



UNIVERSITI PUTRA MALAYSIA

**EVALUATION OF THE ENVIRONMENTAL EDUCATION PROGRAMME AT THE
FOREST RESEARCH INSTITUTE MALAYSIA**

CHONG MEW IM

T FH 2007 5



**EVALUATION OF THE ENVIRONMENTAL EDUCATION PROGRAMME AT
THE FOREST RESEARCH INSTITUTE MALAYSIA**

CHONG MEW IM

**MASTER OF SCIENCE
UNIVERSITI PUTRA MALAYSIA**

2007



**EVALUATION OF THE ENVIRONMENTAL EDUCATION PROGRAMME AT
THE FOREST RESEARCH INSTITUTE MALAYSIA**

By

CHONG MEW IM

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

January 2007



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

**EVALUATION OF THE ENVIRONMENTAL EDUCATION PROGRAMME AT
THE FOREST RESEARCH INSTITUTE MALAYSIA**

By

CHONG MEW IM

January 2007

Chairman: Manohar Mariapan, PhD

Faculty : Forestry

The objective of this study was to evaluate the differences in environmental knowledge and attitude of 11 year old pupils who participated in a one-day environmental education (EE) programme conducted at Forest Research Institute Malaysia (FRIM), Kepong and the differences among three races – Malay, Chinese and Indian. Referring to a standard instrument called Children's Environmental Attitude and Knowledge Scale (CHEAKS), attitude and knowledge were the major scales measured to evaluate the EE programme. 'Verbal commitment', 'actual commitment' and 'affect' are the multiple-measure constructs for attitude that was measured in the programme. The study found that there was an increase in environmental knowledge and attitude but it did not last more than two weeks. Meanwhile, there were no consistent significant differences in respondents' environmental knowledge and attitude score between races. Overall, a one-day programme was found not to be effective in retaining pupils' environmental knowledge gained during the EE programme. From this study, it is recommended that EE

programmes should be conducted in a longer duration and should include emotionally provocative elements.

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

**PENILAIAN ATAS PROGRAM PENDIDIKAN ALAM SEKITAR DI
INSTITUTE PERHUTANAN MALAYSIA**

Oleh

CHONG MEW IM

Januari 2007

Pengerusi: Manohar Mariapan, PhD

Fakulti : Perhutanan

Objektif kajian ini ialah untuk menilai perbezaan dalam pengetahuan dan sikap alam sekitar pada murid umur 11 tahun yang menghadiri program pendidikan alam sekitar (PPAS) sehari di Institut Penyelidikan Perhutanan Malaysia (FRIM), Kepong dan perbezaan di antara tiga bangsa – Melayu, Cina dan India. Dengan merujuk kepada alat piawai yang dinamakan *Childrens' Environmental Attitude and Knowledge Scale (CHEAKS)*, sikap dan pengetahuan merupakan skala-skala pengukur yang utama untuk menilai program tersebut. *'Verbal commitment'*, *'actual commitment'* dan *'affect'* adalah ukuran gandaan yang membina untuk sikap yang diukur dalam program ini. Kajian ini mendapati bahawa ada peningkatan pada pengetahuan dan sikap alam sekitar tetapi ia tidak kekal selepas dua minggu. Pada masa yang sama, perbezaan yang ketara pada pengetahuan dan sikap alam sekitar di antara tiga bangsa tersebut. Kesimpulannya, PPAS ini tidak berkesan dalam menambahkan pengetahuan alam sekitar peserta. Cadangan dari kajian ini ialah PPAS harus dijalankan lebih daripada sehari dan mengandungi elemen yang dapat merangsangkan emosi.

ACKNOWLEDGEMENTS

First of all, I would like to thank Dr. Noor Azlin Yahya, a member of my supervisory committee and also my mentor in FRIM. She gave me an opportunity to continue my degree of master science under FRIM sponsorship and advised me throughout my study.

I am also glad to have a supervisor like Dr. Manohar Mariapan who always gave me constructive comments and advices. Meanwhile, Dr. Azlizam Aziz as a supervisory committee member also have helped me a lot throughout my study. My gratitude to both of them.

My colleagues at FRIM, Teresa Ong, Nik Azyyati, Roslina Mamat, Azmariah, Zaisatul and the education officers from Malaysian Nature Society (MNS), Lee Chui Mei, Azah Ariff and Eng Lee had been giving me helping hands during my data collection. Appreciation to all of them for helping me completed this study.

Last but not least, I would like to thank my beloved family and friends who gave me moral support and encouragement throughout the period of this study.

I certify that an Examination Committee has met on 31 January 2007 to conduct the final examination of Chong Mew Im on her degree thesis entitled "Evaluation on the Environmental Education Programme at the Forest Research Institute Malaysia" in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulations 1981. The Committee recommends that the candidate be awarded the relevant degree. Members of the Examination Committee are as follows:

Abdullah Mohd, PhD

Associate Professor
Faculty of Forestry
Universiti Putra Malaysia
(Chairman)

Ebil Yusof, PhD

Lecturer
Faculty of Forestry
Universiti Putra Malaysia
(Internal examiner)

Azizi Muda, PhD

Associate Professor
Faculty of Environmental Studies
Universiti Putra Malaysia
(Internal examiner)

Nor Khomar Ishak, PhD

Professor
Faculty of Hospitality and Tourism Management
Universiti Tun Abdul Razak
(External Examiner)

HANASAH MOHD GHAZALI, PhD

Professor/Deputy Dean
School of Graduate Studies
Universiti Putra Malaysia

Date: 21 JUNE 2007

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

Manohar Mariapan, PhD

Lecturer
Faculty of Forestry
Universiti Putra Malaysia
(Chairman)

Azlizam Aziz, PhD

Lecturer
Faculty of Forestry
Universiti Putra Malaysia
(Member)

Noor Azlin Yahya, PhD

Forest Research Institute Malaysia
(Member)

AINI IDERIS, PhD

Professor/Dean
School of Graduate Studies
Universiti Putra Malaysia

Date: 17 JULY 2007

DECLARATION

I hereby declare that the thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UPM or other institutions.

CHONG MEW IM

Date: 18 JUNE 2007

TABLE OF CONTENTS

	Page
ABSTRACT	2
ABSTRAK	4
ACKNOWLEDGEMENTS	5
APPROVAL	6
DECLARATION	8
LIST OF TABLES	9
LIST OF FIGURES	11
LIST OF ABBREVIATIONS	12
CHAPTER	
I	
INTRODUCTION	14
Background	14
Problem Statement	16
Objective	17
Significance of Research	18
Assumption	18
II	
LITERATURE REVIEW	19
Definition of Environmental Education	22
Evaluation in Environmental Education	25
Theories/Models	29
Research Framework	31
III	
METHODOLOGY	34
Study Design	34
Sample Size and Sampling	35
Measurement and Instrument	36
EE Programme for Treatment Group	38
Pilot Test of Instrument	40
Data Collection	41
Data Analysis	42
Reliability Analysis	42
Independent Sample T-test	42
Paired-samples T-test	43
Analysis of Variance (ANOVA)	43
Pearson Correlation	43
IV	
RESULTS	44
Respondents' Description	45
Environmental Attitude	46
Description Analysis of Items	47
Internal Consistency of Items (Cronbach's Alpha)	60
Comparison	64
Environmental Knowledge	70
Comparison	70
Relationship	72



V	DISCUSSION	74
VI	IMPLICATION/CONCLUSION	78
	REFERENCES	82
	APPENDICES	87
	BIODATA OF THE AUTHOR	100

LIST OF TABLES

Table		Page
1	Coding of Likert Like Scale	37
2	Schedule of Environmental Education Programme	38
3	Schedule of data collection	41
4	Distribution of respondents by race	45
5	Response of the control group to items in the concepts of environmental attitude in pre-test	46
6	Response of the control group to items in the concepts of environmental attitude in retention test	49
7	Response of the treatment group to items in the concepts of environmental attitude in pre-test	52
8	Response of the treatment group to items in the concepts of environmental attitude in post test	55
9	Response of the treatment group to items in the concepts of environmental attitude in retention test	58
10	Reliability analyses for items in the concepts of environmental attitude in pre-test	61
11	Reliability analyses for items in the concepts of environmental attitude in post test	62
12	Reliability analyses for items in the concepts of environmental attitude in retention test	63
13	Comparison of control and treatment groups' environmental attitude concepts between pre, post and retention tests	64
14	Comparison of environmental attitude concepts between treatment and control groups for pre and retention tests	65
15	Comparison of environmental attitude between races	67
16	Comparison of control and treatment groups' environmental attitude between pre and retention tests for those favoured watching documentaries	68

17	Comparison of control and treatment groups' environmental attitude between pre and retention tests for those did not favour watching documentaries	69
18	Comparison of environmental knowledge score between control and treatment groups in pre and retention tests	70
19	Comparison of environmental knowledge score for treatment group between pre, post and retention tests	71
20	Comparison of environmental knowledge score between races	71
21	Relationship of the total of environmental knowledge score between the overall academic and Malay language performances for control and treatment groups	72

LIST OF FIGURES

Figure		Page
1	Model of Children's Environmental Attitude and Knowledge Scale	30
2	Conceptual framework	33
3	Flow chart of study design	35

LIST OF ABBREVIATIONS

ACAPM	Asian Conservation Awareness Programme Malaysia
ANOVA	Analysis of variance
CAP	Consumer Association of Penang
CDC	Curriculum Development Centre
CHEAK	Children's environmental attitude and knowledge scale
DOE	Department of Environment
DWNP	Department of Wildlife and National Parks
EE	Environmental education
EECOM	Canadian Network for Environmental Education
EIA	Environmental Impact Assessment
ENSEARCH	Environmental Management and Research Association of Malaysia
EPSM	Environmental Protection Society of Malaysia
FRIM	Forest Research Institute of Malaysia
IUCN	International Union for the Conservation of Nature and Natural Resources
JICA	Japan International Cooperation Agency
MNS	Malaysian Nature Society
MoE	Ministry of Education
NGOs	Non-governmental organisations
PPP	Planning-Process-Product
RIC	Rainforest Interpretation Centre
SAM	Friends of the Earth / <i>Sahabat Alam Malaysia</i>
TrEES	Treat Every Environment Special Sdn. Bhd.
UN	United Nations

UNESCO United Nations Educational, Scientific and Cultural Organisation

WWF World Wildlife Fund for Nature



CHAPTER I

INTRODUCTION

Background

In Malaysia, the formal implementation of environmental education (EE) was introduced in the national education system in late 1980s. The Ministry of Education (MoE) developed teaching modules for primary schools from years 4 to 6 in the subject of 'Man and His Environment'. At secondary level, students continue to learn EE related elements through the subjects of 'Science' and 'Geography'. At the beginning of 1996, EE was no longer a part of a subject in school but it was included across the curriculum through multidisciplinary approach. All the subjects at the primary and secondary level are integrated with EE elements which included co-curriculum activities.

On an informal basis, MoE embarked on a national EE programme with the Department of Wildlife and National Parks (DWNP) to create environmental awareness among students through natural environments. Besides this, the Department of Environment (DOE) published several publications on environmental issues to increase the public's awareness especially for school students jointly the universities and institutes through magazines (*ERA hijau, Impak*), green tips, brochures, Environmental Impact Assessment (EIA) reports and others. Besides these, other government agencies are also actively involved in EE activities, namely the Ministry of Health, Forestry Department, Department of Fisheries and Forest Research Institute Malaysia (FRIM).

Non-governmental organisations (NGOs) involved in EE implementation too, such as the Environmental Protection Society of Malaysia (EPSM), Consumer Association of Penang (CAP), Malaysian Nature Society (MNS), Friends of the Earth (SAM), Environmental Management and Research Association of Malaysia (ENSEARCH), World Wildlife Fund for Nature (WWF), Treat Every Environment Special Sdn. Bhd. (TrEES), SHELL Company, and others (Chuah, 1999). The local English newspaper companies like *The Star* and *New Strait Times* also showed their interests in encouraging EE activities. Other mass media like magazines, radio, and television are promoting EE as well. Information are distributed on environmental problems and issues, and encourage people to get involved and contribute to EE activities.

Malaysia has active partnerships with Japan International Cooperation Agency (JICA) and Denmark (Danida) for research purposes and for building the capacity for EE. University of South Africa also has a network with FRIM and MNS in exchanging experience and developing EE. Several workshops and conferences were conducted under the preview of these networks. The networks should be extended to encourage active participation of all stakeholders.

Although EE programmes in Malaysia had been widely conducted, there was a lack of evaluation on their effectiveness. The Sabah Forestry Department (2002) revised a list of the principles of effective EE from Queensland Department of Education, Australia to be used in designing EE programme

across school curriculum as a teachers' guide. Besides this, trainee teachers from the teachers' training centre were encouraged to become volunteers in conducting EE programme at the Rainforest Interpretation Centre (RIC), Sepilok as well as in schools when they started their service as a certified teacher.

The primary purpose of evaluation is to study the effectiveness on the existing knowledge and is used to inform and guide practical action (Clarke and Dawson, 1999). Thus, the outcome of the evaluation would be useful to improve EE programmes. EE programmes should be measured in quantity as well as quality to help ensure that objectives are met. Hence, evaluation practice should be imposed in every EE programme conducted to determine its effectiveness.

Problem Statement

The green ground of FRIM has not been limited only in its function as research institution but also serve as a recreational area. Activities such as sightseeing, nature walks, jogging, hiking, cycling, picnicking, swimming and bird watching are common in FRIM. As a research institute and a well known recreation area, FRIM has educational assets in the forms of arboreta and nature trails. Guide services and educational brochures are available to increase visitors' awareness and knowledge and also to promote EE. The Forest Recreation and Environmental Education Section established in 2001 spearheaded EE related researches and activities at FRIM. The natural

settings of FRIM is suitable and conducive for nature and EE programmes, due to its location and accessibility to the urban population (Noor Azlin, Yap, and Adnan, 1993, Noor Azlin, 1999). FRIM received average 18,921 students a year for EE programmes (FRIM, 2006), thus some evaluations on the effects of a one-day programme at FRIM is needed in order to improve FRIM's services in terms of EE.

Appreciation and awareness are important in building up a person's positive attitude towards environment. The children's basic belief on environment has yet to be properly shaped but adults' beliefs had been formed during their growing process. Thus, increasing the environmental awareness among young people should be the plan for future management. FRIM has often believed in this cause, thus by improving its EE programme is one of its effort in environmental services.

Objectives

The main objective of the study was to evaluate effectiveness of the present EE programme at FRIM, Kepong.

Specifically, the objectives of the study were:

1. To evaluate the differences in environmental knowledge and attitude of 11 years old pupils after undergoing a one-day EE programme in FRIM
2. To compare the environmental attitude and knowledge differences among the Malay, Chinese and Indian pupils

Significance of the Research

This study would be a platform to evaluate the contents of the EE programme in FRIM. It also tested differences among the Malay, Chinese and Indian pupils, the three major races in Malaysia, who practise different cultures and religions.

The findings could be used to improve the FRIM EE programme in order to increase the awareness among pupils and their influence on the communities.

Assumptions

The design of the EE programme was identical for all three schools as treatment for this study was assumed to be consistent across respondents. It is also assumed that facilitators conducting the EE programme delivered the same information with the same approach for all the programmes.

The pupils were assumed to have similar characteristic within their academic performance and understanding of Malay language.

CHAPTER II

LITERATURE REVIEW

Introduction about Environmental Education

Human exploitation of the natural resources has increased since the last decade of the 19th century (Bakshi, 1980; Hughes, 2001). In 1960, the world population was 3.02 billion (United Nations, 1999) and doubled in July 2005 to 6.45 billion (The World Factbook, 2005). Thus, humans need more land for urban sprawl, agriculture, mining, petroleum exploration, industrial plants, landfills and others. The total area of 510 million sq km had been exploited by humans and caused various environmental issues e.g. over population, industrial disasters, pollutions (air, water, acid rain, toxic substances), loss of vegetation (overgrazing, deforestation, desertification), loss of wildlife, soil degradation, soil depletion and erosion (The World Factbook, 2005).

The effects from those issues can contribute to increase the sequence of natural disasters and the degree of severity of these effects, especially the deforestation issues. Besides that, flash floods in urban areas have become a normal phenomenon during heavy rains. The concrete jungles do not function as a sponge like forests do, to absorb the rainwater. Thus, causing flash floods, erosion and landslides.

Now, humans are facing an even more challenging issue, which is global warming. The emissions of carbon dioxide, heat-trapping gases by the burning of fossil fuels primarily and the clearing of forests that remain in the

atmosphere for decades or even centuries have caused global warming (Union of Concerned Scientists, 2005a).

Obviously, human activities were the cause for this problem, so humans should be part of the solution as well. Technologies could help cut down emissions of heat-trapping gases and increase energy efficiency by increasing the usage of renewable energy (wind, solar, geothermal and bio-energy) to replace the non-renewable energy (oil, natural gas, coal and other fossil fuels) (Union of Concerned Scientists, 2005b). Meanwhile, the same concept could be practiced in reducing solid waste and solve landfill problems. However, human commitment is crucial to the successful implementation of environmental education (EE).

How do we view the world? What influences what we see? How does our point of view affect the way we treat the world? These are the guiding questions used by Rous (2000) in her teaching of environmental literature. Each person has his/her own perception about this. Prevention is better than cure and action should be taken before the resources are exhausted by human activities.

It is time for humans to take responsibility for their actions. If humans remain ignorant of environmental problems, these problems would persist. The impacts of human exploitation should be taken care of and reduced as much as possible, for the good of future generations. Seeds need to be sowed to

grow trees for the Earth and for our next generations before the natural resources exhausted.

Humans need to be aware of the environmental problems and their roles in solving them. EE could contribute in educating humans about the environment. Therefore, EE plays an important role in reducing the impacts of environmental problems. The first report that used the EE term was the Keele Conference in March 1965, Britain (Carson, 1978). EE has spread out from developed to developing countries and also to the under developed countries.

The United Nations (UN) Conference on the Human Environment in Stockholm, 1972 recommended that the UN establish an international EE programme. The United Nations Educational, Scientific, and Cultural Organization (UNESCO) followed the recommendation by sponsoring a series of EE workshops and conferences around the world since its launch in 1975. As a result, representatives from member nations met to outline the basic definition and goals of EE.

The goals of EE around the world are similar - to maintain and improve environmental quality and to prevent future environmental problems. In order to achieve these goals, five objectives were formulated in the 1977 UNESCO conference as follows:

1. EE stresses on awareness to help students acquire awareness and sensitivity to the total environment and its problems; develop the ability to