ความรู้ แรงบันดาลใจและการมีส่วนร่วมของนักเรียนที่มีต่อการอนุรักษ์ป่าไม้ของโรงเรียน

Knowledge Inspiration and Participation of Student towards School Forest Conservation

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บทคัดย่อ

การวิจัยนี้เป็นการวิจัยกึ่งทดลอง การวิจัยนี้มีวัตถุประสงค์ เพื่อศึกษาเปรียบเทียบคะแนนเฉลี่ยของความรู้เรื่องการอนุรักษ์ป่าไม้โรงเรียน สิ่งแวดล้อมศึกษา แรงบันดาลใจในการมีจิตสาธารณะ และพฤติกรรมในการอนุรักษ์ป่าไม้โรงเรียนระหว่างก่อนและหลังอบรม และการประเมินการมีส่วนร่วมของนักเรียนในการฝึกอบรมของนักเรียนระดับชั้นมัธยมศึกษาตอนปลายโรงเรียนเชียงยืนพิทยาคม การวิจัยครั้งนี้เป็นการวิจัยเป็นการวิจัยกึ่งทดลองโดยใช้ การประชุมเชิงปฏิบัติการอย่างมีส่วนร่วมแบบพาอิก เครื่องมือมีการประเมิน 3 ด้าน และแบบสอบถาม กลุ่มตัวอย่างเป็นนักเรียนมัธยมศึกษาตอนปลายโรงเรียนเชียงยืนพิทยาคม จำนวน 30 คน ได้จากการสุ่มตัวอย่างแบบเฉพาะเจาะจงตามเกณฑ์ที่กำหนดคือการมีจิตสาธารณะและให้คำมั่นว่าจะมีส่วนร่วมตลอดกระบวนการวิจัย สถิติที่ใช้ในการวิเคราะห์ข้อมูลคือ Paired Sample t-test เพื่อเปรียบเทียบความรู้ก่อนและหลังการอบรม และ One Way ANOVA เพื่อเปรียบเทียบผลการประเมิน 3 ด้าน ผลการวิจัยพบว่า คะแนนเฉลี่ยของเรื่องความรู้การอนุรักษ์ป่าไม้โรงเรียน สิ่งแวดล้อมศึกษา แรงบันดาลใจในการมีจิตสาธารณะ และพฤติกรรมในการอนุรักษ์ป่าไม้โรงเรียนของนักเรียน และผลสัมฤทธิ์การอบรม หลังการอบรม มีคะแนนเฉลี่ยสูงกว่าก่อนการอบรม ซึ่งแตกต่างกันอย่างมีนัยสำคัญทางสถิติที่ระดับ 0.01 ในทุกด้าน ระหว่างการอบรมมีการประเมิน 3 ด้านเพื่อประเมินการมีส่วนร่วมของนักเรียนผู้เข้ารับการฝึกอบรม พบว่า คะแนนเฉลี่ยการประเมินตนเอง การประเมินโดยเพื่อนและการประเมินโดยผู้อำนวยความสะดวก ในสถานการณ์ปัจจุบัน แตกต่างอย่างมีนัยสำคัญทางสถิติที่ระดับ 0.01 ส่วนในสถานการณ์อนาคตพบว่าคะแนนเฉลี่ยทั้งสามด้าน ไม่มีความแตกต่างอย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05

คำสำคัญ: ความรู้, แรงบันดาลใจ, การมีส่วนร่วม, การอนุรักษ์ป่าไม้โรงเรียน

Abstract

The quasi-experimental research was conducted with 30 high school students of Chiang Yuen School that were collected by purposive sampling technique based on criteria of public mind and commitment to participate throughout research operation. The objectives were to compare the mean scores between pretest and posttest of knowledge of school forest conservation, environmental education, inspiration of environmental conservation, and environmental conservation behavior and to evaluate student participation in training process. Three Dimensional Evaluation (TDE) was employed for determination the participation. One-way ANOVA was used to determine the mean cores difference of three groups. After Participation-Appreciation-Influence-Control (PAIC) finished, the results disclosed that mean scores of posttest of knowledge of school forest conservation, environmental education,

inspiration of environmental conservation, environmental conservation behavior and training achievement were higher than pretest with statistical significance ($p < 0.01$ in all aspects). In present situation demonstrated that mean scores were different with statistical significance ($p < 0.01$) but in future situation the mean scores were not different with statistical significance ($p > 0.05$).

Keywords: knowledge, inspiration, participation, school forest conservation

Introduction

Forests are essential to life on Earth, the planet's lungs, and home to people and wildlife including engines of green economies. Above and beyond forest offers direct benefit for human basic needs counting with food, drug, clothing and shelter. Moreover, forests are the carbon dioxide storage, oxygen production, global and local water supplies maintenance, soil erosion prevention, soil fertility improvement, natural thermostat regulating climate, cleaning pollution from the air and helping prevent climate change. Forest conservation and management must be performed by everyone on the earth whether children or adults because everyone obtain direct benefits from it. Therefore, global citizen must take responsibility to protect forest via autonomous participation on planning, decision making, implementing, monitoring and preventing degradation and over consumption *(Fisher 1995; Ruengpanich, 2003; Thiengkamol, 2009c).*

The Food and Agriculture Organization of the United Nations in 2010, reported that world deforestation mainly resulted from the conversion of tropical forests to agricultural land. Forest had decreased over the past ten years but still continues at a frighteningly high rate in many countries. Between 2000 and 2010, about 13 million hectares of forests were globally converted to other uses or lost through natural causes each year when it was compared to around 16 million hectares per year during the 1990s. The study was conducted on 233 countries and areas. Brazil and Indonesia have drastically reduced their deforestation rates as compare to the highest loss of forests in the 1990s. In addition, determined tree planting programs in countries such as China, India, the United States and Viet Nam with combination of natural expansion of forests in some regions have added more than seven million hectares of new forests annually. As a result the net loss of forest area was reduced to 5.2 million hectares per year between 2000 and 2010, down from 8.3 million hectares annually in the 1990s *(FAO, 2010).*

For Thailand, the meaning of forest according to the Forest Act B.E. 2484 *(Revised 2555)*, means the land that no one obtained presumptive title by land law. Generally, it means the area covers with diverse types of trees with high density and large area that influences to the environment such as weather changing, soil and water fertility with wildlife and other creatures interrelation together among these living creatures. Forest in Thailand can be classified into 2 types including evergreen forest covered about 30 percent of forest across country and deciduous forest about 70 percent. The evergreen forest can be classified into 4

types of tropical evergreen forest, coniferous forest, swamp forest and beach forest. The deciduous forest can be classified into 3 types of mixed deciduous forest, deciduous dipterocarp forest, and savanna forest. Besides the forest in national park and protection area, there are also numerous of community forest nearby the school and the school administrators are allocated to look after these forest areas unavoidably, therefore, the students should take important parts to take responsibility as good global citizen to conserve school forest with consciousness *(Ruengpanich, 2003; Thiengkamol, 2009c; Woods et al., 2011).*

Importance of school forest in Thailand, there are some school occupied the forest adjacent the school, therefore administrators of school and community have the authority to take care these forest implicitly. The school administrators who realize to the importance of school forest would be pay attention to establish projects and activities to let students take an essential part to look after school forest by systemic management to support students to directly learn at school forest for forest conservation. The projects and activities are held by teachers and students with deep appreciation would initiate them to have environmental consciousness and aware to protect school forest with public mind because once they cultivate and take care the trees and others living creatures such as herb, mushroom, bird and so on. This would inspire them to love and share their feeling of delicate mind to appreciate the beauty and attraction of nature *(Ruengpanich, 2003; Thiengkamol, 2009c; Thiengkamol, 2011e).*

Environmental education principles are pertinent to concept of sustainable development in basic thought that of sustainable development in agreement to conference of environment and development of United Nation since 1992 that explained in Agenda 21 of global action plan mentioned that "Sustainable development is development which meets the needs of the presented without compromising the ability of future generations to meet their own needs" *(Office of National Economic and Social Development Plan, 2010; WCED, 1987; Volker, 2007; Watkinson, 2009; Thiengkamol, 2011e).* This is basically to clarify that people at present generation should have knowledge, understanding the important of environmental problems. As a result, any their activities for living, it needs to consume the natural resources and they involve to the environmental quality, then they must take responsibility for any activities that they do with public mind to conserve the environment and natural resources sincerely. Moreover, they must have suitable behavior for pro-environment with right awareness and positive attitude to participate in environmental projects and activities together with having sensitivity to realize the necessary of environmental quality and practice to protect environment until it becomes a stable habit and becomes a behavior to concentrate to sustain the environmental quality without requisite of rewards, money or admiration *(Thiengkamol, 2004; Thiengkamol, 2005a; Thiengkamol, 2009a; Thiengkamol, 2009b; Thiengkamol, 2011e).*

Chiang Yuen School has forest in school and locates at Chiang Yuen District, MahaSarakham Province in Northeastern region of Thailand. The high school students of Chiang Yuen School are young adult who are important persons to take responsibility for forest protection and conservation. Therefore if they have public mind inspiration to conserve the school

forest during they are studying in this school. They would be our hope for country to conserve and manage school forest to meet sustainable development. However, they are recruited with criteria of willing to participate through training process and with commitment to devote themselves to be educators or trainers for the others after participating in training like as Participation-Appreciation-Influence-Control (PAIC). They would gain more environmental knowledge and understanding with integration of forest conservation and environmental education principles to attain the sustainable school forest conservation. Environmental education proposes to produce knowledgeable citizen to concern the biophysical environment, to aware environmental quality and to take responsibility for environmental problem together with corrected decision making to solve environmental problem with clear understanding. Simultaneously, the projects and activities for school forest conservation need to be planed to conduct to create a environmental prototype with high school students by Training of Trainer (TOT). PAIC incorporated with environmental education principles assisting to increase high school student to deeply gain knowledge and understanding the biophysical environment at school forest via direct learning experience. Therefore, they would be to aware and concern for forest conservation with actual learning lesson with school forest whether in terms of forest advantages in diverse perspectives of human four basic needs counting of food, drug, shelter and clothing. In addition, forest provides shadow, soil erosion prevention, humidity maintenance and ecological balance. Especially, once they feel appreciate the essence of school forest and together with challenging their public mind for environmental conservation, it would lead to change their behavior in daily life with responsibility for forest conservation. Finally, they will be future generation and our hope to assist to sustainably conserve forest *(Thiengkamol, 2010; Thiengkamol, 2011e; Thiengkamol, 2011h; Thiengkamol, 2012a; Thiengkamol, 2012b; Langly, 1998, Sproull, 1988; InWent-DSE-ZEL, 2002).*

Therefore, the school forest conservation of Chiang Yuen School, Chiang Yuen District, MahaSarakham Province would be attained, thus the high school student must be challenged and encouraged through project and activities that are supported by the school administrators and teachers together with their own realization with the effective training technique like as PAIC process to obtain more forest knowledge, environmental education principles, public mind inspiration of forest conservation to be trainer and educator to act as prototype for other students in this school with properly practice as good role model for others students in this school and the other schools as well *(Thiengkamol, 2004; Thiengkamol, 2005a; Thiengkamol, 2009c; Thiengkamol, 2011e; Thiengkamol, 2011a; Thiengkamol, 2011h; Thiengkamol, 2012a; Thiengkamol, 2012b).*

Objective

The objectives were to compare the mean scores between pretest and posttest of knowledge of school forest conservation, environmental education, inspiration of environmental conservation, and environmental conservation behavior and to evaluate the participation of student in training process.

Conceptual Framework

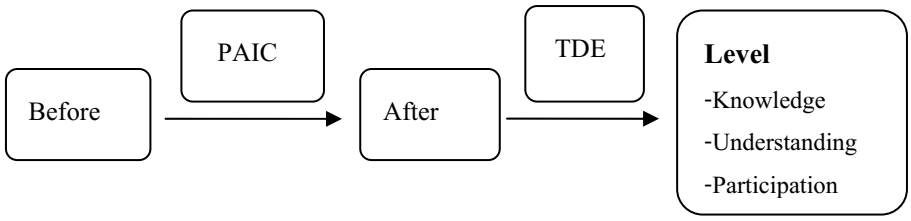

Figure 1 Conceptual Framework

Methodology

The research design was implemented in steps by step as the followings.

Population and Sample

Population were 1,697 high school students of Chiang Yuen School, Chiang Yuen District, Maha Sarakham Province in Northeastern region of Thailand. The purposive sampling was used to select 30 students with criteria of willingness, time, devotion, commitment, and public mind.

Research Tool

The handbook was constructed covering knowledge of school forest conservation, environmental education, inspiration of environmental conservation, and environmental conservation behavior *(Fisher 1995; Woods et al., 2011; InWent-DSE-ZEL, 2002; Ruengpanich, 2003; Thiengkamol, 2009c; Thiengkamol, 2011a; Thiengkamol, 2007, Thiengkamol, 2012a)*. The questionnaire composed of 7 items of demographic characteristics and 40 questions of with 5 rating scales of knowledge of school forest conservation, environmental education, inspiration of environmental conservation, and environmental conservation behavior. The content and structural validity were determined with Item Objective Congruent (IOC) by 5 experts in the aspects of psychology, social science and social research methodology (Rovinelli & Hambleton, 1977). The reliability was done by collecting the sample group from 30 high school of adjacent school. The reliability was determined with Cronbach's Alpha (Cronbach, 1951). The reliability of knowledge of school forest conservation, environmental education, inspiration of environmental conservation, and environmental conservation behavior were 905, 0.918, 0899 and 0.946 respectively. The evaluation form of Three Dimensions was used to evaluate the participant practice as trainer during PAIC implemented (Langly, 1998, Sproull, 1988; InWent-DSE-ZEL., 2002; Thiengkamol, 2012a; Thiengkamol, 2012b).

Data Collection

The questionnaire was used for data collecting from 30 high school students of Chiang Yuen School. The Three Dimensional Evaluation (TDE) was used to examine the congruence of three aspects evaluation, Self-evaluation, Friend-evaluation, and Facilitator-evaluation for training participation (Thiengkamol, 2011a; Thiengkamol, 2011g; Thiengkamol, 2011h; Thiengkamol, 2011e).

Statistical Analysis

1. The descriptive statistics were used that

include frequency, percentage, mean and standard deviation.

2. The inferential statistics used was paired t-test and by considering confident interval at 0.05 and 0.01. One-way ANOVA was used to determine the mean scores difference of three groups.

Results

The results of this study implemented with 30 high school students of Chiang Yuen School were as the followings.

1. General Characteristics of Sample Group

The sample group was 30 high school students of Chiang Yuen School, Chiang Yuen District, MahaSarakham Province in Northeastern region of Thailand in the year of 2013. They were selected to be trained for trainer about knowledge of school forest conservation, environmental education, inspiration of environmental conservation, and environmental conservation behavior. Most of them were female with 23 (76.70%), had age between 16-17 years old with mean of 16.60 years old, had education level at secondary school level 5 with 30 (100.00%), had family characteristics with nuclear family of 18 (60.00%), had home town in Maha Sarakham Province with 28 (93.30%), lived with parents with 22 (73.30%) and grade point average between 1.60-3.24 with mean of 2.49.

2. Results of Pretest and Posttest with PAIC technique

PAIC technique was trained for 30 high school students of Chiang Yuen School about knowledge of school forest conservation, environmental education, inspiration of environmental conservation, and environmental conservation behavior. The research results discovered that before and after PAIC training process implemented, the mean scores of posttest of training achievement on knowledge of school forest conservation, environmental education, inspiration of environmental conservation, environmental conservation behavior and training achievement were higher than pretest with statistical significance ($p< 0.01$, $p< 0.01$, $p< 0.01$, $p< 0.01$, and $p< 0.01$), as demonstrated in table 1.

Table 1

Pretest and Posttest of Sample Group

Training Issues	Posttest		Pretest		t	p
	$\overline{X}$	S.D.	$\overline{X}$	S.D.		
Knowledge of School Forest Conservation	43.87	2.40	40.37	3.07	5.85	0.000**
Environmental Education	45.30	2.15	41.37	3.35	5.06	0.000**
Inspiration of Environmental Conservation	66.07	4.83	58.43	5.14	7.21	0.000**
Environmental Conservation Behavior	64.50	5.62	60.47	3.47	5.22	0.000**
Training Achievement	219.73	9.22	200.63	8.83	11.21	0.000**

** Significant Level at 0.01

3. Results of Three Dimensional Evaluations for Participation in Present Situation

Three Dimensional Evaluations were used for examining participation of 30 high school students in three aspects evaluation of Self-evaluation, Friend-evaluation and Facilitator-evaluation in present situation with One-way ANOVA to analyze the mean score differences of three groups. The results of One-way ANOVA illustrated that there were different mean scores about participation in training process through brain storming with statistical significance ($p<0.01$) as demonstrated in table 2.

Table 2

Three Dimension Evaluation of Sample Group for Participation in Present Situation

Source of Variation	Sum of squares	df	Mean Square	F	Sig.
Between Groups	3.55	2	1.78	29.24	0.000**
Within Groups	5.28	87	0.06		
Total	8.84	89			

** Significant Level at 0.01

The Scheffe was used for comparison of each pair of Three Dimensional Evaluation (TDE) to examine the mean score differences of their participation in the training process of PAIC, it illustrated that Self-Evaluation and Friend-Evaluation, and Self-Evaluation and Facilitator-Evaluation had statistically significant at level of 0.01, and 0.01 as demonstrated in table 3.

Table 3

Scheffe' Analysis of Each Pair Comparisons in Past Situation

Evaluation	$\overline{X}$	Self-valuation	Friend Evaluation	Facilitator Evaluation
		4.46	4.86	4.90
Self-Evaluation	4.45	-	-0.40	0.44-
			(0.000)**	(0.000)**

** Significant Level at 0.01

4. Results of Three Dimensional Evaluations for Participation in Future Situation

Three Dimensional Evaluations were employed for delaminating the participations of 30 high school students in three aspects evaluation composing Self-evaluation, Friend-evaluation, and Facilitator-evaluation in future situation with One-way ANOVA to analyze the mean score differences of three groups. The results of One-way ANOVA illustrated that there were no different mean scores about participation in training process with statistical significance ($p>0.05$) as demonstrated in table 4.

Table 4

Three Dimension Evaluation of Sample Group for Participation in Future Situation

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.02	2	0.01	0.26	0.77
Within Groups	3.72	87	0.04		
Total	3.75	89			

* Significant Level at 0.05

During the PAIC training implemented, focus groups discussion and brain storming were integrated, therefore, it is noticeable that they had a very good participation and they were able to convey their idea and to clarify to their friends in the small group discussion. Afterward, they were able to play role as trainer successfully. Especially, in small group discussion they willingly participated and were able to use their own imagine to draw their own idea, to share and to exchange their thinking to suggest project to implement after PAIC training finished. Furthermore, they planned to share their knowledge and understanding getting from PAIC process to other students and plan to be act as trainer for other students in this school and other schools in the same district and same province with public mind for community forest conservation.

Consequently, the trained high school students are able to be prototype by acting as good role model for school forest conservation for their friend in the Chiang Yuen School. Nevertheless, they also hold training program to train the other students to be prototype for school forest conservation as well.

Discussions

The results was revealed that the high school student who participated having knowledge of school forest conservation, environmental education, inspiration of environmental conservation, and environmental conservation behavior. These were related to different studies of Thiengkamol, (2010b, 2011g, 2011h, 2012a, 2012b) and her colleagues (Morrasri, et al., 2012a; Phinnarach, et al., 2012a; Ngarmsang, et al., 2012a; Gonggool, et al., 2012a; Mongkonsin, et al., 2013a; Pusdorn et al., 2013; Moolmanee et al., 2013; Chaisena et al., 2013). It might implied that the training with PAIC technique is effective to raise knowledge of school forest conservation, understand environmental education principles, create inspiration of environmental conservation, and change environmental conservation behavior after take part in the PAIC training throughout actual practice in their daily life activities to gain more knowledge of school forest conservation, environmental education regarding arise awareness, attitude change, and participate in school forest conservation, inspire environmental conservation, and practice environmental conservation behavior. The results are also relevant to the variety studies of Thiengkamol, (2010b,

2011b,2011c, 2011a, 2011g, 2011h, 2011i, 2011j, 2012a, 2012b) and Thiengkamol colleagues researches of Mongkonsin, et al., 2013a; Pusdorn et al., 2013; Moolmanee et al., 2013; Chaisena et al., 2013; Chomputawat, 2013; Saisunanthararom, 2013 that the participation is affected to practice for diverse topics of whether in terms of health care, biodiversity conservation, flood response and environmental conservation with public mind to achieve the genuine sustainable development via environmental education process.

The results of TDE of 30 participants were used for examining of the relevant of three aspects evaluation covering Self-evaluation, Friend-evaluation, and Facilitator-evaluation. The mean scores three aspects were difference among three aspects in present and no difference in future situations ($p<0.01$, and $p>0.05$). It implies that participants who are the high school students who have the direct experience learning the essence of forest at school forest. Moreover, at present situation, they are modest persons so their mean score both in self-evaluation and friend-evaluation are lower than facilitators.

Furthermore, it was found that PAIC training is effective for training with integration of brain storming process to develop a shared vision, action plan and projects in different issues of training such as urban community food security management, environment and natural resource conservation, elderly health care, dust self-prevention, and environmental conservation of food stand entrepreneur including other issues such as environmental conservation of agriculturist, biodiversity conservation, environmental conservation of disability student, environmental education tourism and holistic tourism management (Thiengkamol, 2010b; Thiengkamol, 2011a; Thiengkamol, 2011g; Thiengkamol, 2011h; Thiengkamol, 2012a; Thiengkamol, 2012b; Pusdorn et al., 2013; Moolmanee et al., 2013; Chaisena et al., 2013; Chomputawat, 2013; Saisunantharom, 2013; Ngarmsang, et al., 2012a; Sangsan-anan, et al., 2012b; Petchang, 2013).

Finally, the results of training achievement was congruent to several studies of Thiengkamol, (2010b, 2011g, 2011h, 2012a, 2012b), and Thiengkamol colleagues included Phinnarach, et al., 2012b; Ngarmsang, et al., 2012a; Gonggool, et al., 2012a; Morrasri, et al., 2012a; Sangsan-anan, et al., 2012b; Pusdorn et al., 2013; Moolmanee et al., 2013; Chaisena et al., 2013; Mongkonsin, et al., 2013a) about different topics involved environmental conservation with public mind and related issues of forest conservation in the numerous target groups whether primary school student, lower and upper secondary school student, undergraduate, general people both in urban and rural areas.

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