
The Development of ASEAN Natural Resources and Environmental Learning Guide for Third Year Secondary School Students, Khi Lek Phitthayakom School, Roi Et Province, Thailand

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The objectives of this study were to: 1) develop an ASEAN natural resources an environmental learning guide and 2) investigate and compare knowledge, attitude, and skills in integrated scientific practice about ASEAN natural resources and environment before and after learning. The subjects in this study were 30 third year secondary school students at Khi Lek Phitthayakom School, Roi Et province and they were obtained by simple random sampling. Research instrument in this study were a learning manual, learning achievement test, attitude test, and integrated scientific practice test. Findings should that the efficiency of the learning manual was equivalent to 97.60/92.16. The effectiveness index of the learning manual was equivalent to 0.8695. Learning progress of the students was 86.95 percent. The integrated scientific practice the students after learning was higher than before with a statistical significance level at .05

Keywords: learning manual, ASEAN natural resources and environment, knowledge, attitude, integrated scientific practice

Introduction

ASEAN stands for “The Association of Southeast Asian Nations” which arises from The Bangkok Declaration on 8th August 1967. It aims to have regional coordination of countries in Southeast Asia. At the initial stay, five countries are members of ASEAN: Indonesia, Malaysia, the Philippines, Singapore, and Thailand. Since the establishment of ASEAN, the association has been trying to present roles on the promotion of peace, stability, security,

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and progress of countries members. It also constructs trustworthiness among the countries and develops economic and social coordination. Later on, other countries in Southeast Asia join the association i.e. Brunei, Myanmar, Vietnam, Laos, and Cambodia. Meanwhile, Papua New Guinea and Timor Leste are in negotiation to be ASEAN members (Bundikul, 2012). In addition, ASEAN is the framework of economic coordination in Southeast Asia. The population of ASEAN is more than 600 million and gross national income is about 2 million US dollars. This makes ASEAN be an important world market. Nowadays, ASEAN is a major institute in the region and multilateral venue on diplomacy and trading. Besides, it is important to ASEAN members in terms of strategies and relationships on the society, culture, economy, politics, environment, and stableness (Luenchawi, 2013). In fact, ASEAN is like a family of ASEAN members which officially established in October 2003. It is developed from the Association of Southeast Asia Nations which aims to be a community having people as the center for development and sustainable utilization of natural resources. It also promotes ASEAN identity to cope with ASEAN culture and social community. There is the coordination in 6 aspects: human resource development, social welfare and protection; social rights and justice; sustainable environment; construction of ASEAN identity; and reduction of development gap (ASEAN Department, Ministry of Foreign Affairs, 2013). Since ASEAN puts the importance on sustainability of environment, “environment studies” is considered as an educational process aiming to develop population to have knowledge and understanding about value of natural resources as well as environmental problem solving. In addition, environmental studies also focus on knowledge about social and physical environment of both concrete and abstract aspects. It also constructs the values of environmental conservation and development as well as quality of life and the society (Werawattananon, 2003). Because of this, the researchers as academics and environmental specialists decided to conduct a study on the development of ASEAN natural resources and environmental learning guide which help develop learners to have knowledge, good attitudes, and skills in integrated scientific practice about ASEAN environment and natural resources.

Objective of the Study

Specifically, this study aimed to:

1. develop ASEAN natural resources and environmental learning guide having an efficiency at 80/80;
2. explore and compare knowledge about ASEAN natural resources and environment before and after learning;

3. explore and compare attitudes towards ASEAN natural resources and environment before and after learning; and
4. explore and compare skills in integrated scientific practice about ASEAN natural resources and environment before and after learning.

Scope and Delimitation of the Study

Population in this study were 50 third year secondary school students at Khi Lek Phitthayakom Schools, Roi Et province (Class 3/1 = 30 students and class 3/2 = 20 students, first semester, academic year 2016). The sample group consisted of 30 students, class 3/1 and they were obtained by simple random sampling.

Research Instrument

Research instrument in this study include the following:

1. ASEAN natural resources and environment learning guide;
2. Test paper on knowledge about ASEAN natural resources and environment;
3. Attitude measurement paper about ASEAN; and
4. Measurement paper on integrated scientific practice about ASEAN natural resources and environment.

Data Collection

There were 2 steps of data collection as follow:

Step 1. Developing ASEAN natural resources and environment learning guide. Basic data were investigated and related literature was analyzed. This was related to learning content framework and the assessment of the development of the learning guide as follow:

1. The construction of ASEAN natural resources and environment learning guide contained 6 units: 1) soil resource of ASEAN; 2) water resource of ASEAN; 3) forest resource of ASEAN; 4) wildlife resource of ASEAN; 5) environmental problems of ASEAN; and 6) impacts and a guideline for environmental problem solving of ASEAN. Consistency value was found and 5 specialists assessed the consistency (IOC = 1.00). The learning guide was consistent with the objectives of the study and could be used for data collection.

2. The knowledge test paper consisted of 60 items (30 scores). The difficulty value range was 0.28-0.69. Discrimination power (B) range was 02.0-0.69, and the reliability value was at 0.92.

3. The attitude measurement paper consisted of 15 items. The discrimination (B) range was 0.21-0.74 and the reliability value was at 0.88.

4. The measurement paper on integrated scientific practice about ASEAN natural resources and environment consisted of 30 items (30 scores). The difficulty value range was 0.28-0.74. The discrimination power (B) range was 0.20-0.69 and the reliability value was at 0.92.

After that, all research instruments were assessed and improved based on suggestions of the specialists.

Step 2. Facilitation of learning activities for the sample groups. It was in the form of integrated learning activities, lecture technique, focus group discussion, question and answer, recreation technique, learning measurement before and after learning. Lastly, measurement of attitudes and skills in integrated scientific practice.

Results

1. The efficiency of the ASEAN natural resources and environment learning guide was equivalent to 94.60/92.16 and the effectiveness of the learning guide was at 0.8695. This implied that the students were progressive in learning (86.95%) as shown in Table 1 and 2.

Table 1. Efficiency of the ASEAN natural resources and environment learning guide

Learning Unit	Total Score	\bar{x}	S.D.	Percentage of an average mean score
Efficiency of the process (E ₁)	30	28.35	0.85	94.60
Efficiency of the process (E ₂)	30	27.65	1.65	92.16
The efficiency of the learning guide was equivalent 94.60/92.16				

Table 2. Effectiveness index (E₁) of the ASEAN natural resources and environment learning guide

Score before learning	Score after learning	No. of learners	Total score after learning	Effectiveness index value
371	831	30	30	0.8695

2. The experimental group had an average mean score knowledge about ASEAN natural resources and environment which was higher than before learning (Statistical significance level at .05) as show in Table 3.

Table 3. A comparison of knowledge about ASEAN natural resources and environmental of the experimental group by using t-test (Dependent Sample)

Knowledge (N = 30)	Before learning		Level of know- ledge	After learning		Level of know- ledge	t	df	p
	\bar{X}	S.D.		\bar{X}	S.D.				
The experimental group	12.00 (40%)	3.56	Low	27.63 (92.10%)	1.65	Highest	23.56	29	.000*

*Statistical significance level at .05

3. The experimental group had an average mean score of attitudes toward ASEAN natural resources an environment which was higher than before learning (Statistical significance level at .05) as shown in Table 4.

Table 4. A comparison of attitudes toward ASEAN natural resources and environment of the experimental group by using t-test (Dependent Samples)

Attitudes (N = 5)	Before learning		Level of attitudes	After learning		Level of attitudes	t	df	p
	\bar{X}	S.D.		\bar{X}	S.D.				
The experimental group	2.66	0.24	Uncertain	4.71	0.19	Strongly agree	-40.70	29	.000*

*Statistical significance level at .05

4. The experimental group had an average mean score of skills in integrated scientific practice about ASEAN natural resources and environment (Statistical significance level at .05) as shown in Table 5.

Table 5. An average mean score, standard deviation, and a level of skills in integrated scientific practice about ASEAN natural resources and environment of the experimental group

Skills	Before learning			After learning			t	df	p
	\bar{X}	S.D.	Level	\bar{X}	S.D.	Level			
Integrated scientific practice	2.66	0.24	Moderate	4.71	0.19	High	-40.70	29	.000*

*Statistical significance level at .05

Discussions

1. The efficiency of the ASEAN natural resources and environment leaning guide was equivalent to 94.60/92.16 and its effectiveness index was 0.8695. This implied that the learning guide had the higher efficiency than the determined criteria (80/80). This is because the researchers had investigated document, textbooks, and related researches. There was a systematic planning on the construction of the learning guide and it was improved in accordance with suggestions of the specialists. It conforms to an idea of Yuangthong (1999, p.29). She determined 5 steps of the construction of learning manual as follows: 1) investigate related basic data from researches, documents, and textbooks; 2) determine objectives and scope of content; 3) write content of the manual in accordance with the objectives; 4) design format, illustration, publishing, and try-out in accordance with the process of quality development of the manual and improvement, and 5) the learning manual is tried-out with the experimental group. This also confirms to an idea of Srisa-ard (2003) which revealed that the construction of media, teaching, or recognition teaching methods must be tried out for finding an efficiency to be confident in further using. Besides, it conforms to a study of Wangsa (2006) on “organism and the process of making a living” for first year secondary school student teaching/learning facilitation. Its efficiency was equivalent to 82.21/81.7 which was higher than 80/80 as set and its effectiveness was 0.76 which implied that the learners had increased learning achievement for 76 percent.

2. Student of the experimental group had an average mean score of knowledge about ASEAN natural resources and environment which was higher than before learning. This implied that the researchers transformed knowledge about natural resources and environmental content through various technologies to the experimental group. This conforms to an idea of Chankaew (1993). She concluded that environmental studies can be understood as the systematic process of knowledge extension about environment through transfer technology to the target group. Also, learning methods have an effect on increased knowledge of learners. The researchers employed learning techniques to assist the students to develop knowledge in which there were 5 steps of activities on knowledge seeking. This made the students be active which resulted in increased knowledge. This conforms to an idea of Wongchantra (2012). She stated that environmental studies can be described as “Knowledge is the perception by the five senses and perception by sentiment. Human perception is important to transfer process in order to achieve the goal.” This can make us know facts or story details which will be accumulated experience of an individual and transferred to others until it becomes to be knowledge. It is essential to measure

knowledge; story recognition ability; and various experiences. According to the experience, it shows that the ASEAN natural resources and environment learning guide has an effect learning performance of the students.

3. The experimental group had an average mean score of attitudes toward ASEAN natural resource and environment which was higher than before learning. This implied that learning guide and the learning methods had an effect on their increased attitudes. This conforms to an idea of Charoongsirawat (2011). He explained that a manual is a document or book prepared for the teacher to use for the facilitation of teaching and learning. That is, teaching can of Choom-Apai (2014) on developing training activities to be environmental leaders at secondary schools in Nam Pong district, Khon Kaen province. It was found that students attending a training on environmental leaders had increased attitudes with a statistical significance level at .05. Besides, it conforms to an idea of Traindis (1971). He explained that attitudes or opinions comprise 3 parts: knowledge/ opinion of an individual towards stimuli; sentiment e.g. sentiment/feeling towards stimuli; and behavior e.g. behavior of an individual towards stimuli.

4. The experimental group had an average mean score of skills in integrated scientific practice which was higher than before learning. This implied that the learning guide had an effect on increased skills in integrated scientific practice. This might be due to learning techniques interpolated in each learning unit which enhanced the students to be able to set a hypothesis, control variables, conduct experiment, and interpret data. In addition, it was found that the students continually developed skills in integration; particularly on hypothesis setting and variable control, and experimenting. This also conforms to a study of Choom-Apai (2014) on developing training activities to be environmental leaders at secondary schools in Nam Pong district, Khon Kaen province. It was found that the participants had skills as environmental leader which was higher than before with a statistical significance level at .05

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