An integration of teaching and learning activities on environmental education in the subjects

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Kongsak Thathong
Khon Kaen University

Abstract

The purposes of this study were to study the outcomes of a training workshop and to develop participants' capability in integration of teaching and learning activities on environmental education in the subjects. This project was a training project based on the principles of action research. The participants were 5 lecturers of Faculty of Education and 28 primary school teachers from 8 schools in Khon Kaen. Mini-lecture, group activities, exercises and presentation were used in this training project. Participant observations, interviews, tests, questionnaires, journal writings, photographs were employed for data collection. At the end of training sessions, questionnaires and two 10-item tests were administered. A criterion score of passing is 6. At least 75% of participants should pass a test. It was found that 96.43% of participants passed two tests which indicated statistically significant higher than 75% of participants ($\chi2 = 6.857$, $p < 0.05$) with means scores of 8.357 and 7.536 and standard deviation of 1.394 and 1.319 for learner centered approach and integration of teaching and learning, respectively. In addition, the participant indicated their opinions and satisfactions towards the program at a high level ($\bar{X} = 4.134$, SD=0.652). The results also indicated that through a training project, the researchers and participants had developed team building, sharing, collaborative work and a sense of belonging.

Keywords: Integration, teaching and learning activities, environmental education, training,

Introduction

The balance of nature has been disturbed and natural resources have depleted as well as environmental degradation has been increasing because of our unsustainable patterns of production, uncontrolled population growth, and social and economic inequality (UNESCO-UNEP, 1994). These problems will cause more and more strain on the earth's natural resources and habitats (Asano, 1991).

It is an important that every person develops an informed awareness of the limits of our natural resources. If this is not done, the peoples and societies of earth are subject to distruction (Huckle, 1991; Fien & Trainer, 1993). At present, everyone knows and acknowledges environmental problems but comparatively few people truly understand and are aware of an importance of the environment. It is difficult and time consuming to persuade other people to appreciate the value and worth of the environment. To achieve this, new attitudes, skills, knowledge, awareness and behaviors towards the environments are needed. Hence, environmental education may be an appropriate way to help us face our environmental problems (UNESCO-UNEP, 1994; Fien & Trainer, 1993).

Educational system plays an important role to solve those problems. Therefore, the teacher is a key agency of change or transformation. Education in, about, and for the environment are three categorical approaches of environmental education. Education in and about the environment are intended to develop knowledge, awareness, attitude, and skills. Education for the environment is intended to enhance values, ethics, problem-solving skills, and action (Spork, 1992). It is education for the environment that seems to have the potential contributing most to the general well being of environment (Sonneborn, 1994). Teaching and learning on environmental education is necessary. It is needed to teach students to act for the environment. In Thailand, there is not an environmental education subject at the basic education level. Environmental education is taught only in science subject but environmental education is related to all subjects, therefore the researchers conducted this study to help the teachers construct the environmental activities and infuse the environmental issues and/or local information in their own assigned subjects. Infusion is one kind of integration of teaching strategies.

Action research emphasizes dissatisfaction in personal practice. It seeks to improve teaching practice by systematically trying alternative strategies in a search for more satisfactory practice. Action research is focussed on the improvement and involvement of its participants (Carr & Kemmis, 1986; Kemmis & McTaggart, 1992). It attempts to involve participants in educational process through studying their own professional work collaboratively (Kemmis, 1988; Kemmis & McTaggart, 1992; Miller, 2002). The primary emphases of action research are action as a fundamental process or the improvement of practice, increasing understanding about practice in a collaborative group, and improving the situation in which the practice takes place (Zuber- Skerritt, 1992). Kemmis and McTaggart (1992) suggest four steps in a self-reflective spiral of action research: planning, acting, observing, and reflecting. These steps provide basis on which participants can formulate new plans, new action, observation, and reflection, and repetition of the whole process until a satisfactory result is achieved.

Purpose of the study

The purposes of this study were to evaluate the outcomes of a training workshop and to develop participants' capability in integration of environmental education in the subjects.

Method

In this study, the researchers employed documentary study and a literature review as well as conducted a participatory workshop. Documentary study was employed to study and understand literature, concepts, and related principles of classroom research. A two day participatory workshop on learner centered approach and an integration of teaching and learning activities on environmental education in the subjects was conducted collaboratively at the Faculty of Education during May 18-19 of 2002. Participants were encouraged to express their opinions and work together. They were required to perform classroom research emphasized on learner centered approach using a content of environmental education. In addition, participants had to meet in a group for once a month to report their progress and ask for suggestions and advice in conducting their research. Mini-lecture will depend on needs and problems in conducting research of participants. The following figure depicted a cycle of action research in conducting the project.
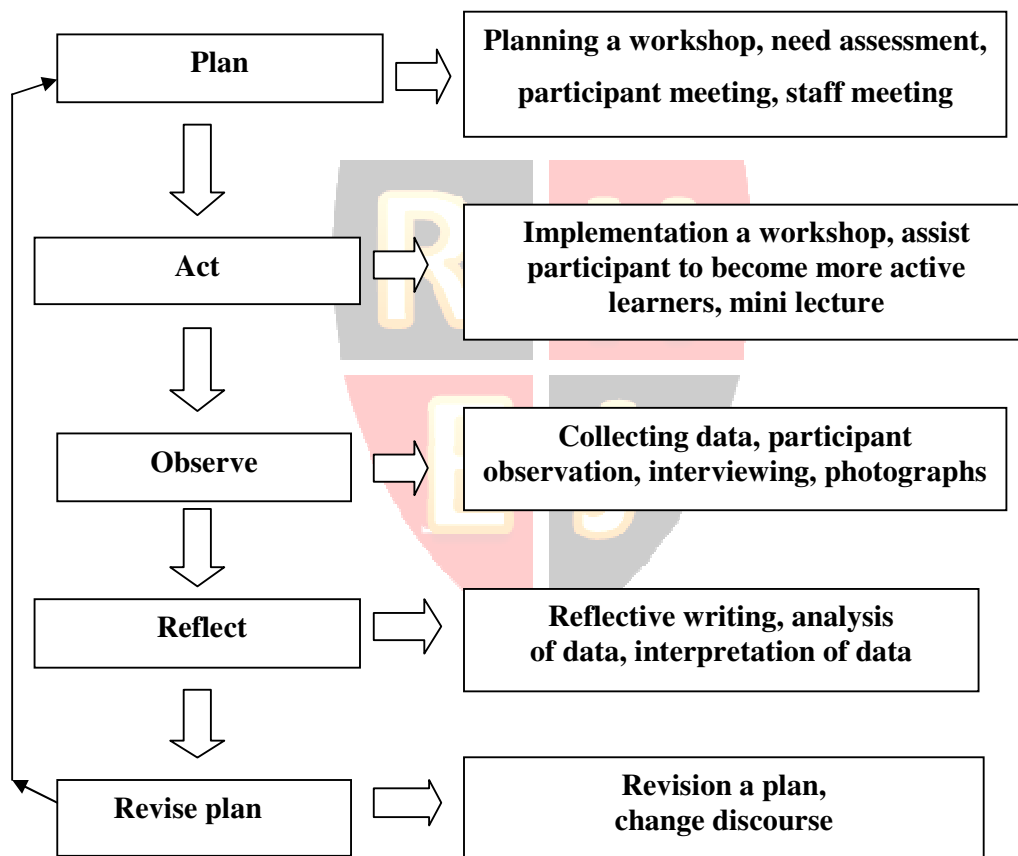

Figure 1   A cycle of action research

The Participants

The participants were 5 lectures (3 males and 2 females) of the Faculty of Education, Khon Kaen University and 28 elementary school teachers from 8 schools in Khon Kaen Province. There were 4 male and 24 female teachers with an average age of 45 years. Their ages ranged from 33 to 55 years. There were 25 teachers who completed B.Ed. and 2 teachers got M.Ed. There was only one teacher who didn't complete a bachelor degree. One participant observer was a graduate student in the Department of Educational Evaluation and Research

Design, who observed and used semi-structured interviews with some participants to assist the researchers to reflect on the activities after completion and to validate these reflections.

Techniques for collecting data and monitoring the study

In monitoring the study, the researchers employed various techniques for collecting data such as interviews, participant observations, journal writing, reflective writing, testing, photographs and questionnaires.

Techniques for analyzing of data

Data were analyzed both quantitatively and qualitatively; with the emphasis was place on quantitative approach. The triangulation technique was used to cross-reference a number of participants' perceptions of an event (Grundy & Kemmis, 1981). Data were cross-checked by interviewing participants using three different interviewers to determine the consistency of data. To ensure trustworthiness and confirmability, journal-writing reports were read, verified, and edited by participants for affirmation of statements as authentic ideas or viewpoints.

In analyzing qualitative data, a process of interpretive approach was used to understand the essences of phenomenon under investigation by focusing on meanings of events and phenomena and the social events from every angle and considering it thoughtfully (Jeans, 1997; Comstock, 1982; Newman, 2000). Illuminative, formative, and summative evaluations were used to investigate the effectiveness of the workshop. During the ongoing workshop, participants were asked to reflect their opinions. At the end of a training session, two 10-item tests were administered to assess participants' knowledge about learning process of learner centered approach and integration of teaching and learning. A criterion score of passing is 6. At least 75% of participants should pass a test. Both open-and closed-ended questionnaires were used at the end of the participatory workshop to assess the effectiveness of the workshop in terms of the participants' satisfaction. The participants were asked to indicate their opinions after participating in the workshop using a five-point rating scale questionnaire. In scoring the instrument, numerical values of one through five were also assigned to each level of opinions: lowest (1), low (2), medium (3), high (4), and highest (5). Means and standard deviations were computed for each item of the questionnaires.

Results

Achievement outcomes

As indicated in table 1, it was found that 96.43% of participants passed two tests which indicated statistically significane higher than 75% of participants ($\chi2 = 6.857$, p <0.05) with means scores of 8.357 and 7.536 and standard deviation of 1.394 and 1.319 for learner centered approach and integration of teaching and learning, respectively.

Table 1 Mean and standard deviation of test score and percentage of passing a criterion
      score with t-test and chi-square

Activity	scores			Percentage of passing	H_O: p =0.75
	$\overline{X}$	SD	H_O: μ =6		
Learner centered	8.357	1.394	t=8.960*	96.43	χ^2=6.857*
Integration	7.536	1.319	T=6.169*	96.43	χ^2=6.857*

*p<0.05

Satisfaction outcomes

      As illustrated in Table 2, the participants indicated their opinions and satisfactions
towards the program at a high level ($\overline{X}$ =4.134, SD=0.652) with the highest levels of opinions
were capability of instructors ($\overline{X}$ =4.643, SD=0.731), easy to participate ($\overline{X}$ = 4.643, SD =
0.522) and usefulness of activities ($\overline{X}$ = 4.500, SD = 0.509).

Table 2. The means and standard deviations of participants' opinions towards activities
      used in the workshop

Items	$\overline{X}$	SD
1. Clarity of content	3.857	0.651
2. An appropriateness of using media	4.000	0.667
3. Climate in a meeting room	4.357	0.622
4. An appropriateness of materials	3.893	0.737
5. Sequence of presentation	4.143	0.705
6. Clarity of presentation	4.000	0.667
7. Interesting of presentation	4.179	0.612
8. An opportunity to ask questions	3.607	0.875
9. Easiness to understand	3.786	0.568
10. Level of satisfied expectation	3.893	0.629
11. Participation in session activities	4.036	0.637
12. Level of gained knowledge	3.786	0.630
13. An appropriateness of activities	4.393	0.497
14. Interesting of activities	4.429	0.504
15. Usefulness of activities	4.500	0.509
16. An appropriateness of time allocation	4.036	0.637
17. Congruence of content and activities	4.286	0.713
18. An appropriateness of presentation	4.214	0.787
19. Easy to participate	4.643	0522
20. Capability of instructor	4.643	0.731
total	4.134	0.652

Reflections

At the end of each phase of the participatory workshop, all participants were asked to anonymously write their reflections. Every participant said that the workshop was worthwhile and necessary. They appreciated the friendly and democratic atmosphere of the workshop; the opportunity to develop and acquire skills in conducting classroom research on learner centered approach; the opportunity to develop and enhance skills in collaborative; and some of opportunity to participate in the workshop. They claimed that they also had the opportunity to develop skills in interpersonal relations, collaborative work, and problem-solving. They also developed their ability to discuss, report, speak, and respond to feedback.

> I have made a right decision to participate in this project. I have gained knowledge and enjoyed practicing collaborative work. I like activities and applied some activities to my students.
>   (Extracted from a participant's journal)
> I have gained fundamental knowledge in providing learning process and I have acquired confidence in conducting classroom research for improving my teaching because of participating in this project for 2 years
>   (Extracted from a participant's journal)
> I would like to tell this team of instructors that they have to be very patient with participants because some participants have no fundamental knowledge and don't have much time to conduct classroom research
>   (Extracted from a participant's journal)
> It is very worthwhile to participate in this activity because of good instructor and good advice
>   (Extracted from a participant's journal)
> I wish that my colleagues should have this opportunity so they could apply some principle into their teaching
>   (Extracted from a participant's journal)
> All participants enjoyed each provided activity. This could be seen and observed from cooperation and helping in group working with happiness
>   (Extracted from a participant's journal)
> I will apply some games and environmental activities in my teaching.
>   (Extracted from a participant's journal)
> All activity about learner centered approach could be applied in teaching and learning in classroom
>   (Extracted from a participant's journal)
> I will use local information and some environmental issues in my teaching
>   (Extracted from a participant's journal)

Conclusion

The results of this research show the effectiveness of the workshop in terms of achievement outcome and satisfaction outcome. Networking is also established because they have to work collaboratively. The participants were very satisfied with workshop and research activities. They gained a lot about working as a group. They knew how to work with other people and knew themselves better. They have also developed skills in conducting research on learning centered approach to improve their teaching-learning activities. In addition, the benefit of this training project was not limited to personal development of teachers but also their students as learner centered. In particular, the participants had acquired skills in

conducting classroom research about learner centered approach. Moreover, the participants conducted research and presented their papers at the Second Conference in Educational Research on February 7, 2003 at the Faculty of Education.

Significance of the study

This study was designed to develop the capability of the elementary teachers to be research teachers for the benefits of their professional development and their students. This project acted as a mentor and a consultant to give suggestions and advice in conducting research.

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