

*A Development of Science Activity Packages learning on Ecosystem and Environment for Mathayomsuksa 1. Students*

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**Abstract**

There were three Purposes of the study: 1) to development and identify educational quality of science activity packages learning on “Ecosystem and Environment”. 2) to study learning outcomes; knowledge and science process skills of Mathayomsuksa 1. Students by science activity packages learning on “Ecosystem and Environment” and 3) to study attitude toward environment of Mathayomsuksa 1. Students by science activity packages learning on “Ecosystem and Environment”. The study was accomplished through two stages of operation; 1) development and quality evaluation of science activity packages learning by the experts and conducting a teaching experimentation with a group of three students and nine students successively. 2) performing experimental teaching by employing the science activity packages learning with the sampling coming up with a group in one class (from 10 class of 40 MS.1 (grade 7) of Sriboonyanon school ) for 14 periods (50 minutes a period)for the experimental teaching. The results were as follows:

1. The science activity packages learning were at higher educational quality good level.
2. Learning outcomes of students exposed to instruction utilizing the developed science activity packages learning were found positive: 1) students’ post-test scores on knowledge were significantly higher than their pre-test scores. 2) students’ post-test scores on science process skills were significantly higher than their pre-test scores.
3. Students’ post-test scores on attitude toward Environment designated as “good level”.

Keywords: science activity packages learning, ecosystem and environment for secondary school, attitude toward environment

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## **Introduction**

At present, environmental problems in Thailand were intensifying, especially the problem of ecological balance, water pollution, air pollution and global warming. [ 1 ] Therefore, teaching science should focus on allowing teachers to create the right learning media. To give students a deep understanding of nature and the environment as well as the relationship between organisms and the environment and ecosystem, as well as the proper use of knowledge to solve such environmental problems. [ 2 ] The teacher was the only person who encourages the student to do the activity as instructed by the teacher. Students will learn by themselves and act. The success achieved will bring a sense of self-esteem that will inspire students to strive for truth, resulting in knowledge, thought skills, scientific process skills, and attitudes to conservation coupled with the environment. [ 3 ] For good instructional media, students should be prepared for science activity packages learning as a means of helping students to learn by themselves. The learning materials were provided in a systematic way to promote students' learning to change their learning behaviors by allowing students to study and follow the series by themselves. It also results in independent learning, interest, not bored in learning. Encourage students to be creative in their development of knowledge, skills, scientific processes and attitudes towards environmental conservation at the same time. [4 ]

So in science teaching for Mathayomsuksa 1. Students, the researcher developed of a science activity packages learning on “Ecosystem and Environment” were divided into 5 units as follows: 1) Ecosystems and environment in the garden of school 2) Ecosystems and environment in the pond of school 3) Ecosystems and environment in the Basketball court of school 4) Drainage ecosystems in densely populated communities 5) Brainstorm, improve the problematic environment. The researcher expects a science activity packages learning on “Ecosystem and Environment” will encourage students to have an understanding of ecosystems and the relationship between ecosystems and the environment. Students will have more scientific process skills and attitudes towards higher environmental conservation. This will result in sustainable solutions to environmental problems in the community. [ 5 ]

Research goals:

- 1) To development and identify educational quality of science activity packages learning on “Ecosystem and Environment”.
- 2) To study learning outcomes; knowledge and science process skills of Mathayomsuksa 1. Students by science activity packages learning on “Ecosystem and Environment”.
- 3) To study attitude toward environment of Mathayomsuksa 1. Students by science activity Packages learning on “Ecosystem and Environment”.

## **Methods**

The study was accomplished in 7 steps:

- 1) Development of the science activity packages learning on “Ecosystem and Environment” were divided into 5 units: 1) Ecosystems and environment in the garden of school 2) Ecosystems and environment in the pond of school 3) Ecosystems

and environment in the Basketball court of school 4) Drainage ecosystems in densely populated communities 5) Brainstorm, improve the problematic environment.

2) Determination of the quality of the science activity packages learning on “Ecosystem and Environment”, by specialist science teachers. A total of 5 people evaluated five areas: 1) contents, 2) using language and illustrations, 3) learning activities, 4) experimental kit and 5) post-test. Each area was evaluated with one of the following ratings: [ 6 ]

1.00 -1.50 = very low

1.51-2.50 = low

2.51- 3.50 = medium

3.51-4.50 = good

4.51-5.00 = Very good

3) Evaluation of the science activity packages learning by specialist science teachers, by conducting a teaching experimentation with a group of three students and nine students successively, before the real trial.

4) Performance of experimental teaching by inviting a single sample group (sampled from 10 classes of 40 Mathayom 1 (grade 7) students, from Sriboonyanoon school, Nonthaburi, Thailand) for 14 periods (50 minutes a period) of experimental teaching.

5) Evaluation of the students’ knowledge gained from learning in science activity packages learning on “Ecosystem and Environment”.

6) Evaluation of the students’ science process skills gained from learning in science activity packages learning on “Ecosystem and Environment”.

7) Evaluation of attitude toward environment, through learning in science activity packages learning on “Ecosystem and Environment”. Tests to measure attitudes toward environment used three levels as follows: 0 = low, 1 = medium, 2 = good. The evaluation criteria was set at 2.00 (good level) or higher.

## **Results**

The results of the research were as follows:

1.The quality of the science activity packages learning on “Ecosystem and Environment” were divided into five units: 1) Ecosystems and environment in the garden of school 2) Ecosystems and environment in the pond of school 3) Ecosystems and environment in the Basketball court of school 4) Drainage ecosystems in densely populated communities 5) Brainstorm improve the problematic environment, by a total of five specialist science teachers, who evaluated five areas: 1) contents, 2) using language and illustrations, 3) learning activities, 4) experimental kit and 5) post-test. The details are shown in Table 1.

Table 1: The quality of the science activity packages learning on “Ecosystem and Environment”, evaluated by a total of five specialist science teachers.

<b>Areas</b> <b>Units</b>	contents	using language and illustrations	learning activities	experimental kit	post-test	$\bar{X}$	Levels
Ecosystems and environment in the garden of school	4.60	4.40	4.80	4.40	4.20	4.48	good
Ecosystems and environment in the pond of school	4.80	4.40	4.60	4.60	4.40	4.56	very good
Ecosystems and environment in the Basketball court of school	4.40	4.40	4.40	4.60	4.20	4.40	good
Drainage ecosystems in densely populated communities.	4.40	4.40	4.60	4.40	4.40	4.44	good
Brainstorm improve the problematic environment	4.80	4.40	4.60	4.40	4.40	4.52	very good
<b>Total average</b>	very good 4.60	good 4.40	very good 4.60	good 4.48	Good 4.32	<b>4.48</b>	<b>good</b>

Table 1 Shows the average quality of the science activity packages learning on “Ecosystem and Environment” evaluated by specialist science teachers. Quality was evaluated across five areas: contents, using language and illustrations, learning activities, experimental kit and post-test. The respective averages of each area were as follows: 4.60 very good, 4.40 good, 4.60 very good, 4.48 good, 4.32 good, while the total average across all areas was 4.48 good.

2. Achievement of learning outcomes among students who used the science activity packages learning on “Ecosystem and Environment” was assessed using the average pretest and posttest scores. The details of the results are shown in Table 2.

Table 2: The comparison of the achievement of learning outcomes among students who used the science activity packages learning on “Ecosystem and Environment”, assessed by pre-test and post-test.

average score	n	$\bar{X}$	SD	df	t
pre-test	40	28.14	3.72		
				39	20.25 *
post-test	40	32.48	3.10		

Table 2 Compares the average achievement of knowledge learning outcomes among students who used the science activity packages learning on “Ecosystem and Environment” assessed by pre-test and post-test. The increase in post-test scores on pre-test scores was statistically significant .05.

3. The achievement of learning outcomes with regard to science process skills in the science activity packages learning on “Ecosystem and Environment” was assessed by comparing the average pretest and posttest scores. The details are shown in Table 3.

Table 3: The comparison of the average achievement of learning outcomes, with regard to science process skills, among students in the science activity packages learning on “Ecosystem and Environment”. This was assessed using pre-test and post-test.

average score	n	$\bar{X}$	SD	df	t
pre-test	40	23.25	1.12		
				39	8.36*
post-test	40	29.45	3.25		

Table 3 compares the average student achievement of learning outcomes, with regard to science process skills, the science activity packages learning on “Ecosystem and Environment”, using pre-test and post-test scores. The increase in post-test scores on pre-test scores was statistically significant .05.

4. Evaluation of attitudes toward water resources among students learning in the science activity packages learning on “Ecosystem and Environment”. The details are shown in Table 4.

Table 4: The average post-test score on attitude toward Environment among students learning in the science activity packages learning on “Ecosystem and Environment”.

average score	n	$\bar{X}$	SD	$\mu=2$	df	t
post-test	40	2.87	0.42	2	39	2.12*

Table 4 Shows the average post-test score of on attitude toward Environment among students learning the science activity packages learning on “Ecosystem and Environment”. The average value of 2.87 (good level) was higher than the criteria set at 2.00, and was statistically significant .05.

### **Conclusions**

The results were as follows:

- 1) The science activity packages learning on “Ecosystem and Environment” were of a high educational quality (good level).
- 2) Learning outcome achievement among students exposed to instruction utilizing the developed the science activity packages learning on “Ecosystem and Environment” was found to be positive: 1) Students’ post-test scores on knowledge were significantly higher than their pre-test scores. 2) Students’ post-test scores on science process skills were significantly higher than their pre-test scores.
- 3) Students’ post-test scores on attitude toward environment, among students learning in the science activity packages learning on “Ecosystem and Environment”, were designated as at a “good level.”

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