An Analysis of School Teachers' Attitudes on the Importance of Environmental Education Goals

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Abstract: This paper analyzed the primary school teachers' attitudes on the importance of environmental education goal levels in Sabah. One hundred and eighty questionnaires were distributed. The data were analyzed using Statistical Analysis System (SAS). Majority of the teachers' attitudes indicated that **all** fifteen environmental goal statements were important. The mean responses to the importance of goals ranged from "the moderate" (4.27) to "the complete extent" (4.63). Goal statement 11 (investigation and evaluation processes), included 12 sub-goal statements, received the grand mean of 4.32. Recommendations included a need to incorporate goals in schools' curriculum and provide training courses.

Abstrak: Kertas ini menganalisis tanggapan guru-guru tentang kepentingan matlamat aras-aras pendidikan alam sekitar di sekolah-sekolah di Sabah. Seratus lapan puluh soalselidik telah diedarkan. Data dianalisis menggunakan program Statistical Analysis System (SAS). Majoriti guru-guru menyatakan kesemua 15 pernyataan matlamat pendidikan alam sekitar adalah penting. Respon min menunjukkan pentingnya matlamat tersebut dari aras "sederhana" (4.27) kepada "sangat penting" (4.63). Pernyataan matlamat 11 (termasuk 12 submatlamat), menerima min besar sehingga 4.32. Kesimpulan daripada kajian ini mencadangkan penggabungan matlamat-matlamat pendidikan alam sekitar ke dalam kurikulum pendidikan sekolah dan mengadakan kursus serta latihan sekerap mungkin.

Keywords: environmental education, man and the environment, alam dan manusia

Introduction

Malaysia gained independence in 1957, and Sabah joined Malaysia in 1963. After independence, the country is developing aggressively to achieve an industrial country status by the year 2020. Many forests are logged. Factories, highways, residential and shop houses, hydroelectric dams, and other infrastructures are constructed almost throughout the country—in Peninsular and East Malaysia. At the same time, the Multimedia Super Corridor (MSC) project is being developed and constructed.

Environmental education, called *Alam dan Manusia=ADM* (Man and Environment), was incorporated in the primary school curriculum in 1982. Even though the terms of environmental education came with many names or terminologies, from the *Nature Study, Study, Outdoor Education, Conservation Education, Community Education* and so on, in general, *Environmental Management Education,* this subject is meant to educate students and people, not only to be more sensitive to what is happening surrounding them, but also to participate positively in protecting and maintaining the environment so that we can be living in the more comfortable and harmonious way, as stated by the United Nations Educational, Scientific, and Cultural Organisation (UNESCO) in 1975 during the Belgrade Charter, 1977 [9] and the Tbilisi Declaration, 1977 [10]. Overall, the environmental education terminology was used as a synonym for each of the five, singly, or in any combination [1] [5] [7].

The American Environmental Education Act (PL 91-516) (1970) indicated that good environmental education should consist of these criteria:

- •An interdisciplinary approach, emphasising nature-human interrelationships
- •A focus on environmental problems relating to the community
- •Incorporation of informal (as well as formal education) programs and resources outside the classroom
- •Development of conservation ethics as well as information
- Involving people of all ages

• A participant-centred design allows involvement in the choice of issues and the problem-solving solutions.

The Tbilisi Conference in 1977 endorsed goals for environmental education into five categories [10]. They are

1. <u>Awareness</u>: to help social group and individuals acquire an awareness of and sensitivity to the total environment and its allied problems

2. <u>Knowledge:</u> to help social group and individuals gain a variety of experience in. and acquire a basic understanding of its associated problems.

3. <u>Attitudes:</u> to help social group and individuals acquire a set of values and feelings of concern for environment, and the motivations for actively participating in environmental improvement and protection.

4. <u>Skills:</u> to help social group and individuals acquire skills for identifying and solving environmental problems.

5. <u>**Participation**</u>: to provide social groups and individuals with opportunity to be actively involved at all levels in working toward resolution of environmental problems (p. 71) [10].

Hungerford, Peyton, and Wilke in 1980, organized and suggested that the operationalized goals within the school curriculum should be categorized into four levels as in **Table A** [6].

Goal Level 1:	Knowledge and Ecological Foundation This sought to provide the receiver with sufficient ecological foundation knowledge to permit him/her to eventually make ecologically sound decisions with respect to environmental
Goal Level 2: Conceptual Awareness of Issues and Values This sought to guide the development of a conceptual awareness individual and collective actions might influence the relationship quality of life and the quality of the environment, and, also, how resulted in environmental issues which must be resolved through evaluation, values clarification, decision-making, and finally, citi action.	
Goal Level 3:	Issue Investigation and Evaluation This level provides for the development of the knowledge and skills necessary to permit receivers to investigate environmental issues and evaluate alternative solutions for remediating these issues. Similarly, values are clarified with respect to these issues and alternative solutions.
Goal Level 4:	Environmental Action Skills and Participation This level sought to guide the development of those skills necessary for receivers to take positive environmental action for the purpose of achieving and/or maintaining a dynamic equilibrium between quality of life, and the quality of environment.

Table A: Environmental Education Goal Levels [6]

The subject of Alam dan Manusia (Man and the Environment) was a multi-disciplinary approach and implemented in Malaysian elementary school curriculum. It was taught to Grade 5, however, this subject did not seem to be taught in secondary schools. The themes cover five areas: (A) Man, animals, and plants experience several life processes, (B) Man, animals, and plants always adapt themselves to the environment, (C) Man manipulates the environment with honesty to fulfil the various needs for survival, (D) Interaction between man and man, and between the environmental elements that produces various phenomena, and (E) Society and the natural environment maintain equilibrium and harmony through various processes. The detailed objectives are shown in **Table B.** Comparing the goals recommended by UNESCO in 1977 and Hungerford et al., in 1980, the goals stated by the Alam Dan Manusia did not seem to cover all four levels [6] [10]

THEME	TOPIC/MAJOR IDEA
A. Man, animals.	1. Our society must relate with other societies for mutual benefit
and plants	2. Our society produces various products and provides different kinds services for our
experience several	mutual needs.
life processes	
B. Man, animals,	3. Economic activities that are related to that are related to physical environmental
and plants always	factors
adapt themselves to	4. Settlements in society are influenced by the state of soil, climate, natural resources
the environment	and social factors.
	5. A society's way of life is influenced by the physical environmental factors and socio- cultural factors
	6. The social and physical environmental should be cared for to ensure harmonious living
C. Man manipulates	7. Man transforms one form of energy to another form to fulfil his various needs.
the environment	8. Society designs and manufactures various equipment for various needs
with honesty to	9. Discoveries and designs that benefits man's life
fulfil the various	10. Manipulation of the environment results in various effects.
needs for survival	
D. Interaction	11. The physical environment that has been polluted has to be restored to ensure
between man and	harmonious living.
man, and between	12. The condition that water, earthquake, volcanic earth could give rise to various
the environ-mental	phenomena.
elements that	13. Interaction between members of the society, which bring about various effects to
produce various	living.
phenomena.	
E. Society and the	14. Society's stability has to be cared for to ensure harmonious living.
natural environment	15. A harmonious peaceful society has to be created and maintained for harmonious
maintain	living.
equilibrium and	16. The advancement of industrial sector is important for the Malaysian economic
harmony through	stability.
various processes.	17. Trade and commerce is important for Malaysian economic stability.
	18. Progress in the communication and transport sector contributes towards the development of Malaysian society.
	19. Progress in the communication and transport sector contributes towards the
	development of the Malaysian society.
	20. Progress in the medical and health sector contributes to the rise in the social status
	of the Malaysian society.

 Table B: The Objectives of Alam dan Manusia (Man and the Environment)
 [6]
 [10]

Purpose

The purpose of this paper is to investigate the attitudes of school teachers on the goals importance of environmental in primary school in Sabah.

Subject and Method

One hundred and eighty grade six primary school teachers in Sabah were randomly selected as samples for the study.

Procedure

The instrument *Alam dan Manusia Teacher Questionnaires (ADMTQ)* was used. It was a modification from the Environmental Education Curriculum Needs Assessment Questionnaire (EECNAQ) used in Volk's, 1983 study in the United States [11]. The ADMTQs bilingual version was tested by the environmental educators in the United States and Malaysia for its validity and reliability.

The research questions on the importance of the environmental education imposed to the goal statements are listed below:

1.	Students gain sufficient knowledge of ecology to permit them to make ecologically sound decisions
	with respect to both humans and the environment.
2.	Students gain an understanding of the ways in which human social activities (economics, religion,
	politics, social customs, etc.) influence the environment.
3.	Students gain an understanding of the ways in which individual human behaviours impact on the
	environment.
4.	Students gain an understanding of a wide variety of environmental issues and both the ecological
	and social implications of these issues.
5.	Students gain an understanding of the various alternative solutions for solving particular
	environmental issues in which the ecological and social implications of the solutions are
	considered.
6.	Students gain an understanding of the roles played by differing human values in solving
	environmental issues.
7.	Students develop those skills which will enable them to identify and investigate issues using both
	primary and secondary sources of information.
8.	Students develop those skills which will enable them to analyse environmental issues and the
	associated value perspectives with respect to their ecological and cultural implications
9.	Students develop those skills which will enable them to identify alternative solutions for particular
	issues and to evaluate those solutions with regard to their ecological and cultural implications.
10.	Students develop those skills which will enable them to identify and evaluate their own value
	positions related to particular issues and to the solutions proposed for those issues.
11.	Students are provided with opportunities to apply, those skills in investigating and evaluating
	environmental issues and their solutions in the following manner:
	A. Identify the environmental problem
	B. Conduct library search for the topic
	C. Write research questions related to the issue
	D. Summarise collected secondary information
	E. Write letters for information and interview resource people (as needed)
	F. Plan a data collection strategy
	G. Develop, pilot test, and revise a survey instrument
	H. Collect survey data
	1. Organise data into tables, charts, graphs, etc.
	J. Interpret the findings, make conclusions. inferences and recommendations
	K. Produce a final written issue investigation report
	L. Present the issue investigation to others.
12.	Students are provided with opportunities to participate in the valuing process in order to examine
	their own values with respect to both quality of life and quality of the environment.
13.	Students develop those citizenship skills which will enable them to take appropriate action/s
	(persuasion, consumerism, legal action, political action, ecomanagement, etc.), either individual or
	group, for the purpose of solving, partially solving, or assisting in solving particular environmental
	issues.
14.	Students are provided with opportunities to apply citizenship skills in making decisions concerning
	appropriate environmental action strategies to be used with respect to particular environmental
	issues.
15.	Students are provided with opportunities to take citizenship action on one or more environmental
10.	

Table C:	Environmental Education Goal Statements	[11]	L

The respondents were asked to indicate their perceptions concerning the above 15 variables based on a fivepoint scale, that is:

> 5 = A Complete Extent 4 = A Moderate Extent 3 = A Little Extent 2 = No Extent 1 = Do Not Have Knowledge

Results and Discussion

The collected data were analysed using Statistical Analysis System 6.06 (SAS); SAS Institute [8]. Missing responses and responses which indicated "1 = Do Not Have Knowledge" at a particular level were dropped in the computation of the means and standard deviations. They were reported in the frequency counts (Table D).

Out of 180 ADMTQ distributed, total of **129** (72% return rate) questionnaires were collected and used for analysing the data. The results of the finding are discussed in **Table D** and **Fig. 1**.

Findings

Table D illustrates the data obtained for answering the research question on the importance of the environmental goals and sub goal statements. It describes in terms of mean, standard deviation, and frequency of Responses Pertaining the Extent of Importance of Environmental Education Goals (n = 129)

Goal					Frequencies*		
Statements	χ	SD	5	4	3	2	1
1	4.54	0.65	80	40	8	1	0
2	4.61	0.64	88	34	5	2	0
3	4.54	0.70	84	32	12	1	0
4	4.36	0.77	67	45	14	3	0
5	4.33	0.72	59	55	13	2	0
6	4.40	0.75	71	39	18	1	0
7	4.38	0.76	66	46	12	3	2
8	4.33	0.77	65	41	21	1	1
9	4.30	0.77	61	45	21	1	1
10	4.27	0.79	59	48	18	3	1
11	4.32	0.86	72	30	21	5	1
A	4.78	0.53	108	14	7	0	0
В	4.41	0.86	80	23	22	3	1
С	4.05	0.95	53	39	28	9	0
D	4.24	0.99	72	26	21	10	0
E	4.19	0.99	66	28	22	10	3
F	4.21	0.90	61	38	22	6	2
G	3.98	0.98	49	38	29	11	2
Н	4.41	0.80	77	29	22	1	0
Ι	4.54	0.74	87	27	13	2	0
J	4.35	0.82	71	33	22	2	1
K	4.27	0.94	69	31	19	8	2
L	4.35	0.84	72	34	19	4	0
12	4.63	0.63	89	30	7	1	2
13	4.42	0.84	79	29	17	4	0
14	4.43	0.74	71	41	13	2	2
15	4.30	0.83	65	41	18	4	1

NOTES:

1. Statements 11A-11L in italics indicate sub goal statements for this study

2. Column headings under Frequencies should be interpreted as:

5 = A Complete Extent	2 = No Extent
4 = A Moderate Extent	1 = Do Not Have Knowledge (were omitted in calculating χ
3 = A Little Extent	χ = means; SD = standard deviations

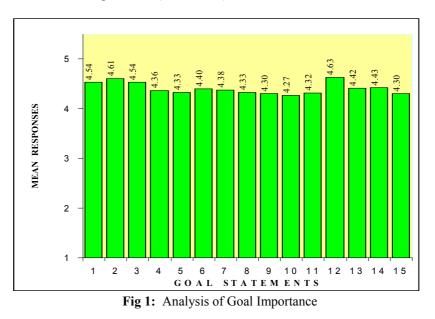
and SD)

Discussion

The mean responses to the importance of goals ranged from "the moderate" (4.27) to "the complete extent" (4.63). The highest means were assigned to goal statement 12 (value clarification opportunity), 2 (individual impact), 3 (cultural impact), and 1 (ecology concept). Those means were 4.63, 4.61, 4.54, and 4.54 respectively. The lowest mean value was associated with goal statement 10 (value clarification opportunity).

Goal statement 11 (investigation and evaluation processes) included 12 sub goal statements (**Table D**). The grand mean for goal statement 11 was 4.32 (**Table D** and **Fig. 1**). However, the range of means for these sub goals were from 3.98 (the lowest) to 4.78 (the highest). One hundred twenty-two, (94.57%) respondents indicated sub goal statement 11A (problem identification) to be of importance to "a complete" or "moderate extent," with the highest mean of 4.78. No responses were made either to "no extent" or "do not have knowledge." The lowest mean, 3.98, was observed on the sub goal statement 11G (survey instrument) in which 87 (67.44%) teachers responded to "a complete" or "moderate extent." Eleven (8.53%) teachers indicated "no extent" and two (2.0%) said they "do not have knowledge."

The distribution of responses for this research question tended toward the higher end of the scale. The majority of teachers attributed moderate to great importance to the 12 sub goal statements included within the investigation and evaluation processes (11A to 11L).



Conclusions

The conclusions drawn from the analysis of school teachers sampled in this study are

1. Majority of the teachers sampled in this study considered goals for environmental education were very important.

2. The mean responses to the importance of goals ranged from "the moderate" (4.27) to the "complete extent," (4.63). The highest means were assigned to goal statement 12 (value clarification opportunity), 2 (individual impact), 3 (cultural impact), and 1 (ecology concept). Those means were 4.63, 4.61, 4.54, and 4.54 respectively. The lowest mean value was associated with goal statement 10 (value clarification opportunity).

3. Goal statement 11 (investigation and evaluation processes) included 12 sub goal statements. The grand mean for goal statement 11 was 4.32. However, the range of means for sub goals was from 3.98 (the lowest) to 4.78 (the highest).

4. One hundred twenty-two, (94.57%) respondents indicated sub goal statement 11A (problem identification) to be of importance to "a complete" or "moderate extent," with the highest mean of 4.78. No responses were made either to "no extent" or "do not have knowledge." The lowest mean, 3.98, was observed on the sub goal statement 11G (survey instrument) in which 87 (67.44%) teachers responded to "a

complete" or "moderate extent." Eleven (8.53%) teachers indicated "no extent" and two (2.0%) said they "do not have knowledge."

5. The distribution of responses for this research question tended toward the higher end of the scale. The majority of teachers attributed moderate to great importance to the 12 sub goal statements included within the investigation and evaluation processes (11A to 11L).

Recommendations

The conclusion resulting from the present study suggests these recommendations.

1. Revise environmental education goals by the Ministry of Education and the Curriculum Development Centre and incorporate the additional goals into the national curriculum. Special emphasis should be placed on those goals in Level III (Investigation and Evaluation Level) and Level IV (Environmental Action Skills of Training and Application).

2. The Ministry of Education should conduct regular training and in-service courses, workshops, seminars, and the like to upgrade and update the teachers' skills and evaluation methods as well as to develop new teaching and learning techniques.

3. The same study should be replicated at all levels: primary, secondary, college and higher educational institutions to present a total picture of environmental education needs and accomplishments.

4. Replace or substitute the Alam dan Manusia with a similar subject in the school curriculum to provide knowledge, awareness, and skills to students and citizens.

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APPENDIX A: Environmental Education Goal Levels and Associated Goal Statements [6]

LEVEL I: ECOLOGICAL FOUNDATIONS.....The knowledge of key concepts and allied ecological principles.

1. Students gain sufficient knowledge of ecology to permit them to make ecologically sound decisions with respect to both humans and the environment.

LEVEL II: CONCEPTUAL AWARENESS LEVEL AND HUMAN VALUES... The knowledge of how human activities may influence the relationship between quality of life and the quality of the environment.

2. Students gain an understanding of the ways in which human social activities (economics, religion, politics, social customs, etc.) influence the environment.

3. Students gain an understanding of the ways in which individual human behaviours impact on the environment.

4. Students gain an understanding of a wide variety of environmental issues and both the ecological and social implications of these issues.

5. Students gain an understanding of the various alternative solutions for solving particular environmental issues in which the ecological and social implications of the solutions are considered.

6. Students gain an understanding of the roles played by differing human values in solving environmental issues.

LEVEL III: THE INVESTIGATION AND EVALUATION OF ISSUES AND SOLUTIONS...The development skills necessary for the actual investigation and evaluation of environmental issues and of the alternative solutions to those issues.

- 7. Students develop those skills which will enable them to identify and investigate issues using both primary and secondary sources of information.
- 8. Students develop those skills which will enable them to analyse environmental issues and the associated value perspectives with respect to their ecological and cultural implications.
- 9. Students develop those skills which will enable them to identify alternative solutions for particular issues and to evaluate those solutions with regard to their ecological and cultural implications.
- 10. Students develop those skills which will enable them to identify and evaluate their own value positions related to particular issues and to the solutions proposed for those issues.
- 11. Students are provided with opportunities to apply, those skills in investigating and evaluating environmental issues and their solutions in the following manner:
 - A. Identify the environmental problem
 - B. Conduct library search for the topic
 - C. Write research questions related to the issue
 - D. Summarise collected secondary information
 - E. Write letters for information and interview resource people (as needed)
 - F. Plan a data collection strategy
 - G. Develop, pilot test, and revise a survey instrument
 - H. Collect survey data
 - 1. Organise data into tables, charts, graphs, etc.
 - J. Interpret the findings, make conclusion. inference and recommendation
 - K. Produce a final written issue investigation report
 - L. Present the issue investigation to others.

LEVEL IV: ENVIRONMENTAL ACTION SKILLS... The development of those skills necessary for students to take appropriate environmental actions.

12. Students are provided with opportunities to participate in the valuing process in order to examine their

own values with respect to both quality of life and quality of the environment.

- 13. Students develop those citizenship skills which will enable them to take appropriate action (persuasion, consumerism, legal action, political action, ecomanagement, etc.), either individual or group for the purpose of solving, partially solving, or assisting in solving particular environmental issues.
- 14. Students are provided with opportunities to apply citizenship skills in making decisions concerning appropriate environmental action strategies to be used with respect to particular environmental issues.
- 15. Students are provided with opportunities to take citizenship action on one or more environmental issues.

APPENDIX B: Alam Dan Manusia Syllabus For Grade 6 [3]

I. OBJECTIVES

The objectives of Alam dan Manusia as outlined by the Malaysia Ministry of Education were as follow:

- 1. To enable students to know and understand the basic aspects related to man and the environment.
- 2. To enable students to know and understand the interactions that takes place between individuals between man and the environment, and between the elements of nature;
- 3. To enable students to have an understanding and awareness of the changes that take place within society and the environment, including the cause and effect of these changes;
- 4. To enable students to develop skills such as the ability to think, observe, question, evaluate and make conclusions regarding man and the environment,
- 5. To enable students to develop positive attitudes in the use of knowledge and skills to solve problems and issues associated with the individual, society and the environment; and
- 6. To enable students to develop positive attitudes and values regarding the importance and necessity of living in unity and harmony in the context of the Malaysian society [3].

II CONTENT SYLLABUS [2] [3] [4]

	THEME	TOPIC/MAJOR IDEA	SCOPE/DETAIL
A.	Man, animals. and plants experience several life processes	1. Our society must relate with other societies for mutual benefit	i. State the areas of relationship such as culture, economy and politics.ii. State the importance of having a relationship, with other countries and organizations
		2. Our society produces various products and provides different kinds services for our mutual needs.	 Name the type of products. State the kind of service and the agencies that provide it. State the importance of ensuring the production of goods and service for all, and our responsibility towards the above.
B.	Man, animals, and plants always adapt themselves to the environment	3. Economic activities that are related to that are related to physical environ- mental factors	 i. State the physical environmental factors that are related to the economic activities such as the state of soil, climate and natural resources. ii. State the relationship between economic activities such as mining, logging, agriculture, fishery, industrialization and trade with the physical environmental factors
		4. Settlements in society are influenced by the state of soil, climate, natural resources and social factors.	 i. Explain the settlement patterns in Malaysia. ii. Explain the relationship between the settlement pattern and the state of soil, climate, natural recourses and social factors.
		5. A society's way of life is influenced by the physical environmental factors and socio-cultural factors	 i. State a few aspects on the way of life of the Malaysian community. ii. State the way man adapts his lifestyle with physical environmental factors such as the state of soil, climate and natural resources. iii. Explain how man adapts his lifestyle with social and culture factors.
		6. The social and physical environmental should be cared for to ensure harmonious living	 i. Explain the need to care for the environment to ensure healthy, safety, aesthetics, ecological equilibrium and a continuity of natural resources. ii. Explain the mode of caring for the physical and social environment: some aspects being reforestation and planning settlement.
C.	Man manipulates the environment with honesty to fulfil the various needs for survival	7. Man transforms one form of energy to another form to fulfil his various needs.	i. Explains the forms of energy transformation. ii. Explain the facilities that could be obtained from man's success in transforming energy
		8. Society designs and manufactures various equipment for various needs	i. State the kind of equipments that reflect the Malaysian society's identity.ii.State the relationship between the equipment and living and working styles.
		9. Discoveries and designs that benefits man's life 10. Manipulation of the environment results in various effects.	i. Explain the effects of environmental manipulation in your own country: air, water, soil, and noise pollution; disturbance of ecological balance; extinction of flora and fauna; diminishing natural resources; erosion, land slide and floods
			ii. Explain the activities that can affect the environment in

	THEME	TOPIC/MAJOR IDEA	SCOPE/DETAIL
			your country such as indiscriminate disposal of sewage and waste; large scale forest clearing; unplanned citing of factories; hunting of wild animals; indiscriminate mining and agricultural activities.
			iii. Explain the steps that have to be taken before, while, and after the occurrence of a natural disaster.
			iv. Explain the aspects of the natural disaster towards man's life and the environment
D.	Interaction between man and man, and between the environ- mental elements that produce various phenomena.	11. The physical environment that has been polluted has to be restored to ensure harmonious living.	 i. State the aspects of the environment that has to be restored such as natural environmental elements and products that reflects cultural heritage. ii. Explain the modes of restoring our environment. iii. Explain the problems related to the restoration of the Malaysian environment.
		12. The condition that water, earthquake, volcanic earth could give rise to various phenomena.	 i. Name the phenomena such as hot water, earthquake, volcanic eruption, weathering, erosion and landslide. ii. State the places where there phenomena can be found. iii. State briefly how these phenomena occurred. iv. State the effects of these phenomena to the physical environments and man's life.
		13. Interaction between members of the society, which bring about various effects to living.	i. Healthy and unhealthy interaction.
		14. Society's stability has to be cared for to ensure harmonious living.	 i. Type of industries: food, textiles, electronic, heavy sector is important industry; location of industrial areas. ii. State the places where these phenomena can be found. iii. State briefly how these phenomena occurred. iv. State the effects of the phenomena to the physical environment and man's life.
		15. A harmonious peaceful society has to be created and maintained for harmonious living.	
		16. The advancement of industrial sector is important for the Malaysian economic stability.	
		17. Trade and commerce is important for Malaysian economic stability.	
		18. Progress in the communication and transport sector contributes towards the development of Malaysian society.	
		19. Progress in the communication and transport sector contributes towards the development of the Malaysian society.	
		20. Progress in the medical and health sector contributes to the rise in the social status of the Malaysian society.	i. Healthy services, its development and success to control local diseases and to improve the quality of life of the people.

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