

The Short Term Effectiveness of an Outdoor Environmental Education on Environmental Awareness and Sensitivity of In-service Teachers*

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Abstract

Outdoor education is mostly mentioned in terms of environmental education. The aim of this research is to determine the short term effectiveness of an outdoor environmental education program on biodiversity awareness, environmental awareness and sensitivity to natural environment. The data is collected from an outdoor environmental education project which is financed by TUBITAK and its name is 'Nature-based Outdoor Environmental Education in Canakkale and Suburbs, 2008.' There are 27 in-service teachers in the project and the project is only for 10 days. An environmental awareness and sensitivity scale is developed for the study. The research design is pre-posttest design. The data is analysed by Wilcoxon signed rank test because of the data is non-parametric. It is found that the nature-based outdoor education program is effective to improve environmental awareness and sensitivity to natural environment; on the other hand it is not successful to improve biodiversity awareness.

Key words: Outdoor education, environmental education, in-service teachers, TUBITAK, Turkey

Introduction

Ecosystem is a quite complex system and composed of many elements which are connected to each other directly or indirectly (Bowen & Roth, 2007; EETAP, 2002). The pressure of the human population and industry has caused increasing of debates on ecosystem, sustainability, future of the world, etc. (Pavlov & Shishkin, 2003). Hence, the education has been started to mention more.

According to a study of Independent Commission on Environmental Education, environmental subjects are examined under other scientific titles (Kassas, 2002; Disinger, 1997). However, environmental education has more specific characteristics than the other science education disciplines. Firstly, environment and environmental education is an interdisciplinary subject and interactions among environmental components are quite complex (Erentay & Erdogan, 2009; Bowen & Roth, 2007; Stevenson, 2007; Robottom & Sauve, 2003; Kassas, 2002; Gayford, 2000; Dreyfus, Wals, & Weelie, 1999; Vester, 1997). Secondly, long-term observations may generally be required in environmental education. Physics and chemistry are usually based on experimental studies and they have relatively results in a short term. However it is so

difficult to understand complex interactions of environment (Stevenson, 2007) and environment education (Kasapoğlu & Turan, 2008; Rickinson, 2001) in a short period.

Different approaches in environmental education bring about varied outputs such as increasing environmental knowledge level, having favourable environmental attitude, increasing environmental awareness, environmental behaviour change, actively participate in solution of environmental problems etc (Erentay & Erdogan, 2009; Stevenson, 2007; Storksdieck, Ellenbogen, & Heimlich, 2005; Hadlock & Beckwith, 2002; Kassas, 2002; Rickinson, 2001; Dori & Herscovitz, 1999). All these outputs are also named as 'environmental literacy' (EETAP, 2002). One of the ways of succeeding environmental literacy is 'outdoor education' (Siegel, 2007; Powers, 2003; Ford, 1986).

Natural environment is used as a natural laboratory area within outdoor education (Carrier, 2004). Outdoor education is not an unplanned program and should absolutely have a program (Tsai, 2006; Carrier, 2004). Environmental Education and Training Partnership (EETAP, 2002) supports outdoor environmental education and notes that environmental literacy advances with outdoor environmental education.

Literature review

There are many international (OECD/ CERI, 2008; Chenoweth, Wehrmeyer, Lipchin, Smith, & Gazit, 2007; Bolstad & Baker, 2004; Rauch, 2002; Rickinson, 2001; Ballantyne, Fien, & Packer, 2001; Palmberg & Kuru, 2000; Breidler, 1999; Eder, 1999; Elliot, 1999; Hart & Nolan, 1999; Bogner, 1998; Bell, Russel, & Plotkin, 1998; Mansaray, Ajiboye, & Audu, 1998; Pfaffenwimmer, 1998; Chen, 1997) and national (Erdoğan & Ok, 2011; Çakır, İrez, & Doğan, 2010; Okur, Yalcin-Ozdilek, & Sahin, 2010; Özbay, 2010; Aktepe & Girgin, 2009; Erdoğan, Marcinkowski, & Ok, 2009; Öztaş & Kalıpçı, 2009; Bozkurt & Kaya, 2008; Kahyaoğlu, Daban, & Yangın, 2008; Kasapoğlu & Turan, 2008; Özden, 2008; Tuncer, 2008; Gökçe, Kaya, Atay, & Özden, 2007; Yalcin & Dogan, 2007; Alp, Ertepinar, Tekkaya, & Yılmaz, 2006; Yalcin- Ozdilek, Kaska, Olgun, & Sonmez, 2006; Erten, 2005; Gökdere, 2005; Tuncer, Ertepinar, Tekkaya, & Sungur, 2005) studies related to environmental education. When we evaluate these international studies, it has realised that some points are common and very remarkable. These points are;

- a. Existed some education programs are not enough for environmental literacy. Hence different environmental education programs should be designed and professional development of teachers should be supported in terms of environmental education (Chen, 1997),
- b. There is a gap between theory and application (OECD/ CERI, 2008; Bolstad & Baker, 2004; Elliot, 1999; Hart & Nolan, 1999; Mansaray et al., 1998),
- c. Some different environmental activities or outdoor education should be used in order to fill this gap (OECD/ CERI, 2008; Bolstad & Baker, 2004; Rauch, 2002; Breidler, 1999; Eder, 1999; Elliot, 1999; Posch, 1999; Bell et al., 1998; Pfaffenwimmer, 1998).

On the other hand Rickinson (2001) evaluates 110 environmental education research which consists of journal articles, books, and government/international projects' reports between 1993- 1999. But he only considers some research which is related to primary and secondary school students. These studies also include outdoor educations. According to this evaluation Rickinson comes up with:

- a. Indoor or outdoor environmental educations are effective on gaining environmental knowledge and having favourable attitude but we do not know how these effects happen and there is not enough explanation about it.

b. Most of the research are for a short term and following up processes are not sufficiently carried out after educations.

c. Hence there should be studied which education programs are effective on which outputs and how these outputs come out.

When we evaluate national programs, it is realised that they have some common suggestions. These are:

a. Existed education programs are not enough so these programs should be reviewed. New programs should be designed and these programs should include 'sustainability' much more than old ones (Çakır et al., 2010; Erdoğan et al., 2009; Öztaş& Kalıpçı, 2009; Özden, 2008; Tuncer, 2008; Alp et al., 2006; Tuncer et al., 2005),

b. There should be used new teaching methods in environmental education (Gökdere, 2005) like outdoor education (Erdoğan & Ok, 2011; Özbay, 2010; Bozkurt& Kaya, 2008, Gökçe et al., 2007)

c. Following up process should be carried out (Kasapoğlu& Turan, 2008),

d. Different governmental institutions and NGOs' should cooperate (Erdoğan et al., 2009; Tuncer, 2008),

e. Teacher education at university level and professional development of in-service teachers should be supported in terms of environmental education (Okur et al., 2010; Özbay, 2010; Aktepe& Girgin, 2009; Erdoğan et al., 2009; Bozkurt& Kaya 2008; Özden, 2008; Kahyaoğlu et al., 2008;Erten, 2005).

As seen above national and international research point out and emphasize same subjects. Especially as said Chen (1997), education programs in Turkey is not enough to develop 'environmental literacy. These programs are just enough for knowledge transfer (Okur et al., 2010) but are not enough participate in solution of environmental problems. At this point TUBITAK (The Scientific and Technological Research Council of Turkey) has started to support some outdoor environmental education projects intended for in-service teachers since 1999 (Erentay & Erdogan, 2009). The aims of these projects are to teach environmental subjects via an actual language, to gain environmental awareness and attitudes, behavioural change, and to participate in solutions of environmental problems (TUBITAK Invitation Paper, 2013), in another word learning/ having environmental literacy. The projects are carried out within collaboration with the universities.

There are many outdoor environmental education projects financed by TUBITAK (TUBITAK Report, 2010) but unfortunately we do not have enough academic outputs of them. Academic publications about outdoor environmental education projects intended for teachers of TUBITAK are very limited:

Guler (2009) carries out an outdoor education projects intended for teachers in 2008. There are 24 in-service teachers at the project which is only for 12 days. The aims of the research are to figure out expectations of the in-service teachers from the project, to determine self-efficacy level of teaching about environmental subjects, and to determine the changing of personal ideas about environmental education. The project data is collected by semi-structured interview and analysed by discourse analysis. As a result, the participants disclose that their expectation form project is to have environmental knowledge, and they have it. They also express they are very glad to have favourable perspective to the world, they sense more responsible to natural environment, and they will explain and teach what they have learnt. However some teachers express that they do not have enough knowledge and skills about environmental subjects so they do not have enough self-confidence to teach them. Lugg and Slattery (2003) has found similar results with Guler. They study with the

teachers at a national park in Victoria, Australia. Outdoor environmental education activities are carried out at this park and the teachers bring students to the park in order to gain environmental knowledge, increase environmental awareness. The teachers say that they do not have enough environmental knowledge and skills so they come to the national park. They collect data via semi-structured interview, observation, and survey within a case study. The teachers do not teach; an instructor on duty at the park carries out activities with the students. At the end of the study the teachers say that their environmental knowledge and awareness level has increased with students after activities. However they complain about that not to have enough outdoor education experience so they cannot direct the park instructor and reflect their explanations. Lugg and Slattery offers that activities should be placed-based, problem-based, and supported of professional development of teachers in terms of either environmental education or outdoor activities.

Keles, Uzun, Varnaci-Uzun (2010) carries out an outdoor education projects intended for pre-service teachers in 2009. 25 pre-service teachers attend to the project which is for 10 days. The aims of the research are to increase environmental awareness and attitudes of the participants by the quantitative approach. The scales are applied as pre/post/postpost test (after 3 months). As a result, it is determined that environmental awareness of the participants is increased, and environmental attitude is changed as favourable.

Eryaman, Yalcin-Ozdilek, Okur, Cetinkaya, and Uygun (2010) apply an outdoor education projects intended for teachers in 2009. The project is 10 days, and there are totally 40 in-service teachers at the project. The participatory action research is used. The aim of the project is to determine tendency of the participants to participate in solving any environmental problem. As a result, the researchers find that the participants are very enthusiastic in order to participate in solving any environmental problem. However the researchers state that they cannot follow up the participants. This is the limitation of the research.

As seen above, every project program has similar or different outputs but beside this each of them searches one side of environmental literacy. On the other hand international studies related to outdoor educations are mostly based on adventure education (Irwin, 2010; Piller, 2002) and environmental education is just a part of this program. These education programs are also carried out with students (Preston, 2004; Preston& Griffiths, 2004; Piller, 2002; Palmberg& Kuru, 2000), not with teachers. Irwin (2010) especially emphasize that outdoor environmental education programs are not enough to have environmental literacy and learn sustainability so outdoor education programs should be evaluated in terms of each side. At this point this research focuses on one side of environmental literacy: environmental awareness and sensitivity and some gaps mentioned above:

- a. The target group is in-service teachers,
- b. An outdoor environmental education program is developed for professional development of the in-service teachers,
- c. Active teaching methods are used at outdoor,
- d. There is collaboration between TUBITAK, a university, and local institutions.

Within this perspective, the aim of this research is to determine the short term effectiveness of an outdoor environmental education program on biodiversity awareness, environmental awareness and sensitivity to natural environment.

Methodology

This study is based on the quantitative approach and has pretest/posttest research design. There is no sample- universe selection. All the research as seen above (Guler, 2009, Keles et al., 2010; Eryaman et al., 2010; Okur-Berberoglu et al., 2013) do not use sample universe selection. The universe is all the participants of the project. The data is collected from an outdoor environmental education project which is financed by TUBITAK and its name is '108B023 coded Nature-based Outdoor Environmental Education in Canakkale and Suburbs, 2008.'

Education program

The literatures determine some characteristics of an outdoor environmental education program so the education program of this project is design according to these characteristics:

-One of them is the program should be designed within interdisciplinary perspective (Brookes 2004; Piller 2002; Bunderson & Cooper 1997). In this perspective, there are 22 different and interrelated environmental subjects in the program (App. 1) and each subject is explained within the connection of the other subjects. Each subject is explained by a lecturer who has PhD degree in the related discipline.

-The other point is to design the program as placed-based and problem-based (Harrison 2010; Irwin 2010; Brookes 2004; Lugg & Slattery, 2003; Piller, 2002; Emmons, 1997). All the activities in the program are based on Canakkale and the educators firstly explain the environmental subjects and problems within Canakkale (local level), and secondly at global level.

Participants' selection

A web-site was set up for this project and the web-site advertisement was posted to e-mail addresses of all primary and secondary schools. The project was publicized by newspapers, and a local TV channel. The volunteer enrolments were collected by the web-site. It was wanted the participants to fill out an online questionnaire. The questionnaire was composed of some demographic information and a specific question, 'why do you want to join this project?'. The participants were selected according to the reply of this question. The researchers were decided to 27 in-service teachers at the end of the evaluation.

Data collection

A scale was developed according to aims if the research. 46 items were prepared at the initial stage. The items were checked by three experts. The scale was designed within 5 Likert Scale. The Likert scale was coded from 1 to 5; as (1) I totally disagree, (2) I disagree, (3) I partly agree, (4) I agree and (5) I totally agree. Negative items were handled with reverse scoring.

The pre-application of the scale was become with 230 people. SPSS.13 package program was used for the analysis. Exploratory factor analysis was considered for validity, and Cronbach Alpha value was considered for reliability. The items, which factor value are above 0.4, are accepted to the scale (Buyukozturk, 2007). It was found that Kaiser- Meyer-Olkin (KMO) value was 0.792, and Bartlett test was 0.000. It meant that sample size was enough and there were themes at this scale (Daniel, 2011; Buyukozturk, 2007; Connolly, 2007; Sencan, 2005).

There were totally 30 items at the last stage of the analyses (App. 2), and whole scale was called 'Environmental awareness and sensitivity scale'. Three themes are determined within 30 items, and they were named as 'biodiversity awareness, environmental awareness and sensitivity to natural environment.' There were 8 items

at the biodiversity awareness theme, 12 items at the environmental awareness theme, and 10 items at the sensitivity to natural environment theme. Every theme's Cronbach alpha value was above 0.65 and Cronbach alpha coefficient value of the whole scale was 0.736. These results were evaluated as the scale is 'suitable' (Daniel, 2011; Buyukozturk, 2007; Connolly, 2007; Sencan, 2005; Karasar, 2003) for the aims of the research.

Firstly, Kolmogorov- Smirnov test was used in order to decide whether the data was parametric or nonparametric. If the significant value is less than 0.05, it means that the data is nonparametric (Daniel, 2011; Buyukozturk, 2007; Connolly, 2007). Wilcoxon signed rank test was used for this research because we had small sample size, the data was nonparametric. The scale was carried out two times as pre/posttest. The confidence interval was chosen as 95% (Daniel, 2011; Buyukozturk, 2007; Connolly, 2007). The Wilcoxon signed rank was carried out four times. One of them was for the total score of whole scale, and three of them were the total score of the each theme.

Results and discussion

We find that the nature-based outdoor education program is effective to improve environmental awareness and sensitivity to natural environment ($p < 0.05$); on the other hand it is not successful to improve biodiversity awareness ($p > 0.05$) in a short term.

Table 1.

The comparison of pre/posttest total scores of whole scale by Wilcoxon Signed Rank

<i>Pre/posttest</i>	<i>n</i>	<i>Mean</i>	<i>Total</i>	<i>Z</i>	<i>p</i>
<i>Negative column</i>	6	11,58	69,50	2,87*	0.004
<i>Positive column</i>	21	14,69	308,50		
<i>Equal</i>	0				

* Based on negative column

Table 1 shows that the comparison of pre/posttest total scores of the whole scale. It is found that there is a statistically meaningful difference between the total scores of test ($z=2.87$, $p < 0.05$). According to this result, the nature-based outdoor environmental education is effective to improve environmental awareness and sensitivity to natural environment of the participants.

Table 2.

The comparison of pre/posttest total scores of the sensitivity theme by Wilcoxon Signed Rank

<i>Pre/posttest</i>	<i>n</i>	<i>Mean</i>	<i>Total</i>	<i>z</i>	<i>p</i>
<i>Negative column</i>	7	12,43	87	2,45*	0.014
<i>Positive column</i>	20	14,55	291		
<i>Equal</i>	0				

* Based on negative column

Table 2 shows that the comparison of pre/posttest total scores of the sensitivity theme. It is found that there is a statistically meaningful difference between the total scores of the sensitivity theme ($z=2.45$, $p<0.05$). As a result, the nature-based outdoor environmental education is effective to improve sensitivity to natural environment of the participants.

Table 3.

The comparison of pre/posttest total scores of the environmental awareness theme by Wilcoxon Signed Rank

<i>Pre/posttest</i>	<i>n</i>	<i>Mean</i>	<i>Total</i>	<i>Z</i>	<i>p</i>
<i>Negative column</i>	4	12,75	51	3,008*	.003
<i>Positive column</i>	21	13,05	274		
<i>Equal</i>	2				

* Based on negative column

Table 3 shows that the comparison of pre/posttest total scores of the environmental awareness theme. There is a statistically meaningful difference between the total scores of the environmental awareness theme ($z=3.008$, $p<0.05$). It shows that the nature-based outdoor environmental education is effective to improve environmental awareness of the participants.

Discussion and Conclusions

At the end of this study, we have found that the nature-based outdoor environmental education program is effective to improve environmental awareness and sensitivity to natural environment. Keles et al (2010) have found similar results at their studies. Although both studies have similar results, we do not know the content of the educational programs. We really do not know which factor really affects to have these outputs; the content of the program or to have education at the outdoor or both of them? Rickinson (2001) offers that educational research should focus on how the

outputs happen. This research is a summative, as well because there is not enough output about the outdoor environmental education projects and their outputs in Turkey. At the further stage, the research can focus on formative evaluation of the programs or the specific evaluation of each activity or how the outputs happen because any factor in an activity might cause the improving of environmental awareness and sensitivity to natural environment.

The program design might also cause to emerge awareness and sensitivity outputs because this program was designed placed- based and problem based (Harrison 2010; Irwin 2010; Brookes 2004; Lugg & Slattery, 2003; Piller, 2002; Emmons, 1997), in other words our priority was Canakkale and its problems. This program might repeat at other places and results might compare in terms of in-service teachers.

Most of the research support that professional development of in- service teachers should be supported with varied educations (Okur et al., 2010; Özbay, 2010; Aktepe& Girgin, 2009; Erdoğan et al., 2009; Bozkurt& Kaya 2008; Özden, 2008; Kahyaoğlu et al., 2008; Erten, 2005; Lugg & Slattery, 2003; Chen, 1997). We have also learnt that some teachers do not have enough self-confidence to teach environmental subjects (Guler, 2009; Lugg & Slattery, 2003). We have not reached to this result at our study because of quantitative approach but this study might cause same output. We also take part different outdoor environmental education projects. One of the participants who is a Biology teacher at a program has mentioned that she and her colleague do not have enough knowledge about environmental subjects and how to teach them but they are ashamed to mention this deficiency. We must need deep research within qualitative approach in order to determine this deficiency.

Qualitative approach might be used in order to determine biodiversity awareness because this research program is unsuccessful on biodiversity awareness. The other research has not mentioned biodiversity theme. Their programs should probably mention biodiversity however they might not need to evaluate biodiversity as a theme whereas Young (2001) and Kassas (2002) say that biodiversity is an important part of ecology, and it should be pointed out. On the other hand quantitative approach has advantages and disadvantages. One of the disadvantages of quantitative approach is to limit the people how they think by scale items (Tracy, 2013; Bas & Akturan, 2008; Yildirim & Simsek, 2006). The scale items of biodiversity awareness might be insufficient. If we also use qualitative approach, we might determine improving at the biodiversity awareness theme. The qualitative and quantitative approaches can be used together in further researches. The using both approaches together is called mixed methodology (Tashakkori & Teddlie, 1998). Guler (2009), Eryaman et al (2010) uses also the qualitative approach. This research and Keles et al (2010) use quantitative approach.

The other shortage of the scale is to be formed by the explanatory factor analysis. Recently, the confirmatory factor analysis is used in order to develop a scale (Okur & Yalcin-Ozdilek, 2013; Okur & Yalcin-Ozdilek, 2013; Okur-Berberoglu & Uygun, 2012; Morais & Ogden, 2011). The explanatory factor analysis has the inductive perspective, and the confirmatory factor analysis has the deductive perspective therefore using both perspectives in order to develop a scale helps the researcher to eliminate disadvantages of both perspectives.

Another shortage of this study is that not to have following up procedure although literatures offer to follow up (Kasapoğlu& Turan, 2008; Rickinson, 2001). We could only evaluate the short term effects of the education program whereas Keles et al (2010) applied following up after three months and could evaluate the long term effects of their program. The long term effects of the education might happen in further times (Barr & Gilg, 2007). Maybe increasing of biodiversity awareness might determine in future

times. If the further research also uses following up procedure, they might have more coherent results.

This study tries to determine the effectiveness of an outdoor environmental education program but we did not focus on demographic properties of the participants (For example, age, gender, education level, job, living area -urban or rural-, socio-economic status etc.). On the other hand Brymer and Davids (2012) criticise summative research. They say that the environmental education programs which focus on effectiveness of a program has 'one size fits all' perspective. Whereas each person has different background so outputs of the people will be varied. Each person can even reflect on same output in different timescales so they offer 'ecological dynamics model' for environmental education programs. (Brymer & Davids, 2012) The ecological dynamics model or individual evaluation might be used in further studies.

This research results are very important in terms of evaluation of an outdoor environmental education program although having some shortages. There are some gaps (introduction) in terms of environmental education and this study has helped to fill these gaps. There are many more educational outputs. In fact, environmental education is a comprehensive subject. People have to have holistic perspective because of complex interactions of nature. In other words, human (*Homo sapiens sapiens*) is not the governor of the world; is only a part of the world. This is the starting philosophy of the outdoor environmental education (Halligan, 2007; Carrier, 2004; Ford, 1986). Maybe the comprehensive structure of the environmental education might cause the different outputs (Young, 2001). Fien and Tilbury (1996) determine fifty seven different outputs within environmental education. This study only mentions two of these outputs related to environmental literacy. As say Irwin (2010) and Rickinson (2001), each output may be evaluated within different studies. A scale or survey might be developed related to environmental literacy or its subthemes in further researches.

The other debate of the environmental education is education place. School comes to mind when somebody mentions 'education'. Storksdieck et al. (2005) emphasize that it is difficult to achieve desired outcomes within existing school programs. The school is found for mass education from the beginning of the 19th century and its aims are to grow up generations who are able to have critical thinking, handle social themes, do research, become problem solver, participate in decision making process in environmental and political events (Stevenson, 2007). From the perspective of environmental education, it is underlined that there are some negative aspects of schools. Vester (1997) suggests that mental abilities start to leave form physical activities faster within school education. As a result, human-environment relationship damages at the most sensitive point. A research conducted in the Netherlands and Israel revealed that there is no connection between providing great deal of information related to environment and the favourable change in environmental awareness and environmental behaviour (Dreyfus et al., 1999). Fadigan and Hammrich (2004) hypothesize that a large part of the learning takes place outside of schools despite the fact that they spend most of the time in schools. However, Tsai (2006) and Kassas (2002) note that the subjects about nature can be given after combination of in-door school learning with school-related extracurricular activities. Fadigan and Hammrich (2004) underline that learning can happen in schools as well as at homes, museums, science centres; also it is argued that extra-curricular activities might increase student's academic achievement, team-work skill, competition, take of responsibility and self-confidence (Mitchell, 2008; Halligan, 2006; Tsai, 2006; Shanely, 2006; Powers, 2004; Palmberg & Kuru, 2000). Outdoor education might be also used in order to have social and psychological outputs.

The outdoor environmental education is a huge and complicated subject. Outdoor or indoor activities and their effectiveness should be evaluated one by one. TUBITAK

especially wants to educate in-service teachers in order to have common effect on public. The projects educate in-service teachers; the teachers educate students and share their acquisitions/ learning with their family, friends, and students. It should be researched which one is more effective in order to have environmental education outputs: outdoor, indoor, or both of them, or none of them.

At this point, institutionalization comes forward. School is an institution and indoor or outdoor activities can be done within schools. There are also outdoor education institutions or centres. A museum or science museum, zoo, aquarium, some of sport/adventure centres, national parks etc are evaluated in terms of outdoor education (Irwin, 2010; Bozdogan, 2007; Tsai, 2006; Lugg & Slattery, 2003; Ford, 1986). Lugg and Slattery (2003) have studied with in-service teachers in a national park in Australia and there are instructors in order to show outdoor environmental activities in a park.

The outdoor education centres in Turkey are very limited. Last decade, TUBITAK has started to support to open more outdoor education centres (Bursa Science Museum, 2013; TUBITAK Legislation, 2012) but then again, there is still shortage about 'outdoor environmental education centres'. The outdoor environmental education centres are at the institutionalization level in Australia and New Zealand (Auckland City Council, Waikato Environmental Trust, Canterbury Environmental Trust, etc) and there are many centres. There is also a specific department about the sustainability and outdoor education at the Canterbury Polytechnic Institute of Technology (CPIT, 2013). The universities in New Zealand support the sustainability via different applications. For example the University of Otago is very successful about sustainability applications and it has 'Centre of Sustainability' (The University of Otago, 2013). As a result, in-service teachers, students, and public can easily have environmental education and sustainability applications. These institutions are good samples for sustainable development and present new job vacancies for young generation.

The chancellors of 436 universities from 52 different countries come together in Tallories, France in 1999 and discuss the responsibilities of the universities for sustainability, the programs of the future environmental education at all education levels, cooperation of non-governmental organizations and schools (Tallories Declaration, 2012). According to the document, Ankara University from Turkey only signs this declaration (Tallories Declaration Action Plan, 2012), however Ankara University does not have a sustainability centre. This result might be another research subject. It is unknown sustainability or environmental education applications of schools and universities in Turkey. On the other hand, TUBITAK's supports are very valuable in terms of environmental education. We believe that if project teams publish their results, then more quality educational programs might be developed. The number of the environmental education centres should be increased. TUBITAK projects usually carry out in summer. However, if centres are set up, then they would be open to education.

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APPENDIX 1.

The context of the education program which is based on Canakkale

1. The Astrophysic and Big Bang Theory
2. The geological structure of Canakkale
3. The macrovertebrates of Canakkale
4. Marine acosystem and marine biodiversity of Canakkale
5. Stream ecology and water micro invertebrates.
6. Forest ecosystem of Canakkale
7. Endemic plants of Canakkale
8. Energy production: 'Can' Thermal Reactor and the effects on the nature
9. Water resources, and Atikhisar Dam
10. Etnobotanic
11. Folkloric structure of Canakkale
12. National Parks in Canakkale
13. Tourism and sustainability
14. Ecoturism
15. Biologic combat
16. Recreational areas in Canakkale
17. Canakkale Wars and effects on Gallopoli Peninsula
18. Troia Antic City and the roots of the civilization
19. Recycling and compost production
20. Geographic Information System and orienting
21. Architectural structure of Canakkale
22. First aid

APPENDIX 2.

The scale of nature- based outdoor environmental education

	totally agree	Agree	I am not sure	I do not agree	I never agree
1. I do not know how my life will be affected if a species becomes extinct in nature.	Sensitivity to the natural environment (SE)				
2. I cannot relate between 'the biodiversity' and the environmental problems.	Biodiversity awareness (BA)				
3. I think that all the insects damage to the other species.	BA, Negative item (NI)				
4. It is contended with harmful animal and plant by the chemicals.					
5. It is inevitable to convert the forest area to the agricultural area in order to satisfy the food need.					
6. I believe that the nature has a complex process which human cannot perceive.	SE				
7. I do not know the alternative energy resources.	SE, NI				
8. The nature renews own self so it is not necessary to protect it.					
9. It is an absurd thinking that all the animals and plants, which I can see or not, are a part of my life.	BA, Negative item (NI)				
10. It is enough to protect the plants which are only important for the economy.					
11. It is not richness for an area to have many animal and plant species.					
12. It is enough to grow up a plant, which is close to being extinct, in an artificial area.					
13. People do not know how to protect the World.	Environmental awareness (EA)				
14. It is not important how much a new car pollutes the air.					
15. Using the private car instead of the bus is to damage our lives.					
16. People wonder about the environmental problems pointlessly.	SE, NI				
17. People need more motorways in order to increase their relationship.					
18. Every city must have an airport.	EA, NI				
19. The draining the swamp is a kind of combat with mosquitos.	EA				
20. The factories should be set up distant from the living areas.	SE, NI				
21. It is not effectively possible to use solar energy in Turkey.	EA, NI				
22. Everything in nature is for human.					
23. There is no connection between a thermal reactor and ground-water pollution.	EA				
24. The thermal reactor is one of the green energy resources.					
25. There is no connection between the geological structure and biodiversity of the soil.					
26. People must solve the environmental problem in order to improve their lives.	EA				
27. The nature is damaged while the technology is using.					
28. The organic agriculture is a kind of agriculture that there is no using of a chemical.					
29. Every soil structure is suitable for the organic agriculture.					
30. The aim of the organic agriculture is to increase the quantity.	EA, NI				

Okul Dışı Çevre Eğitiminin Öğretmenlerin Çevre Bilinci ve Hassasiyeti Üzerindeki Kısa Dönemli Etkisi

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Özet

Okul dışı eğitim çoğunlukla çevre eğitimi ile ilişkilendirilir. Bu araştırmanın amacı bir okul dışı eğitim programının biyoçeşitlilik farkındalığı, çevre bilinci ve doğal çevre hassasiyeti üzerindeki kısa dönemli etkisini belirlemektir. Veriler, TÜBİTAK tarafından finanse edilen bir okul dışı çevre eğitimi projesinden elde edilmiştir. Söz konusu projenin adı 'Çanakkale ve Yakın Çevresinde Ekoloji Bilinci Kazandırmak Amaçlı Doğa Eğitimi, 2008' şeklindedir. Projede 27 öğretmen yer almıştır ve proje sadece 10 gün sürmüştür. Çalışma için bir çevre bilinci ve hassasiyeti ölçeği geliştirilmiştir. Öntest son test araştırma deseni kullanılmıştır. Veriler parametrik olmadığı için Wilcoxon İşaretli Sıralar Toplamı Testi ile analiz edilmiştir. Doğa tabanlı okul dışı eğitim programının çevre bilinci ve doğal çevre hassasiyetini geliştirmede etkili olduğu fakat biyoçeşitlilik farkındalığını geliştirmede etkili olmadığı tespit edilmiştir.

Anahtar Kelimeler: Okuldışı eğitim, çevre eğitimi, öğretmen, TÜBİTAK, Türkiye