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Teaching for Quality Education in Environmental Education: Challenges and Possibilities

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Abstract

The paper is based on critical reflection about 'innovative' teaching strategies and learning experiences of a facilitator and learners about the environmental education course at Aga Khan University Institute for Educational Development, Pakistan. This 16-week elective course on environment education was offered from October 2004 to February 2005. This paper examines "what teaching strategies and learning experiences are most effective in environmental education course for bringing about positive change in knowledge skills and attitude towards environment conservation?"

Our findings indicate that the course has impacted learners in terms of knowledge and personal development, through the experiences of partnership, community interaction and taking responsible conservation action in schools. They were able to understand, cope with and positively influence the environment in which they found themselves.

We conclude that environmental education can be effectively offered to in-service teacher educators by providing them real life experiences of environmental conservation in the environment, appreciation about the environment, project conservation work in schools for the environment, through developing collaborative work, partnerships between facilitator and learner, and encouraging learners to think themselves as environmental literate citizens.

Introduction

This paper is based on critical reflection by a facilitator and learners on the 'innovative' teaching strategies and learning experiences of the Environmental Education (EE) course at Aga Khan University Institute of Educational Development Pakistan (AKU-IED).

In particular, this paper examines what teaching strategies and learning experiences are most effective in the environmental education course for

bringing about positive change in knowledge skills and attitude towards environment conservation.

Teaching strategies for environmental education must provide learners with learning experiences and opportunities to confront their own views and values related to the environmental issues in order for them to address the environmental issues (Sanera, 1998). The aim of the learning process and experiences should be to increase knowledge and awareness about the environment and its associated challenges, develop the necessary skills and expertise to address these challenges, and foster attitudes, motivation and commitment to make informed decisions and take responsible action (Wilke, 1997).

Learners in this course viewed the experience of designing and implementing the conservation project in schools as one of the most contextually relevant experiences. Teaching through infusion of environmental education in different disciplines, in order to deliver the content of EE in the real context, was also an opportunity to develop skills and knowledge for environmental conservation.

Importance of Environmental Education for Change

Several studies have suggested that Pakistan's natural resources base is constantly declining (Shahid et al. 2005 p.12; Shah 2005a. and Shah 2005b). Palmer (1998) rightly advocates for global partnership for addressing the environmental issues. Similarly, Ndiaye Orr (1994) states that environmental education can awaken communities to the danger facing their environment.

The introduction of environmental education as a means to addressing environmental issues presents a major challenge to the dominant conception, organization and transmission of knowledge in the schools. This creates a conflict for teacher with their approach to teaching and learning (Palmer 1998, p. 96).

The goals, principle and guidelines of environmental education (see UNESCO 1976., 1978; UNCED, 1992) suggest a particular orientation of curriculum and pedagogical practices in which learners engage individually or in a group in problem-solving, action-based activities. The real focus of environmental issues calls for interdisciplinary and flexible inquiry.

AKU-IED was established realizing the educational needs of developing countries and Pakistan. One of the strategies for school improvement by AKU-IED is to

develop the capacity of the in-service teacher. The environmental education course was offered as an elective course in the Master of Education (MEd) programme at AKU-IED in 2002. Building the capacity of teachers is a strategy used to provide teachers with the skills and knowledge necessary to teach their learners, thus providing improved opportunities to learn for all their pupils (Hargreaves & Fullan, 1992).

Education is critical for promoting sustainable development and improving the capacity of people to address environment and development issues.... It is also critical for achieving environmental and ethical awareness, values and attitudes, skills and behavior consistent with sustainable development and for effective public participation in decision-making. (Hart et al, 1999)

Environmental Education Course: Key features

The environmental education course has its theoretical foundations in the notion of teacher development where, its aims are to develop the knowledge, skills and attitudes necessary for the integration of environmental education into teaching and learning.

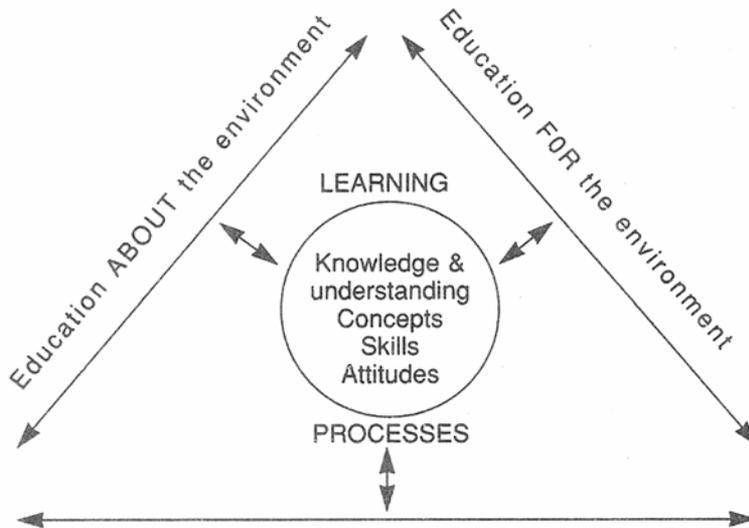
Thematic Mosaic of the Course

The content of the environmental education course is based on six major themes given below. Each theme in the course is delivered through various pedagogical approaches and strategies.

1. Definition and scope of environmental education
2. The natural and social environment
3. Human Impact on Environment
4. Sustainable Development
5. Environmental Education: Approaches and Strategies
6. Environmental Management Practices

EE Pedagogy 'IN, FOR and ABOUT' the Environment

The interaction between the course tutors and learners and among learners was encouraged through an electronic discussion forum and eight face-to-face meetings, where this was possible. Palmer & Neil suggest that teaching and learning experiences in environmental education could be based on a framework proposed by them (1994). The framework is given below.



The EE framework has focused on three aspects of the environment in teaching and integrating environmental education in teaching at all levels. The universality of the framework is very important, as this framework was used to teach learners for Africa, Central Asia, Middle East and South East Asia. The three main components of the framework as suggested by (Palmer & Olive, 1994) are:

- Education *about* the environment has the purpose of developing leaders' knowledge and understanding about *values* and *attitudes*.
- Education *for* the environment encourages learners to explore their personal response to and relationship with the environment and environmental issues. This is linked to the development of *attitudes* and *values*, including the element of human understanding and behavior necessary for the development of sustainable and caring use of the environment.

- Education in or *through* the environment uses the environment as a resource for learning. It is a resource which enables the development of a great deal of knowledge as well as *skills* of investigation and communication.

Constructivism as a Learning Discourse

Constructivist learning has emerged as a prominent approach to teaching. Constructivism is based on the notion that learners construct their own knowledge on the basis of interaction with environment. The constructivist teaching and learning model emphasizes active and collaborative learning. It places great importance on learners and teachers discovering and constructing knowledge together (Zhao, 2003). Hence the environmental education course uses the constructivist discourse with the environmental education framework “in, for and about” the environment.

Teaching conservation through environmental infusion in school (about the environment)

Learners enriched one teaching unit plan of their own subject and taught in the school after infusing environmental education into the subject.

Designing and implementing conservation projects in schools (IN and FOR the Environment)

Learners working in groups of two designed and implemented a conservation project in school, at AKU-IED, Safari Park Karachi and at their hostel.

Field visits to WWF and Coastal Communities (IN the Environment)

Learners made a day-trip to a coastal village of Karachi. Community issues were discussed with the Pakistan Fisher Folk Forum (PFF), an NGO working in the area. In another field visit, learners visited Wetland centre of WWF Pakistan. They visited a community initiative to save mangroves and in a boat, looked at the habitats of the mangroves and learned about their functions. Learners also released Green Turtles, protected specie, into the sea, as their own action.

Reflecting on Their Experiences

Critical reflection refers to people developing a critical attitude through a reflective process. Dawey and Schsm (in Burton, 2005) acknowledge reflection as an essential teaching activity and skill. This includes asking ‘why’, ‘how’ and ‘how come’ questions about their own learning, subject, assessment, education, lives and society at large Burtan (2005). Learners posted their reflection on the online discussion forum by responding to various environmental themes.

Methodology

In order to answer the question posed in this paper, we have collected and analyzed learners’ reflections, after getting their consent. Out of ten learners who completed the course, seven learners participated in this study. They did these reflections as part of their assignment. Eight learners also responded to an open-ended questionnaire. The purpose of the questionnaire was to get specific views about the teaching and learning experiences in the course.

These reflections from learners were analyzed based on the following themes i) learners ability to connect their learning to the understanding of complex systems affecting the environment – political, economic and social (Knowledge); ii) evidence of inquiry into real world environmental issues for their teaching and learning (Skills); iii) ability to understand the relationship of environment, education and sustainable development (Knowledge); and iv) preparedness and/or willingness to take social action for conservation (change in attitude and action for conservation). Each theme was then separated into various learning experiences according to “IN, FOR and ABOUT” the environment. The voices of learners in the reflection are significantly important in this study. The learners’ questionnaires were analyzed based on the themes of innovative teaching strategies and valuable experiences.

Findings and Discussion

Learning Experiences “In” the Environment

Living and interacting in a particular environment and community is essential for developing learner’s communication and information analysis skills (Palmer, 1998). Learners viewed the experience of getting into the environment as very valuable as they had the opportunity to interact with the environment in reality. They claimed that “live” experience contributed in their sensitivity about the

environment and motivated them towards action. They learned skills to protect the marine environment and understood the dependence and relationship of the environment to human beings. Theoretical knowledge in the course was extended to real life experiences through experiential learning. They viewed this as a connection of local action to global environmental issues. This connection and understanding is very important for their future role as professional development teachers.

Reflecting on the experience Wassef from Syria noted “it was a wonderful experience to see how earth is being saved”.

Discussing environmental issues and then seeing them with their own eyes and discussing them with communities helped them understand the linkages between environment and community.

Humera from Punjab, Pakistan wrote in her reflection “I realized our environmental issues regarding mangroves forest and also I come to know the role of mangrove in the sea. I learn some of the activities to protect marine life especially turtle”.

Alfred from East Africa reflecting on the experience of meeting the community group emphasized the relevance of the field visit to the course and wrote “these field trips were very relevant in the course as they gave me “live experience” on the efforts made by various groups in preserving the environment.”

Wetland centre visit was one of the amazing practices of my learning in environmental subject. (Bahrome)

A variety of experiences in the environment contributed not only to the learners’ knowledge but also provided them with skills to analyze environmental issues, to see the big picture and to appreciate the environment. Their being in the environment and seeing what could be done to conserve the environment was an experience which contributed to their learning.

Effective Strategies “About and For” the Environment

Conservation Project through Experiential Knowing

Experiential knowing is “through direct face to face encounter with person, place or thing; it knows through empathy and resonance” (Reason, 1998, p. 44 in Nicol, 2002). Learners viewed working in the school for conservation with teachers and children as a means to raise awareness of stakeholders. It was an

opportunity for them to meet new people and to take action to “save the globe”. Mortari (2004) advances the argument that ethics of care is not learned just intellectually but through practice, by involving learners in actual caring experiences. The project was an experience learners want to replicate in their own context. The project was seen as an action whose result they could see and enjoy. (Nicol, 2002) considers direct experience as a foundation of experiential knowing and is valuable in many ways to learners.

For project I had most valuable learning experience. Working with teachers was learning for me as teacher. Project work realized me the benefits and problems of real context and take initiative to overcome them. (Humera)

Doing project itself was a very interesting reflection which help me to see the results of my work and encourage me to apply it in my context with my colleagues. (Wassef)

Project-based learning in the environment provided the opportunity to learners to work with real life environmental issues in and around the schools (Orr, 1994). They learned and demonstrated skills of action and motivation, from negotiating with the head of the school, to motivating the general public to clean a park. Learners developed an environmental policy for a school, initiated a solid waste and composting project and developed a water conservation project at the AKU-IED hostel. Reflection on critical incidents provided them the opportunity to learn and redesign their activities and project.

The critical question faced during the project also influenced their attitude and thinking. Fida from Sindh, Pakistan reflected after completing the clean-a-park project with school children ‘Why do we keep our environment clean? Why do we do not care about it and make it polluted? Why it is our common attitude towards our environment?’ His reflection led to his conclusion that ‘education based on environment-rich content knowledge leads the students to learn the skills needed to work for society and environment and is focus[ed] on action [rather] than only on class room activities.

Wassef faced challenges during implementation of his compost-making project when students of the school were throwing rubbish in the place where he was making compost. He had to convince the students about the usefulness and purpose of the activity. Reflecting on the challenges he wrote “I realized that it is important to convince others what you do to let them help you and get good results”. Children must learn to control their own thinking in order to develop their thinking beyond the context of their immediate environment (Nicol, 2002).

Project work provoked Sadaf to think beyond her immediate project. She reflected on the experience and wrote:

The experience of working on the project was challenging but interesting. We as a teacher should not limit our work within single organization rather, we must try to work collaboratively and expand our activities of environmental education beyond it.

For me project was a practical learning experience where I got an opportunity to apply my knowledge, my skills of identifying and resolving environmental issues and my caring and concern about the quality of environment.... I feel ownership of project as I was responsible for my own learning and most importantly I feel confidence that my action can make a difference. (Sadaf)

Doing a conservation project was one of the most valuable experiences for learners. This experience also allowed independent learning with real context and experience. Learners were able to build relationships with stakeholders and to collaborate with each other. The project provided them the opportunity to reflect and face challenges and to address them. The project was about change in the environment through learner's action. This experience changed their attitude towards the environment.

Face-to-Face Session

Issue-based discussions about environmental issues were recognized as useful by learners. They also found the 'hands-and-minds-on' experiences through various activities like "apple activity" and "interdependence activity" as very useful. Discussion in the class and presentation, which was followed by questions, was considered an effective teaching strategy.

Wassef noted that:

Face to face session encouraged me to learn more from my colleagues and facilitators as well and to share my ideas about the discussion concept. I can clarify points which were not clear in my mind. It was very good strategy especially for weak learners whom have less knowledge about the topic.

Face-to-face sessions supplemented learner knowledge about themes related to the environment and new concepts. It allowed learners to share their experiences and issues. They were a very useful source of support for the students, especially

since the course was in open and distance learning mode. These eight sessions allowed all learners to gather and share information about topics, clarify ideas, listen to other views and remove misconceptions.

Teaching in Schools

Learners considered teaching to be a rich and rewarding experience. In teacher education, attention to pedagogy is critical; *how* one teaches is part and parcel of *what* one teaches (Loughran & Russel, 1997). The process of self realization involves identification with, empathy for, and heightened expansion of concern for non human beings. Self realization depends on the individual's own experiences (Nicol, 2002) and teaching in the school provided learners the opportunity for self realization. Learners viewed it as a way of transforming the knowledge, skills and attitudes of future generations in order to create awareness for future actions to conserve the environment.

Learners realized that teaching was possible through infusion in different subjects. Learners were able to integrate and infuse environmental education themes and concepts in English, Science and Social Studies. The integration was innovatively done through incorporating the learning from the course. For example in science, it was integrated through relating ecosystem, human needs and relationship of humans with nature.

Hart et al emphasized the importance of providing experiences in the natural place, of feeling of earth (1999). Integrating and teaching environmental education in school has its challenges. Addressing real life issues develop critical thinking skills but also create challenges in teaching. Environmental education helped citizens, young and old, explore their own question (Hart et al, 1999). Sadaf faced a challenge when one student asked her that "Miss you told us not to pollute water so if some one is polluting then tell me what I can do? She had to look for the social context and action appropriate for the age of learner to respond to the query. Sher Azim reflected on the challenges of in-serve teacher education based on his experience. He reflected that Teacher also confronted the challenges of planning, like selecting the topic for the lesson and designing activities without knowing the level of students.

Alfred faced the challenges of understanding students' prior knowledge, lack of teaching resources (video, color photograph etc), time constraints and difficulty in using the actual environment (like taking students to the zoo) as a visiting in-service teacher attempting to introduce infusion of EE. Alfred reflected on his teaching experiences despite all the challenges he faced "The students were eager

to learn although I was new to them. They participated fully to the activities I had planned and were ready to ask for assistance whenever they encountered difficulties". Alfred concluded in his reflection "to create awareness, positive attitude, skills and action, environmental education teachers should use various teaching strategies like field visit so as to relate it to the students own environment".

Integration of EE into teaching with the learners' context had immediate impacts. Bahrome from Central Asia reflected on a critical incident and said,

I realized that my lesson was delivered well, because students were very active while discussing the topic of the lesson. One girl suggested social action to save environment by creating green clubs volunteers who will look after the cleanliness of streets all over Pakistan.

Learners were introduced to the local issues through effective and quality teaching, which impacted the learners and they were able to see the bigger picture.

Teaching through infusion of environmental education in different disciplines was an effective strategy in delivering content of EE in learners' own area of specialization (subject) in a real life setting. Despite the challenges they faced, they used innovative strategies to deliver environmental education content to school children. This was possible due to the practicing of integration and teaching of EE content during the course. They got the confidence that it was possible to teach and bring about small positive change in the attitude of future generations.

Online Discussion Forum

The discussion forum was an ongoing process in which learners started reflecting from the beginning of the course. Based on their postings, we could see a change in their knowledge, attitude towards environmental issues, their own practices, beliefs and future roles.

The discussion forum was also used by learners to critique their peers, share views and exchange new information on environmental concepts, other than those needed for assignments. The discussion forum also provided facilitators the opportunity to gauge learners' understanding of the concepts. Facilitators were able to learn and interact with them in the virtual world. Facilitators also used critical questions to probe, guide, discuss and challenge learners' views (Shah 2005c).

Commenting on the gender aspect of the discussion forum, Humera posted

....I observed in discussion forum men view environment mostly for sustainable development and they emphasize on science. While women environmental view based on their beliefs and social interaction.

Similar views were posted by Sadaf, emphasizing the relationship of belief system and environmental protection. Her belief is that environmental protection is a context-specific issue and is surrogate to the needs of the people. She posted:

The hungry man will be interested to eat bread instead to think about the procedure how to grow wheat, and in contrast the farmer will be interested in getting huge quantity of crops by excessive use of fertilizers without caring about soil erosion.

Wassef felt confident that as a result of the course he could use the concept of sustainable development in his teaching. He wrote:

Now I am as a teacher I can use the knowledge and information about sustainable development in environmental education....

Sadaf reflected on the issue of sustainable development and how she could integrate sustainable development into her teaching. She also gave context-specific examples of how she could bring in sustainable development in her teaching. She wrote:

Now as a teacher what should I do? if I look deeply into my teaching practices I can find many ways to contribute. For example while teaching any environmental issue instead to just teach text knowledge, I can practically involve the learners because they want to take some action themselves and feel happy to take responsibility.

Conclusion

Environmental education for in-service teacher educators is critical for developing teacher educators with context-specific learning experiences in a variety of environments. Teacher educators with knowledge, skills and attitudes to conserve the environment are able to teach conservation to future generations. In order to effectively deliver teacher education programmes, the 'IN, FOR and ABOUT' Environmental Education Framework and constructivist

teaching pedagogies are essential. Learning through the conservation project in the course provided learners the opportunity to learn conservation skills and take social action. Teaching in the real-life context with infusion of environmental education provided learners the opportunity to experiment with their pedagogy and the skills to bring about change in the school context. The field visit helped them to observe and discuss pristine and polluted environments with stakeholders and changed their attitude to care for and take social action. The discussion forum provided learners and facilitators the opportunity to reflect on their learning and to collaborate with each other.

According to learners, the two most profound learning experiences in the course were: (i) designing and implementing the conservation project in schools, which provided them contextually relevant experience; and ii) teaching to deliver content of EE in real context. These were also seen as opportunities to develop skills and knowledge for environmental conservation.

Based on the experience of this course, it is recommended that future programmes in EE in the developing country context, where AKU-IED and other teacher education institutes are working, should use the environment as a resource. The course may use a reflective constructivist approach and real life experiences to teach and provide opportunities to learners to take social action during their studies through a conservation project.

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