

The Effect of Environmental Education Training Course in Soil, Water and Forest Conservation on the Concept of The King Rama IX of Thailand

Kannika Sookngam¹, Prayoon Wongchantra¹ & Wutthisak Bunnaen²

¹ Faculty of Environment and Resource Studies, Mahasarakham University, Maha Sarakham, Thailand

² Mahasarakham University Demonstration School (Secondary) Maha Sarakham, Thailand

Correspondence: Prayoon Wongchantra, Faculty of Environment and Resource Studies, Mahasarakham University, Maha Sarakham, Thailand.

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Abstract

The purposes of this research were to study and compare knowledge about soil, water and forests conservation, environmental ethics and environmental volunteers using the environmental education training course on the concept of The King Rama IX of Thailand in soil, water and forest conservation before and after training of students having different genders and Grade Point Average (GPA). There were two sample used this research: one involved in the curriculum development consisting of 94 students in Environmental Education, Faculty of Environment and Resource Studies Mahasarakham University enrolled in the course Environmental Education Training Curriculum in the first semester of the academic year 2018, and the other composed of 67 first-year students in Environmental Studies who were enrolled in the course Environmental Education in the second semester of the academic year 2018. Both groups were selected through the purposive sampling. The research instruments were Environmental Education Training Course in soil, water and forest conservation on the concept of The King Rama IX of Thailand, knowledge test about soil, water and forest conservation, environmental ethics test and environmental volunteers test. The statistics used in the research were frequency, percentage, mean, standard deviation, including hypothesis testing using t-test, F-test One-Way MANOVA, One-Way MANCOVA, and Univariate Test. The results showed that:

1. The students' average score of knowledge about soil, water and forest conservation on the concept of The King Rama IX of Thailand, environmental ethics, and environmental volunteers in the posttest was higher than the pretest statistical significance ($p < .05$).

2. There was significant different of average score of knowledge about soil, water and forest conservation on the concept of The King Rama IX science of Thailand, environmental ethics, and environmental volunteers between students with different gender statistical ($p < .05$).

3. There was significant different of average score of knowledge about soil, water and forest conservation on the concept of The King Rama IX of Thailand, environmental ethics, and environmental volunteers between students with different Grade Point Average (GPA) statistical ($p < .05$).

Keywords: environmental education training course, the concept of The King Rama IX of Thailand, soil conservation, water conservation, forest conservation, environmental ethics, environmental volunteers

1. Introduction

Natural resources are always essential for life and all human beings that bring natural resources that are widely utilized without limits. It may result in a lack of natural resources in the future. Therefore, the importance of natural resources in all areas should be learned and understood of the effective quality management, planning, and conservation of natural resources and the environment along with environmental development, and all of these are great importance (Prayoon Wongchantra, 2016). Natural resources and environment are considered the origin of the four basic factors: food, clothing, housing, medicine. Such basic needs are the major cause for the decline in natural resources which is resulted from the increase in population and consumption behavior, and inadequate knowledge

and all of these undeniably lead to many environmental problems. In other words, the world is encountering environmental problems related to degradation natural resources, insufficient water resources, polluted water, and continuous degradation of forest resources. (Prayoon Wongchantra, 2010)

The concept of The King Rama IX of Thailand have taken for all Thai people since in 1997, and his intention was to develop and enhance the quality of life, the well-being, and the awareness of his subjects as a guide to lead Thailand to a balanced and sustainable development (Punyabal, D, 2017). The King Rama IX emphasized on the balance of nature. His Majesty realized that soil, water, forests and all forms of living creatures are interrelated and dependent on one another despite this diversity of ecosystem. If something ever happens, this will have an effect on living things in the nature in a cynical way, and eventually on human beings too. Therefore, His Majesty had studied and put all his efforted in the maintenance and conservation of soil, water, and forests soil through natural processes and methods (Land Development Department: 2011).

Training courses can be considered as the heart of education that reflects the value of human resource development in each society (Adisak Singseevo, 2015). Therefore every curriculum should have these four components: purpose, content, activities, and evaluation (Hida Taba: 1962). In Training courses development, the objective of curriculum design must be clear and practical (Henson: 2001). A training course is therefore viewed as a tool in setting guidelines for educational management which involved a lot planning so as to change the learner's behavior for the better as specified in the objectives of the curriculum. This also includes the evaluation of the curriculum as the flection of the changes in the learner to see if he has changed according the curriculum's goals and objectives (Sajeewan Darbavasu, 2005).

Environmental education is the process of transferring or communicating environmental knowledge to people to instill knowledge about the environment, environmental opinions attitudes and values, environmental awareness, skills for solving environmental problems, participation in solving environmental problems, and evaluation of solving environmental problems, for sustainable environmental quality and quality of life (Prayoon Wongchantra, 2016). It provides environmental knowledge for all, based on the belief that environmental education the will help people participate in the prevention and solving environmental problems or improving the quality of the environment on the basis of selflessness, generosity, and social responsibility (Vinai Veeravatnanond, 1996), and all of that should be expressed on the basis of appropriate environmental ethics, and environmental volunteers.

This research study realizes the importance of guidelines for developing environmental education training courses on the concept of The King Rama IX of Thailand in soil, water and forest conservation. The training course in this study is aimed at the second year students in Environmental Education at the Faculty of Environment and Resource Studies, Mahasarakham University during the second semester in the academic year 2018, with the purpose to increase knowledge about soil, water and forests the conservation on the concept of The King Rama IX of Thailand, as well as environmental ethics, and environmental volunteers. The study was conducted on the principles of environmental education aimed at transferring and developing environmental training courses on the concept of The King Rama IX of Thailand in soil, water and forest conservation. This training course can be of great help for courses dealing with the teaching and learning of environmental education which is a systematic and traditional process of educating knowledge in developing knowledge, environmental ethics and environmental volunteers to realize the concept and achieve the stated purpose.

2. Method

2.1 Research Conceptual Framework

The development of environmental education training course in soil, water and forest conservation on the concept of The King Rama IX science of Thailand was created using the concept of Arun Rakthum (1997) contains the importance of the course objectives training unit content techniques and training methods training materials and evaluation of each training unit. Which the training unit is in the field of soil resources Water resources and for forest resources, a total of 12 training units consisted of training unit 1; the soil aggravation project, training unit 2; vetiver grass wall, training unit 3; the cover land water resources, training unit 4; check dam, training unit 5; sediment trap weir, training unit 6; phytoremediation water hyacinth forest resources, training unit 7; wet forest, training unit 8; watershed forest, training unit 9; plant a forest in the high ground, training unit 10; 3 forests 4 benefits, training unit 11; plant a forest in your heart, training unit 12; reforestation without planting and the design of research tools such as training manual, knowledge test, environmental ethics test and environmental volunteers test by using the tools created to consult with an advisor, then send 5 experts to determine the consistency of the communication and evaluation tools after that, try out with students who are not sample groups, year 2, academic year 2018, semester to find the difficulty individual value of authority and the entire confidence value by creating an integrated training

course and created the development of environmental education training course in soil, water and forest conservation on the concept of The King Rama IX of Thailand in the Environmental Education Training Curriculum for the 4th year of undergraduate students, Semester 1, Academic Year 2018. And organize environmental training course in soil, water and forest conservation on the concept of The King Rama IX of Thailand for undergraduate students, first year, semester 2, academic year 2018 for students enrolled in the Environmental Education courses to provide students with knowledge environmental ethics and environmental volunteers to provide students with knowledge, environmental ethics and environmental volunteers about soil, water and forests conservation according on the concept of The King Rama IX of Thailand. (As shown in Figure 1.)

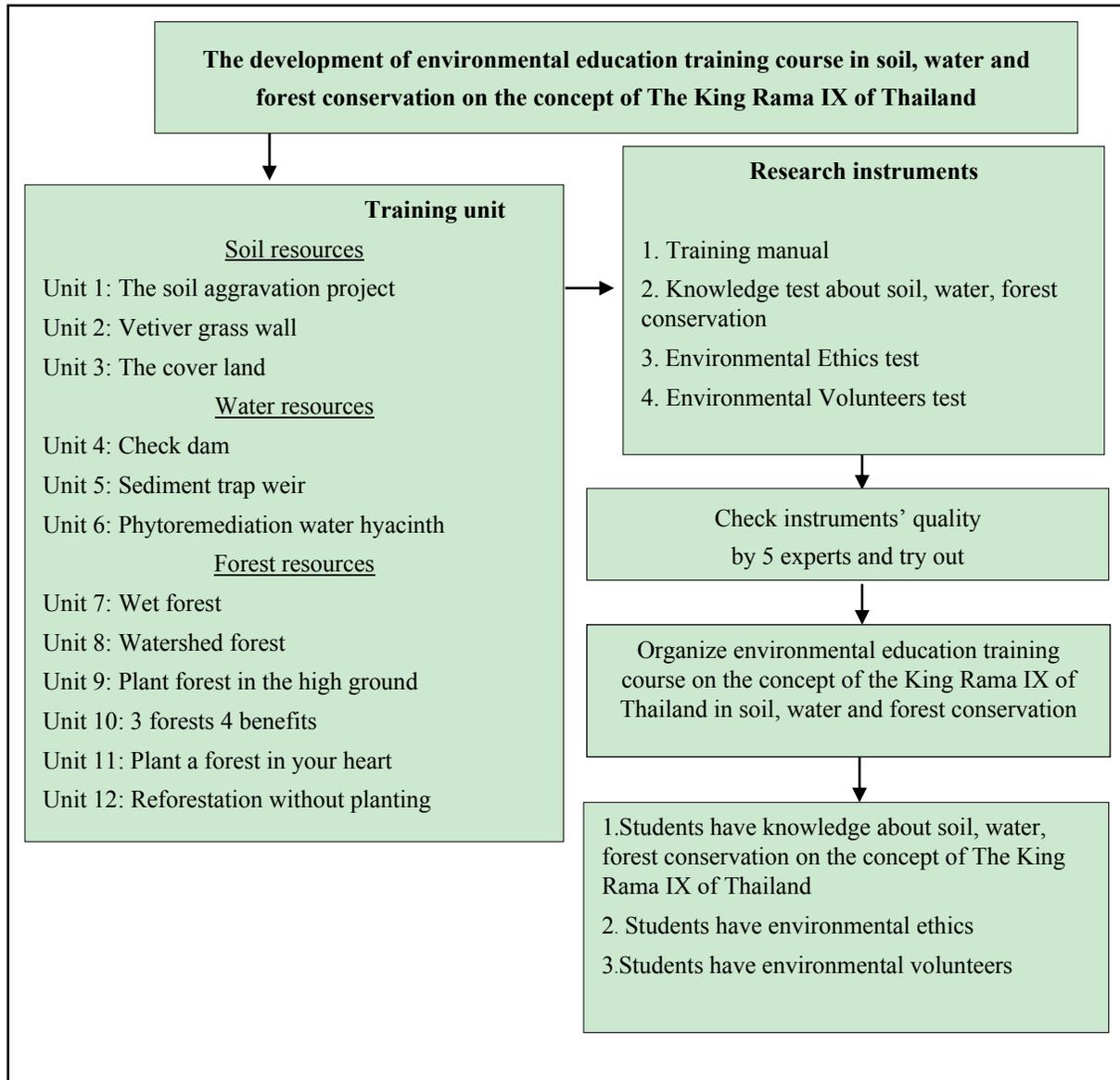


Figure 1. Research conceptual framework

2.2 Population and Sample

The population used in this research were 376 undergraduate students in years 1-4 in Environmental Education program, Faculty of Environment and Resource Studies, Maharakham University in academic year 2018.

The sample used in the research

(1) The sample used in making training course were 94 the fourth year undergraduate students in Environmental Education program, Faculty of Environment and Resource Studies, Maharakham University in academic year

2018, semester 1, which were derived from purposive sampling in Environmental Education Training Curriculum Course.

(2) The sample used in the study were 67 the first year undergraduate students in Environmental Education program., Faculty of Environment and Resource Studies, Mahasarakham University in academic year 2018, semester 2, which were derived from purposive sampling in Environmental Education Curriculum Course.

2.3 Variables

1) The independent variables were environmental education training course on the concept of the King Rama IX of Thailand in soil, water and forest conservation, gender and Grade Point Average (GPA); including low, medium and high of the sample students.

2) The dependent variable were knowledge about of soil, water, forest conservation on the concept of the King Rama IX of Thailand, environmental ethics and environmental volunteers.

2.4 The Research Instruments and Checking Instruments' Quality

Researcher have built and checked for quality tools as follows:

1) The instrument used in the training were environmental education training course in soil, water and forest conservation on the concept of the King Rama IX of Thailand with the following steps:

1.1) Study and research preliminary information related to development of training course by studying the concepts, theories, documents and related research about to plan for effective curriculum development.

1.2) Study of knowledge about soil, water and forest conservation of The King Rama IX King by studying from documents, books, textbooks and various media to guide the training, focus on the content to be consistent with the training objectives.

1.3) Researcher and 94 fourth year undergraduate students in Environmental Education program, Faculty of Environment and Resource Studies, Mahasarakham University in academic year 2018, semester 1, enrolled in Environmental Education Training Curriculum get together to analyze and synthesize content the King Rama IX that are relevant to the current situation in soil, water and forest conservation to find conclusions and frame the content in training course in soil, water and forest conservation on the concept of the King Rama IX of Thailand. When analyzing the content, training unit can be assigned into a total of 12 training units.

1.4) Bring it created, sent to 5 experts to consider the consistency of the research instrument with the objectives of the environmental education training course in soil, water and forest conservation on the concept of The King Rama IX of Thailand. It showed that there was a reasonable value with mean (\bar{x}) = 4.27 and the standard deviation (S.D.) = 0.81 in the most appropriate level and the consistency value (IOC) = 0.96.

1.5) Improve training course, then lead training course used in training with students which were 67 the first year undergraduate students in Environmental Education program, Faculty of Environment and Resource Studies, Mahasarakham University in academic year 2018, semester 2, which were derived from purposive sampling in Environmental Education course.

2) The instruments used in the measurement and evaluation, including the knowledge tetes about soil, water and forests conservation on the concept of the King Rama IX of Thailand, environmental ethics test and environmental volunteers test the details are as follows:

2.1) Studying and searching preliminary information related to the development of environmental education training course on the concept of The King Rama IX of Thailand in soil, water and forest conservation by studying concepts, theories, documents and related research to plan for the preparation of research instruments.

2.2) Using the data studied to create the instrument used in measurement and evaluation, including

(1) Knowledge test about soil, water and forests conservation on the concept of The King Rama IX of Thailand which is selecting option, 4 options which are A, B, C and D 60 items, choose only one correct answer. The criteria for correct answer gave 1 point, wrong answer gave 0 points, the criteria for interpreting the points are as follows: (Boonchom SriSa-ard: 1997). It showed that the average score was 0.00 - 12.00 means that the students have the least level of knowledge, the average score was 12.01 - 24.00 means that the students have a low level of knowledge, the average score was 24.01 - 36.00 means that students have moderate knowledge, the average score was 36.01 - 48.00 means that the student's knowledge was at a high level and the average score was 48.01 - 60.00 means that students have the knowledge at the highest level.

(2) Environmental ethics test there are 4 options, which are A, B, C and D, 60 items. There are 4 levels set by the ethical rating as follows: (Prayoon Wongchantra: 2016). Level 1; average score 1.00 – 1.75 for myself, Level 2; average score 1.76 – 2.50 for the relatives and friends, Level 3; average score 2.51 – 3.25 for society and Level 4; average score 3.26 – 4.00 for the rightness and goodness.

(3) Environmental volunteers test there are 5 options, which are: A, B, C, D and E, 60 items with the following scoring criteria : (Chatchavan Ruengprapran: 1996), level 1; average score 1.00 - 1.80 means that the least amount of volunteers spirit, level 2 ; average score of 1.81 - 2.60 means that a low level of volunteers, level 3; average score of 2.61 - 3.40 means that the moderate volunteers, level 4; average score 3.41 - 4.20 means that a high level of volunteers spirit and level 5; average score of 4.21 - 5.00 means that the highest level of volunteers.

3) Bring the created instruments sent to 5 experts to consider the consistency of the research instruments with the development of environmental education training course in soil, water and forest conservation on the concept of The King Rama IX of Thailand. It found that knowledge test about soil, water and forests conservation on the concept of The King Rama IX of Thailand in the index of item objective congruence was = 0.97. Environmental ethics in the index of item objective congruence was (IOC) = 0.95. Environmental volunteers test in the consistency value item objective congruence was (IOC) = 0.96. Showed that all questions are relevant for their content and purpose and can be used for data collection.

4) Using the research instruments to try out with second year undergraduate students in Environmental Education program, Faculty of Environment and Resource Studies Mahasarakham University academic year 2018, semester1, that is not a sample to find the difficulty individual value of authority and the confidence of the whole version found that:

4.1) Knowledge test about soil, water and forests conservation on the concept of The King Rama IX of Thailand. All of them were a valid level of difficulty: the lowest 0.53 and the highest 0.67 for the individual discrimination using criteria for classifying high and low groups analysis of the discriminant power for each item with a value of 0.20 and above. It was found that all questions were individual discretionary powers at the valid level, ie, between 0.27 - 0.90, and the whole confidence of the Cronbach's alpha coefficient method of knowledge test. The results were found to be a confidence factor of 0.978, indicating that all of the knowledge quizzes were compliant with the higher tolerances greater than 0.70 and could be used for data collection. The results were found to be a confidence factor of 0.978, indicating that all of the knowledge quizzes were compliant with the higher tolerances greater than 0.70 and could be used for data collection.

4.2) The environmental ethics test was used to determine the individualized power of the environmental ethics measure and select questions with discriminating power from 0.20 or more. It was found that all environmental ethics measurements was individual discriminatory power at the applicable level, ie, there was a classification power between 0.25 - 0.73 (Prayoon Wongchantra, 2016). The environmental ethics model was used to determine the confidence of the whole version by using Cronbach's alpha coefficient method. (α – Cronbach Coefficient). It was found to be a confidence factor of 0.951, indicating that all environmental ethics measurements were compliant with acceptable values greater than 0.70 and could be used for data collection.

4.3) The environmental volunteers test was used to find the individualized power of the environmental volunteers and select questions with discriminating power from 0.20 or more all environmental volunteers was individual discriminatory power in the applicable level, namely, the classification power was between 0.68 - 0.98 and the environmental volunteers test was used to find the confidence value using the Cronbach alpha coefficient method (α – Cronbach Coefficient). It was found to be a confidence value of 0.994, indicating that all environmental volunteer measurements were compliant with an acceptable value greater than 0.70 (Prayoon Wongchantra, 2012). It can be used for data collection.

2.5) Data Collection

1) Design and the development of environmental education training course in soil, water and forest conservation on the concept of The King Rama IX of Thailand. It is a quasi-experimental research by using one sample group as an experimental group results were measured before and after the experiment. (One Group Pretest-Posttest Design) (Luan Saiyot and Angkhana Saiyot, 2000).

Table 1 Research model the development of environmental education training course in soil, water and forest conservation on the concept of the King Rama IX of Thailand

Sample Group	Pre-test	Treatment	Post-test
E	T ₁	X	T ₂
E mean	Sample (Experimental group)		
T ₁ mean	Environmental knowledge test, environmental ethics test, environmental volunteers test (pre-test)		
X mean	Environmental education training course (Treatment)		
T ₂ mean	Environmental knowledge test, environmental ethics test, environmental volunteers test (Post-test)		

2) Preparation before the training activity; The researcher had prepared documents for the development of environmental education training course in soil, water and forest conservation on the concept of the King Rama IX of Thailand, knowledge test about soil, water and forests conservation on the concept of The King Rama IX of Thailand, environmental ethics test and the environmental volunteers test.

3) Take a training pre-test with a sample of students by using a knowledge test about soil, water and forest conservation on the concept of The King Rama IX of Thailand, environmental ethics test and the environmental volunteers test that the researcher has created.

4) Conduct training activities environmental education training course in soil, water and forest conservation on the concept of The King Rama IX of Thailand, 12 training units with a total training period of 15 times 3 hours each time, 45 hours in total , there are 3 steps in the training process which is taken into the training, training stage and the training measurement stage by applying from the theory of (Anuchit Hunsawasdikul, 1995). Which in organizing training activities is the first year 67 undergraduate students in Environmental Education program, Faculty of Environment and Resource Studies, Mahasarakham University, academic year 2018, semester 2. (As showed in Table 2)

Table 2. environmental education training course in soil, water and forest conservation on the concept of The King Rama IX of Thailand

Week	Training unit	long-term (hours)
1	Introduce the training course, pretest for knowledge, environmental ethics, Environmental Volunteers	3
2	Unit 1: The soil aggravation project	3
3	Unit 2: Vetiver grass wall	3
4	Unit 3: The cover land water resources	3
5	Unit 4: Check dam	3
6	Unit 5: Sediment trap weir	3
7	Unit 6: Phytoremediation water hyacinth forest resources	3
8	Unit 7: wet forest	3
9	Unit 8: Watershed forest	3
10	Unit 9: Plant A Forest in the high ground	3
11	Unit 10: 3 forests 4 benefits	3
12	Unit 11: Plant a forest in your heart	3
13	Unit 12: Reforestation without planting	3
14	Summary of training activities and presenting guidelines for conserving soil, water and forests on the concept of the King Rama IX of Thailand.	3
15	Posttest- knowledge, environmental ethics and environmental volunteers	3
	Total	45

5) There were 3 steps in the training which is applied from the theory of (Anuchit Hunsawasdikul, 1995):

(1) Step into the training; the trainer introduces himself, acquaintances with the students who attend training activities, creates an atmosphere for the participants to have fun and interest. (Recreational techniques) and before entering the training process, students must take a test.

(2) Training stage:

(2.1) The trainer take knowledge about soil, water and forest conservation according to the concept of the King Rama IX of Thailand (Lecture techniques). There were questions and answers with an emphasis on students' participation and interest (Questioning technique-answer). In addition, the games were used while the lecturers were educated in order to keep students interested and not boring from the lectures (Recreational techniques).

(2.2) The speakers gave examples of case studies and invited students to participate in activities related to soil, water and forest conservation on the concept of The King Rama IX of Thailand (Lecture techniques and Recreational techniques). In addition to the evaluation, students were asked to test their knowledge on soil, water and forest conservation on the concept of The King Rama IX of Thailand during the training of all 12 training units divided into soil resources water resources and forest resources.

(2.3) The trainer take an opportunity for students to share opinions, analyze, synthesize about soil, water and forest conservation on the concept of The King Rama IX of Thailand. It is a way of exchanging ideas, brainstorming, grouping, learning or doing various activities in order for the trainees to practice thinking and interact more enable students to develop environmental ethics and environmental volunteers in conserving soil, water and forest resources (Group discussion techniques).

(3) Training measures stage: It is a test of knowledge about soil, water and forest conservation on the concept of The King Rama IX of Thailand, environmental ethics and environmental volunteers to measure the results of students after the training.

6)The results of the development of environmental education training course on the concept of The King Rama IX of Thailand in soil, water and forest conservation. It was found that the development of environmental education training course on the concept of The King Rama IX of Thailand in soil, water and forest conservation was 90.31 / 88.75, which is higher than the set 80/80 criteria and the effectiveness index of the environmental education training program according to the monarchy in soil, water and forest conservation was 0.7573, indicating that the student's learning progress increased by 75.73%.

7) Research statistics

The statistics used to analyze data in this research. The details are as follows.

7.1) Basic statistics are frequency, percentage, mean and standard deviation.

7.2) The statistics to test the efficiency of the instrument were the suitability of the environmental education training course in soil, water and forest conservation on the concept of The King Rama IX of Thailand, conformity index value the difficulty of the test of knowledge about soil, water and forest conservation on the concept of The King Rama IX of Thailand. The discriminant power of the questionnaire Confidence Value Process Efficiency Value (E_1) Result Efficiency Value (E_2) Effectiveness Index (E.I.).

7.3) Statistics test results and hypotheses at the .05 level of statistical significance, namely Paired t-test One-Way, MANOVA One – Way, MANCOVA, Univariate Test and comparison of pairs according to Scheffe' s method in One-Way ANOVA.

3. Results

The results of training on environmental education training course in soil, water and forest conservation can on the concept of The King Rama IX of Thailand be summarized as follows:

1) The results of the study and comparison of the knowledge average score on soil, water and forest conservation on the concept of The King Rama IX of Thailand, environmental ethics and environmental volunteers of students before and after the training using the environmental education training course in soil, water and forest conservation on the concept of The King Rama IX of Thailand, it was found that (as shown in Table 3)

1.1) The students' average score of knowledge about soil, water and forest conservation on the concept of The King Rama IX of Thailand, before the training (pretest) was overall at a medium level (\bar{x} = 32.19) and after the training (posttest) was overall at the highest level (\bar{x} = 53.25). When comparing the knowledge average score of soil, water

and forest conservation before and after the training (pretest-posttest), it was found that after training, the students had knowledge scores higher than before the training statistical significance ($p < .05$).

1.2) The students' average score of environmental ethics of the pretest was overall training at the social contribution level ($\bar{x} = 2.51$) and the posttest was overall at the level for rightness and goodness ($\bar{x} = 3.49$). When comparing the environmental ethics average score pretest and posttest, it was found that students have average score on environmental ethics posttest higher than pretest statistical significance ($p < .05$).

1.3) The students' average score of environmental volunteers, pretest was overall at a low level ($\bar{x} = 2.45$) and posttest was overall at a high level ($\bar{x} = 3.90$). When comparing the environmental volunteer scores, the pretest and the posttest, it was found that students have an average score of environmental volunteers, posttest higher than pretest statistical significance ($p < .05$).

Table 3 The results of the comparison of knowledge of soil, water and forests on the conservation on the concept of the King Rama IX of Thailand, environmental ethics and environmental volunteers of students before and after the training.

Item	Pretest		Level of Knowledge	Posttest		Level of Knowledge	<i>t</i>	df	p
	\bar{x}	S.D.		\bar{x}	S.D.				
Knowledge (N = 60)	32.19	3.00	Medium	53.25	2.21	Highest	-46.84	66	.000*
Environmental ethics (N = 4)	2.51	0.18	For society	3.48	0.12	For the rightness and goodness	-43.10	66	.003*
Environmental volunteers (N = 5)	2.45	0.23	Least	3.90	0.18	Highest	-38.44	66	.000*

* Statistically significant .05, N: full score.

2) The results of this study and comparison of knowledge about soil, water and forest conservation on the concept of The King Rama IX of Thailand, environmental ethics and environmental volunteers of students with different genders using One-Way MANOVA (As shown in table 4). It was found that there were no different of students' average score of knowledge about soil, water and forest conservation, environmental ethics, environmental volunteers of students with different gender. Therefore, one-way test of the covariance of average score of the knowledge of soil, water and forest, environmental ethics and environmental volunteers (posttest) of students of different genders using pre-test scores as a covariate using (One – Way MANCOVA). It was found that the students with different gender and had different environmental volunteers statistical significance ($p < .05$), but there were no different of students with different gender of average score of knowledge, environmental ethics. (As shown in Table 5)

Table 4. The results of comparing the variance of knowledge, environmental ethics and environmental volunteers of students with different gender using One – Way MANOVA.

Test statistics	Value	Hypothesis df	Error df	F	p
Pillai's Trace	.099	3.000	63.000	2.297	.086
Wilks' Lambda	.901	3.000	63.000	2.297	.086
Hotelling's Trace	.109	3.000	63.000	2.297	.086
Roy's Largest Root	.109	3.000	63.000	2.297	.086

* Statistically significant .05

Table 5 One-way covariance of knowledge of soil, water and forest conservation on the concept of The King Rama IX of Thailand, environmental ethics and environmental volunteers of students with different gender using pre-test scores is a common variable (One – Way MANCOVA).

Early variant	Dependent variable	SS	df	MS	F	p
gender	Knowledge about soil, water and forests conservation	9.796	1	9.796	2.022	.160
	Environmental ethics	.002	1	.002	.123	.727
	Environmental volunteers	.186	1	.186	5.989	.017*

* Statistically significant .05

3) The results of this study and comparison of knowledge about soil, water and forest conservation, environmental ethics and environmental volunteers of students with different GPA. It was found that students with different GPA had different knowledge about soil, water and forest conservation on the concept of The King Rama IX of Thailand statistical significance .But students with different GPA have environmental ethics and environmental volunteers was not different (as in Table 6-7) Therefore, the knowledge of soil, water and forest conservation was compared on the concept of The King Rama IX of Thailand of the students with different GPA in pairs according to the Scheffe method. It showed that students with low GPA had different knowledge from those with medium GPA, Low GPA students have different knowledge from students with high GPA and students with medium GPA have different knowledge from students with high GPA (As shown in table 8).

Table 6. Comparing the variance of knowledge, environmental ethics and environmental volunteers in soil, water and forest conservation on the concept of The King Rama IX of Thailand of students with different GPA using One – Way MANOVA.

Test statistics	Value	Hypothesis df	Error df	F	p
Pillai's Trace	.646	6.000	120.000	9.545	.000*
Wilks' Lambda	.370	6.000	118.000	12.686	.000*
Hotelling's Trace	1.664	6.000	116.000	16.084	.000*
Roy's Largest Root	1.638	3.000	60.000	32.760	.000*

* Statistically significant .05

Table 7. One-way covariance of knowledge, environmental ethics and environmental volunteers overall, after the training of students with different GPA using Pre-test scores is a common variable (One – Way MANCOVA).

Early variant	Dependent variable	SS	df	MS	F	p
Grade Point Average (GPA)	Knowledge about soil, water and forest conservation	202.914	2	101.457	53.323	.000*
	Environmental ethics	.078	2	.039	2.640	.079
	Environmental volunteers	.134	2	.067	2.072	.134

* Statistically significant .05

Table 8 The results of comparing knowledge on soil, water and forest conservation of the students with different GPA in pairs according to the Scheffe method.

GPA	\bar{x}	low 50.16	medium 53.44	high 56.21
low	50.16	-	.000*	.000*
medium	53.44	-	-	.000*
high	56.21	-	-	-

* Statistically significant .05

4. Discussion

The results of training on environmental education training course in soil, water and forest conservation on the concept of The King Rama IX of Thailand, the researcher has the following points to discuss:

4.1) The results of the comparison of the knowledge average score course in soil, water and forest conservation on the concept of The King Rama IX of Thailand, environmental ethics and environmental volunteers before and after training on environmental education training course in soil, water and forest conservation on the concept of The King Rama IX of Thailand, it was found that

1) Students had knowledge about soil, water and forest conservation on the concept of The King Rama IX of Thailand, after the training was higher than before the training. This is the result of an environmental education training course based on the concept of The King Rama IX of Thailand in soil, water and forest conservation, it is an effective and efficient caused by the curriculum formatting to have complete content and consistent with specified objectives by applying on the concept of The King Rama IX of Thailand in the conservation of soil, water and forest resources as a tool to pass on knowledge to students which emphasizes the process of transferring knowledge using lecture techniques group discussion and asking and answering as a result, students had increased interest and knowledge after the training. Almost of the students had the highest score on forest resource knowledge followed by water resources and soil resources, respectively. Which has embraced on the concept of The King Rama IX of Thailand. That arose from the study, research and experiment until the birth of a project under the royal initiative on the environment. (Sombud Nopparak: 2018). His Majesty adheres to the method of understanding, access, and development and applies to people, society and environment, resulting in a successful solution to the problems of soil, water, and forests that are clearly illustrated (Thanat Chanampai: 2018). So the transfer of knowledge from knowledge sources reach the target population through media, tools, equipment with specialized processes and methods. (Kasem Chankaew, 1993). It is caused by sensory perception, by sight, hearing, touch and observation (Kitima Pridi Dilok, 1977). As a result, students have more knowledge after the training which is consistent with the study results of (Jiranoot Thinkamchoet. and Prayoon Wongchantra, 2018); found that youths had more knowledgeable about conservation of ASEAN natural resources and environment after attending camp activities than before participating in camp activities and Suwakhon Phakeewai and Prayoon Wongchantra: 2020); found that youths had higher knowledge of the environment after participating in the activities than before participating in the environmental recreation camp and (Kiattisak Charoensook et al.,2013); found that knowledge of the conservation of the War Basin folk vegetables was higher than before the training. And Kanittha Nammai and Namtip Cumrae (2017) found that the students had more knowledge about preliminary water quality measurements after the training than before the training. And Phasita MaiKami and Prayoon Wongchandra (2018) found that students have knowledge about the use of green products after strengthening higher than before strengthening. And Phanadda Ritsumdaeng, Prayoon Wongchantra, Kannika Sookngam (2019) found that the students had a mean score of knowledge about water resource conservation by doing dam upstream and stream on the concept of the King Rama IX of Thailand, higher after joining the training than before joining the training. And Namtip Cumrae, Pornnipa Toomhome and Sangrawee Momkuntod (2016) found that the students with knowledge about eco-friendly consumption after the training is higher than before the training. It shows that environmental education training on concept of the King Rama IX of Thailand in soil, water and forest conservation was a good training planning process and there is a process of transferring knowledge through effective training materials, resulting in students gain more knowledge after the training.

2) Students had environmental ethics about soil, water and forest conservation on concept of the King Rama IX of Thailand after the training higher than before the training. This is the result of an environmental education training course in soil, water and forest conservation on concept of the King Rama IX of Thailand. It is integrated into the training activities, consisting of 12 training units, focusing on the content of conservation of soil, water and forests to make it interesting. There are examples of the royal initiatives of the King Rama IX of Thailand used as a case study on soil, water and forest resources. This reflects the concept of environmental ethics for students and exhibits behavior in conserving soil, water and forest resources. As a result, students have ethics, environment after training and environmental ethics at the level for accuracy and goodness in terms of soil, water and forest resources. The concept of the King Rama IX of Thailand is the method of understanding, access, and development to the people, society and environment that he has clearly set an example (Thakorn Sitticho, 2017). And environmental ethics is also a principle of environmental practice for human beings that take the righteous Moral principles and compassion relying on the environment (Prayoon Wongchantra, 2016). There are processes to make people appreciate, lead to skills in making decisions about the environment and creating good ethics (Kongsak Thatthong, 2004). And it is a person's feelings towards various ethical behavioral characteristics (Duangduean Phanthumanawin and Penkhae Prachonpachanuk, 1977) making students have environmental ethics about soil, water and forest conservation according to the royal science after the training is higher than before the training. Which is consistent with the study results of Prachumporn Lauprasert (2019) found that students have environmental ethics higher after the experiment

than before the experiment. And Banjerd Pan Ngeon (2009) found that personnel had higher ethics for natural resource and environmental conservation after training than before the training. And Pisarn Khrualit and Chaiwat Sutthirat (2016) found that students had higher environmental ethics after participating in activities than before participating in activities. And Pattana Chanaaphan, Prayoon Wongchantra, Kannikar Sookngam (2019) found that the students had environmental ethics in relation to soil resource conservation by covering the soil on the concept of the King Rama IX of Thailand, higher after participating in activities than before participating in activities. And Thakorn Sittichok (2017) found that students have developed environmental ethics after study higher than before study. It showed that environmental education training course in soil, water and forest conservation on concept of the King Rama IX of Thailand is a training process that results in students thinking and analyzing, reflecting the concept that students have more ethical environment after the training.

3) Students had environmental volunteers in soil, water and forest conservation on concept of the King Rama IX of Thailand after the training higher than before the training. As a result of the process of transmitting activities created from environmental education training course in soil, water and forest conservation on concept of the King Rama IX of Thailand. The transmission technique was used to emphasize the participation of the students who participated in the present situation analysis on soil, water and forest resources together with the use of lecture techniques with the introduction of royal initiatives, on concept of the King Rama IX of Thailand brought the truth about the possibilities of nature and the rules of nature, leading to important practices in solving soil, water and forest resources problems. In order to stimulate and promote ideas for students to express their behavior towards the environment voluntarily. As a result, students have environmental volunteers spirit after training and have environmental volunteers spirit at a high level. From the royal duties and royal duties in the development and assistance of the population of the King Rama IX of Thailand remembers the benefits (Thanat Chanampai, 2018) where having a public mind is things that happen according to the lifestyle of the individual affecting the moral and ethical development of the person under the influence of both internal and external environmental factors (Paiboon CultureSiri and Roaming society, 2000). And people have volunteers minds to help society voluntarily and make sacrifices to help others Develop society without expecting compensation (Thanit Kongkaew, 2017). The students had environmental awareness about soil, water and forest conservation on concept of the King Rama IX of Thailand, after the training higher than before the training. Which is consistent with the study results of Prayoon Wongchantra et al., (2020) found that the students had a higher mean score of environmental volunteers after training than before the training. And Surasak Kaewngam and Prayoon Wongchantra (2018) found that after the training the students had higher environmental volunteers than before the training. And Kraruna Vitayarat (2018) found that the students had the volunteers qualities of the private colleges after the training higher than before the training. And Anon Chantasri, Prayoon Wongchantra and Kannika Sookngam (2020) found that the students had a higher environmental volunteers after participating in the activities than before participating in the activities. And Boonya Tulyakul (2020) found that the private higher education institutions had higher volunteer leadership status after training than before the training. It showed that environmental education training course in soil, water and forest conservation on concept of the King Rama IX of Thailand, is training process that results in students' thinking and analytical thinking to make students more environmental volunteers after the training.

4.2) The results of the comparison of the knowledge, environmental ethic and environmental volunteers about to soil, water and forest conservation on concept of the King Rama IX of Thailand of student different gender, it was found that:

1) Students with different gender were no different of knowledge about to soil, water and forest conservation on concept of the King Rama IX of Thailand. This is the result of the curriculum formatting to be complete and consistent with the objectives on soil, water and forest conservation on concept of the King Rama IX of Thailand. It is a medium used to transfer knowledge to students who have participated in the training narrative techniques are used group discussion and Q&A. There is an integration of environmental conservation activities to create students to see value, awareness and understanding of environmental conservation, leading to the development of knowledge and caused interest both male and female. The students will receive knowledge in the form the same methods and materials for training to denote equality, resulting in male and female students were no different of knowledge about to soil, water and forest conservation on concept of the King Rama IX of Thailand. The transfer of knowledge on the environment is an art of bringing environmental knowledge through people and tools that are central to the target population the tools and equipment used in the broadcasting must depend primarily on the type of knowledge they give (Kasem Chankaew,1993). And training is an organized process to improve increase knowledge, develop skills and abilities of people leading to behavior changes (Pattana Sukprasert,1998). And perception about facts, observations, studies, experiences in both the natural and social environment, basic knowledge of individuals that

people have memorized or collected and can act in behavior observable or measurable (Sangchan Sopakarn, 2007). The result found that students with different gender were no different of knowledge about soil, water and forest conservation on concept of the King Rama IX of Thailand. Which is consistent with the study results of Jiranoot Thinkamchoet. and Prayoon Wongchantra. (2018) found that youths with different genders were no different of knowledge about to natural resources and environment and Suwakhon Phakeewai and Prayoon Wongchantra (2020) found that youths with different gender were no different of knowledge environmental aspects in environmental recreation camp activities and Chatchue Chuenghom, Prayoon Wongchantra, Manit Sachiyo (2015) found that both male and female youths were no different of knowledge about to conservation of upper vegetation. It shows that the training has a transfer pattern that has the same techniques in providing knowledge in the same form, method, and teaching media, thus resulting in the students receiving equal knowledge make students with different gender were no different of knowledge.

2) Students with different gender were no different environmental ethics about to soil, water and forest conservation on concept of the King Rama IX of Thailand. Because the training is well planned, the training unit. There are techniques for creating a good and suitable group atmosphere. It is a strategy that affects the disclosure of ideas, feelings, experiences of group members with willingness and sincerity. Give an example of a project royal initiatives on soil, water and forest resources to reflect the concept and to persuade and appreciate in terms of soil, water, and forest resources, it is the creation of environmental ethics resulting from the learning environment in male and female found that students were no different of environmental ethics about to soil, water and forest conservation on concept of the King Rama IX of Thailand. The principle of the relationship between humans and the environment lead to the development of attitudes, awareness and responsibility for environmental preservation. This includes developing the skills in making decisions about the environment and establishing ethical practices in the environment for good environmental quality (Kongsak Thatthong: 2004). And environmental ethics is principle of ethical practices for human beings based on fairness, integrity and compassion that relied on treating natural resources and environment (Prayoon Wongchantra, 2012). And the reasoning of the individual in choosing to act or choose not to do any particular behavior this ethical justification will provide an idea of the motive or the motivation behind various actions (Duangduean Phanthumanawin and Penkhae Prachonpachanuk, 1977). It showed that the use of environmental education training course in soil, water and forest conservation on concept of the King Rama IX of Thailand, as a result, students with different gender were no different of environmental ethics which is consistent with the study results of Jaiyen,K (2013) found that students of different gender were no different of an average of environmental ethical behavior and Ceylan Guriçin, Omer Seyfettin Sevinç (2020) found that male and female teachers were no different of a level of environmental ethics and Sakorn Phromkote (2013) found that students with different gender were no different of ethical behavior and Yang Chu Yingyang, Charin Mangkhang and Jarunee Maneekul (2019) found that students of different gender were no different for support environmental conservation activities from the school and environmental awareness with average environmental ethical behavior and Pradit Pawanna (2020) found that students of different genders were no different of environmental ethics. Due to environmental education training course in soil, water and forest conservation on concept of the King Rama IX of Thailand, so there are techniques to create a good and suitable group atmosphere. There are examples of case studies that give students an inspiration in environmental conservation and see the value about the environment causing male and female students were no different of environmental ethics.

3) Students with different gender were different of environmental volunteers in soil, water and forest conservation on concept of the King Rama IX of Thailand. This is a result of the process of transferring training activities resulting from the environmental education training course in soil, water and forest conservation on concept of the King Rama IX of Thailand, integrated with training activities techniques that emphasize students' participation in activities on concept of the King Rama IX of Thailand. Therefore, conservation of soil, water as a case study for students to see the value of natural resources and the environment this encourages and strengthens the ideas for students to lead to important practices in soil, water and forest conservation on concept of the King Rama IX of Thailand. This is encourage and strengthens of ideas for students to lead to important practices in soil, water and forest conservation on concept of the King Rama IX of Thailand. As a result, male and female students have different environmental volunteers for the environment in relation to soil, water and forest conservation which science is the Lord of the land His Highness intends to help Thai people to live well-being through sustainable development methods for nature conservation and the science of coexistence (Arnon Sakworawich,2017). And the public mind is something that arises according to the lifestyle of the individual, in various environments (Paiboon Wattanasiritham and Songkom Sunjorn, 2000). It is a person's awareness of the problems that arise in society causing a feeling of desire to help society, wanting to go into solving crises (Haruthai Ajpru, 2001). From the use of environmental education training

course on concept of the King Rama IX of Thailand in soil, water and forest conservation as a result, students of different gender were different of environmental volunteers which is consistent with the study results of Supattra Panetram (2016) found that students with different gender were different volunteer behavior in all Every side. Jittiya Wajee (2016) found that high school students with different genders were different of public mental behaviors and Butsakon Kaewmun, Therdsak Maitaoutong, Pawa Panmekha (2013) found that students with different gender were different of public minds. So, in environmental education training course on concept of the King Rama IX of Thailand in soil, water and forest conservation is causing male and female students were different of environmental volunteers.

4.3) The results of study and comparison of knowledge Environmental ethics and environmental volunteers of students with different grade point average (GPA) found that:

1) Students with different GPA were different of knowledge about soil, water and forest conservation on concept of the King Rama IX of Thailand as a result of the training process involves the use of environmental education training course on concept of the King Rama IX of Thailand in soil, water and forest conservation to effective as a medium to transmit knowledge on soil, water and forest conservation on concept of the King Rama IX of Thailand using a lecture technique, asking and answering techniques with clear questions and brainstorming activity is organized for all students to participate in expressing opinions on solutions to soil, water and forest resources in the current situation by the royal initiative the King Rama IX of Thailand to solve environmental management problems. But since the students who participate in the training have different of GPA, knowledge, experience, and perceptual interests. As a result, students with different GPA have different knowledge about soil, water and forest conservation on concept of the King Rama IX of Thailand which is a body of knowledge that covers the factors that are important to life and environment (Sombud Nopparak, 2018) and is concept of self-control development to be a practice and set a good example. It is the concept of coexistence in a peaceful society. Which will lead to the sustainable development of the country forever (Disnadda Diskul, 2017). And knowledge has its origins through belief, telling, the subconscious mind, logic, and through sensory perception. (Kitima Pridilok, 1977). It is separated into knowledge that arises from formal experience and knowledge (Pornthida Wichianpanya, 2004). From the use of environmental education training course in soil, water and forest conservation on concept of the King Rama IX of Thailand as a result, students with different GPA point have different knowledge which is consistent with the study results of Prayoon Wongchantra (2009) found that the experimental groups with different GPA had different of environmental knowledge. Because, the experimental group students with high GPA had higher environmental literacy scores than those with low GPA. And Mareeyam Jae Teh and Wisakha Phoochinda (2013) found that students with different GPA were different of environmental knowledge. It was shown that the training was a technique for educating knowledge in a methodology. They have the same teaching materials, but the basics of interests and perceptions of students are different, resulting in students with different GPA and different knowledge.

2) Students with different GPA were no different in environmental ethics in soil, water and forest conservation on concept of the King Rama IX of Thailand. It is the result of a good training plan leading environmental training on concept of the King Rama IX of Thailand in effective soil, water and forest conservation to be used as a medium to convey knowledge in soil, water and forest on concept of the King Rama IX of Thailand and addition, techniques are used to create a good group atmosphere suitable for the student group and simulate environmental situations. This is a strategy that has an impact on the disclosure of equal thoughts and conduct. Reflecting ideas lead to persuasion and appreciation in terms of soil, water, forest resources and provide students with expressive behaviors in caring for and conservation of soil, water and forest resources on concept of the King Rama IX of Thailand as a clear example of success as a result, students with different GPA were no differences in environmental ethics regarding soil, water and forest conservation being principles of environmental practice for human beings based on integrity and integrity and compassion that relied on treating natural resources and the environment (Prayoon Wongchantra: 2012). And the reasoning of the individual in choosing to act or choose not to do any particular behavior. This ethical justification will provide an idea of the motive or the motives behind the actions (Duangduean Phanthumanawin and Penkhae Prachonpachanuk: 1977). From the use of training courses on environmental education training course in soil, water and forest conservation on concept of the King Rama IX of Thailand, students with different GPA were environmental ethics which is consistent with the study results of Pradit Pawanna (2020) found that students with different GPA were no different of environmental ethics and Spinolo, H. (2015) found that the environmental behavior of the 9th grade students in both schools was no different. And Ratchakrit Buddhapoovachot and Sukarn Pichapiyathamwarakun (2014) found that teachers with different educational background and work experience, there are no different ethics. Which environmental education training studies in soil, water and forest conservation on concept of the King Rama IX of Thailand was techniques to create a good and suitable group atmosphere, an

example of a case study has been provided for students to be inspired to change their behavior towards environmental conservation and see the value about the environment as a result, students with different GPA were no different of environmental ethics.

3) Students with different GPA were no different of environmental volunteers in soil, water and forest conservation on concept of the King Rama IX of Thailand. It is the result of the implementation of environmental education training course in soil, water and forest conservation on concept of the King Rama IX of Thailand, integrated in training activities that emphasize students' participation in activities on concept of the King Rama IX of Thailand. So that students can see the value of soil, water and forest resources. It encourages students see environmental quality that can lead to an important practice in the conservation of soil, water and forests by transferring in the same format and media in training operators causing students to be cultivated in the equality side as a result, so students with different GPA were no different of environmental volunteers after the training. Which the concept of the King Rama IX of Thailand in development to be a practice and a good example to be a practice and a good example. And the concept of coexistence in society which will lead to the sustainable development of the country (Disnadda Diskul, 2017). By consciousness of the society of the person who is mentally inclined feelings before engaging in activities that contribute to change in society in a better direction (Supattara Pusitrattanavalee, 2004). And actions that are benefit to others as a helping behavior philanthropic behavior selflessness and volunteers (Baron and Byrne, 2000). From the use of environmental education training course in soil, water and forest conservation on concept of the King Rama IX of Thailand causing students with different GPA were no different in environmental volunteers. Which is consistent with the study results of Raveewan Wongdechannun, Somchai Srinok, PhraWidesbrommakun (2018) found that students with different GPA were no different of opinions about teaching and learning to promote public consciousness and Phra Athikansudthisak sampannamedhi (kongmag), Panjitr Sukumal (2020) found that students with different GPA were different of volunteering and Kittipon Tangpiew (2013) found that communities with different educational levels were no different of volunteers in the conservation of natural resources and environment and Surasak Kaewngam and Prayoon Wongchantra (2018) found that students with different GPA were no different of skills as leader of environmental volunteers. It showed that environmental education training course in soil, water and forest conservation on concept of the King Rama IX of Thailand, can see the value of natural resources and environment causing students with different GPA were no different of environmental volunteers.

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