

A Participatory Action Research Study of Nature Education in Nature: Towards Community-based Eco-pedagogy

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Abstract:

Contemporary nature education is exploring different ways to develop awareness for change and initiate action. Such educational activities go beyond creating understanding and awareness in order to develop a sense of commitment for individual and collective action. This participatory action research study aimed to improve teachers' sensitiveness towards nature, and to achieve environmental literacy and sustainability by inspiring community action and educational opportunities that support sustainable and thriving environments for a Community-based Eco-pedagogy. The study further explores the possibilities of helping the adults -through communication and collaboration with each other and their communities to re-evaluate and discover the diversity and importance of their surrounding environment while utilizing pedagogical strategies which will involve the participants to the in-depth study of the nature, history, the culture, the traditional customs, and the natural environment.

Keywords: Eco-pedagogy, Participatory action research, Community

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Introduction

The ecological crisis is the vital issue that faces all of humankind. Nature education is, therefore, crucial for the development of environmental consciousness and for strengthening the ability of the individuals and communities to resist the environmentally destructive forces of the crisis. Traditional nature education models often simplify environmental issues by not critically examining their social, cultural, and practical relevance (Day, 2000). In these models, learning about nature only occurs within traditional classroom settings (Gronomeyer, 1987). Community-based Eco-pedagogy (CEP) provides alternatives to traditional nature education (Elder, 2003; Kahn, 2010).

The literature is growing on the importance of nature and environmental education for adults (Kahn, 2010). However, enhancing environmental awareness and ecological knowledge through education alone does not guarantee environmentally-friendly action. Contemporary nature education is exploring different ways to develop awareness for change and initiate action. Such educational activities go beyond creating understanding and awareness in order to develop a sense of commitment for individual and collective action (UNESCO, 1997; Kahn, 2010). Community-based Eco-pedagogy has the potential to bring about action at individual, community and governmental levels by situating local knowledge within a critical pedagogy and social activism. CEP therefore needs to address all section of society for a collective action: individuals, local disadvantaged communities, public institutions, the private sector, schools, governments, policy-makers, unions and international organizations.

The primary purposes of this participatory action research study were to improve sensitiveness of adults particularly the teachers towards nature, and to achieve environmental literacy and sustainability by inspiring community action and educational opportunities that support sustainable and thriving environments for a Community-based Eco-pedagogy. CEP involves new concepts of creativity, ethics, and experiential and life long learning in which individuals would start seeing the nature as a “communion of subjects” and not as the mere “collection of objects” to which modern science reduces the world.

The study further explores the possibilities of helping the teachers through communication and collaboration with each other and their communities to re-evaluate and discover the diversity and importance of their surrounding environment while utilizing pedagogical strategies which will involve the participants to the in-depth study of the nature, history, the culture, the traditional customs, and the natural environment.

In addition, the study articulates various strategies for designing and implementing eco-pedagogy program that include sustainability, biodiversity, ecological restoration, scientific discourse on nature, environmental literacy to discuss the importance of nature education for adults, who can use ecological knowledge to facilitate social and environmental actions.

The Project and Research Setting

This study was a part of an outdoor nature education project financed by Turkish Science and Technologic Research Foundation (TUBITAK)¹. Within this project, developing an environmental education and CEP program was understood as “a process where concerned citizens, government agencies, industry, academia, community groups and local institutions collaborate to monitor, track and respond to issues of common community concern” (Whitelaw, Vaughan, Craig & Atkinson, 2003, p. 410). The project aimed at giving the project members the opportunity to both collect data and use the information generated to promote informed decision-making. It thus promoted sustainability at a local and at a wider level.

The project was conducted in two terms between 27.07.2009 and 15.08.2009 at the following locations: Kaz Mountain, Troia and Gelibolu National Parks, Bozcadada Island, Can and Ezine provinces, Pınarbaşı and Nusratlı villages, Karamenderes stream and Dalak water resource. (See Table-1).

The project management team at Canakkale Onsekiz Mart University has organized an environmental education and CEP program for the 40 project participants who were working as public school teachers at the different cities of Turkey. 26 professors, 4 research assistants from the departments of Education, Archeology, Zoology, Botanic, Physics, Chemistry, History, Geology, Agriculture, Fishery, and Geography participated in the development and evaluation processes of CEP program. 34 seminars, workshops, and evaluation activities were organized within the program including compost production from organic home waste, endemic vegetation of the city and its surrounding, importance and characteristics of river ecology, use of Geographical Information Systems (GIS) in environmental research and GIS applications, Ecologically Sensitive City Planning in Canakkale, Ethnobotanic, Visits to Local Water Processing Center and Atikhisar Dam, etc. (See Table-1).

Methodology

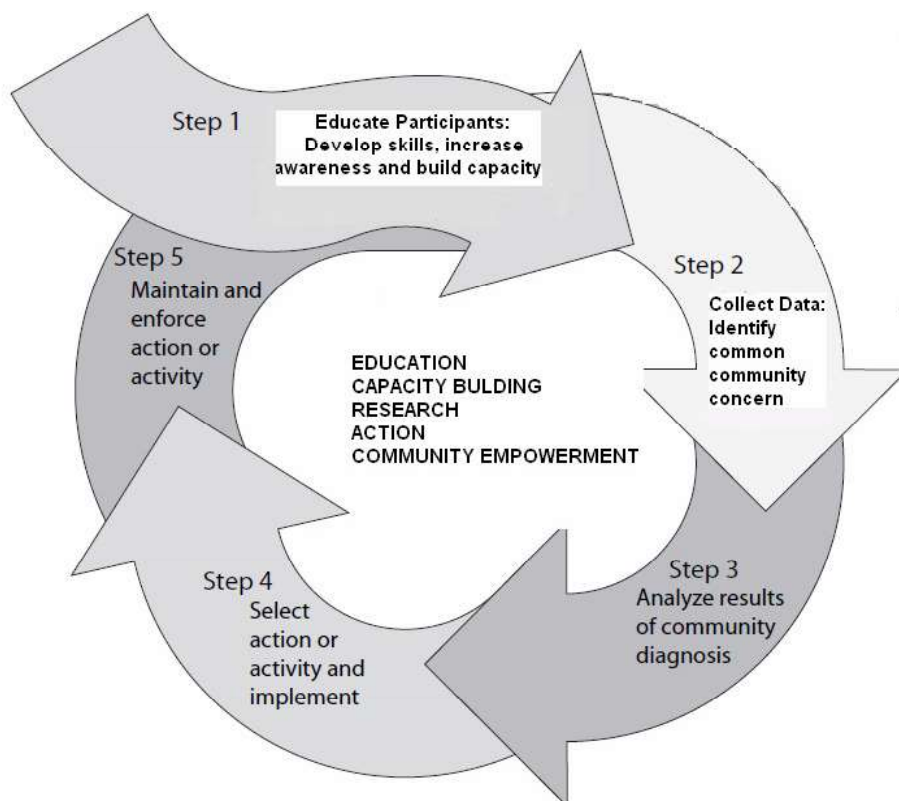
This study is a participatory action research that focuses on the effects of the researchers' direct actions of practice within a participatory community with the aim of improving the conditions of the community or an area of concern (Carr & Kemmis, 1986).

Participatory action research involves utilizing transformative methods of planning, taking action, observing, evaluating (including self-evaluation) and critical reflection (Burns, 2007; Brydon-Miller, 2002). It is a collaborative method to explore new ideas and implement action for change.

By implementing the CEP program, the project team aimed to develop a 5-step community action and empowerment model (Figure-1). This community-driven model designed to build project participants' capacity to address the issues of common community concern about exploitation of nature and environmental sustainability.

¹ For more information: <http://www.tubitak.gov.tr/home.do?ot=1&sid=803&pid=800>

Figure1. *Community action and empowerment model for environmental sustainability*



Fundamental to the model is a critical analysis identifying the underlying social, economic, and political forces which lead to the growing destruction of the ecosystem. The model provides individuals and communities with the pedagogical framework necessary to acquire the skills and resources to plan, implement, and evaluate nature and ecology related actions and policies.

By designing and using this model, the project team aimed to promote environmental change by helping project participants in acquiring the skills needed to accomplish environmental change themselves and by mobilizing project members and agencies to eliminate characteristics of the community that promote environmental problems.

Data Collection

In the study, participants' perceptions of environmental sustainability and CEP were assessed and documented each phases of the project both in theoretical seminars and practical activities in nature. Participants completed open-ended surveys. They also completed detailed reaction papers about their experiences. Photographic and videotaped images were also captured throughout the nature trips, workshops and seminars. Semi-structured and open ended interviews were conducted to let the participants reflect on their experience in developing an environmental consciousness and ecologically friendly practices.

Table 1. Sources of Data

Interviews	Initial semi-structured interviews Group reflective interview Open ended interviews
Documents	Written reports and assignments Survey Results Field notes
Observations and debriefings	Observation notes Reflexive writings Debriefing notes
Videotaping	Seminar activities Mentor-mentee meetings

Data Analysis

Data were thematized through the common qualitative practice of coding in order to attach relevant labels to segments of the data sources. Both deductive and inductive coding occurred as fieldnotes, transcripts, videotapes and survey results were reviewed and labeled with codes that emerged from the data. Initial codes were collapsed into theme codes which represented ideas that came from the data. Narrative text was attached to each theme code by displaying color-coded segments on index cards that could be physically manipulated.

At this point in the analysis, there were two general themes developed: 1- Capacity building for knowledge accumulation and community awareness, and 2- Advocacy for community empowerment and change

Knowledge accumulation for capacity building and community awareness

Knowledge accumulation for capacity building and community awareness has become an increasingly important part of environmental sustainability. Unfortunately, the reality in many areas of Turkey is that, due to lack of communication between universities, public schools and local communities, there are large gaps in connecting theory with practice to develop community awareness.

In order to eliminate the gap between theory and action, the CEP program in this project provided project participants who were public school teachers with the practical and theoretical opportunities to bring about action at individual, school and community levels by situating local knowledge within a critical pedagogy and social activism.

At the end of the project, almost all participants indicated that the CEP program help them recognize the importance of designing public school curriculum for finding practical ways to develop community awareness which addresses all section of society for a collective action to develop environmental consciousness:

individuals, local disadvantaged communities, public institutions, the private sector, schools, governments, policy-makers, unions and international organizations. As part of the process of developing community awareness, university professors provided the project participants with skill and knowledge-based training in their particular project area. This initial training allowed the teachers to have a clear and concrete understanding of the community action process, along with specific activities included in the curriculum of the CEP program, helping them identify and focus on a specific area of work. The following represent the teachers' reflections which best exemplify some their success experiences in building capacity and developing community awareness:

As part of the "Endemic Vegetation of Canakkale and its Surroundings" and "Forest Ecosystem and its Characteristics" activities, the participants went to the Dalak Water resource to collect plants and analyze their morphological properties in order to learn more about biodiversity. At the end, the participants tried to identify what these plants were. One of the elementary school teachers, who participated in the these activities, indicated that

Learning about endemic plants by collecting and analyzing them with my group members at the Dalak Water resource was very interesting and educative for me. I personally did not know that there is such a great plant population in Canakkale. The professor from the botanic department told us that there are 12000 plant species only in Turkey. We should educate the students at our schools to work together to protect these natural treasures.

Through learning in nature by doing, the participants moved beyond their classroom experiences. This knowledge accumulation promises to enhance future learning in regards to environmental sustainability.

Another science teacher who participated in the activities mentioned the importance of knowledge sharing for community awareness:

Local communities and school teachers need to be educated on environmental conservation and the importance of sustainable development in Canakkale. Our students at public schools and their parents should be encouraged to gain further knowledge and detailed understanding of environmental issues. We can achieve this by helping them to participate in outdoor educational activities in nature and acquire skills in identifying, preventing and resolving environmental problems like we did in this project.

During and after every project activity, participants engaged in dialogue about concerns and issues they want to address and choose a focus area that has meaning to their learning. For example, at the "Compost production from organic home waste" activity, the participants engaged in dialogue about how to dispose of home waste to protect the environment in simple and tangible way. For the activity, the participants collected organic waste from the hotel's kitchen and filled them in barrel with 30 lt. In addition, an oxygen system was installed into the barrel. The participants were divided in five groups and a thermometer was given to each group. Groups measured the barrel's temperature every morning during 10 days and analyzed the heat change at the end. One teacher who participated in the activity indicated that

This activity was one of the best ways to get our students to protect the environment and to show them the impact of their actions on the world around them. Compost producing is a simple and applicable method. It affected me and I would apply this method with my students at my school.

Another teacher mentioned that the activity help them understand how the waste that has been fermenting in the compost pile supply rich organic matter that may benefit the soil by improving the soil structure, aeration and water preservation.

Another CEP related learning opportunity was the “Stream Ecology, its Properties and Importance” activity. At the activity, the participants were divided into five groups. They caught invertebrate larva with sieve in stream and classified larva to family level by species identification paper. Participants were took water specimen from stream and measured some water properties such as PO₄, NO₃, Ca by using chemical kits. One of the participants said that with this activity they learned how to connect classroom learning to the nature.

Catching insect larva, identifying them and conducting water analysis activities which we performed at Karamenderes Stream affected me and my perception of learning by doing. I have never done such things before. Especially, water analyses will help me and my students relate the Biology course to the Chemistry lessons in my school.

In their reflection papers, almost all participants mentioned the importance of project activities and how these activities would radically change their perception of curriculum and classroom practice.

Advocacy for community empowerment and change

Throughout the project, CEP program involved educating and organizing project members to serve as advocates of community empowerment and change for environmental sustainability. The project seminars and activities stressed on importance of defining, designing, and implementing a community action research to determine the main causes of an environmental problem and outline the resources necessary to solve it. This process was an important step where university professors and public school teachers work together to design and implement strategies that can be used to assess the extent of the environmental problem. Furthermore, by identifying an issue and developing strategies, the participants critically analyzed and identified the underlying social, economic, and political forces creating the environmental problems. For example, at the “Electrosmog and Environmental Health” seminar, the participants learned about the theory of magnetic area and later they measured various electrical tools such as hair dryer, refrigerator, various mobile phones etc at laboratory. Then, in Bozcaada Island, the magnetic area of wind turbines was measured by the participants. They found out that the wind grandstands had much more magnetic effect on nature and bird migration than many electrical tools. On the other hand, the participants compared the limitations and opportunities of wind energy with what they have learnt about limitations of thermal energy at Çan 18 March Fossil-Fuel Thermal Power Plant.

After the project seminar, one of the school teachers argued that

Coal fueled power stations produces the most important greenhouse gas, CO₂, which is a major contributor to the global warming. In addition, particulates from the power plant can be harmful and have negative health impacts on local people. Even though wind grandstands may have magnetic effect on nature and bird migration, they are much more nature and health friendly alternative energy source than coal fueled power stations. As we have seen in Bozcaada, if Canakkale uses its wind and solar energy capacity properly, the city would not need any other energy source for many years. I think the university and public schools should inform the local community about the importance of clean energy sources.

The example above demonstrates the teachers' reflections which best exemplify their success experiences in developing environmental consciousness and in providing alternative solutions to the ecological problems.

Another CEP related learning opportunity was the "Our ecological foot prints: How did we live 100 years ago, how do we live now?" seminar. At the seminar, the participants analyzed sea turtles' life circles and ovulation ceremony to better understand the crucial process of sustainability of lives of endangered animals. The seminar is given by a professor from the Biology department who is the head of sea turtle research and recovery center where a research network of biologists, educators, community groups and state representatives is committed to an integrated, regional center that ensures the recovery and sustainable management of sea turtle populations. One of the participants identified the seminar as follows:

It was fascinating to learn about the *Caretta caretta* sea turtles' ovulation ceremony and striving of junior turtles to arrive the sea. It is a crucial process for sustainability of their life. I have understood that there is a wonderful balance at nature during our activity.

The seminar involved the project participant in selecting, planning, and implementing an action to address their issue of concern on sustainability of sea turtles' lives. Here participants used the findings of their analysis to determine solutions to the issues they have chosen to address and ways to develop community awareness and action. The project participants identified the characteristics of a community action plan as follows: (1) achievable, (2) having the potential for sustainability, and (3) bringing members of local communities, academicians, students, agencies, and NGOs to change their community for the lives of sea turtles.

One of the school teachers who participated in the seminar argued that

The seminar was really informative and I am grateful for what I am learning about environmental sustainability and for what I am learning about what I can do to make a difference. If we want to effectively protect the lives of sea turtles, we need to find imaginative ways for people to come together and develop new strategies and policies. I will encourage my students to be advocates to develop and implement community action and strategies for environmental protection for endangered animals that may be in the form of

outreach, media advocacy, development of a model policy, or advocating for a policy.

In their reflection papers, the project participants identified one of the main goals of the project as raising awareness. By raising awareness, they would be encouraged to gain further knowledge and understanding of environmental issues and of their roles in overcoming the problems. Almost all participants mentioned the importance of the project activities and how these activities enabled and encouraged them to participate in the community action for environmental sustainability and nature protection. They also mentioned that they would implement what they have learnt in the project in their schools to develop a change of perception and attitudes towards environment and nature, which should then motivate the students to actively participate in and continue towards environmental sustainability.

Conclusion

Outdoor nature education project with Community-based Ecopedagogy activities can provide a number of benefits and opportunities for universities, public schools and the local communities. These projects can benefit local communities and public schools through promotion of public participation, the engagement of students, teacher and parents in local environmental issues, and the development of social capital to achieve environmental sustainability. By situating local knowledge within a critical pedagogy and social activism, these projects can help universities to bridge the gap between academia and society.

The current project helped project participants to understand their own complex situation by learning the political, economic and social factors which lead to the growing destruction of the environment. The project activities encouraged the project participants to recognize the importance of designing university programs and public school curriculum for finding practical ways to develop community awareness which addresses all section of society for a collective action to develop environmental consciousness. As part of the process of developing community awareness, university professors provided the project participants with skill and knowledge-based training in their particular project area. This initial training allowed the participants to have a clear and concrete understanding of the CEP program. But awareness-raising activities alone cannot lead to sustained change. The project stressed on importance of defining, designing, and implementing a community action research to determine the main causes of an environmental problem and outline the resources necessary to solve it.

In order to develop a sustained change, Local communities and governments should increase the emphasis on environmental education in schools and should raise environmental awareness and educate students on the importance of environmental conservation. Universities should continue their partnership work with public schools and NGOs to incorporate CEP program into the formal university and public school curriculum.

Table 1. *Project Time-table (Environmental Education and CEP Program)*

Date	Time	Event/Activity	Location
27.07. 2009	13:00- 14:00	Introduction and drama activity	CATOML (Canakkale Turizm High School)
27.07. 2009	17:30- 18:30	Introduction to First aid	CATOML
27.07. 2009	14:00- 17:00	Compost production from organic home waste	CATOML
27.07. 2009	19:30- 21:30	Vertebrates living in and around of Canakkale-Theoretical	CATOML
27.07. 2009	22.00- 23.00	Participatory observation activity	CATOML
28.07. 2009	10:00- 12:00	Endemic Vegetation of Canakkale and its surrounding	Dalak Water Resource
28.07. 2009	13:00- 16:00	Forest Ecosystem and its characteristics	Dalak Water Resource
28.07. 2009	17:00- 18:30	Nature protection and the role of insects in biological control	Dalak Water Resource (2. term Bozcaada)
29.07. 2009	8:30- 10.30	Canakkale and Weather	ÇATOML
29.07. 2009	10:30- 12:30	Importance of Nature in Food Production in Canakkale: Ezine Cheese ve Canakkale Cheese Halva and their importance	Ezine
29.07. 2009	14:30- 18:00	River Ecology, importance and characteristics	Pınarbası Village
30.07. 2009	08:00- 19:00	Historical Importance of Canakkale	Gelibolu Peninsula
31.07. 2009	8:30- 10:00	Development of National Parks in terms of protection and use policies	ÇATOML
31.07. 2009	10:30- 13:00	Importance of Geographical Information Systems (GIS) in nature research and GIS applications	COMÜ Faculty of Engineering
31.07. 2009	14.00- 15.00	Fishery Museum	Faculty of Fishery
31.07. 2009	16:00- 19:30	Historical Troia National Park: From Prehistoric Era to Today	Historical Troia National Park
01.08. 2009	9:00- 12:00	Natural or Human-made Magnetic Space and environmental health	Faculty of Education
01.08. 2009	13:30- 15:00	Ecologically Sensitive City Planning in Canakkale	Faculty of Education
01.08. 2009	15:30- 18:00	Exploring Naval Museum and Arceology Museum	Naval Museum, Arceology Museum
01.08. 2009	21:30-	Astrophysics and finding direction at night,	ÇOMÜ Ulupınar Observatory

	23:00	Are we alone at the Universe?	
2.08.2 009	8:30- 10:30	Geological History and Structure of Canakkale Theory	ÇATOML
2.08.2 009	10:30- 13:00	Geological History and Structure of Canakkale Practicum	Ayvacic, Nusratlı Village
2.08.2 009	14:30- 16:30	Practicum	Ayvacic, Nusratlı Village
02.08. 2009	21:30 22:30	Interactive Presentation Activities	ÇATOML
03.08. 2009	08:30- 10:00	Visiting Local Water Processing Center and Atikhisar Dam	Çanakkale-Çan Road
03.08. 2009	11:00- 16:00	Can 18 March Thermal Power Plant and Can Coal Reserves, Water Reserves	Çan
03.08. 2009	17:00- 19:00	Ethnobotanic	ÇATOML
03.08. 2009	21:00- 23:00	Under water and See Ecology	Bozcaada
04.08. 2009	9:30- 11:00	Ecotourism	Bozcaada
04.08. 2009	13:00- 19:00	Under water and See Ecology	Bozcaada
04.08. 2009	22:30- 23:00	Interactive Presentation Activities	ÇATOML
05.08. 2009	09:00- 11:00	Our ecological foot prints: How did we live 100 years ago, how do we live now?	ÇATOML
05.08. 2009	11:00- 12:00	Compost production from organic home waste	ÇATOML
05.08. 2009	12:00- 14:00	Evaluation	ÇATOML

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