Knowledge, Understanding and Attitudes towards Natural Resources Management of Students in Secondary School*

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Abstract

The purposes of this research were to: 1) study the knowledge and understanding of natural resources management of secondary school students and 2) study the attitudes towards natural resources management of secondary school students at Srikranuanwit tayakom School, located in Kranuan District, Khon Kaen Province. The data was derived from quantitative research and obtained from 100 samples of secondary students of Srikranuanwittayakom School, who consented and participated in the workshop that focused on encouraging young volunteers to conserve natural resources and protect the environment of Kranuan District. The pre-and post-workshop questionnaires have been administered, and the results analyzed by the Descriptive Statistics method into frequencies, percentages, means, standard deviations and t-test for dependent samples.

The research results find that:

1. The sample group has improved their level of knowledge, understanding after the workshop.

2. The attitudes towards natural resources management with post-workshop questionnaire scores being higher than pre-workshop scores. When exploring the attitude towards each specific resource management, land, forest, and water management showed the highest to lowest mean score, respectively. In addition, the difference in the results

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of pre- and post-workshop questionnaires is statistically significant at the level of 0.01.

Keywords: Natural Resources Management; Student; Secondary School

1. Introduction

The natural resource and environmental issue is one of the major sustainable development goals (SDGs), according to the Announcement of the United Nation. The goal in natural resource and environmental development is divided into sub-goals, namely Goal No. 13: Climate Action, Goal No. 14: Life below Water, and Goal No. 15: Life on Land. It can be understood that these goals in natural resource and environment developmentare continual and have multi- dimensional coverages (Office of the National Economic and Social Development Council, 2021).

The global development situation in 2020 was affected by the new Corona virus (COVID-19), which added to the problematic situations related to natural resources and environment. Although COVID-19 pandemic has reduced roughly 6% of greenhouse gases from the production sector while marine resources have been restored; the situation lasted only a short while. Forest land all over the globe still has continuously decreasing tendency due to expansion of farmland (United Nations, 2020).

Forest land in Thailand during 2018-2019 covered 102,484,072.71 rais or 31.68% of the total land area of the country, a 4,229.48-rai decrease from 2017-2018 (Seub Nakhasathien Foundation, 2020). For the national water resource, the data shows 230,042 million cubic meters of runoff in 2017. This amount decreased to 193,321 million cubic metersin 2018. Solid wastes had increasing tendency from 41,532 tons daily in 2010 to 78,665 tons per day in 2020 (National Statistical Office, 2021). These statistics data reflect the crisis of the natural resource and environmental situation, denoting the decreasing tendency of forest and water resources as opposed to increasing tendency of solid wastes.

Knowledge, understanding, and good attitudes towards management of natural resources and environment are important in conserving and sustaining natural resources and the environment. Intensive dissemination of knowledge and understanding of the environment and the ecological system by incorporating it in textbooks or different learning programs will result in building good attitudes

towards the natural resources and the environment among the population, especially the youths (Sangchai, 2002). The youths, in particular, are the key agents with a partial but important role in natural resource and environmental conservation. Young people usually have public mindedness and would readily join the activities concerning the environment with their community or school (Thuppaen et al., 2018, pp. 20-29). It had been found, in addition, that the youths are expected by their parent generation to acquire knowledge and skills for management of marine, fishery, and forestry resources in their respective region in the future (Zurba and Trimble, 2014, pp. 78-87).

The area of Kranuan District, Khon Kaen Province has been found confronting the following inclusive natural resources and environment situation: 1) The people still lack conscience in conserving and nurturing their community natural resources. 2) No systematic management is carried out on solid waste problems. 3) Wood cutting and burning of sugarcane plantation before transporting to the sugar mills result in black carbon deposit blown all over the residential zone. 4) There are problems from fetid smells and waste water during the runoff season when water discharged from the tapioca flour mill flows into the farmers' paddies, although not reaching a critical level. 5) There is a problem from chemicals used in cropping and animal farms. These problems are chronic and bring impacts on the living of the people in the area (Narongchai, 2020). Srikranuan wittayakom School participated in many projects, for instance, the astronomy camp and boy scout camp in Nampong district, Khon Kaen province. Moreover, this school is well-known about the To Be Number One project, that is the project related drug protection. However, the activities related the environment aspect is rarely arranged. From the above issues and in order to raise participation in the management of natural resources and environment, the researcher saw the importance to study the knowledge, understanding, and attitudes of school pupils. The study was conducted under a workshop project to build young volunteers for conservation of natural resources and environment of Kranuan District, Khon Kaen Province.

The Natural Resources Management concept (NRM) is adopted to this study, NRM is the efficiency procedure as the conservation, e.g. utilization, collection,

maintenance, revitalization, protection, preservation, zoning and development the natural resources and environment. This concept is focusing on the natural resources remaining and increasing both directly and indirectly procedure (Jankaew, 2010).

This paper was an activity under the research project on the development of an innovation for sustainable management of the natural resources and the environment at Kranuan District, Khon Kaen Province.

2. Research Objectives

1. To study the knowledge and understanding of the natural resource and environmental management of secondary school students of Srikranuanwittayakom School, Kranuan District, Khon Kaen Province.

2. To study the attitudes towards the natural resource and environmental management of secondary school students of Srikranuanwittayakom School, Kranuan District, Khon Kaen Province

3. Research Methodology

This research applies quantitative research methodology to study the knowledge, understanding and attitudes of the natural resource and environmental management of secondary school students of Srikranuanwittayakom School, Kranuan District, Khon Kaen Province. The research methodology consists of sample group, data collection tool, data collection and data analyses.

1. Sample Group.

The sample group in this research comprised 100 secondary school students of Srikranuanwittayakom School, Kranuan District, Khon Kaen who were consented in the workshop project to build young volunteers for conservation of natural resources and environment of Kranuan District, Khon Kaen Province.

2. Data Collection Tool

The data collecting tool was the questionnaire, which was validated the contents by the expert related environmental field and divided into 3 parts: Part 1-general data of the respondents, Part 2-10 true and false questions on the knowledge and understanding of the natural resource and environmental management, and Part 3-5 questions on the attitudes towards the natural resource and environmental management, in the form of 5 levels Likert Scale.

3. Data Collection

The data was collected twice under the workshop project to build young volunteers for conservation of natural resources and the environment of Kranuan

District, Khon Kaen Province, as follows: 1) Before the workshop on the management of natural resources and environment, by means of questionnaire administered with the school students, and 2) After the workshop for a month, with a new questionnaire that consisted of the same questions administered with the same group of school students.

4. Data Analyses

The descriptive statistics were used, including frequencies, percentages, means, standard deviations and t-test for dependent samples, which were then analyzed to obtain the knowledge, under standing and attitudes of the secondary school students of Srikranuanwittayakom School, Kranuan District, Khon Kaen on the management of natural resources and environment.

4. Results

The results of the study can be divided into 3 parts: 1) the knowledge and understanding of the secondary school students of Srikranuanwittayakom School, Kranuan district, Khon Kaen province on the management of natural resources and environment; 2) the attitudes of the secondary school students of Srikranuanwittayakom School, Kranuan District, Khon Kaen on the management of natural resources and environment; and 3) the results of the pre- and post-workshop tests on the knowledge and understanding of the secondary school students. The details of the results are given below:

1. The knowledge and under standing of the natural resource and environmental management of secondary school students of Srikranuanwittayakom School, Kranuan district, Khon Kaen province

Overall, the knowledge and under standing of the secondary school students were at a high level (8-10 points), with the post-workshop scores higher than the pre-workshop scores: 67.00% and 50.00%, respectively. The average scores of the knowledge and understanding from the pre-test were 7.29 and 8.07 points, respectively, from the full scores both of the pre- and post-tests of 10.00 points (Table 1) The changes of scores from the pre- to the post-tests reflected the changes in their knowledge as a result of the workshop.

Table 1 Percentages of the students, classified by the overall knowledge and understanding towards the management of natural resources and environment

Level of knowledge and understanding	Percentage	
	Pre-workshop	Post-workshop
Low (0 – 4 points)	8.00	1.00
Moderate (5 – 7 points)	42.00	32.00
High (8 – 10 points)	50.00	67.00
Total	100.00 (100)	100.00 (100)
Mean	7.29	8.07
S.D.	1.94	1.36
Minimum	0.00	4.00
Maximum	10.00	10.00

2. The attitudes towards the natural resource and environmental management of secondary school students of Srikranu anwittayakom School, Kranuan district, Khon Kaen province

Overall, the study of the attitudes towards the management of natural resources and environment showed that most of the school students were not certain (34-41 points) towards the knowledge in the management of natural resources and environment, equally both before and after the workshop (56.00%). They agreed (42-49 points) with the higher level of knowledge in managing natural resources and environ mentafter the workshop i.e., at 39.00% and 28.00%, respectively. The average scores of the attitudes before and after the workshop were 37.94 and 40.03 points, in that order, with the highest pre-workshop and post-workshop scores of 46.00 and 49.00 points, respectively (Table 2).

Table 2 Percentage of school students, classified by the overall attitudes towards the management of natural resources and environment

Level of attitudes	Percentage	
	Pre-workshop	Post-workshop
Disagree (25 – 33 points)	16.00	5.00
Not certain (34 – 41 points)	56.00	56.00
Agree (42 – 49points)	28.00	39.00
Total	100.00 (100)	100.00 (100)
Mean	37.94	40.03
S.D.	4.79	4.22
Minimum	25.00	30.00
Maximum	46.00	49.00

Based on item-by-item analysis, most of the school students showed the following attitudes towards the management of natural resources and environment: pre-workshop-disagreeing (6- 10 points) and not certain (11- 15 points) at 9.00% and 59.0%, respectively, whereas only 32.00% agreed (16- 20 points). After the workshop, the agreeing attitude (16- 20 points) increased to 42.00%, while disagreement (6- 10 points) decreased to only 2.00%, with the means of their pre- and post-workshop attitude levels at 14.12 and 15.18 points, respectively, and the highest points being 19.00 points before the workshop and 20.00 points after the workshop (Table 3).

In so far as the water resource was concerned, the attitudes towards management prior to the workshop were disagreeing (5-8 points) and uncertain (9-12 points) at 21.00% and 51.00%, respectively. However, after the workshop, the scores of disagreeing attitude (5-8 points) and uncertainty (9-12 points) decreased whereas the agreeing attitude after the training increased, i.e. at 32.00 and 28.00%, respectively, with the pre-workshop and post-workshop means being 10.83 and 11.34 points, in that order, and the pre- and post-workshop highest

scores being equal at 15.00 point (Table 3).

The school students' attitudes towards the management of forestry resource and environment were as follows: prior to the training-6.00% disagreed (7-9 points) and 34.00% were not certain (10-12 points), whereas only 60.00% showed agreeing attitude (13-15 points); after training 72.00% were found to agree (13-15 points, with the pre- and post-workshop means scores being 12.99 and 13.51 points, respectively, and the pre- and post-work shop highest score being equal at 15.00 points (Table 3).

Table 3 Percentage of school students, classified by the attitudes towards the manage ment of natural resources and environment, based on items

Level of attitudes by items	Percentage	
	Pre-workshop	Post-workshop
Soil resource		
Disagree (6-10 points)	9.00	2.00
Not certain (11-15 points)	59.00	56.00
Agree (16-20 points)	32.00	42.00
Total	100.00 (100)	100.00 (100)
Mean	14.12	15.18
S.D.	2.59	2.41
Minimum	6.00	9.00
Maximum	19.00	20.00
Water resource		
Disagree (5-8 points)	21.00	11.00
Not certain (9-12 points)	51.00	57.00
Agree (13-15 points)	28.00	32.00
Total	100.00 (100)	100.00 (100)
Mean	10.83	11.34
S.D.	2.64	2.30

Level of attitudes by items	Percentage	
	Pre-workshop	Post-workshop
Minimum	5.00	6.00
Maximum	15.00	15.00
Forest resource		
Disagree (7-9 points)	6.00	3.00
Not certain (10-12 points)	34.00	25.00
Agree(13-15 points)	60.00	72.00
Total	100.00 (100)	100.00 (100)
Mean	12.99	13.51
S.D.	1.68	1.75
Minimum	9.00	7.00
Maximum	15.00	15.00

3. The results of the pre- and post-tests onthe students'knowledge and understanding

3.1 Knowledge and under standing of the management of natural resources and environment

The analysis of the difference between the means scores of knowledge and understanding of natural resources and environmental management showed significant difference at 0.01 level. The means scores after the workshop were higher than before the workshop, i.e., at 8.10 and 7.29 points, respectively (Table 4).

Table 4 The means scores of knowledge and understanding of natural resources and environmental management

Knowledge and understanding scores	$\bar{x}$	S.D.	Number	t
Pre-workshop	7.29	1.94	100	3.52
Post-workshop	8.07	1.36	100	

df = 99 level of significance = 0.01

3.2 The attitudes towards the management of natural resources and environment of the school students

The analysis of the difference between the means scores of the attitudes towards natural resources and environmental management showed significant difference at 0.01 level. The means scores after the workshop were higher than before the workshop, i.e., at 40.03 and 37.94 points, respectively (Table 5).

Table 5 The means scores of the attitudes towards natural resources and environmental management

Attitude score	$\bar{x}$	S.D.	Number	t
Pre-workshop	37.94	4.80	100	3.15
Post-workshop	40.03	4.22	100	

df = 99 level of significance = 0.01

5. Conclusion and Discussion

The study of the knowledge, under standing, and attitudes of the management of natural resources and environment of the secondary school students of Srikranuan wittayakom, Kranuan District, Khon Kaen, showed that the students had a high level of knowledge and understanding of natural resources management. This finding agrees with Cheatea (2013), who conducted a study on factors associated with environmental conservation in a secondary school, a case study of Thammawittaya Moonnithi School, Muang District, Songkhla Province. This study showed that the students' knowledge, understanding, and attitudes towards school environment conservation were at a high level. The result also corresponded to a study by Naphan and Sueprasertsith (2019, pp. 70-80) on factors affecting behaviors in marine resource conservation s of people in Chonglom Temple Community, Naklua Sub-district, Banglamung District, Chonburi Province, which showed that the sample group had a very good level of knowledge on the coastal ecological system. The present study also corresponds to the study by Mahaworasiri (2005) on the attitude of adolescents towards environmental conservation and energy saving: a case study of Ramkhamhaeng University students. This study showed that the understanding and

knowledge related to environmental conservation and energy saving is one factor that affects the adolescents' attitudes towards environmental conservation.

The attitudes towards the management of natural resources and environment of the secondary school students of Srikranuan wittayakom School, Kranuan District, Khon Kaen Province were found to be higher after the workshop than before, i.e., their attitudes changed after they had acquired the knowledge and understanding and joined the activities. This corresponded to a study by Xuto and Prathum (2015, pp. 52-59) on the perception of high school students in the environmental management. The study showed that after receiving the knowledge and understanding of the environmental management, the means of perception in this regard significantly increased than before the workshop ($p < 0.05$). The findings also agreed with a study by Rayasawath (2016, pp. 42-48) on natural resource management for area development based on the participation method. It was shown that the participatory environmental management of the network allies in Makluamai Sub-district, Sungnoen District, NakhonRatchasima Province included 8 steps. Transfer of knowledge in management is one of the processes in natural resource management. The study also corresponded to a study by Ritsriboon (2020, pp. 67-76) on environmental literacy and the 21st Century skills of the 8th Graders, under the project-based learning activity of the subject: "World Sciences", which showed that their environmental literacy was higher than the criterion level of 80.

The knowledge, understanding, and attitudes towards natural resources and environment management of the school students were found at a high level, which reflected the importance of natural resources management that should be enhanced, promoted and instilled among the youths. Young generation is important and should be involved in the school and community activities related to the environment so that they would perceive the right ways of management (Thuppaen et al., 2018, pp. 20-29). Moreover, youths are an indicator expected by the elder generation to succeed in environmental and natural resource conservation in their hometown in the future (Zurba and Trimble, 2014, pp. 78-87).

6. Suggestion

1. The sample group who participated in the workshop to build environmental

and natural resource conservation volunteers at Kranuan district, Khon Kaen province was a group of secondary school students. The knowledge and understanding towards the management of natural resources and environment should be publicized to all grades of students and in the schools in other areas so that they have the right knowledge and understanding that leads to sustainable natural resource and environmental management in the future.

2. Studies should be conducted on factors affecting the behaviors in managing natural resources and understanding of school students in order to have guidelines for promoting and supporting natural resources and environmental management that is appropriate to specific area conditions.

7. Knowledge Assets

The knowledge assets of this paper were 1) after the workshop, the sample group has improved their level of knowledge under standing and attitudes towards natural resources management and 2) the workshop was the key for the feedback loop.

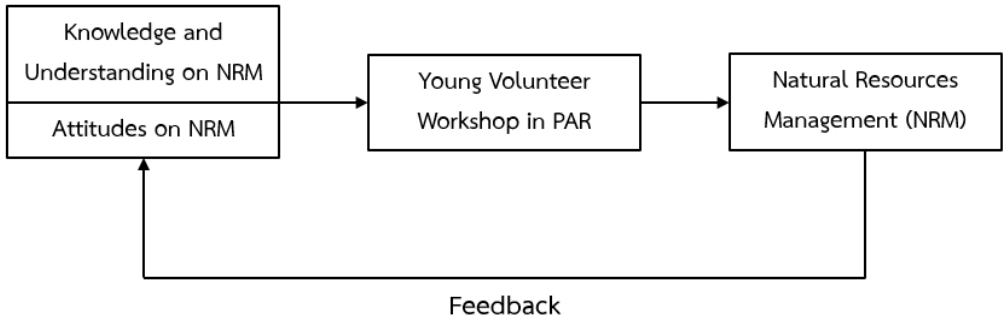

Figure 1 Knowledge Assets

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