

The Effect of Integrated Instructional Activities of Environmental Education by Using Community - Based Learning and Active Learning

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Abstract

The purposes of this research were to study and compare environmental knowledge, environmental ethics and environmental volunteers before and after integrated instructional activities of environmental education by using community - based learning and active learning, to compare environmental knowledge, environmental ethics and environmental volunteers of students with different gender and Grade Point Average (GPA). The sample used in the study were 89 the first year undergraduate students in Environmental Education program, Faculty of Environment and Resource Studies, Mahasarakham University, which was derived by purposive sampling in environmental studies course. The research tools were the integrated instructional activities of environmental education by using community - based learning and active learning, environmental knowledge test, environmental ethics test and environmental volunteers test. The statistics used for data analysis were frequency, percentage, mean, standard deviation and hypothesis testing using t-test, F-test (One-Way MANOVA, One-Way MANCOVA and Univariate Test). The results of the research showed that:

- 1) The students had average score of the environment knowledge, environmental ethics and environmental volunteers in the posttest higher than pretest statistical significance ($p < .05$).
- 2) There was no significant difference between average score of the environmental knowledge, environmental ethics and environmental volunteers of undergraduate students with different gender ($p > .05$).
- 3) There was statistically significant difference between average score of the environmental knowledge, environmental ethics and environmental volunteers of undergraduate students with different Grade Point Average (GPA) ($p < .05$).

Keywords: environmental education, integrated instructional activities, community - based learning, active learning, environmental knowledge, environmental ethics, environmental volunteers

1. Introduction

Today, higher education learning in the 21st century try to change the role of the instructor who taught the faculty and collaborative design activities in the learning process that learners can build the body of knowledge by their owner and they exchange the knowledge with friends in the classroom. Educational management must be based on the principle that all learners have the ability to learn and develop themselves and that learners are most important. The educational management process must encourage learners to develop naturally and full potential (Prisana Mutchima & Nattha Phiwma, 2017).

Teaching about the environment or environmental education is another way to help in solving environmental problems. It is an educational process that focuses on educating the physical and social environment, both concrete and abstract that causes changes in the environment and their impacts on human beings that will create attitudes, behaviors and values in the conservation and development of the quality of the environment and the quality of life for themselves and the society as a whole (Vinai Veeravatanond, 2003). Therefore, environmental education covers many dimensions including natural resource, social and cultural, belief and spiritual, economic and technological

dimensions. Due to the nature of the content of environmental education infused and related on all subjects. So the instructors must understand and recognize and aware of the importance of environmental education and integrated teach into the content and environmental education activities by proper compliance (Kasem Chunkao, 1993).

These are 4 elements of unique environmental education: 1) knowledge of the environment, including knowledge about the environment and natural resources, social and cultural or man-made environment. 2) The transfer of knowledge and communication of knowledge on the environment to the people to achieve the objectives of environmental education. 3) target group including those who have been broadcast communication or knowledge to achieve the environmental objectives of the environment and 4) achievement of environmental education objectives, namely to achieve 1) environmental knowledge 2) attitudes, opinion and values for the environment 3) awareness of environmental problems 4) skills in solving environmental problems 5) participation in solving environmental problems and 6) evaluation of solving environmental problems (Prayoon Wongchantra, 2011).

It can be seen that education about the environment helps students have a better understanding of the environment and make the learners have awareness, opinion, environmental ethics, environmental volunteers and environmental skills. There are various ways of transmitting the environment. Active learning is another teaching and learning process that focuses on engaging and interactive learning activities through varieties of practice with the activities taken to develop critical thinking skills, critical thinking, communication, presentation and using of information technology appropriate. This style of learning active learning is the development of ideas, solutions and knowledge application. The students can participate in organizing learning and creating knowledge by interacting together in a form of cooperation rather than competition. As well as the opportunity for the students involved in the learning process up (Savittree Rochanasmita Arnold, 2012). It is appropriate learning in higher education and teaching active learning can help students to learn, engage and encourage students to build knowledge on their own. So that consistent and supportive education management can improve the quality of life, economy and society of the local area. By the way to solve one such problem is bringing the community to participate in curriculum development and learning activities, known as community-based learning management is a strategy or a learning management model that integrates curriculum content to connect with the community by using operations allowing learners to learn by doing work from real situations in the community. That allows students to learn what they want from the community. Community-based learning is one strategy that can be used to build real-world skills and benefit learners in other areas (Disayuit Buajoom, 2014).

In this regard, good education must be education that encourages individuals to develop to their full potential and to their full potential and ability to learn and live independently based on their resources and environment. In the management of teaching and learning at the tertiary level is necessary to encourage learners to learn, practice both on campus and off campus to achieve knowledge and practical experience and in accordance to the teaching and learning management according to the educational curriculum. Therefore, the researcher is interested to study and compare environmental knowledge, environmental ethics and environmental volunteers before and after the instruction of students with different genders and Grade Point Average (GPA) by integrated instructional activities of environmental education by using community - based learning and active learning.

2. Methods

2.1 Conceptual Framework for Research

Integrated instructional activities of environmental education by using community - based learning and active learning, there are 6 steps which are applied from the theory of Disayuit Buajoom (2014) and Prayoon Boonchai & Bhumbhong Jomhongbhibhat (2015) as follows: step 1; explore the community, step 2; analyze the learning resources in the community, step 3; design the unit, step 4; organize practical learning, step 5; remove the lessons learned and step 6; evaluation which comprising of 7 learning plans include plan 1; forest resources, plan 2; water resources, plan 3; soil resources, plan 4; waste management, plan 5; organic agriculture, plan 6; sufficiency economy and plan 7; global warming. The research tools were 7 learning plans, environmental knowledge test, environmental ethics test and environmental volunteers test by using the quality tools by 5 experts and used to try out with the first year 2018 for undergraduate students in Environmental Education program, Faculty of Environment and Resource Studies, Mahasarakham University as shown in figure 1.

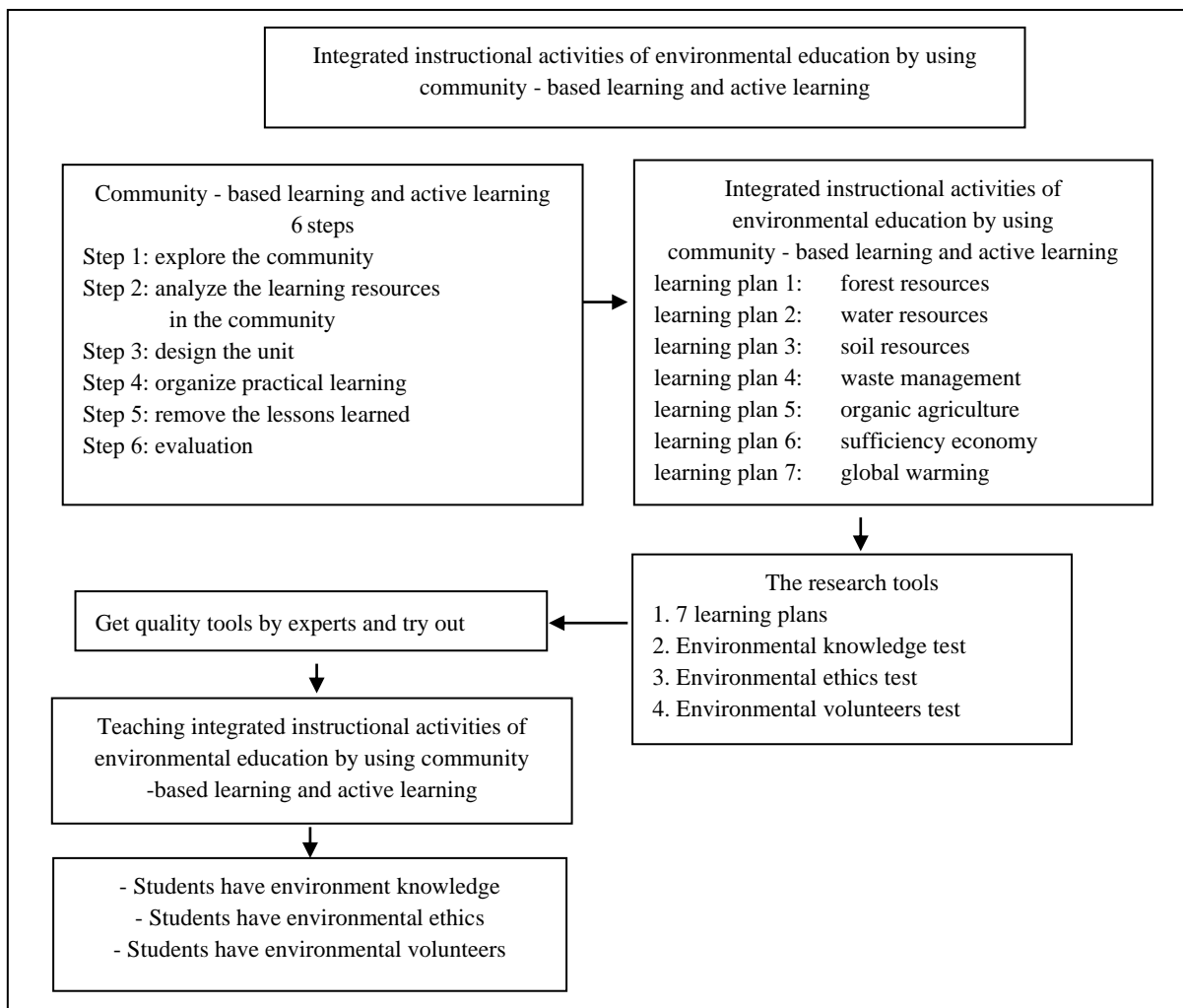


Figure 1. Research Conceptual Framework

2.2 Population and Sample

The population used in this research were 374 undergraduate students in years 1-4 in Environmental Education program, Faculty of Environment and Resource Studies, Maharakham University, the beginning of the academic year 2019. The sample used in the study were 89 the first year undergraduate students in Environmental Education program, Faculty of Environment and Resource Studies, Maharakham University, which were derived from purposive sampling in environmental studies course.

2.3 Study Variables

The independent variables were integrated instructional activities of environmental education by using community -based learning and active learning, gender and Grade Point Average (GPA) of the sample students. The dependent variable were environment knowledge, environmental ethics and environmental volunteers.

2.4 The Research Tools and Quality of Tools

The researcher has built and evaluated the quality of the research tools, the procedure as follows:

2.4.1 The Plans of Integrated Instructional Activities of Environmental Education by Using Community - Based Learning and Active Learning.

1) Study details of the bachelor of science program, department of environmental education by the curriculum to analyze goals purpose and content, to be the information to create an integrated instructional environmental education learning plan.

- 2) Study the principles and methods for creating plans of integrated instructional activities of environmental education by using community - based learning and active learning from relevant documents, books and research to set the subject by focusing on the content corresponding to the bachelor of science program.
- 3) The researcher has developed a framework for the contents of the plans of integrated instructional activities of environmental education by using community - based learning and active learning for experts to review and give advice, consisting. (As shown in figure 1)
- 4) Bring the plans of integrated instructional activities of environmental education by using community - based learning and active learning to 5 experts.
- 5) Adopt plans of integrated instructional activities of environmental education by using community - based learning and active learning from expert assessment to analyze base on the average score of 3.50 or more as a criterion. It was found that there were the suitability of plans of integrated instructional activities of environmental education by using community - based learning and active learning at the mean (\bar{x}) = 4.80 and the standard deviation (S.D.) = 0.03 in the most appropriate level and the consistency value (IOC) = 0.88.
- 6) Improve the integrated instructional activities of environmental education by using community - based learning and active learning and applied to try out with the first year 67 undergraduate students in Environmental Education program, Faculty of Environment and Resource Studies, Mahasarakham University, that were not a sample for 1 semester, the academic year 2018.
- 7) Adopt an integrated instructional activity of environmental education by using community - based learning and active learning to improve and complete for further data collection with the samples.

2.4.2 The Tools Used in the Measurement and Evaluation, Including the Environmental Knowledge Test, Environmental Ethics Test and Environmental Volunteers Test are Details as Follows:

- 1) Study basic information from textbooks, relevant research papers to guide the creation of research tools.
- 2) Using data to create tools for measuring and evaluating results, including:
 - 2.1) Environmental knowledge test which is a select-and-answer option, there are 4 options, which are: A, B, C and D, 70 items choose only one correct answer. The criteria for a correct answer gave 1 point, the wrong answer gave 0 points, the criteria for interpreting the points are as follows : the average score is 0.00 - 13.99 means that the students are the least level of knowledge, the average score is 14.00 - 27.99 means that the students are a low level of knowledge, the average score of 28.00 - 41.99 means that students are moderate knowledge, the average score of 42.00 - 55.99 means that the students are at a high knowledge level and the average score of 56.00 - 70.00 means that students are at the highest knowledge level.
 - 2.2) Environmental ethics test, there are 4 options, which are: A, B, C and D, 35 items. There are 4 levels set by the ethical rating as follows: for myself, the average score is 1.00 - 1.75, for relatives and friends, the average score is 1.76 - 2.50, for society, average score 2.51 - 3.25 and average score 3.26 - 4.00 for correctness and goodness average.
 - 2.3) Environmental volunteers test, there are 5 options, which are: A, B, C, D and E, 35 items with the following scoring criteria : an average score 1.00 - 1.80 means that the students have the least volunteer, an average score of 1.81 - 2.60 means that the students have a low volunteers, average score of 2.61 - 3.40 means that the students have moderate volunteers, average score 3.41 - 4.20 means that the students have a high volunteer and average score of 4.21 - 5.00 means that the students have the highest volunteers.
- 3) Take the measuring and evaluating tools to 5 experts for considering the consistency of the instruments used for research purposes to find: environmental knowledge test, the index of item objective congruence was 0.91, Environmental ethics test, the index of item objective congruence was 0.92 and Environmental volunteers test, the index of item objective congruence was 0.89 which is greater than 0.50 indicated that all tests are correct for their content and purpose and can be used for data collection.
- 4) Take the measuring and evaluating tools to try out with the first year 67 undergraduate students in the first semester of the academic year 2018 in Environmental Education program, Faculty of Environment and Resource Studies, Mahasarakham University that is not a sample for 1 semester to analyze the difficulty index, discrimination and reliability found that:
 - 4.1) All of the environmental knowledge tests had an available difficulty index level; the lowest 0.44 and the highest 0.79 using criteria for classifying high and low groups analysis of the discrimination to classify each item with a

value of 0.20 and above found that all questions have discrimination at a valid level; 0.397 - 0.596. The reliability of the knowledge test using the α - Cronbach Coefficient method was found that there is a confidence factor of 0.961, indicated that all tests of knowledge comply with an acceptable value of 0.70 or higher, which can be used to collect data.

4.2) All of the environmental ethics tests had available discrimination at a valid level; 0.369 – 0.617. The reliability of the environmental ethics test using the α - Cronbach Coefficient method was found that there is a confidence factor of 0.926, indicated that all tests of environmental ethics comply with an acceptable value of 0.70 or higher, can be used to collect data.

4.3) All of the environmental volunteers tests had available discrimination at a valid level; 0.375 – 0.680. The reliability of the environmental volunteers test using the α - Cronbach Coefficient method was found that there is a confidence factor of 0.932, indicated that all tests of environmental volunteers comply with an acceptable value of 0.70 or higher, can be used to collect data.

5) Revised the tools used for measurement and evaluation and make them complete to collect data with the sample.

2.5 Data Collection

2.5.1 This Study is a Quasi Experimental Research by Using One Sample Group with a One-group Pretest-Posttest Design Research Plan (Luan Sayyot&Angkana Sayyot, 1995). (As shown in table 1)

Table 1. One-Group Pretest-posttest Design Research Plan

Group	Pretest	Treatment	Posttest
E	T ₁	X	T ₂

The symbols used in the research plan are:

E=Experimental group

T₁= Pretest

X=Treatment

T₂= Posttest

2.5.2 Preparation before Teaching: the Researcher has Prepared Teaching Materials Including, Integrated Instructional Activities of Environmental Education by Using Community - Based Learning and Active Learning, Environmental Knowledge Test, Environmental Ethics Test and Environmental Volunteers Test.

2.5.3 Take a Test before Studying with an Environmental Knowledge Test, Environmental Ethics Test and Environmental Volunteers Test that the Researcher Created.

2.5.4 Teach by Using Integrated Instructional Activities of Environmental Education by Using Community - Based Learning and Active Learning. There are 6 Steps that are Applied from the Theory of Disayuit Buajoom (2014) and Prayoon Boonchai & Bhumbhong Jomhongbhibhat (2015) as Follows:

step 1: explore the community, step 2: analyze the learning resources in the community, step 3: design the unit, step 4: organize practical learning, step 5: remove the lessons learned and step 6: evaluation which organized an integrated instructional activities of environmental education with a sample group of 89 the first-year undergraduate students in Environmental Education program, Faculty of Environment and Resource Studies, Mahasarakham University, 1 academic semester as follows: (As shown in table 2)

Table 2. The Plan Lesson of Integrated Instructional Activities of Environmental Education by Using Community - Based Learning and Active Learning

Week	Title	Hours
1	Recommended lesson plans and pretest	3
2-3	Lesson plan 1: Learn about forest resources	6
4-5	Lesson plan 2: Learn about water resources	6
6-7	Lesson plan 3: Learn about soil resources	6
8-9	Lesson plan 4: Learn about waste management	6
10-11	Lesson plan 5: Learn about organic agriculture	6
12-13	Lesson plan 6: Learn about sufficiency economy	6
14-15	Lesson plan 7: Learn about global warming	6
16	Lesson plan summary and posttest	3
Total number of hours throughout the semester		48

1) Study background information in the community context from publications, online media, or interviews with community leaders and explore the community area to collect information such as village history terrain location area/ location/ distance, territory, population, property, government, politics, occupation, religion, religious place, education, public utilities (electricity/ water/ road) local culture/ local tradition and community map.

2) Analyze learning resources in the community about the environment which students summarize and present together through a flowchart paper along with inserting knowledge about the environment according to 7 teaching plans, 6 hours per plan, including lesson plan 1: learn about forest resources, lesson plan 2: learn about water resources, lesson plan 3: learn about soil resources, lesson plan 4: learn about waste management, lesson plan 5: learn about organic agriculture, lesson plan 6: learn about sufficiency economy and lesson plan 7: learn about global warming.

3) Design the unit for learning about the environment as follows: 1) set goals of learning activities, 2) plan the implementation of learning activities and 3) organize environmental learning activities.

4) Organize learning about the environment as follows:

4.1) The goal of learning activities is to educate students about environmental knowledge, environmental ethics and environmental volunteers.

4.2) Plan environmental activities, including meetings to assign operational duties by dividing them into equal groups and provide equipment for environmental activities.

4.3) Go to the area to carry out environmental activities according to the teaching plan, 7 plans.

4.4) Take off lessons learned by allowing each group of students to discuss a method to promote the environment in the community to create ethics and volunteers in environmental conservation.

4.5) Evaluate results by each group of students come out to propose guidelines for promoting the environment in the community and do the exercises at the end of the chapter, including environmental knowledge test, environmental ethics test and environmental volunteers test including sharing a summary about the environment in the community.

5) When the teaching is completed as scheduled take the test after studying with a knowledge test, environmental ethics test and environmental volunteers test, which is the same set as the pre-test.

6) Analyze pretest-posttest scores by statistical methods to test the hypothesis.

7) Results of the development of integrated instructional activities of environmental education by using community - based learning and active learning were the efficiency of 82.52/83.27, which is higher than the threshold set at 80/80. And the effectiveness of the integrated instructional activities of the environmental education index was equal to 0.6398. It showed that students have progressed in learning up 63.98 percent.

2.6 Statistics Used in Research

The statistics used for data analysis in this research, the details are as follows:

2.6.1 Basic Statistics such as Frequency, Percentage, Mean and Standard Deviation

2.6.2 To Test the Efficiency of the Engine, Including the Appropriateness of Teaching Environmental Education Integrated, Conformity Index Value, Difficulty Index of the Environmental Knowledge Test, Discrimination,

Reliability, Process Efficiency Factor (E_1), Result Efficiency Value (E_2) and the Effectiveness Index (E.I.).

2.6.3 Statistics Test Results and Hypotheses the .05 Levels of Statistical Significance were Paired t-test, One-Way MANOVA, One – Way MANCOVA, Univariate Test, and a Double Comparison according to Scheffe's Method in One-Way ANOVA.

3. Results

The effect of integrated instructional activities of environmental education by using community - based learning and active learning can be summarized as follows:

3.1 *The Results of Comparison of Environmental Knowledge, Environmental Ethics and Environmental Volunteers of the students before and after instruction using community - based learning and Active Learning Found That: (As in table 3)*

3.1.1 Students had an average score of overall environmental knowledge in the pretest at a medium level (\bar{x} = 58.29) and an average score of overall environment knowledge in the posttest at the highest level (\bar{x} = 58.29). When comparing the average score of environmental knowledge in the pretest and posttest, it was found that students had a score of environmental knowledge in the posttest higher than the pretest statistical significance ($p < .05$).

3.1.2 Students had an overall average score of environmental ethics in the pretest at the level for relatives and friends (\bar{x} = 2.48) and in the posttest, students had an overall average score at the level for society (\bar{x} = 3.25). When comparing an average score of environmental ethics in the pretest and posttest, it was found that students had the posttest average scores of environmental ethics higher than the pretest statistical significance ($p < .05$).

3.1.3 Students had the average score of environmental volunteers in the pretest at the medium level (\bar{x} = 3.19) and in the posttest, students had an overall average score at a high level (\bar{x} = 3.83). When comparing the average score of environmental volunteers in the pretest and posttest, it was found that the students had an average score of environmental volunteers in the posttest higher than the pretest statistical significance ($p < .05$).

Table 3. The Results of the Comparison of the Average Score of Environmental Knowledge, Environmental Ethics and Environmental Volunteers of Students in the Pretest and Posttest

Topic	Pretest			Posttest			t	df	p
	\bar{x}	S.D.	Degree	\bar{x}	S.D.	Degree			
Environmental knowledge (N = 70)	37.4 9	5.78	Medium	58.29	3.08	The Highest	-32.058	88	.000*
Environmental ethics (N = 4)	2.48	0.24	For relatives and friends	3.25	0.14	For society	-23.901	88	.000*
Environmental volunteers (N = 5)	3.19	0.21	Medium	3.83	0.26	High	-21.997	88	.000*

* Statistical significance. 05

3.2 *The Results of Comparison of Environmental Knowledge, Environmental Ethics and the Environmental Volunteers of Students with Different Gender Found That:*

There was no significant difference between the average score of the environmental knowledge, environmental ethics and environmental volunteers of undergraduate students with different gender ($p > .05$) (As in table 4-5).

Table 4. Results of the Study of the Multiple Variances of the Environmental Knowledge, Environmental Ethics and Environmental Volunteers of Students with Different Genders Using One-Way MANOVA

Test statistics	Value	Hypothesis df	Error df	F	p
Pillai's Trace	.042	3.000	81.000	1.185	.321
Wilks' Lambda	.958	3.000	81.000	1.185	.321
Hotelling's Trace	.044	3.000	81.000	1.185	.321
Roy's Largest Root	.044	3.000	81.000	1.185	.321

Table 5. Results of the Study of One-way Covariance of Environmental Knowledge, Environmental Ethics and Environmental Volunteers Overall Posttest of Students with Different Gender Using a Pre-test as a Common Variable (One-Way MANCOVA)

Early variant	Dependent variable	SS	df	MS	F	p
Gender	Environmental knowledge	10.788	1	10.788	1.128	.291
	Environmental ethics	.053	1	.053	2.745	.101
	Environmental volunteers	.002	1	.002	.025	.875

3.3 The Results of Comparison of Environmental Knowledge, Environmental Ethics and the Environmental Volunteers of Students with Different GPA Found that: (As shown in table 6-7)

3.3.1 There was a Statistically Significant Difference between the Average Score of the Environmental Knowledge, Environmental Ethics and Environmental Volunteers of Undergraduate Students with Different GPA ($p < .05$).

It showed that Univariate Test found that: there was a statistically significant difference between an average score of environmental knowledge and environmental volunteers of students with different GPA ($p < .05$). There was no significant difference between the average score of environmental ethics of undergraduate students with different GPA ($p > .05$) (As shown in table 8-9).

3.3.2 There was a Different between the Average Score of Environmental Knowledge of Students with Medium GPA and Low GPA the Statistical Significance ($p < .05$).

3.3.3 There was a Different between the Average Score of Environmental Knowledge of Students with High GPA and low GPA the Statistical Significance ($p < .05$).

Table 6. Results of the Study of the Multiple Variances of the Environmental Knowledge, Environmental Ethics and Environmental Volunteers of Students with Different GPA Using One-Way MANOVA

Test statistics	Value	Hypothesis df	Error df	F	p
Pillai's Trace	.170	6.000	164.000	2.544	.022*
Wilks' Lambda	.832	6.000	162.000	2.608	.019*
Hotelling's Trace	.200	6.000	160.000	2.670	.017*
Roy's Largest Root	.188	3.000	82.000	5.150	.003*

* Statistical significance. 05.

Table 7. Results of the Study of One-way Covariance of Environmental Knowledge, Environmental Ethics and Environmental Volunteers Overall Posttest of Students with Different GPA Using a Pre-test as a Common Variable (One-Way MANCOVA)

Early variant	Dependent variable	SS	df	MS	F	p
Grade Point Average (GPA)	Environmental knowledge	71.969	2	35.984	4.048	.021*
	Environmental ethics	.012	2	.006	.290	.749
	Environmental volunteers	.605	2	.302	4.619	.012*

*Statistical significance. 05.

Table 8. The Result of the Study of Environmental Knowledge of Students with Different GPA in Pairs According to the Scheffe Method

Grades	\bar{x}	Low	Medium	High
		55.77	59.00	58.32
Low	55.77	-	.021*	.068
Medium	59.00	-	-	.616
High	58.32	-	-	-

* Statistical significance. 05.

Table 9. Result of the Environmental Volunteers of Students with Different GPA in Pairs According to the Scheffe Method

Grades	\bar{x}	Low	Medium	High
		3.59	3.82	3.87
Low	3.59	-	.063	.012*
Medium	3.82	-	-	.712
High	3.87	-	-	-

* Statistical significance. 05.

4. Discussion

The effect of integrated instructional activities of environmental education by using community - based learning and active learning, the researcher has the following points to discuss.

4.1 The Results of Comparison of Environmental Knowledge, Environmental Ethics and Environmental Volunteers of the Students in Pretest and Posttest by Integrated Instructional Activities of Environmental Education by Using Community - Based Learning and Active Learning Found That:

4.1.1 The Students had an Average Score of the Environment Knowledge in the Posttest Higher than Pretest

This is the result of the teaching and learning activities using community-based learning. That the researcher developed had the following steps: 1) study basic information, community context 2) survey the community area to collect information 3) analyze learning resources in the community about the environment 4) design the unit 5) manage learning and 6) take off lessons learned. It is a learning management model that integrated curriculum's content in connection with the community by using operations allowing the learners to learn by doing work from the real situation in the community under the participation of teachers and learners and a group of people in the community which it aims to promote learning and develop learners of a wide range of knowledge and skills. And active learning is a student-centered teaching activity in which the learners have to control their learning by themselves in performing various activities. It provides opportunities to think and make decisions about speaking, listening, reading, writing, reflecting on ideas and knowledge gained (Phannipa Kiteak, 2007). Where knowledge is the perception of facts, events, observations, studies, experiences in both natural and social environments. Fundamental knowledge of individuals that have been remembered or collected and expressed in observable or measurable behavior (Saengchan Sopakarn, 2007). This allows students to learn about natural resources and the environment from the community in all aspects which is consistent with the study results of Prayoon Wongchantra et al., (2017: 385) found that the sample group had higher knowledge scores of green universities after learning activities than before learning. And Siriwatthanamichai, N. and Kurukodt, J. (2018: 1921) found that the farmers had more knowledge after the training than before the training. And Prayoon Wongchantra et al., (2017) found that students had higher knowledge of ecology than before studying. And Nirun Yingyuad (2017) found that students had higher knowledge about waste management after the activity than before participating in the activities. And Wason Srihirun, Kobsook Kongmanus & Sumalee Chaicharoen (2019) and Tommanee Sooksai (2017) found that the academic achievement of the learners had a higher score after studying than before studying. And Supreeya Pailom (2019) found that students had higher academic achievement after studying than before studying. Therefore, it was shown that the students who studied using community - based learning and active learning affected students have more environmental knowledge than before the study.

4.1.2 The Students had an Average Score of Environmental Ethics in the Posttest Higher than Pretest

This is the result of integrated instructional activities of environmental education by using community - based learning and active learning. The researcher developed 7 plans: forest resources, water resources, soil resources, waste management, organic agriculture, sufficiency economy and global warming which focuses on student's participation and learning activities through practice. So that students can link ethics and environment into practice which is a sustainable environmental management method and help students to become more cherished and responsible for the environment. The approach of learning management by using community-based space is the integration of learning management to be implemented and take action to solve problems within the community so that the research results can be used in the community (Bunpod Phijitkamnerd et al., 2020). It also emphasizes a process that emphasizes action which is an innovative teaching method for learning in the 21st century, allowing students to take action. Organize activities for students to learn using advanced thinking processes, including analysis, synthesis and valuation to enable students to create knowledge and organize self-learning systems for a new

generation of citizens (Ariya Kuha et al., 2019). And the principles of environmental practices based on accuracy and goodness correctness according to morality and compassion to treat the environment (Vinai Veeravatanond, 2003) to lead to guidelines for creating environmental ethics by teaching and training to appreciate the importance of the natural environment, to know that the environment is very important to the existence of human life (Prayoon Wongchantra, 2011) which is consistent with the study results of Prayoon Wongchantra et al., (2017) found that inserting environmental ethics in teaching ecology for environmental studies resulted that students having higher environmental ethics in the posttest more than the pretest. And Prayoon Wongchantra et al., (2017) found that teaching environmental education using a case study method, students had environmental ethics in the posttest higher than the pretest. And Prachumporn Lauprasert (2019) found that teaching ethical practices to develop environmental ethics, bachelor students had environmental ethics in the posttest more than the pretest. And Thakorn Sittichok & Orapin Sirisamphan (2017) found that students had scored on environmental ethics in the posttest higher than the pretest. And Amoulux shouchupon (2014) found that the results of environmental ethics development of students in the service field in the aviation industry, they had environmental ethics in the posttest higher than the pretest. And Prayoon Wongchantra et al., (2008; 2017) found that students had environmental ethics in the posttest higher than the pretest. And Ceylan Gürüçin, Ömer Seyfettin Sevinç (2020) found that teachers had a level of environmental ethics in the posttest higher than the pretest. Therefore, it shows that students who study using community - based learning and active learning effected in more environmental ethics for students.

4.1.3 The Students had an Average Score of the Environmental Volunteers in the Posttest Higher than Pretest

This is the result of community-based integrated instructional activities of environmental education by studying basic information, community context explores the community area analyze learning resources in the community area design a learning unit manage learn to take off lessons learned and evaluate results. Which is integrated with active learning teaching that focuses on engaging learners and learning activities through practice by analysis synthesis, brainstorming, exchange of ideas and taking action. So that students can connect knowledge or create knowledge for themselves by doing real practice through learning activities according to the teaching plan. Learning management processes in which learners must participate in activities to develop thinking process discuss and exchange ideas together until the formation of one's knowledge. Good education management must be education that can learn and live independently based on their resources and environment (Roongporn Klyprayong, 2020). A good education must be in line with the community context aiming for community livelihood and development. It is an educational arrangement to strengthen the community through social institutions concepts and beliefs of school society and social activities (Chuanpit Siriphantana & Sutep Uamcharoen, 2016). By creating learning in the area of environmental conservation and community development create a culture of volunteers to society to the public. As well as promote the exchange of educational knowledge and culture between students and the community to create a volunteer process (Walailak Bunpa, 2010). The volunteers are due to be implanted and to raise awareness through activities that provide help and benefit others which is consistent with the study results of Prayoon Wongchantra et al., (2017) found that teaching environmental education using the reverse classroom learning method gave students had environmental volunteers in the posttest more than the pretest. And Sunisa Throngyu (2017) found that teacher professional students had higher volunteer spirit in the posttest more than pretest. And Supawan Lekvilai et al., (2019) found that students had public spirits in the posttest higher than the pretest. And Prayoon Wongchantra et al., (2020) found that the students had a mean score for environmental volunteers in the posttest higher than the pretest. Therefore, it was shown that the students who studied using community - based learning and active learning had environment volunteers is increasing.

4.2 *The Results of Comparison of Environmental Knowledge, Environmental Ethics and the Environmental Volunteers of Students with Different Gender Found That:*

4.2.1 There was no Significant Difference between the Average Score of the Environmental Knowledge of Undergraduate Students with a Different Gender

This may be because gender factors do not affect knowledge. Where learning is community-based and operational learning. Knowledge is transferred equally, regardless of gender or gender including the processes used in teaching and learning, there are various activities. And it is a process that enables students to learn natural resources and the environment from all aspects of the community to develop knowledge until learning. This is consistent with the concept of Prayoon Wongchantra (2016) said that the knowledge transfer of environment is the introduction of knowledge from knowledge sources to the target population through media, tools, equipment, with specific processes and methods. This is consistent with the concept of Somchit Chanchai (2014) said that in the development of teaching and learning plans there is a teaching component, namely learning purpose. Instruction process and teaching

activities used in the implementation of each step teaching materials and evaluation of learners by using community - based learning and active learning which is consistent with the concept of Surakrai Nantaburom (2017) said the learning area and proactive learning is the learning that the learner is the one doing on their own rather than taking the knowledge from the teacher alone. This learning can be arranged to meet the learning styles of the students has been mixed and positively affect the learning outcome of the learners. Active learning management can also be organized in conjunction with blended learning principles that enable the learner to continue learning in and out of the classroom without time and place limits. This is consistent with the study results of Kim, Heejung et al., (2016) found that the male and female people had knowledge understanding the separation of household waste is no different. And Suksringarm, J., Singseewo, A. and Appamraka, S. (2019) found that male students had no different knowledge about social and environmental issues than female students. And Anastasia Goulgouti et.al. (2019) found that teachers before serving in government service with different gender had no different knowledge of environmental concepts. So showed that male and female through community - based learning and active learning as a result, the students' environmental knowledge is no different.

4.2.2 There was no Significant Difference between the Average Score of the Environmental Ethics of Undergraduate Students with a Different Gender

Maybe due to environmental conservation and the environment is something that can be practiced all ages on a personal level. Any gender can act, so there is no difference in gender involved with environmental ethics. However, integrated instructional activities of environmental education by using community - based learning and active learning management models that focus on enabling learners to learn from working in real community situations emphasize students to see the value of the environment that can be applied to all aspects of life and development. And the use of natural resources for the worth and the sustainable benefits which the contents and teaching process were integrated to show the connection and relationship which learning in a community-based by creating a learning experience (Bedri and Dowling (2017). When the learner takes action, it allows the learner to experience the true nature of that knowledge by studying the learning resources in the community and learning workshop (Sura Banchongchit, 2008). It is a teaching and learning that encourages students to participate in learning. It is for students to study and research for themselves which emphasizes analytical thinking and problem solving including the environment learning that is conducive and allows learners to seek and build knowledge on their own through activities with the goal of learning activities for students to have the ethical environment (Integrated Executive Committee General Education, 2004). It is a principle that should behave in the environment which resulted in the environment living in an ecological balance and benefiting all things that live in the environment without compromising the relationship between oneself and the environment. Environmental ethics are inseparable from life, society and community ethics, and their potential is the main link in life, community, society and environment to be sustainable which is consistent with the study results of Sakorn Phromkot (2012) found that the male and female Loei Rajabhat University students had no different ethical behavior. And Amoulux shouchupon (2014) found that male students and female students had no different results in developing environmental ethics. And Ceylan Gürüçin, Ömer Seyfettin Sevinç (2020) found that male and female teacher applicants had no different levels of environmental ethics. And Kronlid, David (2003) found that the environmental ethics of feminism were no different. And Anastasia Goulgouti et.al., (2019) found that the pro-government teachers with different sexes had no different environmental behavior. So show that male and female through community-based learning and operational learning, as a result, environmental ethics are no different.

4.2.3 There was no Significant Difference between the Average Score of the Environmental Volunteers of Undergraduate Students of a Different Gender

This may be because both males and females have no different interests in natural resources and environmental conservation. However, community-based learning and operational learning are effective and efficient based on established criteria causing students to be interested in learning to have the motivation to develop themselves to have more environmental volunteers. There is a process of working in groups. There is an exchange of knowledge between students and the community which learning in the environment (Department of Environmental Quality Promotion, 2006). It is an education that allows students to be promoted and develop their awareness about the environment, by allowing learners to experience the environment directly. Therefore teaching and learning are teaching outside the classroom or doing field activities and data is collected in various ways. This will help learners develop consciousness and cooperate in the conservation and take care of the environment around them, which learning is a process of action active process that occurs in each person (Sumalee Chaijaroen, 2014). The learning process is the nature that allows learners to create knowledge by working together to solve problems leading to the development of environmental volunteers (Nutnichakorn Sriporiboon, 2007) to have a sense of individual towards

society as a whole with care and support volunteer people will demonstrate behaviors that volunteer to benefit the public, helping others and society without expecting returns which is consistent with the study results of Anusorn Sapploy (2008) found that Chandrakasem Rajabhat University students male and female have no differences in volunteers. And Somchay Srisuntornvohohan (2013) it was found that students of different sexes showed no differences in public mental behavior overall. And Prayoon Wongchantra et al., (2020) found that male and female students had no difference in environmental volunteers scores. And Bethany Alender (2016) found that volunteers of different genders had no differences in helping the environment or community. So showed that male and female through community - based learning and active learning resulted in environmental volunteers no different.

4.3 The Results of Comparison of Environmental Knowledge, Environmental Ethics and Environmental Volunteers of Students with Different GPA Found That:

4.3.1 There was a Statistically Significant Difference between the Average Score of the Environmental Knowledge of Undergraduate Students with Different GPA

This is the result of community-based learning and operational learning with activities for students to take action on each plan. There are activities suitable for the learning nature of the students as well as going to study outside the place to see different conditions practical action by using the community as a base for 4 steps (Chuanpit Siriphantana&Sutep Uamcharoen, 2016): planning, designing, teaching learning management measurement and evaluation by providing learning for the students in the classroom (Utsanee Tepvorachai, 1999). And there is the freedom to learn activities must cover problem solving processes and investigate problems. That will lead to a system of knowledge transfer in the environment (Prayoon Wongchantra, 2016). These include lectures, stories, practice, training, public relations, conferences, seminars through media, demonstrations and field trips will depend on the nature of the content, which will connect to the broadcaster each type of media, when and where to broadcast. This will lead to the knowledge and understanding of the target population, which shows significant behavioral changes by examining and evaluating results which knowledge arises within (Phontida Wichianpanya, 2004). It may arise from the experience or intuition of the individual. It is the knowledge that can be transmitted in speech or in writing in various media which is consistent with the study results of Punnawit Baikularb&Sukkeaw Kumsorn (2015) found that students and teachers had different results in research. So showed that students with different GPA through community - based learning and active learning resulting in different environmental knowledge.

4.3.2 There was no Significant Difference between the Average Score of the Environmental Ethics of Undergraduate Students with Different GPA

It may be because students who study with the same course with a similar cumulative grade point average of course, there are environmental ethics in the same direction and sees that the natural environment helps human beings as well. However, community-based learning and action learning are aimed at improving learners or changing behaviors with emphasis on students to develop themselves to their full potential which learning about the environment (Department of Environmental Quality Promotion., 2006). Because only beliefs, feelings and consciousness are not enough to produce a habit of using the environment wisely. It is therefore imperative that humans understand the natural processes and the impact due to human actions on the environment. The learning in which the learner has a role to play responsible for their learning energetically (Siriporn Manopichetwattana, 2004) by taking action and thinking of what they are doing from the given teaching and learning activities. Emphasis is given to the learners to gain direct experience from the students' activities to achieve environmental ethics (Prayoon Wongchantra, 2011). That must create and instill a person's consciousness towards nature, the environment, which will result in fewer environmental problems or less until the level of development of the environment to be balanced between humans social and environmental sustainability and does not lose balance. This is consistent with the study results of Titiya Netwong (2013) found that students with different grades had no different ethical reasons. And Praves Intongpan& Phramaha Prachuap Suhchocho (2015) found that the students used the principles of morality in their learning classified by grades. And Phramaha Sermsak Nisspho (Suwan Pradit) et al., (2018) found that there was no difference in ethical conduct when classified by grades. So showed that students with different grades through community - based learning and active learning as a result, there is no difference in environmental ethics.

4.3.3 There was a Statistically Significant Difference between the Average Score of the Environmental Volunteers of Undergraduate Students with Different GPA

It is the result of community-based learning and operational learning with effective and suitable communication tools for students. Besides, there is also integrated, learner-centered learning, fostering cooperation in the group. There are various teaching methods, it is the integration between serving the community and studying the contents of the curriculum to strengthen responsibility for civil society and community and activities set by students to meet the

needs of the community and can be linked to the goals of the curriculum-based learning. In which the learning process is student-centered by allowing students to use their speaking, listening, reading, thinking, writing and expressing skills while doing activities (Wanpen Kamtet, 2006) which consists of teaching methods and a variety of teaching techniques resulting in students interacting with each other and be able to create knowledge by themselves meaningfully to lead the process of volunteers, it consists of cultivating awareness of the importance of volunteers, preparation, both physically, mind, knowledge and communication building self-confidence and participation in activities continuously the creation of consciousness through activities that help and benefit others (Walailak Bunpa, 2010). The creation of consciousness and the benefit of the public will generate from oneself to create learning in the field of environmental conservation and community development build a volunteer culture for the public. As well as promote the exchange of culture, knowledge, education between students and the community which is consistent with the study results of Prapawan Samutpaochinda (2013) found that early childhood education students with different academic achievements had different levels of public consciousness. And Phramaha Praison Kota, Suwaporn Tungsomworapongs & Achara Wattananarong (2011) found that students with different academic achievements had different public consciousness. So showed that students with different grades through community - based learning and active learning resulting in different environmental volunteers.

5. Conclusion

The effect of in 563+tegrated instructional activities of environmental education by using community - based learning and active learning, the results of the research showed that:

- 1) The students had an average score of the environment knowledge, environmental ethics and environmental volunteers in the posttest higher than the pretest.
- 2) There was no significant difference between the average score of the environmental knowledge, environmental ethics and environmental volunteers of undergraduate students with a different gender.
- 3) There was a statistically significant difference between the average score of the environmental knowledge, environmental ethics and environmental volunteers of undergraduate students with different Grade Point Average (GPA).

Integrated instructional activities of environmental education by using community - based learning and active learning and learning, a centered learning approach allows undergraduates to understand and learn through actions with learners together. It uses a community as a base that allows undergraduates to learn what they want from the community. As well as enhancing their expertise in working according to real conditions so that the bachelor's degree can have appropriate mental and volunteer knowledge.

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