post Delayed Test	93
5	DISCUSSION, CONCLUSION, IMPLICATION AND RECOMMANDATION	98
5.1	Introduction	98
5.2	Summary	98
5.3	Discussion	99
5.3.1	The Level of Knowledge in Pre-Test, Post-Test, One Month Post Delayed Test and Six Months Post Delayed Test	99
5.3.2	The Level of Attitude in Pre-Test, Post-Test, One Month Post Delayed Test and Six Months Post Delayed Test	100
5.3.3	The Level of Behaviour Intention in Pre-Test, Post-Test, One Month Post Delayed Test and Six Months Post Delayed Test	101
5.3.4	The Level of Behaviour in Pre-Test, Post-test, One Month Post Delayed Test and Six Months Post Delayed Test	102

5.3.5	The Effectiveness of Environmental Education (EE) in Enhancing Pupils' Knowledge in Pre-Test, Post-Test, One Month Post Delayed Test and Six Months Post Delayed Test	102
5.3.6	The Effectiveness of Environmental Education (EE) in Enhancing Pupils' Attitude in Pre-Test, Post-Test, One Month Post Delayed Test and Six Months Post Delayed Test	104
5.3.7	The Effectiveness of Environmental Education (EE) in Enhancing Pupils' Behaviour Intention in Pre-Test, Post-Test, One Month Post Delayed Test and Six Months Post Delayed Test	105
5.3.8	The Effectiveness of Environmental Education (EE) in Enhancing Pupils' Behaviour in Pre-Test, Post-Test, One Month Post Delayed Test and Six Months Post Delayed Test	107
5.4	Conclusions	108
5.5	Implication	108
5.6	Recommendation for Future Research	109
REFERENCES		111
APPENDIX		123
BIODATA OF STUDENT		164
LIST OF PUBLICATION		165

LIST OF TABLES

Table		Page
1.1	The Module, Contents, and List of Developers for Environmental Awareness Camp	4
2.1	Dates and Events Regarding Environment	19
2.2	Variables and Instrument Used in the Study	27
2.3	Result/Finding of the Study	27
2.4	Instruments and Its Components used to Evaluate the Effectiveness of the Tropical Forest Ecosystem Teaching Module in Improving Students' Knowledge and Attitude	29
2.5	Instruments and Its Components Used to Evaluate the Effects of Project-Based Learning on Environmentally Literacy of Pre-service Teachers at An Institute of Teacher Education in Malaysia.	32
3.1	Overview of the Research Design	34
3.2	List of Samples	39
3.3	Summary of Instrument	44
3.4	List of Experts	45
3.5	Reliability Indices for the Instrument.	46
3.6	Difficulty Index and Discrimination Index of Item in Knowledge Towards Environment Domains.	48
3.7	Scoring for the Item in Likert Scale	49
3.8	Research Questions and The Inferential Statistic Used in The Analysis	51
4.1	Number of School and Respondents Involved	53
4.2	Tests of Normality for Knowledge Towards Environment	54
4.3	Tests of Skewness and Kurtosis for Knowledge Towards Environment	54
4.4	Tests of Normality for Attitude Towards Environment	59

4.5	Tests of Skewness and Kurtosis for Attitude Towards Environment	59
4.6	Tests of Normality for Behaviour Intention Towards Environment	64
4.7	Tests of Skewness and Kurtosis for Behaviour Intention Towards Environment	64
4.8	Tests of Normality for Behaviour Towards Environment	69
4.9	Tests of Skewness and Kurtosis for Behaviour Towards Environment	69
4.10	Summary of Result in Explanatory Data Analysis for Knowledge, Attitude, Behaviour Intention and Behaviour Towards Environment	74
4.11	Range of Mean and the its Interpretation of Knowledge Towards Environment	76
4.12	Summary of Mean and SD for Knowledge Towards Environment in Pre-Test, Post-Test, One Month Post-Delayed Test and Six Months Post-Delayed Test.	78
4.13	Range of Mean and Its Interpretation of Attitude Towards Environment	79
4.14	Overall Level of Attitude Towards Environment in Pre-Test, Post-Test, One Month Post-Delayed Test and Six Months Post-Delayed Test	80
4.15	Summary of Mean and SD for Attitude Towards Environment in Pre-Test, Post-Test, One Month Post-Delayed Test and Six Months Post-Delayed Test.	80
4.16	Overall Level of Behaviour Intention Towards Environment in Pre-Test, Post-Test, One Month Post-Delayed Test and Six months Post-Delayed Test	81
4.17	Summary of Mean and SD for Behaviour Intention Towards Environment in Pre-Test, Post-Test, One Month Post-Delayed Test and Six Months Post-Delayed Test.	82
4.18	Overall Level of Behaviour Towards Environment in Pre-Test, Post-Test, One Month Post-Delayed Test and Six Months Post-Delayed Test	83

4.19	Summary of Mean and SD for Behaviour Towards Environment in Pre-Test, Post-Test, One Month Post-Delayed Test and Six Months Post-Delayed Test.	83
4.20	Summary of Descriptive Analysis Results for Knowledge, Attitude, Behaviour Intention and Behaviour Towards Environment in Pre-Test, Post-Test, One Month Post-Delayed Test and Six Months Post-Delayed Test	85
4.21	Descriptive Statistics for Knowledge Towards Environment in With Statistics Test Score for Pre-Test, Post-Test One Month Post Delayed Test and Six Months Post-Delayed Test.	87
4.22	Multivariate Tests for Knowledge Towards Environment in Pre-Test, Post-Test One Month Post Delayed Test and Six Months Post-Delayed Test	87
4.23	Pairwise Comparison of Knowledge Towards Environment for Pre-Test, Post-Test, One Month Post Delayed Test and Six Months Post-Delayed Test.	88
4.24	Descriptive Statistics for Attitude Towards Environment in Statistics Test Score for Pre-Test, Post-Test, Delayed One-Month Post-Test, and Six Months Post-Delayed Test.	90
4.25	Multivariate Tests for Attitude Towards Environment in Pre-Test, Post-Test One Month Post Delayed Test and Six Months Post-Delayed Test.	90
4.26	Descriptive statistics for Behaviour Intention Towards the Environment in with Statistics Test Score for Pre-Test, Post-Test, One Month Post Delayed Test and Six Months Post-Delayed Test.	91
4.27	Multivariate Test for Behaviour Intention Towards Environment in Pre-Test, Post-Test One Month Post Delayed test and Six Months Post-Delayed Test.	91
4.28	Pairwise Comparison of Behaviour Intention Towards Environment for Pre-Test, Post-Test, One Month Post Delayed Test and Six Months Post-Delayed Test.	92
4.29	Descriptive statistics for Behaviour Towards Environment in with Statistics Test Score for Pre-Test, Post-Test, One Month Post Delayed Test and Six Months Post-Delayed Test.	94

4.30	Multivariate Test for Behaviour Towards Environment in Pre-Test, Post-Test One Month Post Delayed Test and Six Months Post-Delayed Test	94
4.31	Summary of Inferential Analysis Results for Knowledge, Attitude, Behaviour Intention and Behaviour Towards Environment in Pre-Test, Post-Test, One Month Post-Delayed Test and Six Months Post-Delayed Test	96



LIST OF FIGURES

Figure		Page
2.1	The Elements in Environmental Education Learning Approach Model	20
2.2	Early Models of Pro-environmental Behaviour	21
2.3	The Model of Responsible Behaviour, ERB	22
2.4	The Theory of Reasoned Action, TRA	23
2.5	Theory of Planned Behaviour, TBP	24
3.1	Research Framework (Adapted from Russel, 1974)	37
3.2	Research Procedure	42
4.1	Histogram with Frequency Curve of Knowledge Towards Environment in (a) Pre-Test (b) Post-Test (c) One Month Post-Delayed Test (d) Six Months Post-Delayed Test	55
4.2	Boxplot of Knowledge Towards Environment in (a) Pre-Test (b) Post-Test (c) One Month Post-Delayed Test (d) Six Months Post-Delayed Test	56
4.3	Normal Q-Q Plot of Knowledge Towards Environment in (a) Pre-Test (b) Post-test (c) One Month Post-Delayed Test (d) Six Months Post-Delayed Test	57
4.4	Detrended Normal Q-Q Plot of Knowledge Towards Environment in (a) Pre-Test (b) Post-Test (c) One Month Post-Delayed Test (d) Six Months Post-Delayed Test	58
4.5	Histogram with Frequency Curve of Attitude Towards in a) Pre-Test (b) Post-test (c) One Month Post-Delayed Test (d) Six-Months Post- Delayed Test	60
4.6	Boxplot of Attitude Towards Environment in a) Pre-Test (b) Post-Test (c) One Month Post-Delayed Test (d) Six Months Post-Delayed Test	61
4.7	Normal Q-Q plot of Attitude Towards Environment in a) Pre-Test (b) Post-Test (c) One Month Post-Delayed Test (d) Six Months Post-Delayed Test	62

4.8	Detrended Normal Q-Q Plot of Attitude Towards Environment in a) Pre-Test (b) Post -Test (c) One Month Post-Delayed Test (d) Six Months Post-Delayed Test	63
4.9	Histogram with Frequency Curve of Behaviour Intention Towards Environment in a) Pre-Test (b) Post-Test (c) One Month Post-Delayed Test (d) Six Months Post-Delayed Test	65
4.10	Boxplot of Behaviour Intention Towards Environment in a) Pre-Test (b) Post-Test (c) One Month Post-Delayed Test (d) Six Months Post-Delayed Test	66
4.11	Normal Q-Q plot of Behaviour Intention Towards Environment in a) Pre-Test (b) Post -Test (c) One Month Post-Delayed Test (d) Six Months Post-Delayed Test	67
4.12	Detrended Normal Q-Q plot of Behaviour Intention Towards Environment in a) Pre-Test (b) Post -Test (c) One Month Post-Delayed Test (d) Six Months Post-Delayed Test	68
4.13	Histogram with Frequency Curve of Behaviour Towards Environment in a) Pre-Test (b) Post-Test (c) One Month Post-Delayed Test (d) Six Months Post-Delayed Test	70
4.14	Boxplot of Behaviour Towards Environment in a) Pre-Test (b) Post-Test (c) One Month Post-Delayed Test (d) Six Months Post-Delayed Test	71
4.15	Normal Q-Q Plot of Behaviour Towards Environment in a) Pre-Test (b) Post-Test (c) One Month Post-Delayed Test (d) Six Months Post-Delayed Test	72
4.16	Detrended Normal Q-Q Plot of Behaviour Towards Environment in a) Pre-Test (b) Post -Test (c) One Month Post-Delayed Test (d) Six Months Post-Delayed Test	73

LIST OF ABBREVIATIONS

EE	Environmental Education
DOE	Department of Environment
MBPJ	Petaling Jaya City Council
ERB	Environmental Responsible Behaviour
TRA	Theory of Reasoned Action
TPB	Theory of Planned Behaviour
PBC	Perceived Behavioural Control
KR20	Kuder Richardson 20
EDA	Explanatory Data Analysis

CHAPTER 1

INTRODUCTION

1.1 Preface

This chapter describes the background of the study and the statement of the problem. It will be followed by the research objectives, research questions, research hypotheses, limitation of the study, significance of the study, and the operational definition of terms.

1.2 Background of the Study

Nowadays, humankind faces numerous environmental issues, along with rapid development globally. These imbalances had occurred in the ecological system as natural disasters such as global warming, air pollution, water pollution, ozone depletion, dwindling of natural resources and an increase in residual waste (Mahat et.al, 2019). Biologist sees that all of these disruptions and threats as a warning that the Earth are reaching its limits. According to the United National Millenium Ecosystem Assessment (2005), there is a substantial loss in the diversity of life on earth. Humans have changed their ecosystem more rapidly and extensively over the past 50 years compared to the period in human history in order to meet the demands of the development. These proofs that human had to make a major alteration on the earth that cause many drawbacks to nature and human itself.

In the Malaysia context, environmental disaster keeps happening every year. Chemical pollution of Sungai Kim Kim in Johor had affected many civilians, and some of them experienced permanent health problems due to the toxic fume (Berita Harian, 2019). Our first UNESCO biosphere reserve area in Malaysia, Tasik Chini is also slowly fading away due to these threats. This reserve area had been exploited by the irresponsible humans in the name of development (Astro Awani, 2018). In addition, illegal logging in Cameron Highland, Pahang and Kelantan in 2015 that was not aware by the local authorities had also threaten the sustainability of natural resources. Unprecedented occurrence of a flash flood in Kelantan, Pahang and followed by Sabah in 2014, are few other evidences of the human destruction in Malaysia. People nowadays are getting more in-humane in order to fulfil their self-interest.

Environmental Performance Index (EPI) is an index that measures the environmental performance of countries worldwide. It encloses comprehensive indicators on measuring and tracking a country's environmental performance under two major objectives, which are the Environmental Public Health and Ecosystem Vitality Performance. It ranks 180 countries based on 24 performance indicators.

Based on the performances of these objectives, Malaysia ranked ninth position in 2006, 26th in 2008, 54th in 2010, 25th in 2012, 51st in 2014 and 63rd in 2016 (Mei, Wai & Rahmalan Ahamad, 2016). Recent report produced by the Yale Centre for Environmental Law and Policy and the Centre for International Earth Science Information Network of Columbia University in 2018 witnessed that Malaysia had gone down to the 75th place. It had clearly shown us that our environment quality is getting worst each year. The dropping of Malaysia's performance in global EPI has raised the attention and concerns from the government and other authorities (Mei et al., 2016).

Environmental deterioration is mainly caused by poor values and irresponsible attitudes, lack of knowledge about the environment and incapacity to take remedial actions. Research by Omar Firdaus, (2016), also highlighted that the destruction of the environment is caused by attitude and insufficient knowledge about the cause and effects of their actions towards the environment and its impacts to human itself. Schier, (2003) mentioned that the concern over the loss of traditional moral values and ethical standards are due to development.

Furthermore, Kua (2001) attributed that the cause of environmental degradation is due to irresponsibility and non-accountability by certain parties while Haliza, (2017) stated that the main cause of this destruction is the tendency of human to neglect the responsibilities that have been entrusted to them by the Creator. In addition, Rosta and Noor Azura (2007) stated that the environmental problems such as destruction of forest, illegal logging, haze, landslides and others in Malaysia is a never-ending problem as the humans utilized all the natural resources without any limits.

Under all the circumstances stated above, education is one of the best methods to create a generation with knowledge, awareness and strong implementation of the practice of sustainability (Mahat, Hashim, Saleh and Balkhis, 2019). It is also the best approach in shaping the generation that is environmental knowledgeable and equipped with an awareness of nature (Jamilah et al., 2011).

Education had been accepted as a foundation tool to control the environment and sustainable development since the Tbilisi in 1977. Furthermore, environmental education plays a vital role in instilling values and attitudes and act as a tool for managing our environment (Haliza, 2017). Additionally, Kartini, (2008) also found that environmental education is a suitable and important approach to enhance knowledge, attitude and awareness towards environmental issues and problems. On the other hand, Kimaryo, (2011) also agrees and stated that education is a vital tool to preserve the environment through the development of knowledge, skills and positive attitude.

In Malaysia, environmental education is conducted via formal and in-formal education. In formal education, environmental education was not taught as a single subject (Muhammad Ibrahim et al., 2016). It was a cross-curricular elements that been integrated through few subjects since 1993. Research stated that the integration was not successfully executed and did not achieve its objectives (Gan, 1987; Mageswary et al.,

2006; Evalyn, 2003; Haliza, 2017). Thus, an alternative initiative was sought in order to ensure the EE objectives could be achieved

1.3 Statement of Problem

As mentioned before, the integration of Environmental Education in formal education found to be unsuccessful and failed to achieve the EE objectives (Gan, 1987; Mageswary et al., 2006; Evalyn, 2003; Haliza, 2017). Another alternative to implement the environmental education is through the in-formal education.

In in-formal education, efforts were put through by government and non-government organization, NGO. This in-formal education was conducted in various ways. For example, the Awareness Camp (initiated in 1994), Wira Alam Project (initiated in 1998), Green School Projects (initiated in 2003), Environment Scrap Book Competition, Talks on Environmental Awareness, 3R Programme, Environmental Week and others (Fatimah Hassan et al., 2012; Kartini, 2008; Mohd Zohir & Nordin, 2007).

Among the earliest and on-going efforts in-formal education conducted in Malaysia was the Environmental Awareness Camp (KeKAS) organized by the Department of Environment (DOE) in collaboration with the State Education Department and few City Councils in Malaysia. It was initiated in 1994 and hundred series of the camp were conducted throughout Malaysia.

This camp was launched with the purpose generally to promote the knowledge, attitude, and awareness of students and teachers towards the environment through the camping activities. The duration of the camp is usually four days and three nights for teachers and three days and two nights for students. The camp was conducted by the trained facilitator appointed by the Department of the Environment. The objectives of the camp are mentioned below:

- (i) To expose the participants on the importance of environmental awareness.
- (ii) To develop a positive and responsible attitude and instill love to the environment and appreciate the beauty of nature.
- (iii) To develop attitude and cooperation among participants in environmental conservation and sustainability.
- (iv) To enable the participants to enjoy recreational activities on the environment.

To ensure the camp achieved its objectives, the government also established modules that act as the main teaching and learning tools in the camps. A series of the module was published in 1996 to facilitate the teaching and learning process. This module was a project funded by the Malaysia Governments in the Seventh Malaysia Plan (1996-200) under the project Number SETIA 75 00500.

In the series, there are seven modules available. For every camp that was held, one of the modules that suit the location and the ecosystem available at the campsite will be chosen by the organizer. The module was developed by the Department of Environment and few other collaborators from a non-governmental organization, NGO and experts from the local universities and experts from the private sectors as described in Table 1.1.

Table 1.1: The Module, Contents, and List of Developers for Environmental Awareness Camp (Kartini, 2008)

Name of Module	Content of Module	Developer of the Module
Organic Agriculture Ecosystems	<ul style="list-style-type: none"> • Preparation of Organic Fertilizer • Variety Planting • Pest Control Management 	Centre for Environmental Technology and Development Malaysia (CETDEM)
Highlands Ecosystems	<ul style="list-style-type: none"> • Environment Network • Cross Forest Highlands • Forest Transect Study 	World Wide Fund for Nature Malaysia
Forest Ecosystems	<ul style="list-style-type: none"> • Blind Trail • Tropical Rainforest • Bird Watching 	Persatuan Pencinta Alam Malaysia
Coastal Marine Ecosystems	<ul style="list-style-type: none"> • Introduction on Beach • Environmental Games • Introduction on Forest Beach 	Universiti Pertanian Malaysia
River Ecosystems	<ul style="list-style-type: none"> • Water Quality Measurement • River Habitat Survey • Study on The Diversity of Fish 	Universiti Malaya
Oil Palm Plantation Ecosystems	<ul style="list-style-type: none"> • Introduction on Oil Palm Plantation • Species Diversity • Replanting Without Burning 	Golden Hope Plantations Berhad
Urban Ecosystems	<ul style="list-style-type: none"> • Envirowalk • Understanding Urbanization & Nature • Municipal & Urban on Climate 	Persatuan Pengguna Selangor dan Wilayah Persekutuan

Although the camp was started 20 years ago but the impacts or outcomes from the camps were not investigated. This was confirmed by the officer-in-charge via verbal interview. The reports available in the annual reports were only on the frequencies of the camp organized, the numbers of participants involved and the locations of the camps were conducted which does not reflect the outcomes of such interventions. This has shown that there is a need to conduct a study regarding the effectiveness of the Awareness camp in term of the usage of EE module as it is the main teaching and learning tools in the camps.

In addition, in 2003 Annual Reports published by the Department of Environment (DOE), the government had allocated RM 330,000 to sponsor the execution of the camps in Malaysia for that particular year. Logically, the government had spent millions of ringgits through these camps to educate the people about the environment, but the impacts were unknown. Thus, a study regarding the effectiveness or the impacts of the program need to be established in order to see the impacts and the worthiness of the investment.

According to Sidek Noah and Jamaluddin Ahmad, (2006) one of the characteristics of a good module is that the module must have a pre and post-test components to access the existing students' level of knowledge before using the module in the pre-test (at the beginning) and post-test that contain the similar items to access the improvements of the instructional methods used. Furthermore, Russell, (1974) in his Modular Approach Model state that a module is proven to be effective when it is able to improve the knowledge and attitude of students after using it. This clearly indicates that, an evaluation of the effectiveness of the module in the camp need to be conducted. The evaluation of the effectiveness of the Environmental Education Module in enhancing student's knowledge, attitude and behaviour intention and behaviours are important to evaluate the changes.

Based on the justifications mentioned above, it is clearly showed that a study need to be establish to investigate the effectiveness of the EE module which is the main teaching and learning tools in the Awareness Camp, KEKAS.

1.4 Objectives of the Study

The general objective for this present study is to determine the effectiveness of environmental education module towards pupils under the supervision of Petaling Jaya City Council (MBPJ) in enhancing pupil's knowledge, attitude, behaviour intention and behaviour towards the environment.

The specific objectives of this present study are as follow:

- i. To determine the level of knowledge, attitude, behaviour intention and behaviour towards the environment in the pre-test, post-test, one-month post-delayed test and six-month post-delayed test among primary pupils.
- ii. To determine the effectiveness of the Environmental Education Module towards knowledge, attitude, behaviour intention and behaviour in pre-test, post-test, one-month post-delayed test and six-month post-delayed test among primary pupils.

1.5 Research Question

There is a total of eight (8) research questions derived from two objectives stated above.

1. What is the level of knowledge towards the environment in the pre-test, post-test, one month post-delayed test and six-month post-delayed test among the pupils?
2. What is the level of attitude towards the environment in the pre-test, post-test, one month post-delayed test and six-month post-delayed test among the pupils?
3. What is the level of behaviour intention towards the environment in the pre-test, post-test, one-month post-delayed test and six-month post-delayed test among the pupils?
4. What is the level of behaviour towards the environment in the pre-test, post-test, one-month post-delayed test and six-month post-delayed test among the pupils?
5. Is there any significant difference in the mean score of knowledge in the pre-test, post-test, one-month post-delayed test and six-month post-delayed test among the pupils after the usage of the environmental education module?
6. Is there any significant difference in the mean score of attitude in the pre-test, post-test, one-month post-delayed test and six-month post-delayed test among the pupils after the usage of the environmental education module?
7. Is there any significant difference in the mean score behaviour intention in the pre-test, post-test, one-month post-delayed test and six-month post-delayed test among the pupils after the usage of the environmental education module?
8. Is there any significant difference in the mean score of behaviour in the pre-test, post-test, one-month post-delayed test and six-month post-delayed test among the pupils after the usage of the environmental education module?

1.6 Research Hypothesis

This study utilizes on group pre and post quasi-experimental study that with one independent variable of teaching and learning by using Environmental Education Module and four dependent variables of knowledge, attitude, behaviour intention and behaviour towards the environment. Based on the second objective, four hypotheses are constructed.

- H₀₁ There is no significant difference in the overall mean scores in knowledge between pre-test, post-test, one month post-delayed test and six-month post-delayed test among primary pupils.
- H₀₂ There is no significant difference in the overall mean scores attitude between pre-test, post-test, one month post-delayed test and six-month post-delayed test among primary pupils.
- H₀₃ There is no significant difference in the overall mean scores in behaviour intention between pre-test, post-test, one month post-delayed test and six-month post-delayed test among primary pupils.
- H₀₄ There is no significant difference in the overall mean scores in behaviour between pre-test, post-test, one-month post-delayed test and six-month post-delayed test among primary pupils.

1.7 Scope and Limitation of the Study

This study will be limited to the pupils from the schools in the area of Petaling Jaya which is under the supervision of the Petaling Jaya City Council (MBPJ). MBPJ is one of the active local authority that conducts more than six awareness camp each year with different target groups while other local authorities had limited the organizing of camps due to financial constraints.

In addition, the effectiveness of module will only measure the level of knowledge, attitude, behaviour intention and behaviour enhancement towards one module although there are seven modules available with seven different series of the modules according to the ecosystem settings.

1.8 Significance of the Study

This study will establish the effectiveness of the Environmental Education Module in enhancing the pupils' knowledge, attitude, behaviour intention and behaviour towards the environment.

This study will contribute to the well-being of the society as the government through the Department of Environment had spent millions of ringgits to organized camps in their efforts to educate the people, but the impacts of their effort were unknown as there was no scientific study conducted. This study will also provide a preliminary information on the effectiveness and outcomes of teaching and learning by using the module during the camp.

This study will provide inputs regarding the effectiveness of EE module used in the camp in term of knowledge, attitude, behaviour intention and behaviour towards the environment. It might also help the agencies in-charge (MBPJ) in providing the information regarding the effectiveness of the programme or intervention. This study will also provide information regarding the module whether it needs to be revise, upgrade or modified. The findings will provide inputs in elements needed to trigger the changes in the variables investigated.

The survey instruments used in this study will give a brief idea to help the Department of Environment (DOE) to complete the missing elements of a functional module which is the pre and post-test. As mentioned by Russell (1974) and Sidek Noah and Jamaluddin (2005), pre and post-test are the crucial elements in a good module. The series of pre and post-test in the study might help to give guidance and initiate more works to establish a more reliable pre and post-test to complete the module.

This research will also provide a brief information on the current level of knowledge, attitude, behaviour intention and behaviour of the pupils from two identified school in the area of Petaling Jaya. The data provided might help the Petaling Jaya Council City in planning more programmes based on environmental education, especially interventions for primary school pupils.

Besides that, the outcomes of this study will help in providing information to the Ministry of Education, MOE or Pusat Perkembangan Kurikulum in their effort to update and strengthen the policy, planning or updating the syllabus regarding the existing integration of environmental education across the curriculum and in extra-curricular activities.

Furthermore, the findings of this study might be useful to the teachers or trainers in planning and organizing activities that integrate the elements of environmental education in their formal and in-formal lesson in schools in order to produce the environment literate generations. This is to help them in planning suitable approaches or interventions that is useful in teaching in order to achieve the desired objectives.

This study also will contribute towards the existing body of knowledge on environmental education as it determines the effectiveness of the instructional method in influencing the behaviour intention that is less studied compared to the other three variables. This might initiate more research to be conducted within this element.

1.9 Operational Definition of Terms

The meanings of the following terms and phrases used throughout this study are based on the definition given below:

Effectiveness - According to Norijah Mohamed, (1997) effectiveness is an overall view on how far does the achievement and the learning outcomes had been achieved by students while Russell, (1974), define effectiveness is the measurement on the increment of marks gained by the students after a lesson by using module is being used.

In this research, effectiveness is defined as the increment in the mean score of post-test, one-month post-delayed and six months post-delayed test compare to the pre-test in the knowledge, attitude, behaviour intention and behaviour after the Environmental Education Module being used.

Module - Sidek Mohd Noah and Jamaluddin Ahmad, (2005) stated that module in from the context of education is a media unit in a lesson plan to facilitate students' understandings while the module is defined as a package of teaching and learning that consists the conceptual units for a subject (Russell, 1974).

In this study, a module is a package of teaching and learning tool, environmental education module about the coastal marine ecosystem that is used in the Environmental Awareness Camp organized by the Petaling Jaya City Council (MBPJ) and use as the main tool in teaching and learning process during the camp.

Knowledge - Palmer and Neal (1994) in their models stated that knowledge is a concept and information regarding the environment while Wiersma (2000) mentioned that knowledge is an achievement measurement which is the score of the test.

In this study, knowledge is individual participants' change in knowledge towards coastal marine ecosystem after the exposure of the module.

Attitude - Attitude is an act/action based on opinion or judgment. Attitude is primarily characterized by the evaluative human response, but these expressions may or may not be accompanied by the associated action beyond the verbal level (Knapp, 1972).

This study defines attitude as individual participants' change in attitude towards the subject of environmental education actions related to the exposure.

Behaviour Intention - Behaviour intention is a plan or desire to do something (Summers et al., 2003). It is also assumed as a motivational factor that influences a behaviour

whether a person is willing to try and how much of an effort he or she is planning to exert in order to perform the behaviour (Ajzen, 2005).

In this research, the behaviour intention refers to individual participants' self-reported intent to perform or change behaviour towards the subject of environmental education related to the exposure.

Behaviour - Behaviour is defined as the conative component of attitude that refers to the action tendencies of an individual regarding an object (Bohl, 1976).

In this study, the behaviour is defined as the individual participants' self-reported behaviour change towards the subject of environmental education actions related to the exposure.

Experimental Group - An experimental group is a group of students that received and undergoes the intervention or program (Johnson and Christensen, 2004; Burns, 2000; Carey, 2001; Borg & Gall, 1991).

In this study, the experimental group refers to a group of primary pupils that undergoes the intervention, which is the usage of Environmental Education Module in the Environmental Awareness Camp organized by the MBPJ.

Pre-Test - Pre-test is defined as the test that is given before a program or experiments begins. (Johnson and Christensen, 2004; Cohen, Manion & Morrison, 2002; Rosniza Rahmat, 1999). Creswell (2012), a pre-test provides a measure on some attribute or characteristic that you assess for participants in an experiment before they receive treatment. After the treatment, you take another reading on attribute or characteristic.

In this study, it is defined as a knowledge test and questionnaire regarding the attitude, behaviour intention and behaviour that will be given to the experimental group before the treatment or intervention applied. (Environmental Education Module usage).

Post-Test - Post-test is a test or a measurement that is administrated at the end of a program or experiment (Johnson & Christensen, 2004; Cohen et al., 2002; Rosniza Rahmat, 1999; Fitz-Gibbon & Morris, 1987). Yusup Hashim (1999) defines post-test as a test that is administrated at the end of a learning unit by using a module to measure the level of achievement of students.

In this study, it is defined as the knowledge test and the attitude, behaviour intention and behaviour questionnaire that is administrated to the experimental group immediately after the treatment (usage of Environmental Education Module) to access the immediate effects of the treatment.

One Month Post-Delayed Test - Second post-test is a repetition of test that is administrated to the treatment group after certain intervals usually range from a month until six months after the intervention and the first test. (Chen-Yin et al., 2002; Bogner, 1998; Easler & Pease, 1999).

In this study, it refers to a knowledge test, attitude, behaviour intention and behaviour questionnaire that is administrated to the treatment group after one month upon completion of the treatment (usage of Environmental Education Module) to access the continuous effects of the treatment.

Six Month Post-Delayed Test - Second post-test is a repetition of test that is administrated to the treatment group after certain intervals usually range from a month until six months after the intervention and the first test. (Chen-Yin et al., 2002; Bogner, 1998; Easler & Pease, 1999).

In this study, it refers to a knowledge test, attitude, behaviour intention and behaviour questionnaire that is administrated to the treatment group after six months from the treatment (usage of Environmental Education Module) to access the continuous and long-term effects of the treatment.

1.10 Thesis Organization

This study aims to investigate the effectiveness of the module of environmental education used as the main teaching and learning tool in the Awareness Camp organized by the Petaling Jaya City Council as in-formal education initiative.

The effectiveness of the module is measured towards the knowledge, attitude, behaviour intention and behaviour towards the environment. In order to achieve the objective of this study, a set of systematic and organized approach was conducted. The thesis organization for other chapters are as follows:

Chapter 2 in this study provides an overview of scholarly literatures relevant to environmental education, models, and theory associated with the study. This chapter also discusses previous research conducted in environmental education by using modules.

Chapter 3 describes the research methodology of one group pre and post quasi-experimental with the repeated-measure design. This chapter discusses the research design, research samplings and techniques, procedures, instrumentation and its reliability and validity process. The data analysis procedures are also explained in depth in this chapter.

Chapter 4 discusses the results obtained from the study. In this chapter, Explanatory Data Analysis, EDA is further elaborated. The results from the descriptive and inferential analysis by using Repeated Measure ANOVA and pairwise comparison by using the Bonferroni procedure are also presented in this chapter. The results of this research are explained according to the research questions, as mentioned in sub-chapter 1.4.

Chapter 5 summarizes the study through interpretation and discussion of the findings according to the research questions. This chapter also states the conclusions and recommendations for future practice and research.



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