

The Effects of Nature Education Project on the Environmental Sensitivity

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Abstract: The purpose of this study is to investigate the effects of the project “Nature Education in Ihlara Valley (Aksaray) and Its Surrounding Area III” supported by The Scientific and Technological Research Council of Turkey (TUBITAK) on environmental sensitivity. “Environmental Sensitivity Scale” were used to collect data in the present study. The study was carried out in line with the pre-test-post-test design. The difference between the environmental sensitivity pre-test and post-test scores of the participants was found to be statistically significant as a result of the t-test analysis ($t_{(29)} = -3,518, p < 0.01$). In light of this result, it can be argued that nature education raised the environmental sensitivity of the participants.

Key words: environmental sensitivity, nature education, pre-service teachers

Introduction

In today’s world where global environmental problems are growing rapidly, the carbon emission has already reached the possible highest level and ecologic foot traces have climbed to the top of the loading capacity of the earth environmental education has gained greater importance.

In the analysis of the environment, perceiving the unity of nature and our planet, and raising our environmental awareness and sensitivity, environmental education is of vital importance (Schmidt, 1996; Erten, 2005). Training of teachers with ecological knowledge and experience sufficient enough to carry out theoretical and applied environmental works efficiently can make the biggest contribution to the development of environmental education and achieving its goals (Kahyaoğlu et al., 2008). Environmental education should not only provide information but also lead to changes in human behaviors. The main objective of environmental education should be permanent and positive changes of behaviors and active participation of individuals in efforts made to find solutions to problems (Özgen, 2012). In order to train environmentally-sensitive individuals, education systems promoting the active participation of individuals should be adopted (Çabuk & Karacaoğlu, 2003). Environmental sensitivity is 'an empathetic or understanding view of the environment', and is characterized by the individual who 'refuses to litter highways and natural areas... conserves natural resources... works to preserve ecologically important natural areas... strives for a stable and appropriate human population level... respects hunting and fishing laws... insists on rational zoning requirements... etc.' (Hungerfordh, Peytonr & Yolk, 1992; Sivek, 2002).

When environmental education is given in the natural environment, it may increase the interest in nature and enable the participants to look at the life by creating empathy with nature; hence, it is very important (Atasoy, 2006; Ozaner, 2004; Palmberg & Kuru, 2001). Many authors have emphasized that nature education informs individuals about natural processes, makes them more sensitive and conscious, when it is accompanied by field trips, the information gained can be turned into behavior more easily and becomes more permanent and makes contribution to the creation of more independently thinking individuals (Shepard & Speelman, 1985; Dresner & Gill, 1994; Erten, 2004; Farmer et al., 2007). The purpose of this study is to investigate the effects of the project “Nature Education in Ihlara Valley (Aksaray) and Its Surrounding Area III” supported by The Scientific and Technological Research Council of Turkey (TUBITAK) on environmental sensitivity.

Materials and Method

Study group

The study group consists of 30 pre-service teachers studying in 4 different departments (preschool education, primary education, social studies, science and physics) of the education faculties of 17 universities who participated in nature education program carried out on 27 August-02 September 2012 with the support of TUBITAK. 18 (54%) of the participants are girls and 12 (46%) are boys.

Activities carried out within the framework of the nature education

With this project, where active learning methods were used, the pre-service teachers were introduced to geological, geomorphologic, floral, faunal and cultural features of the natural environment and to the problems stemming from the mass tourism activities taking place in the region. In this respect, some field studies were carried out on the volcanic structure around Ihlara Valley and Hasan Mountain. Besides field studies, some activities in a classroom setting were also carried out. In the classroom setting, creative drama activities were performed for the pre-service teachers to get to know each other and take individual responsibilities.

Data collection instruments

“Environmental Sensivity Scale” developed by Çabuk and Karacaoğlu (2003) was used to evaluate the changes in the pre-service teachers’ environmental sensivity as a result of the nature education they participated in. The scale consists of 24 items designed in the form of 3-Point Likert type (always, sometimes, never). The Cronbach Alpha reliability coefficient was found to be .72. This scale was administered as pre-test on the first day of the program and post-test on the last day of the program.

Data analysis

SPSS program package was employed to analyze the data, and after presenting the descriptive statistics related to the scores, paired t-test was used to find out whether there are significant differences between the pre-test scores for environmental sensitivity and those of the post-test.

Results

In this section of the study, the data obtained through “Environmental Sensivity Scale” designed to elicit the environmental sensitivity of the pre-service teachers are discussed. In the evaluation, first the means of the pre-service teachers’ scores concerning their opinions about air pollution, water pollution, soil pollution, ecologic balance, participation in environmental works and training taken in their formal education institutions were descriptively evaluated in the form of pre-test and post-test. Then, t-test was conducted to test whether the pre-service teachers’ environmental sensitivity scores significantly changed as a result of education given. Mean values of the pre-service teachers’ scores taken for their sensitivity towards air pollution (pretest-posttest) are presented in Table 1.

Table 1: Pretest-posttest mean values for the pre-service teachers’ sensitivity towards air pollution

No	Items (Air pollution)	N	Mean (pre-test)	Mean (post-test)	t	p
1	Do you pay any attention not to use consumption goods (deodorants etc.) including substances harmful to Ozone Layer?	30	2,20	2,33		
2	Even if you had your own vehicle, would you use public transportation not to pollute the earth?	30	2,23	2,43		
3	Do you pay attention not to disturb other people while you are talking or using some tools?	30	2,90	2,93		
4	Do you warn people to be sensitive towards air pollution?	30	2,50	2,66		
Total		30	9,83	10,35	-1,606	,119

As can be seen in Table 1, the mean values obtained for the responses given by the pre-service teachers to the items concerning their sensitivity towards air pollution have increased as a result of the application for the four items. On the other hand, the participants' posttest mean score concerning air pollution ($\bar{X} = 10.35$) was found to be higher than their pre-test mean score ($\bar{X} = 9.83$), yet, this difference is not statistically significant ($t = -1.606$; $p > .05$).

Mean values of the pre-service teachers' scores taken for their sensitivity towards water pollution (pretest-posttest) are presented in Table 2.

Table 1: Pretest-posttest mean values for the pre-service teachers' sensitivity towards water pollution

No	Items (Water pollution)	N	Mean (pre-test)	Mean (post-test)	t	p
5	While purchasing cleaners, do you pay attention to whether they include harmful chemicals or not?	30	2,23	2,26		
6	Are you thrifty in any circumstances in water use?	30	2,80	2,86		
7	Do you pay any attention to prevent harmful chemical substances such as engine oils, paints from being dumped into sewer system?	30	2,46	2,50		
8	Do you warn people to be sensitive towards water pollution?	30	2,63	2,76		
Total		30	10,12	10,38	-,830	,413

The score obtained for the responses of the pre-service teachers to the items concerning water pollution is higher for one item favoring the posttest score. In general, the mean score of the pre-service teachers taken from the posttest ($\bar{X} = 10.38$) is higher than that of the pretest ($\bar{X} = 10.12$). The difference found between these two scores (0.26) is not significant ($t = -.830$; $p > .05$) (Table 2).

Mean values of the pre-service teachers' scores taken for their sensitivity towards soil pollution (pretest-posttest) are presented in Table 2.

Table 2: Pretest-posttest mean values for the pre-service teachers' sensitivity towards soil pollution

No	Items (Soil pollution)	N	Mean (pre-test)	Mean (post-test)	t	p
9	Do you pay attention to using the both sides of a paper you are writing on?	30	2,66	2,83		
10	Are you thrifty in any case in terms of using paper tissues?	30	2,46	2,50		
11	Do you plant trees by looking for suitable environments for them to grow?	30	2,26	2,36		
12	Do you pay attention for wastes to end up in garbage?	30	2,80	2,90		
13	Do you sort out the wastes by using suitable boxes to achieve the most effective recycling?	30	2,70	2,76		
14	While leaving your garbage out, do you sort out it?	30	2,36	2,46		
15	Do you warn people around you to be sensitive towards soil pollution?	30	2,36	2,56		
Total		30	17,60	18,37	-2,292	,029

As can be seen in Table 3, it is clear that the pre-service teachers' sensitivity towards soil pollution changed significantly for 7 of the items as a result of the application. In general, the posttest mean score of the pre-service

teachers ($\bar{X} = 18.37$) was found to be higher than their pretest mean score ($\bar{X} = 17.60$) and this difference is statistically significant ($t = -2.292$; $p < .05$). Hence, the application can be claimed to have made important contributions to the sensitivity towards environment.

Mean values of the pre-service teachers' scores taken for their sensitivity towards ecological balance (pretest-posttest) are presented in Table 4.

Table 3: Pretest-posttest mean values for the pre-service teachers' sensitivity towards the concept of ecological balance

No	Items (The concept of ecological balance)	N	Mean (pre-test)	Mean (post-test)	t	p
16	I you were/are married, would/do you pay attention to family planning considering ecological balance?	30	2,83	2,90		
17	Do you support experiments carried out on animals for the benefit of humanity?	30	1,53	1,40		
18	Do you warn people around you to be sensitive towards the protection of ecological balance?	30	2,63	2,73		
Total		30	6,99	7,03	-,128	,899

Posttest mean score obtained from the pre-service teachers' responses to the items aiming to elicit their sensitivities towards the concept of ecological balance ($\bar{X} = 7.03$) is higher than their posttest mean score ($\bar{X} = 6.99$). However, this difference is not statistically significant ($t = -.128$; $p > .05$) (Table 4).

Mean values of the pre-service teachers' scores taken for their sensitivity towards participation in environmental works (pretest-posttest) are presented in Table 5

Table 4: Pretest-posttest mean values for the pre-service teachers' sensitivity towards participation in environmental works

No	Items (Participation in environmental works)	N	Mean (pre-test)	Mean (post-test)	t	P
19	Do you participate in scientific activities on environment such as seminar, panel, conference etc.?	30	2,40	2,60		
20	Do you take part in the activities of voluntary organizations working on environment?	30	2,26	2,43		
Total		30	4,66	5,03	-1,779	,086

As can be seen in Table 5, the posttest mean score obtained for the pre-service teachers sensitivity towards participation in environmental works ($\bar{X} = 5.03$) is higher than their pretest mean score ($\bar{X} = 4.66$), yet, this difference is not statistically significant ($t = -1.779$; $p > .05$).

The mean values of the pre-service teachers' scores taken from their opinions about the education they were given in formal education institutions are presented in Table 6.

Table 5: The mean values of the pre-service teachers' scores taken from their opinions about the education they were given in formal education institutions

No	Items (Environmental education in formal education institutions)	N	Mean (pre-test)	Mean (post-test)	t	p
21	Do you think that you have had enough instruction to raise your awareness of air pollution?	30	1,93	2,26		
22	Do you think that you have had enough instruction to raise your awareness of water pollution?	30	1,96	2,33		
23	Do you think that you have had enough instruction to raise your awareness of soil pollution?	30	1,93	2,36		
24	Do you think that you have had enough instruction to raise your awareness of ecologic balance?	30	1,86	2,56		
Total		30	7,68	9,51	-3,596	,001

As can be seen in Table 6, for all the items, posttest scores taken by the pre-service teachers from the items concerning their sensitivity towards the environmental education taken at formal education institutions are higher than those of pre-test scores. The mean score taken from the posttest ($\bar{X} = 9.51$) is higher than that of the pretest ($\bar{X} = 7.68$) and this difference is statistically significant ($t = -3.596$; $p < .01$). This shows that the pre-service teachers included the training they took during the application in their general formal environmental education and think that the application enhanced their sensitivity.

In order to test whether there is a significant difference between the pre-service teachers' environmental sensitivity before and after the application, their general scores were evaluated.

Table 7: T-test results concerning environmental sensitivity pretest and posttest scores

Environmental sensitivity scale	N	\bar{X}	S	Sd	t	p
Pretest	30	56,96	4,76	29	-3,518	,001
Posttest	30	60,66	4,63			

$p < .01$

The results of the analysis revealed that before participating in nature education project, the mean pretest environmental sensitivity score of the pre-service teachers is $\bar{X} = 56,96$, and after participating in the nature education project, it became $\bar{X} = 60,66$. The difference found between environmental sensitivity pretest and posttest mean scores is statistically significant ($t = -3,518$, $p < 0.01$) (Table 7). Hence, it can be argued that seven-day nature education project significantly improved the participants' environmental sensitivity.

Discussion, conclusions and suggestions

In light of the findings of the study, it is seen that prior to nature education, the participants' environmental sensitivity was high. Moreover, at the end of education, their environmental sensitivity significantly improved. In a study looking at the environmental sensitivity of the social sciences high school students, the environmental sensitivity of the students was found to be medium (Aydm & Kaya, 2011). In another study a profile of environmentally sensitive high school students was developed (Sivek, 2002).

In another study employing the same scale used in the present study, it was found that the environmental sensitivity of university students varied significantly depending on gender and education level. In addition to this, the same study also revealed the students have poor attitudes towards participating in activities of environmental organizations. However, the present study showed that the participants have positive attitudes towards participating in environmental activities. Again, in the same study, while the students have positive attitudes towards using animals

and humans in medical experiments, the participants of the present study have negative attitudes (Çabuk & Karacaoğlu, 2003).

The effectiveness of nature education in improving the students' environmental sensitivity shows the importance of environmental education programs integrating active teaching techniques used in nature. Therefore, such programs should be promoted and made widespread. To be able to carry out such programs, first thing to be done should be to train pre-service teachers.

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