



## The Impact of Immediate Vicinity Training on Academic Success and Environmental Attitudes of the Fourth Graders in the Primary School \*

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### Abstract

This research seeks to increase the knowledge of the fourth graders in primary school and their attitudes towards the environment positively through immediate vicinity education. The research was carried out with the experimental design of the pre-test-post-test control group with the participation of 44 fourth graders in a private school located in the centre of Ankara. The data were obtained by applying "Ankara Environmental Booklet Achievement Test (AEBAT) and Environmental Attitude Scale (EAS)" as a pre-test and post-test to the experimental and control groups. "A Two-Factor ANOVA for Mixed Measurements" was used to compare pre-test and post-test scores. After the completion of the education process, a significant increase was found both in the AEBAT and in the EAS scores in the experimental group who were trained with Ankara Environmental Booklet and continued their official curriculum in the post-tests. However, no significant change was observed between the AEBAT and the EAS scores of the control group, who were only attending to the official curriculum, which did not receive any immediate vicinity education. It was concluded that there was no significant change in the knowledge level of the students regarding the immediate vicinity and their positive attitudes towards their environment in the control group while experimental group has developed both their academic success regarding their immediate vicinity and positive attitude towards the environment.

### Keywords

Environmental education  
Primary school  
Environmental knowledge  
Environmental attitude

### Article Info

Received: 02.17.2019  
Accepted: 11.20.2019  
Online Published: 04.08.2020

DOI: 10.15390/EB.2020.8521

\* This article is derived from Taha Yasin Bacakoğlu's Master's thesis entitled "The effect of close environment education on academic success and environmental attitude of the 4th grade primary school students", conducted under the supervision of İlkay Doğan Taş.

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## Introduction

People start their lives in the family and continue all their life activities in different circles until the end of their lives. Çekiç and Murat (2011) noted that all human and non-human elements, in which they are directly or indirectly related, constitute the environment. Also referring the atmosphere in which we are living, the environment (Özdemir, 2012; Poortinga, Steg, & Vlek, 2004) is defined as the whole of biological, social, natural, cultural, historical, climatic and physical values which directly or indirectly affect or are affected by a living organism during its life (Cansaran et al., 2012; Yücel & Morgil, 1998). Furthermore, the existence of social, cultural, geographical, historical, touristic or industrial environments further broadens the concept of environment. All of the connections and interactions that are difficult to understand between living and non-living beings both affect the environment and are affected by them. (Hungerford & Peyton, 1976). As the natural elements of the environment, human-beings started to be together to maintain their lives, which has paved the way for transformation of the cities into a more cosmopolitan environment and creation of many new cultures (Koydemir & Demir, 2005; Sinha, Jangira, & Das, 1985). Reasons such as the rapid increase in the world population, the development of technology, the acceleration of industrialization, irregular urbanization and insensitive attitudes of people towards the environment led to some environmental problems in the last century. Almost all of the environmental problems, which disrupt the health of the creatures, environmental values and ecological order or pave the way for the environment to be detrimental to the human by distorting the nature of the environment (Ertürk, 2009) are human-induced (United Nations Educational Scientific and Cultural Organization-United Nations Environment Programme [UNESCO-UNEP], 1985).

Many pollutants used by humans cause destruction in nature. The products, which are used by people (deodorants, artificial fertilizers, detergents, fossil fuels, pesticides, etc) cause environmental problems through their adverse effects (Houghton, 2005; Yılmaz, 2016). These problems are categorized as air pollution, soil pollution, water pollution, forest destructions and water and energy waste, which triggers such problems (Yıldız, Sipahioğlu, & Yılmaz, 2005).

With the rapid increase in industrialization in the world, nature has started to be polluted and life threatened rapidly. (Tung, Huang, & Kawala, 2002). Some organizations have been established to reduce or eliminate environmental pollution as low as possible. Some of them are international organizations and national ones that are established by states while others have emerged as non-governmental organizations established by volunteers. Foundation for Environment, Culture and Values Preservation, The Turkish Foundation for Combating Erosion Reforestation and the Protection of Natural Habitats, the Provincial Animal Protection Council, Greenpeace, the World Wildlife Foundation (WWF), Conservation International, CI (Conservation International), International Fauna and Flora and FFI (Fauna and Flora International) operate to prevent or mitigate environmental problems. However, these activities alone are not sufficient for people to have enough knowledge about nature and to develop positive attitudes and skills towards it. (UNESCO-UNEP, 1985). In this process, environmental training plays an important role.

### *Environmental Problems and Environmental Training*

The activities of people to meet their never-ending needs affect and change the environment. As the damages of such activities have been understood, the idea that nature is not inherited, but entrusted to us for future generations has been spread and the environmental problems have gained importance as a global problem (Chapman & Sharma, 2001). In the declaration adopted at the Intergovernmental Conference on Environmental Education held in Tbilisi on October 14-26, 1977, it was stated that Environmental Education should take an important role in raising awareness of environmental problems by utilizing the opportunities of science and technology. In this declaration, environmental education is defined as the whole of activities that will raise awareness and responsibility of every nation against the environment and its own resources (Kapyla & Wahlstrom, 2000; Yılmaz, 2016).

Carrier (2009) notes that it may be possible for the next generations, who receive environmental education, to take an active role in protecting the environment in which they live and will live in the future. The next generations who have knowledge about the environment have an opinion on environmental problems and may want to be part of the solution over time. As in every education, the characteristics of age, level and readiness of the students in environmental education are important variables that should be considered. (Gülay & Önder, 2011). The objective of the environmental education of 21st century should not only develop environmental knowledge and sensitivity but also aim to completely change the environmental and vital attitudes and behaviours of modern human (Schmieder, 1975). This new understanding of education should reveal individuals who react to environmental problems, make recommendations for solving these problems, actively participate in, investigate, question and discuss. In this way, it is easier to reach the educational objectives for the environment (Atasoy & Ertürk, 2008). One of the most important factors in achieving the objective of environmental education is about "how" environmental education should be done.

As in all areas of education, environmental education should be conducted in accordance with the "Student-centred Curriculum." (McCrea, 2006). When preparing this curriculum, behaviours should be planned from simple to complex, from concrete to abstract, from easy to difficult and as the cause of each other. Human behaviours: can be divided into three categories such as affective, cognitive, and temporal. Areas should not be completely separated from each other and have a vertical and horizontal relationship (Yaşaroğlu, 2012). Curricula include these criteria as the basis and the age level of the students should also be considered. Environmental education in the early years of school life should be different from the education given to older children and adults (Leeming, Porter, Dwyer, Cobern, & Oliver, 1997). Interaction of young children with the environment should be increased in this environment education. Children should be able to play games in nature, lay on the grass, see animals, grow plants and watch insects (Environmental Protection Agency, 2009). Student-centred curriculum is an educational approach in which students are active and they have the opportunity to experience by doing, can solve the problems encountered in daily life and is appropriate to the developmental characteristics of children. Accordingly, different methods and techniques can be used in environmental education. The main principles, methods and techniques used in environmental education are as follows: the near to far principle, the principle of simplicity to complexity, problem based learning method, case study method, station method, project technique, brainstorming technique, drama technique, travel technique, question-answer technique (Gülay & Önder, 2011). In using such methods, the activity-based curriculum should be created to contribute to the transformation of information into attitude and behaviour (Braus, 1995). The aim of activity-based learning is to create mental models that require advanced performance such as problem solving, transferring knowledge and skills in students. Activity-based learning begins with the need for learning. It should be based on the idea that rather than having teachers think "What should we say", having students think "what should we do" for solving the problem. The student examines the learning needs and thinks about how to solve a problem. Students do not learn the content. On the contrary, they can learn about the process of solving the problem (Koç, 2018). In the process of environmental education, this method can be followed for the student to solve the problems in their immediate vicinities. Countries have provided environmental education in various ways in their curriculum.

There is no environmental education course specifically or any unit directly concerned with environmental education in the official curriculum being used in primary schools in Turkey. However, there are some learning outcomes concerning the environmental education, distributed around different course modules. Such learning outcomes include; light and sound pollution, taking role in cleaning immediate vicinity, knowing the creatures in the immediate vicinity, the importance of natural resources and using them economically, establishing a relationship between demands and needs with family budget, knowing the natural and touristic places in immediate vicinity, grasping the importance

of plants and animals for humans, knowing the cultivation conditions of fruits and vegetables, being aware of the importance of recycling for human beings, choosing wisely between demands and needs, recognizing economic activities around, using environmental resources without any waste. Followings are the numbers for learning outcomes regarding the environmental education of the curriculums that used in 2017 and to be used in 2018 for identifying the qualitative nature of the relation of environmental education with curriculums in Turkey (Ministry of National Education, 2008, 2010, 2013, 2015, 2018a, 2018b, 2018c, 2018d):

**Table 1.** Environmental Education in Curriculum

Year	Curriculum	Number of Learning Outcomes
2015	Primary School First Grade Life Science	8
	Primary School Second Grade Life Science	10
2008	Primary school Third Grade Life Science	7
	Primary school Fourth Grade Social Studies	1
2010	Primary school Fourth Grade Religious Culture and Moral Knowledge	7
2013	Primary school Fourth Grade Science and Technology	13
<b>Total</b>		<b>46</b>
2018	Primary School First Grade Life Science	9
	Primary School Second Grade Life Science	6
	Primary School 3rd Grade Life Science	7
	Primary school Fourth Grade Social Studies	4
	Primary school Third Grade Science	5
	Primary school Fourth Grade Science	9
	Primary school Fourth Grade Religious Culture and Moral Knowledge	2
<b>Total</b>		<b>42</b>

When the number of learning outcomes related to environmental education in the curriculums given in Table 1 is examined, there are 46 learning outcomes in six courses in the curriculum used in 2017. In the 2018 curriculum, while the number of courses has been increased by adding Science to the Primary School Third Grade the number of learning outcomes related to environmental education has decreased. When the content of the learning outcomes is examined, the above-mentioned subjects are similar for both curriculums. In addition, it is known that by the nature of environmental education, it will be more functional to conduct activities such as environment trips and tree planting, where students can be as active as possible. However, the learning outcomes in both curriculums include teaching the lessons in the classroom environment via teaching the concepts mostly. Besides, the structure and environmental conditions of school buildings and gardens can be seen as a factor in limiting the outcomes in this way.

There is no "Environmental Education" course in primary school curriculum that is used in the schools and some modules include learning outcomes for environmental education. However, it is thought that these learning outcomes do not have enough quality for students to sufficiently know their immediate surroundings and develop a positive attitude towards their environment. While due to the nature of the environmental education, students should start learning their immediate vicinity, which they are in touch with nature and its problems Schmieder (1975) but both the outcomes and content of the existing curriculums and the environmental conditions of the schools are considered inappropriate. Therefore, it should be sought whether the knowledge level of the students and their attitudes towards the environment have changed in a positive way through the immediate vicinity education.

### *Aim of the Research*

The main aim of this research is to determine the level of knowledge and the attitudes of the fourth grade students about the city they live in through the immediate vicinity education. To this end, answers to the following questions were sought:

1. Is there a significant difference between the pre-test and post-test scores of the students in the experiment and control group from Ankara Environmental Booklet Achievement Test (AEBAT)?
2. Is there a significant difference between the pre-test and post-test scores of the students in the experiment and control group from Environmental Attitude Scale (EAS)?

### *Limitations of the Research*

Environmental booklet and achievement test used in the scope of the research were prepared in accordance with 4th grade students and Ankara province. Therefore, the data obtained in this study can only be correlated with the specified student level and Ankara province.

## **Method**

This part analyses the research model, the working group, the data collection tools used, the data collection process and the data analysis and the statistics used.

### *Model of Research*

The aim of the study is to identify whether there is a significant difference in the attitudes of the fourth grade students towards the city they live in and their attitudes towards their environment through the immediate vicinity education and it has utilized pre-test and post-test experimental design with a control group.

### *Study Group*

Criterion sampling was used in determining the study group of the research. Critical sampling, which is one of the purposeful sampling methods, is the selection of the sample in which the research will be carried out in a way to provide certain criteria set by the researcher or the predetermined list of criteria (Büyüköztürk, Çakmak, Akgün, Karadeniz, & Demirel, 2015). Within the scope of the research, it was considered as the criteria that the students to be included in the sampling group in terms of gender, class size and pre-test scores of Ankara Environmental Booklet Achievement Test which are determined as important factors that can affect the readiness of students. The reason for this is to ensure that the students' acquisitions are equivalent in terms of their cognitive and affective characteristics, which are the prerequisites of the outcomes.

In this direction, to identify the study group, Ankara Environmental Booklet Achievement Test (AEBAT) has been applied on 4/A, 4/B, 4/C, 4/D and 4/E classes in X primary school of Keçiören Provincial Directorate of National Education in 2016-2017 academic year. The arithmetic mean of the data obtained in this test is calculated. Table 2 illustrates the achievements and their distribution by gender for the classes on which the test has been applied.

**Table 2.** AEBAT results and Class Distribution by Gender to identify the Study Group

	<b>4-A</b>	<b>4-B</b>	<b>4-C</b>	<b>4-D</b>	<b>4-E</b>
<b>Achievement Rate</b>	53.18	37,04	52.72	41,40	44,05
<b>Male</b>	10	7	12	14	8
<b>Female</b>	12	10	10	5	8
<b>Class Size</b>	22	17	22	19	16

As a result of and data shown in detail in Table 2, we have decided to work with 4-A and 4-C classes on the grounds that both achievement scores, class size and the number of female and male students were close to each other. We have casted lots between the classes and identified 4-A as a control group and 4-C as an experimental group.

### ***Data Collection Tools***

Two different data collection tools have been used for this study, one of which is “Ankara Environmental Booklet Achievement Test (AEBAT)” and the other one is “Environmental Attitude Scale (EAS)” Two which is prepare for fourth and fifth graders in primary school.

#### ***Ankara Environmental Booklet Achievement Test***

AEBAT has been prepared to measure the preliminary knowledge regarding *the general environmental awareness, water and energy savings, animals, recycling and pollution* and their post-application, using Ankara Environmental Booklet. The questions were constructed within the scope of learning areas and achievements determined in local learning on environment. While three-quarters (15 questions) of the questions asked the information given in the formal education program (the importance and benefits of trees in Ankara province, what recycling is and its importance, saving energy and water, and etc.), one-quarter (5 questions) asked the specific information (conversion facilities, animal shelters, forests, etc.) about Ankara province. The learning outcomes and questions regarding the AEBAT is not only about the knowledge level but also involves advanced level cognitive skills such as implementation, analysis and synthesis. Initially, we have prepared 30 questions about the learning outcomes in developing the AEBAT. These questions were categorized by four classroom teachers according to their difficulty and the number of questions was reduced to 25. The existing questions were rearranged again by five class teachers, two Social Studies teachers, three Science and Technology teachers and two Turkish teachers. The pre-application of the test of 25 questions was applied to three different classes of 65 people and the number of the questions was reduced to 20 as the results have been assessed again on a question basis by the domain experts. The draft achievement test prepared was given to five class teachers, two Social Studies teachers, three Science and Technology teachers and two Turkish Language teachers together with the Ankara Environmental Booklet in order to determine the scope validity and examine the suitability of the questions. The number of questions was decreased to 25 after the teachers' examinations. Pre-application of the test consisting of 25 questions was applied to three different classes with 65 students, and the results were re-evaluated by the same teachers on a question-by-question basis. Then the number of questions was reduced to 20. In order to determine the reliability of the test, a pilot scheme has been applied to a 4<sup>th</sup> grade level student group of 28 other than the study group. Cronbach alpha value was calculated for reliability analysis of AEBAT and it is determined as .727.

#### ***Environment Attitude Scale (EAS)***

*Environment Attitude Scale* that we use in the research has been developed by Yaşaroğlu (2012). In developing the scale, the curriculum of the related courses was examined and a pool of materials was created. In general, the articles include "general environmental awareness, animals, energy, recycling, water, pollution". EAS response form was created according to the Likert-type response method according to the rating scale. In the assessment process, three points are given to the most positive response for the sentences within the scale and one point is given to the most negative one. The response options have been formed in three different ways such as; "Yes, I agree (3)", "Slightly agree (2)", "Disagree (1)". Codes of negative substances (articles 2, 3, 6, 9, 16, 20, 23, 27, 31) were made in reverse. Accordingly, the scoring is "Yes Agree (1)", "Slightly Agree (2)" and "No, Disagree (3)".

The articles written in accordance with the scale format were transformed into data collection tools. In this process, for expert opinion, it was sent from forest engineering from various universities, one from environmental engineering and six from the curriculum and instruction field and was rearranged according to the feedback. Subsequently, the scale was examined by six class teachers and the related revisions were done taking into consideration the feedback. After the activities with the teachers, face-to-face interviews were conducted with the students on the clarity and comprehensibility of the articles by going to a primary school which is not in the study group. In order to determine the construct validity of the scale, the pilot scheme form of the scale was applied to a total of 360 primary school students (175 from the city centre, 80 from the town centre and 80 from the villages) which were not in the real study group considering the student ratios determined for the stratified sample. The data

obtained by evaluating the data collection tools of the pilot scheme forms were subjected to factor analysis. The Cronbach alpha value of the whole scale was calculated for the reliability analysis of the Environmental Attitude Scale and it is determined as .84. Split-half method obtained by Guttman split-half coefficient has been found as .80. After the procedures, 4 articles from 36 articles were removed and a total of 32 article remained.

#### *Ankara Environmental Booklet Applied to Experimental Group and Its Application*

When the literature is reviewed, three different types of education comes to the fore within the scope of environmental education (National Curriculum Council, 1990, as cited in Kesicioğlu & Alisinanoğlu, 2009).

1. Education in the natural environment: This is the education in which children have the opportunity to interact with nature directly and obtain information by doing and living. Children are asked to develop a positive attitude towards their natural environment by contacting their natural environment (playing in the soil, feeding animals, etc.).
2. Environmental education: It is expressed as the education in which students have knowledge about natural events. These are the educational activities where students gain basic knowledge about the topics such as the formation of rain, the growth of plants and natural disasters.
3. Education for the environment: It is the education given to protect the natural environment, the relationship between the living and non-living things in the environment and to take measures to restore the deteriorated natural balance.

The Ankara Environmental Booklet, designed by the researcher, was prepared within the scope of education for the environment. In this context, the booklet (learning outcomes, content, activities) was prepared to cover the subjects of education for the environment. In this way, the content validity of the determined learning outcomes and the content were tried to be achieved.

Ankara Environmental Booklet applied to the experimental group, consists of general environmental awareness, water and saving, energy and saving, animals, recycling and pollution learning areas, which were determined by considering the topics that need to be covered within the scope of education for the environment. It consists of twenty-five learning outcomes related to general environmental awareness, four related to water and saving, four related to animals, four related to energy and saving, and four related to recycling and pollution.

The principles of constructivist learning theory are taken into account in creating the booklet. In this respect, the learning areas and the learning outcomes determined by the researcher were presented to the field and program development experts in order to determine the validity of the content and the appropriateness of the learning outcomes. As a result of the evaluations of the experts, the curriculum development principles and ineligible learning outcomes were determined and revised. Secondly, the content suitable for the learning outcomes was identified. We consider that the content should be suitable for the lifestyles of the fourth graders and contribute to their problem-solving, creativity, critical thinking skills. In this sense, we have planned learning and teaching process suitable to the contents. We have utilized teaching methods and techniques such as brainstorming and station technique in general environmental education unit, speech ring and question-answer on recycling and pollution issues, storytelling on animals issue, excursion-observation on energy issue, which enable the student to interact with the teacher in designing the teaching process. In addition, active participation of the family in the environmental education process has been ensured through the conduct of joint research and interviews with the family members. The Ankara Environmental Booklet Draft, which all dimensions have been completed, were sent to the domain experts for their assessments. In accordance with the feedback received from the experts, we have made the necessary revisions and the booklet was finalized and ready for application. We have organized four different trips, namely drinking water treatment plant, solid waste treatment plant, animal shelter and forest trips concerning the learning outcomes for implementing the booklet. Furthermore, we have carried out short-term class and school

garden cleaning, tree planting and triple flowering activities every day for six weeks. At the evaluation stage, we have implemented assessment and evaluations that are suitable to the learning outcomes and learning and teaching processes with questions at the end of the subjects. A section from the Ankara Environmental Booklet prepared for the environmental education is presented below. In this section, Alim and Ankara Angora Goat talk about how Ankara's water needs are met. Angora goat, Ankara Water and Sewerage Administration (ASKI) and dams that meet the water needs (Kesikköprü, Kargalı, Kurtboğazi) mentions. The continuation of the text discusses the characteristics of these dams, occupancy rates, how water is brought from the dams to the city, how it goes through the processes before coming to our homes, and in which facilities these processes are carried out. In addition, students are shown websites and information about dams and treatment plants. At the end of the text, five different activities are held with the students. During the activities, they were asked to think about how they can protect water resources and the correct use of water, and brainstorming and station methods were applied. In addition, they were asked to discuss with their parents what diseases and problems may arise as a result of not using and preserving the water correctly and to investigate together and write a story on the given case.



### Data Collection Process

First of all, 96 students in five different classes of primary school were enrolled in Ankara Environmental Booklet Achievement Test. Taking into account the achievement test results and gender distributions, the two closest classes were determined as experimental and control groups. These classes were simultaneously administered to EAS. Then, 4-C class, which was identified as the experimental group, was taught for six weeks, two hours every week in second semester in 2016-2017 academic year. Simultaneously, the official curriculum was also continued. A special environmental curriculum was not applied to the 4-A class, which is a control group, it has continued to receive Social Studies, Science and Religious Culture and Moral Knowledge, which are indirectly related with the environmental education. In this context, all courses are processed in accordance with the curriculum published in TTKB and the textbooks proposed by the Ministry of National Education without adding or subtracting any of the outcomes. The teacher carried out a student-centred teaching process adopted by the constructivist approach. In this process, he preferred student-centred teaching methods and techniques such as speech ring, brainstorming, station and drama. After 6 weeks of application, AEBAT and EAS were applied to the experimental and control groups again.



### *Analysis of Data*

In the analysis of the data obtained with EAS and AEBAT, "Two-Factor ANOVA for Mixed Measurements" was used to determine whether there was a significant difference between repeated (pre-test and post-test) measurements, and the data were given as tables in a way to illustrate the necessary findings. Büyüköztürk (2015) notes that "Two-Factor ANOVA for Mixed Measurements" is used to determine the effectiveness of the experimental application for two-factor mixed patterns and the effect of time when repeated (pre-test-post-test) measurements are made in the groups.

### *Measurements Taken Against the Factors That Can Affect the Internal Validity*

Internal validity is the disclosability of the result with known reasons (with test variables) in a causal relationship (Karasar, 2015). In an experimental study, there are many factors such as the selection of subjects that may affect internal validity, the maturation of subjects, data collection tool, history of the subjects, the effect of the loss of subjects (death or leaving the group), pre-test measurement (anticipation) effect, statistical regression, interaction effect (Büyüköztürk et al., 2015). In the selection of subjects within the scope of the research, firstly, grades with similar success scores, gender and socio-economic level were chosen in order to control the factors that might affect the internal validity. In addition, all the subjects who participated in the study were living in the same area starting from the first grade and continuing to study with the same teacher in the same classroom. This suggests that subjects have similar experiences in socio-cultural and educational terms. Thus, it was tried to minimize the effect that may arise from the past experiences of the subjects. With a preference of 6 weeks, which is short or not to be considered a long time, for the determination of the subjects impartially and for the implementation of the activities, it was assumed that time-dependent maturation would be similar for all subjects. As the pre-test and post-test were the same in the scope of the study, most of the questions in the test were prepared in accordance with the content of the official curriculum and the tests were applied by the same researcher, there was no difference in the experimental conditions and the effect of the tool was minimized. In addition, there was no loss in subjects that took the pre-test and post-test. Thus, it can be said that the properties and equivalence of the groups were preserved. In the study, a period of 6-week gap was left between the pre-test and post-test, and thus it was tried to prevent the subjects from remembering the questions in the pre-test. In addition, when the test scores of the subjects were examined, it was seen that there were no grades at two far ends (very good or very bad scores compared to the group). This indicates that the subjects' scores in the pre-test are not due to chance. As the effect of only one independent variable is examined in the study, interaction effect between the independent variables is not observed. Thanks to the measures taken, it is thought that the factors, that reduce the internal validity, that were likely to occur during the research process were taken under control.

## **Results**

This part illustrates the findings of the study, which were presented and interpreted whether there was a significant difference between the scores of the experimental and control groups from the AEBAT and the EAS.

### *Findings and Comments About the Results of Ankara Environmental Booklet Achievement Test*

Table 3 indicates the pre-test and post-test mean scores and standard deviations of the students from AEBAT.

**Table 3.** AEBAT Average and Standard Deviation Values

Group	PRETEST			POST-TEST		
	X	S	N	X	S	N
Experimental	52.73	13.16	22	81.14	11.44	22
Control	53.18	16.22	22	54.09	11.92	22

According to the Table 3, the average score of the students who received the "Immediate Vicinity Education" and continued their official curriculum (experimental group) was 52.73 prior to

application and 81.14 after the application. The averages of the students who continue their official curriculum (control group) was 53.18 prior to application and 54.09 after the application. Accordingly, while a significant increase of 28.41 points was observed in the achievement level of the students in the experimental group concerning the immediate vicinity achievement level, we observe that there is a slight increase of 0.91 between the pre-test and post-test scores of the control group. On the other hand, it can be interpreted that as the pre-test score averages of the students in experimental and control groups are close to each other, their prior knowledge level before the education was similar.

Table 4 illustrate the results of ANOVA indicating whether the observed changes in the AEBAT scores of the students after the experiment show a significant difference.

**Table 4.** Two-Factor ANOVA Results for Mixed Measurements of AEBAT Pretest-Posttest Scores

Variance Source	Squares	Total	sd	Average of Squares	F	p	Partial Eta-Squared
Inter-subjects	14630.40		43				
Group	3888.92		1	3888.92	15.21	0.00	0.27
Error	10741.48		42	255.75			
Within the subjects	13037.50		44				
Measurement	4727.56		1	4727.56	47.84	0.00	0.53
Group*Measurement	4159.38		1	4159.38	42.09	0.00	0.50
Error	4150.57		42	98.82			
Total	27667.90		87				

According to Table 4, the scores were significantly differed prior to experiment, that is to say that, receiving "Immediate Vicinity Education" and the impacts of repeated measurement factors on AEBAT were apparent [ $F(1,42)=42.09$ ,  $p < .001$ , partial  $\eta^2 = .50$ ]. This finding shows that "Immediate Vicinity Education" has different impacts on increasing the success of students in AEBAT. Thus, it can be concluded that the change in the achievement test scores of the students in the experimental group based on the Ankara Environmental Booklet was different from the change observed in the achievement test scores of the students in the control group. In other words, the success of students as a result of the experimental process changes. It can be said that the change in the success of the students in the experimental group related to AEBAT is due to Ankara Environmental Booklet. Leech, Barrett, and Morgan (2005) argue that the eta-squared value between .36 - .51 is considered as medium effect size. Eta-squared value of .50 indicates that 50% of achievement post-test scores variance arises from the independent variables.

#### *Findings and Comments Related to Results of the Environmental Attitude Scale*

Table 5 illustrates the pre-test and post-test average scores and standard deviations of the students.

**Table 5.** EAS Average and Standard Deviation Values

Group	PRETEST			POST-TEST		
	X	S	N	X	S	N
Experimental	65.50	18.07	22	77.50	12.89	22
Control	73.50	8.80	22	74.27	9.32	22

Table 5 indicates that the average scores of the students for EAS, which have received "Immediate Vicinity Education" and continued their official curriculum was 65.50 prior to application and it was 77.50 after. The average of the students who attend the official curriculum is 73.50 prior to application, and their post-application score is 74.27. Accordingly, while 12.00 points increase was observed in the EAS scores of the students in the experimental group prior to "Immediate Vicinity Education", 0,77 change has been observed in the average scores of the control group. When the average scores before the application is taken into consideration, it is seen that the attitude of the control group

is higher than the experimental group. This situation shows that the students in the control group are more sensitive to the environment they live in. However, there was a significant increase in the attitude of the group that was determined to be less sensitive to the environment with the training given in the study.

Table 6 illustrates the ANOVA results whether EAS scores of the students indicate a significant difference before and after the experiment.

**Table 6.** Two-Factor ANOVA Results for Mixed Measurements of Pre-test and Post-Test Scores

Variance Source	Squares Total	sd	Average of Squares	F	p	Partial Eta-Squared
Inter-subjects	6815.22	43				
Group	125.28	1	125.28	0.79	0.38	0.02
Error	6,689.93	42	159.28			
Within the subjects	8697.50	44				
Measurement	897.28	1	897.28	5.30	0.03	0.11
Group*Measurement	693.28	1	693.28	4.10	0.05	0.09
Error	7106.93	42	169.21			
Total	15512.72	87				

According to Table 6, it was found that there was a significant difference between before and after the experiment, the effects of immediate vicinity education and repeated measurement factors on the EAS were significant [ $F(1,42) = 4.10$ ,  $p\eta^2 < .01$ , partial = .09]. This finding illustrates that "Immediate Vicinity Education" has a different effect in increasing the EAS scores of the students. Thus, it can be concluded that the change observed in the attitude test scores of the students in the experimental group based on the Ankara Environmental Booklet was different from the change observed in the statistical attitudes of the students in the control group. In other words, the attitudes of the students change as a result of the experimental process. It can be said that the change in the students' achievement in the experimental group was due to the teaching based on Ankara Environmental Booklet. When the literature is reviewed, there are studies that support the study.

In their research on applied environmental education, Skelly and Zajicek (1998) concluded that the environmental attitudes of the children who take environmental education by participating in the garden activities are higher than the children doing environmental education in the classroom.

In their experimental study that investigated the effect of environmental awareness of "Green Class Model", Uzun, Sağlam, and Uzun (2008) identified that the scores of pre-test and post-test scores of the control and experimental groups showed a significant difference in favour of the post-test. The comparison between post-test and post-study follow-up test scores showed that the environmental awareness average of the experimental group provided results in favour of the experimental group significantly higher than the mean of the control group. In that sense, it is possible to say that the applied environmental education based on a Green Class Model significantly increases the environmental awareness of the students and the environmental awareness that is formed is permanent.

In his study where he investigated the effect of the use of sociological argumentation approach on the achievement of the students, their environmental attitude and their attitudes towards environmental problems as an alternative to environmental education in the official curriculums, Deniz (2014) has reached the following results:

- It was found that there was a change in the academic achievement levels of the study group students, on whom environmental education has been provided with the sociological argumentation approach, in favour of the post-test results between before and after the application.
- It was found that there was a change in the environmental attitude levels of the study group students, on whom environmental education has been provided with the sociological

argumentation approach, in favour of the post-test results between before and after the application.

According to the findings of the study and the literature review, it can be said that the education directly related with environment has a more positive effect on the students' environmental perspectives than the indirect education through the environmental learning outcomes within the official curriculums.

### **Discussion, Conclusion and Suggestions**

The aim of this study was to determine the effect of local learning on environment on students' knowledge levels and their attitudes towards environment. The study has an experimental design with control group and 44 students from the 4th grade of primary school participated to the study in which pre-test and post-test were conducted. In addition to the 4th grade program the experimental group was educated with "Ankara Environmental Booklet" for 2 hours per week within 6 weeks. The control group did not receive any additional education on environment, only the 4th grade curriculum was continued. The data were collected by "The Achievement Test of The Environmental Booklet of Ankara (ATEBA)" and The Scale of Attitude towards Environment (SATE) developed by Yaşaroğlu (2012). The ATEBA and SEA were conducted to the experimental and control groups as pre-test and post-test in the data collection process of the research. "Two-way ANOVA for Mixed Design" was used to compare the pre-test and post-test scores. The results of the research are discussed below.

There is a significant effect between the achievement scores towards environment of the pre-test and post-tests conducted to the students of the experimental group educated by the local learning on environment beside the curriculum of formal education. This result can be interpreted as the education program subjected to this study increases the academic achievement towards the environment. In case, the results show that there is not any significant difference between academic achievement scores gathered from the pre-test and post-tests of the students of the control group educated by only the curriculum of the formal education. This result is interpreted as the curriculum of the formal education does not have any significant effect on the academic achievement towards environment. While the results of the pre-test measuring the environmental knowledge indicate failure on the direct knowledge; there is a medium level success on the results of the pre-test measuring the environmental knowledge. For example; most of the students cannot determine the list of the forests in Ankara, and the trees and animals lived in these forests. There is an increase in the scores of the pre-test as a result of the films, field trips and the student oriented activities at class during practice. The enriched in-class and out-of-class activities affected students' the knowledge and attitudes towards environment. In addition to these, it was detected from the results of the pre-test that almost all of the students of control and experimental group do not have enough knowledge about the animal shelters, water treatment and solid waste disposal plants in their neighborhood; as for the post-test it was seen that only the students of the experimental group answer these questions correctly. As much as it was thought that the control group does not educated for the answers of these questions specially, the curriculum of the formal education includes the related subjects for answering these questions. Moreover, not to find an increase in the achievement scores gathered from basic questions of the post-test conducted to control group is interpreted as a significant finding. In addition to these, according to the results of the pre-test and post-test it was found that both of the students at the control and experimental group have the knowledge about the importance of trees, protecting the forests, water and energy saving.

It can be said that the related literature about the researches on the environmental knowledge of the students has similar training practices and findings with this study. Bogner (1998) mentioned that the enriched out-of-class activities increases the students' knowledge on environment. In their study about the knowledge level of the primary school students about environment, Chapman and Sharma (2001) found an increase on the environmental academic knowledge level of the Philippine and Indian primary and secondary school students after attending the environmental education program. It can be

said the results of this study are supported by the results of the other studies and the similar environmental education program sourced by a booklet in the study of Chapman and Sharma, the out-of-class activities, and similar instructional methods mentioned in the literature.

In Fisman's (2005) study on local learning on environment conducted with students in the 3rd and 5th grade of primary school, it was concluded that experimental group students' attitudes and knowledge levels towards environment affected by the local learning on environment in which the students observe the nature. In their semi-experimental studies with pre-test and post-test conducted to Nigerian students attending 5th grade, Ajiboye and Olatundun (2010) determined that environmental education carried out in the classroom and in nature increased the level of knowledge of students about environmental problems. Similarly, Ok (2016) investigated the effect of nature education activities integrated to the course but applied outside the course on the environmental knowledge and environmental attitude of 7th grade students. As a result of the research, it was observed that both knowledge and attitude levels increased in the experimental group. The findings obtained in the researches are in line with the results of the study; and within the scope of the curriculum, forest trip, waste water treatment plant, solid waste treatment plant trips and school environment arrangement activities are similar in terms of methods and techniques used in education.

Gökler (2012) investigated the effect of environmental education on students' perceptions of environmental concepts and their academic achievements related to environmental experience. This study concluded that the perceptions about the concepts like ecosystem, environment, land, human being and forest show significant differences after the experiment and the teaching program depending on the experience of nature significantly increases the achievement of the students in the experimental group. The results of this study also support the results of the research. In addition, the activities of tree and flower planting, forest trip and observation in the local learning on environment program have similarities with the curriculum.

Karpudewan, Roth, and Abdullah (2015) conducted a semi-experimental environmental education studies with student-centred 5E model in the experimental group, and teaching techniques as teacher-centred lecture and question-answer in the control group. The participants of the study are 11-year-old primary school students attending 5th grade. At the end of the study, a significant increase was observed in the environmental knowledge of the students in the experimental group educated by the student-centred methods and techniques compared to the students who were educated with traditional methods. These results are consistent with the results of the research. In addition, there are also similarities with the use of student-centred methods, techniques and strategies such as station technique, brainstorming, excursion-observation and circle practice in the courses of local learning on environment.

Another result of the study indicated that after the training of the students in the experimental group with environmental education, there is a significant increase in the scores of the Scale of Attitude Towards the Environment. This result about the application of the Ankara Environmental Booklet was interpreted as the positive contribution to the students' environmental attitudes. No significant difference was found between the scores gathered from the Scale of Attitude towards Environment of the students who did not attend the local learning environment before and after the application. Not to reach a significant difference indicates that the formal education program being implemented has no significant effect on environmental attitude.

The pre-test results of the scale of students' attitudes towards the environment indicate more positive attitudes towards animals, while attitudes towards plants, energy saving, water saving or recycling could not be observed. There was a significant increase in the post-test scores of the experimental group due to the forest trips, the visits and observations to the treatment and recycling facilities, tree and flower planting activities, and the active participation of the students to the out-of-class activities with their families.

When the literature is examined, it can be said that the researches on the attitudes of the students towards the environment are similar to the present study in terms of both educational process and the results; and also these results are supported by the related literature. In their study, Leeming et al. (1997) aimed to measure whether there was a significant change in the environmental knowledge and attitudes of students who participated in the environmental education program by introducing the immediate environment of the students or not. In the study, it was determined that there was a positive change in the attitudes of the students attending the classes towards the environment and a significant change was observed in their knowledge about the environment. This result coincides with the environmental attitude dimension of the research as well as the environmental knowledge dimension. Moreover, it supports the study carried out in the direction of environmental education starting from the near abroad.

The study of Palmberg and Kuru (2000), which investigates the various activities such as field trips, hiking, camps, adventure activities, and the attitudes of the of 11-12 years old Finn children to the environment, shows that the students who experienced outdoor activities have more strong relation with environment and more positive attitudes compared to the students who did not. They have observed that they have an empathic relationship and generally develop a positive attitude towards the environment. This finding is similar to the research results and teaching methods, techniques and strategies.

In their environmental education research conducted in Yellowstone National Park, Brody and Tomkiewicz (2002) found that in order to change the environment education into attitude and the interaction with the immediate environment. This result is consistent with the results of the study. The visits to the wastewater treatment and the solid waste treatment plant in the scope of the research show similarities with the excursion-observation activities.

Aktepe and Girgin (2009) compared the attitudes and knowledge levels of primary school students attending to eco-schools and classical schools; and found that eco-school students were more conscious in practice and developed a more positive attitude towards the environment due to the activities in their schools. Because of conducting applied environmental education in the natural environment, this research has similarities with the practices of this research and the results of this study are consistent with their study.

Abel, Appleton, and Hanuscin (2010), Özdemir and Uzun (2006) and Tilbury (1994) found that science and nature activities carried out in a green classroom environment based on interaction with living beings increased the students' perceptions of the environment. The results of the research showed that environmental education in green classroom environment is more effective than those carried out in traditional environment. In the researches, it has been concluded that environmental education should be started as early as possible by starting from applied and close environment. These studies overlap with the results of the research and show similarities with the teaching methods and techniques applied.

In his PHD, in which he evaluated the attitude and behaviours of the first graders in the primary school, Yaşaroğlu (2012) noted that the environmental education topics especially in some courses (Science and Technology, Social Studies, Religious Culture and Moral Knowledge) in 2005 curriculum should be enriched with teaching processes that will provide active participation of the students. In their study, Akengin and İbrahimoglu (2015) stated that the learning outcomes of environmental education are there for students only to learn the environmental concepts, that is to say that, they merely learn the environmental concepts without sufficiently engaging with the environment. Consequently, the fact that the learning outcomes do not achieve enough success depends largely on the students' inability to actively participate in the course processes and that the courses remain in theory without students involved in real-life experience. These results show similarities to the education of environmental education within the scope of the research and the results of the research.

### *Suggestions*

Recommendations for the researchers:

- Subjects of environmental education should not be covered in a specific time period and only in certain units of the courses as science of life, social studies, and science; it should be kept on the curriculum of the students for a longer period of time.
- The learning outcomes of the environmental education should enable the students to progress from the inner circle to the great, to use the theory in practice, and to teach the lessons in natural environments.
- The study carried out at the 4th grade level of primary school can be studied long-term at different grade levels vertically. In this study memorability tests can be applied to the dimensions related to environmental knowledge and environmental attitude that cannot be done.
- Achievement tests for local learning that are appropriate for different class levels can be established and applied at regular intervals.
- Interactive applications that support environmental knowledge and environmental attitudes, applications that can be used on tablets and mobile phones, or augmented reality applications can be created and made available to teachers and students.

Recommendations for teachers:

Although this study was carried out in Ankara province, teachers in different cities may pay attention to the following when conducting environmental education:

- Student-centred instructional activities and group activities such as station technique, brainstorming, excursion-observation and circle practice can be used actively when planning instructional activities for the environment education.
- During environmental education, students attend classroom and school yard cleaning activities where they can take responsibility for their immediate environment, and tree and flower planting activities where they can be intertwined with nature; in line with the opportunities of the city where they are located in relation to the gains, drinking water treatment plant, solid waste treatment plant, animal shelters and so on. trips. It is thought that such activities and trips will contribute to both the knowledge level of the students and their positive attitude towards them.
- As in the case of Ankara in the Ankara Environmental Booklet, each teacher can prepare worksheets and information brochures introducing the natural beauties of the region, national parks, forests, seas, rivers, animal shelters; organize activities such as writing, drawing and painting in accordance with the age level of the students.
- School and classroom cleaning, school environmental regulation, school management to participate in the decision-making process, according to the climatic and physical conditions of the geographic area of the school yard, planting various plants and taking care of can be provided to the students.
- The family can be informed and involved in the environmental education process.

Recommendations for families;

- Subjects of environmental education can be adapted to the agenda of the families and the importance of the environment for people can be mentioned.
- An activity like “A tree for each family member every year” can be planned for families.
- The child can be assigned to care for plants in the home or planting.
- Due to the climatic challenges of the region food can be provided to the street animals that cannot find food or water with or without children.
- Animal shelters can be visited with the child, shelter can be provided financially or pets can be taken.

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