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The Effects of Seed and Vegetative Planting Activities on the Environment Awareness of Children

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Abstract

The aim of the article is to explore the results of seed-vegetation planting activities on the development of landscape and environmental awareness of preschool children. The experimental class of the study contained 40 students who participated in seed and vegetation planting activities and the control group consisted of 40 students who participated planting activities only as observers. Therefore, the present study investigated the parent opinions in terms of the effects of planting activities on the development of preschool children. The research was realized with a total of 80 children and their parents and in two educational institutions in Trabzon Province, during the between 2017-2019 academic years. The reliability of the scale was analyzed via the internal consistency coefficient, Cronbach Alpha, which yielded a value of 0.923. Such findings indicate that the measurement tool was valid and reliable as a scale that determined the effects of planting activities on the development of landscape and natural environmental awareness of the children. The significance level was accepted as 0.05 and findings were evaluated accordingly. Furthermore, 25 items in the scale were asked to both groups. There existed no significant differences in 6 expressions ($p > 0.05$).

Keywords: Environmental education, Nature and environmental awareness, Pre-school education, Theory and practical education.

Tohum ve Bitki Faaliyetlerinin Çocuklarin Çevre Bilinçleri Üzerindeki Etkileri

Öz

Bu çalışmanın amacı, okul öncesi okullarda eğitim gören çocukların katıldığı tohum ekme, bitki dikme gibi faaliyetlerin, çocuklardaki peyzaj ve çevre bilincinin gelişimine etkilerini incelemektir. Araştırmada tohum ekme, bitki dikme gibi faaliyetlerini gerçekleştiren 40 kişilik deney grubu ve bu etkinlikleri sadece izleyerek katılan 40 kişilik kontrol grubu öğrencileri yer almıştır. Uygulama 3 hafta boyunca sürmüştür. Geliştirilen ölçek iki gruba da uygulanmıştır. Bu iki grup arasında peyzaj ve çevre bilinçleri gelişimi arasında anlamlı bir fark olup olmadığı tespit edilmeye çalışılmıştır. Bu amaç doğrultusunda, bu etkinliklerinin okul öncesi çocukların gelişimleri üzerindeki etkileri ile ilgili ebeveyn görüşlerinin incelenmiştir. Araştırma, 2017–2018 ve 2018-2019 eğitim ve öğretim yıllarının ikinci yarıyıllarında Trabzon İli Akçaabat İlçesi Söğütlü ve Yıldızlı Mahallelerindeki iki eğitim kurumunda 80 çocuk ve ebeveynleri ile yürütülmüştür. Annelerin çocuklarla ilgili görüşlerini belirlemek amacıyla anket formu kullanılmıştır. Ölçeğin güvenirlik analizlerinde Cronbach Alpha iç tutarlık katsayısı hesaplanmış ve 0,923 değeri bulunmuştur. Elde edilen bu bulgular, bu ölçme aracının çocukların peyzaj ve doğal çevre bilincinin gelişmesine etkilerini belirlemede geçerli ve güvenilir bir ölçek olduğunu göstermiştir. Istatistiki analizler yapılırken % 5anlamlılık seviyesine göre yapılmıştır. Ayrıca geliştirilen ölçekte 25 ifade her iki gruba sorgulanmış 6 ifade açısından anlamlı fark bulunmazken ($p>0.05$) geri kalan 19 ifade açısından her iki grup arasındaki fark ($p<0.05$) anlamlı çıkmıştır.

Anahtar Kelimeler: Çevre eğitimi, Doğa ve çevre bilinci, Okul öncesi eğitim, Teori ve uygulama

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1. Introduction

Montessori, an Italian educator, who is the architect of a hundred-year educational philosophy and who emphasized the significance of the preschool period stating that children naturally have an ability to learn, developed the idea of establishing schools with gardens, fields and animals and designated the benefits of such schools for children as follows:

- Observing the development of living beings: Once a child is given the responsibility to take care of a plant or animal, the child also monitors the development of these plants and animals. Such an awareness of responsibility increases the attention, aspiration and care towards plants and animals.
- Learning to be patient and accustomed to waiting: It takes time a quite while for a plant to germinate and develop into a flower or tree from the seed. During this period, the responsibility taken by the child contributes to the development of these personality traits.
- Feeling sympathy and trust towards the nature and living beings: Children, who feed, care, or be interested in such activities start to have love, sympathy and trust for these creatures.
- Developing a form of self-education and vision: Once a child learns that the life of a depends on the water given by him/her and an animal waits for the food he/she gives, the child begins to realize that he/she has a responsibility to other living beings. Furthermore, the child is expected to fulfil the above-mentioned responsibilities spontaneously, without the intervention of teachers, parents or adults, these activities contribute to the development of self-control (Akyüz, 1979; Almers, Askerlund, & Kjellström, 2018; Başal, 2005; Khan, Bell, McGeown, & Silveirinha de Oliveira, 2019; Khan, McGeown, & Islam, 2019; Loureiro & André Dal-Farra, 2018; Güngör et al., 2019).

Various variables influence the behavior of children towards their natural environment or landscape. Harvey (1989) investigated the correlation with one on either side the behavior of children towards the natural environment and their past experiences with plants at home and playgrounds and concluded that there was a positive correlation between the behavior and experiences. Harvey argued that learning environments that provide direct experiences with nature were essential for children, based on their learning habits in the natural environment (Castle, 1996; Cruz-Garcia, Caffi, Zans, & Sanchez-Choy, 2018; Malberg Dyg & Wistoft, 2018; Watkins, Teh, & Fernandez, 2019). Each natural element and phenomenon in nature that the child interact with were found to be effective in the development of relevant attitudes and behaviors (Ozburak, Batırbaygil, & Uzunoglu, 2018; Surbrook, 1997, Yılmaz et al., 2020). While the use of natural plant species is encouraged in other countries, the use of foreign domestic plants is increasing in our country (Corbacı et al., 2019). Therefore, encouraging the use of seeds of natural plant species is very important in terms of conservation and sustainability of genetic diversity as well as developing environmental awareness of children. (Ertekin & Çorbacı 2018).

Providing a natural environment education based on the early developmental characteristics of children might contribute to their cognitive development (questioning, discovery, etc.), while at the same time, it will enable them to improve favorable behaviors related to science education in pre-school period.

Given that nature is a significant research environment, children become capable of finding answers to their questions through exploring it. Consequently, it is possible to define nature as an open classroom that supports the cognitive and physical development of children (Dinçer, 2005; Vatansever Bayraktar and Fırat, 2020; Akyüz, 2020). For instance, seasonal differences allow children to observe the change in the living beings around them. It becomes possible to observe the changes that occur in leaves, trees, soil, water, etc. and discuss these changes in the classroom environment. Field trips could help children become familiar with different living spaces. Different plants that could be grown in the classroom and fish species in an aquarium can be compared. Methods such as outdoor classroom activities increase children's relationship in the environment while helping them to perceive life from a more biocentric point of view. Particularly, use of plants is less prone to ethical problems, therefore, it could contribute to the perception of natural environment and science concepts (Khan, McGeown, et al., 2019; Sass & Sullivan, 2019; Taşkın, 2005). Similarly, natural environment education provided in preschool could help children to understand their natural environment better and develop a positive attitude towards it (Erdem, 2018; Jansson, Mårtensson, & Gunnarsson, 2018; Ozburak et al., 2018; Smith, 2001).

The concept of natural environment education in preschool was first used by Jaus in 1982 (Russo, 2001). Several studies emphasized the significance of natural environment education in preschool for creating a positive attitude towards the natural environment (Omidvar et al., 2019; Tuuling and Ugaste, 2019; Lubomira, 2004; Palmer, 1995; Cohen and Horm 1993). Likewise, Horwitz (1996) indicated that interest in the natural environment and relation with nature began at early ages. Furthermore, studies emphasized that a positive attitude towards the natural

environment was shaped through formal education processes, and pre-school education was considered extremely significant in shaping relevant educational approaches (Taşkın, 2004).

Basile (2000) argued that preschool played a significant role in natural environment education and in shaping the attitudes and behaviors towards the natural environment. Basile conducted a study with 9-year-old students who participated in nature activities and reported that these students claimed that they had less knowledge about the natural environment compared to those who did not participate in similar activities. Thus, Basile argued that the participation of children in activities related to science and environment could have a positive effect on the perceived relationship between these two concepts (Basile, White, & Robinson, 2000).

Currently, the daily routines and the new lifestyles with unsustainable habits continuously and increasingly damage future generations' right to the life and lead to the destruction of the habitable world heritage (O'Gorman & Davis, 2013). Individuals, who receive environmental education, are expected to develop an environmental literacy, through the knowledge on the impact of human activities on the systems within the nature and the right attitudes and behaviors towards the environment (Teksöz, Şahin, & Ertepınar, 2010). Erten (2012) argued that the environmental knowledge of an individual could be understood from the multifaceted relationship between environmental knowledge, attitude and behavior levels.

Environmental awareness provided through environmental education could help to solve the majority of environmental problems (Karataş, 2011). It would be possible to develop the environmental awareness of individuals through environmental education, thus, the sensitivity towards the environment could increase, and a livable environment could be maintained (Figure 1). Environmental schooling is an multidisciplinary issue of study that goals to develope the awareness and knowledge of person on the artificial or natural environments they inhabit (Gülay & Önder, 2011; Gülay & Öznacar, 2010)

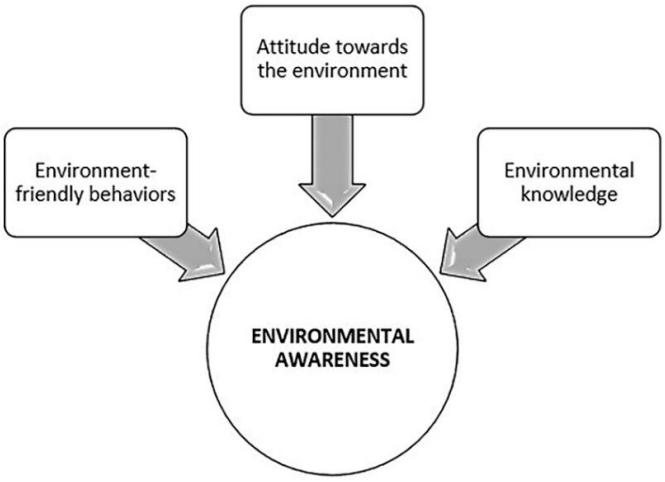

Figure 1. Environmental awareness and the attitude, knowledge and behaviors that constitute environmental awareness

Environmental education is highly significant to control and solve the increasing environmental problems and to nurture individuals towards being environmentally sensitive. Behavioral change is possible in a short time due to environmental education. In order to develop positive behaviors towards the environment, environmental knowledge should be improved through environmental education (Pooley & O'Connor, 2000). Environmental education does not only focus on delivering knowledge, but also focuses on the values, attitudes, ethics and actions. Therefore, environmental awareness includes emotional, behavioral and intellectual dimensions. Family, school, mass media and non-governmental organizations are important in the progress of environmental awareness (Selanik Ay, 2010). The individual initially receives environmental education from the family and then continues to learn during preschool and primary education. Environmental education practices at school constitute the basis for the students to become individuals, who have environmental awareness. Therefore, environmental education in primary education should be considered significant. It is acknowledged that children's environmental sensitivity improves during the primary school years, at the ages of 6 to 7. Environmental education should initially determine the knowledge, awareness and attitude of children and improve such characteristics. It is possible to state that as the individuals have more environmental knowledge, awareness and positive attitude, the environmental problems

would decrease. Given that children of the current era would become the grown-ups of the near future, that is highly essential to provide environmental education to children during preschool.

The present study, therefore, was intended to propose and test the idea that preschool children, engaged in activities such as seed planting or planting, benefit from these activities and develop awareness based on landscape and natural environment. Due to the current and rapid increase in the significance of natural environment, the "Protocol on Cooperation in the Discipline of Natural Environmental Education" was signed between the Ministry of Environment and the Ministry of National Education in Turkey and was promulgated on October 14, 1999 to "focus on applied natural environment education to develop natural environmental awareness in preschool and primary school age children", with the idea that starting natural environment education during preschool and continuing systematically and regularly in primary and secondary school would provide significant results (Kesicioğlu & Alisinanoğlu, 2009).

Environmental education is commonly investigated about 3 themes:

1. Education carried out in natural and ecological environment; It is an schooling approach in that children interact with nature and get knowledge through making and experiencing. Students are encouraged to improve more favorable attitudes towards their environment through connecting with their natural environment (sowing seeds, planting, cutting grass, feeding birds, picking fruit, watering plants, playing with mud, etc.).
2. Education on the natural environment; It is the education in which children learn about how natural events occur. It is the training process in which plants gain basic knowledge on how they grow.
3. Education for natural environment: It is the education approach that provides knowledge about protection of the environment and measures against the deteriorating balance in natural environment (National Curriculum Council, 1990).

2.Material and Method

This research was carried out to determine whether the environmental awareness of children developed as a result of activities related to plants and seeds and whether children participated in the greenhouse or the classroom environment and how these activities affected children's awareness in their natural environment.

2.1. Research Sample

80 students, who were between the ages of 5 and 6 and enrolled in two preschool institutions in Söğütlü and Yıldızlı neighborhoods of Akçaabat district of Trabzon in Turkey (Figure 2), participated the present study. 40 of these students were included in the test group and the remaining 40 students were included in the control group (Table 1).

Table 1. Study groups.

Study Groups	Female	Male	Total
Experimental group	20	20	40
Control group	21	19	40
Total	41	39	80

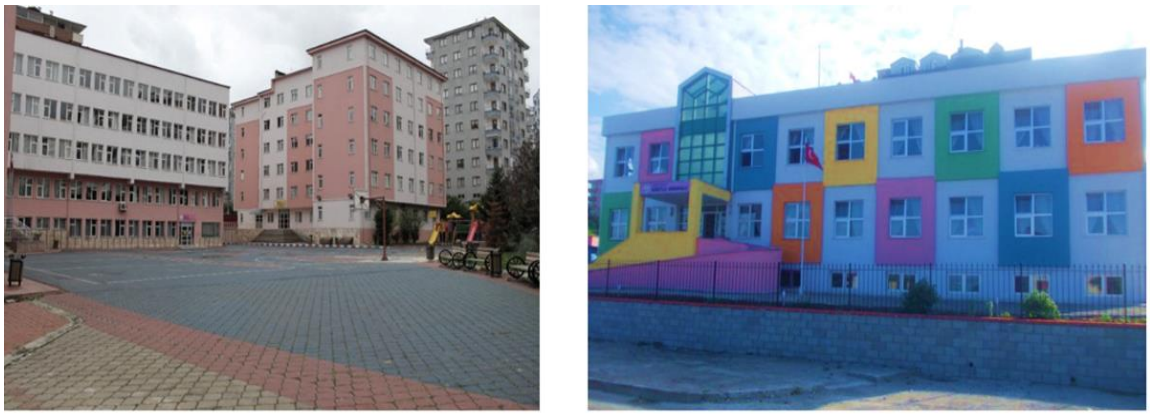

Figure 2. Study areas

2.2. Research Instruments and Procedures

The aim was to determine the difference between the children who actively participated the program prepared by the researcher and the children who participated only through observation (Figure 3, 4, 5).

Figure 3. First week program activities.

Figure 4. Second week program activities

Figure 5. Third week program activities

5-point Likert type scale was employed, where 5 was coded as strongly oppose, 4 as oppose, 3 as no idea, 2 as agree and 1 as strongly agree. The questionnaire was conducted with the mothers of children in the control and experimental groups. Questionnaire form:

Please evaluate the effects of activities such as planting and seeding, carried out at your child's school, garden and greenhouse, on your child within the context of following statements:

1. Improved the sense of protecting the landscape (plants) and the environment.
2. Helped to eliminate lack of knowledge and/or reinforce the knowledge on landscape (plants) and the environment.
3. Created interest and curiosity towards landscape (plants) and the environment.
4. Led the children to conduct research on landscape and environment.
5. Contributed to the social development of the children.
6. Contributed to the mental development of the children.
7. Especially contributed the skill of learning biology.
8. Helped the children to develop a relationship with the real world.
9. Increased the motivation of the children in courses based on environment.
10. Developed the communication skills of the children.

11. Allowed children to enjoy their time.
12. Delivered the children the habit of observation.
13. Contributed the visual learning in children.
14. Provided an awareness of acknowledging and protecting the environment for the children.
15. Taught the children the biological richness of Turkey.
16. Provided general culture for the children.
17. Taught the ecological benefits of the plants.
18. Contributed to the development of biological diversity.
19. Taught that plants brought beauty to the environment.
20. Taught that plants made their immediate environments beautiful.
21. Taught that plants provided pleasant smell through their scents in their immediate environments.
22. Taught that plant leaves could have different colors.
23. Taught that plant leaves could have different sizes and shapes.
24. Taught that flowers of the plants could have various colors, sizes and shapes.
25. Taught to love the plants and the environment more.

The datasets were gathered during the between of the 2017-2019 academic years. Descriptive statistical techniques (frequency, percentage analysis) and one-way ANOVA analysis were performed via the SPSS 11.5 software to examine the datum.

3.Results

Initially, the results of the preliminary questionnaire, which was intended to determine the previous experiences of children in the progress of their natural environmental awareness, were analyzed and presented in Figure 6. Based on Figure 6, it is possible to observe that 13 participants responded with a "yes" to the first statement, 58 participants responded with a "yes" to the third statement, 17 participants responded with a "yes" to the fourth statement and 46 participants responded with a "yes" to the fifth statement (Figure 6). All parents responded with a "no" to the second statement (N = 80). Except for the third and fifth statements, the parents mostly responded the statements with a "yes".

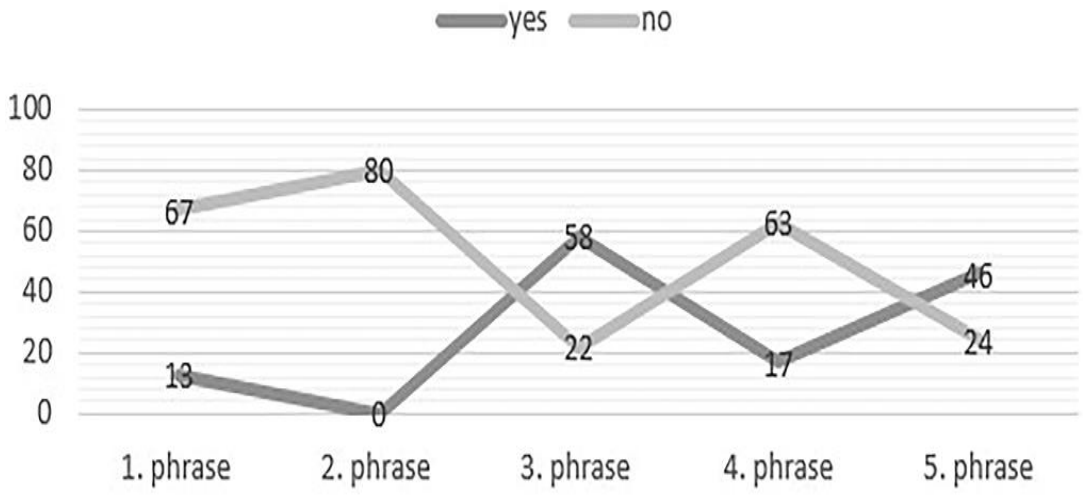

Figure 6. Findings of the preliminary questionnaire (N).

Following the preliminary questionnaire, the program, which aimed to raise awareness of the natural environment and the landscape (plants) and was prepared by the researcher, was implemented to the children in the test and control groups. Subsequent to the implementation of the program, the mothers of the students, who participated the test and control groups in the present study, were submitted the 25-item scale and their responses were separately analyzed and graphically represented (Figure 7). First, an availability and reliability research of the scale was carried out to test the reliability of the scale. Cronbach's Alpha coefficient was obtained as 0.923 for the statements, i.e. the scale was found to be highly reliable. Each expression was separately examined in the following phase of the analysis. Table 2 presents the arithmetic averages of control and experimental groups and the number of participants that responded to the five levels of the scale for the statements (Table 2).

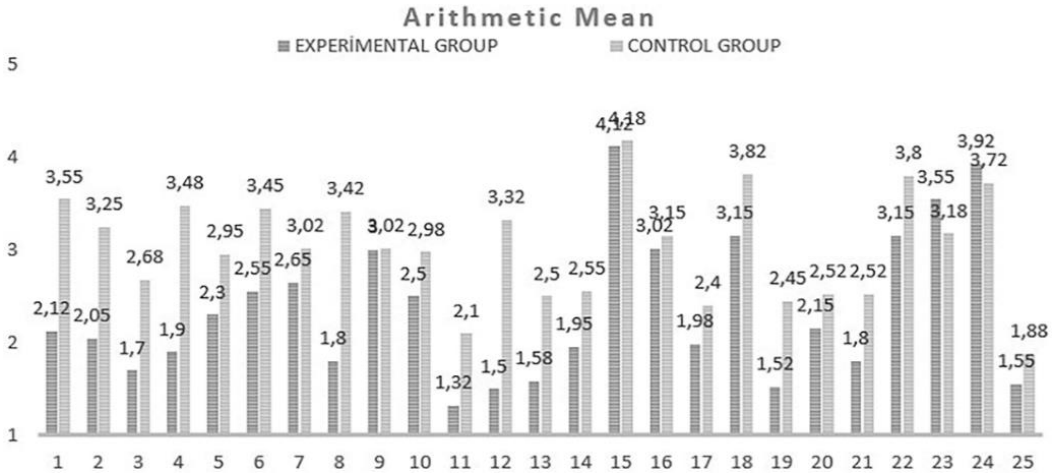

Figure 7. Findings based on the 25-item scale (N).

The analysis of the data indicated that the arithmetic average of the responses received from the test and the control groups were 2.12 and 3.55, respectively, for the statement that environmental activities prepared by the researcher "improved the sense of protecting the landscape (plants) and the environment" for the actively participating and observing students. In other words, the children who participated the experimental group became more protective towards their environment due to these activities, however, no such effect was detected in the children participating the control group.

The responses to the second statement, that the activities "helped to eliminate lack of knowledge and/or reinforce the knowledge on landscape (plants) and the environment" provided an arithmetic mean of 2.05 for the test group and 3.25 for the control group. In other words, the lack of knowledge of the students in the test group was eliminated due to the program (2.05), and no such effect was observed in the control group (3.25). The activities created curiosity towards the natural environment, landscape and plants, higher in the test group (1.70) and lower in the control group (2.68).

The fourth statement that these activities "led the children to conduct research on landscape and environment" provided a mean value of 1.9 for the children in the experimental group and 3.48 for the children in the control group. That is to say, that the children in the experimental group attempted to conduct research in the natural environment due to these activities, yet, the students in the control group did not exhibit like attempts. The mean values for the students in the test and the control groups were 2.55 and 3.45, respectively, for the sixth statement that these activities "contributed to the mental development of the children." In other words, the parents of the students in the control group did not have any idea about such mental development, however, the parents of the students in the test group experienced certain improvement yet the level was not high.

The seventh statement that the conducted activities "especially contributed the skill of learning biology" was responded with an average value of 3.05 and 2.65 for the control and experimental groups, respectively. The participants responded the ninth statement that the activities "increased the motivation of the children in courses based on environment" with an average value of 3.02 for the control group and 3.0 for the test group. Given the ninth statement, the parents were undecided whether the activity program was a source of motivation for both groups.

The tenth statement that these activities "developed the communication skills of the children" provided an average value of 2.50 for the test group and 2.98 for the control group. The skills of the experimental group were partly increased however no decision could be reached for the control group. Responses from both the experiment and the control group to the eleventh statement indicated that the activities "allowed children to enjoy their time." It was found that the experimental group enjoyed more with an average value of 1.42 and the control group expressed enjoying their time with a value of 2.10.

The experimental group agreed-strongly agreed with the twelfth statement that the activities "delivered the children the habit of observation" with an average value of 1.5, whereas the parents of the studenst in the control group indicated that they had no idea towards this statement. The thirteen statement was also strongly agreed by the experimental group (1.58) the parents of the children in the control group agreed such opinion (2.50). The experimental group strongly agreed with the fourteen statement (1.95) and the parents of the children in the control

group agreed the opinion (2.55). In other words, both groups confirmed that these activities provided and awareness towards the protection of the natural environment.

Both groups disagreed with the fifteenth statement, which claimed that these activities "taught the children the biological richness of Turkey," with an average value of 4.18 for the control group and 4.12 for the test group. The responses to the sixteenth statement were determined as an arithmetic mean value of 3.02 for the control group and 3.15 for the test group. In other words, parents indicated no idea or were undecided based on the statement that these activities "provided general culture for the children."

The children in the experimental group responded to the seventeenth statement, which claimed that the activities "taught the ecological benefits of the plants," with an arithmetic mean of 1.98, whereas those in the control group responded with a mean value of 2.40. It was determined that these activities taught both groups that plants were ecologically beneficial for the environment. The control group responded the eighteenth statement, which argued that the actions "support to the improvement of biological diversity," with an arithmetic mean value of 3.82 and the experimental group responded with a value of 3.15. The parents of the children in both groups indicated no idea or were undecided.

The experimental group responded the nineteenth statement, which claimed that the activities "taught that plants brought beauty to the environment," with an arithmetic mean value of 1.52 and the control group responded with a value of 2.45. In other words, on behalf of both groups, the parents expressed their opinions as strongly agree and agree. The parents of the children, who responded the scale on behalf of both groups, agreed the twentieth statement that the activities "taught that plants made their immediate environments beautiful." The arithmetic mean value for the responses to the twentieth statement was 2.52 for the control group and 2.15 for the test group.

The parents of the children in the experimental group predominantly responded the twenty-first statement that the activities "taught that plants provided pleasant smell through their scents in their immediate environments" with strongly agree and the parents of the children in the control group predominantly responded with agree. The participants of the both groups had no idea or were undecided about the twenty-second statement that these activities "taught the children that plant leaves could have different colors." It was found that the arithmetic mean value for the twenty-second statement was 3.15 for the test group and 3.80 for the control group.

The twenty-third statement, which claimed that these activities "taught that plant leaves could have different sizes and shapes," provided a similar average response with the twenty-second statement for both groups. Both groups either had no idea or were undecided. It was found that the arithmetic mean value for the twenty-third statement was 3.55 for the test group and 3.18 for the control group. The twenty-fourth statement also delivered similar results with the former two statements. The parents of the children in the experiment group responded the twenty-fifth statement that the activities "taught to love the plants and the environment more" with an arithmetic mean value of 1.55 and the parents of the students in the control group responded with an arithmetic mean of 1.88. In other words, the children started to love the plants and the environment more due to the applied activities.

Table 2. Arithmetic mean of the responses for control and experimental groups.

Statement		N	Mean	5	4	3	2	1
1.	**Experimental group**	40	2,12	0	4	8	17	11
	Control group	40	3,55	7	15	13	3	2
2.	**Experimental group**	40	2,05	1	4	7	12	16
	Control group	40	3,25	3	12	17	8	0
3.	**Experimental group**	40	1,70	1	2	3	12	22
	Control group	40	2,68	2	4	14	19	1
4.	**Experimental group**	40	1,90	1	4	5	10	20
	Control group	40	3,48	4	17	13	6	0

5.	**Experimental group**	40	2,30	0	1	15	19	5
	Control group	40	2,95	2	5	23	9	1
6.	**Experimental group**	40	2,55	2	2	15	18	3
	Control group	40	3,45	6	8	24	2	0
7.	**Experimental group**	40	2,65	0	4	21	12	3
	Control group	40	3,02	0	7	27	6	0
8.	**Experimental group**	40	1,80	0	2	2	22	14
	Control group	40	3,42	0	10	16	7	0
9.	**Experimental group**	40	3,0	4	6	16	14	0
	Control group	40	3,02	1	10	18	11	0
10.	**Experimental group**	40	2,50	0	5	15	15	5
	Control group	40	2,98	4	8	14	11	3
11.	**Experimental group**	40	1,32	0	0	1	11	28
	Control group	40	2,10	0	0	9	26	5
12.	**Experimental group**	40	1,5	0	0	0	20	20
	Control group	40	3,32	0	16	22	1	1
13.	**Experimental group**	40	1,58	0	0	1	21	18
	Control group	40	2,50	0	4	12	24	0
14.	**Experimental group**	40	1,95	0	0	5	28	7
	Control group	40	2,55	0	5	12	23	0
15.	**Experimental group**	40	4,12	7	32	0	1	0
	Control group	40	4,18	9	29	2	0	0
16.	**Experimental group**	40	3,02	0	6	18	14	2
	Control group	40	3,15	2	12	16	10	0
17.	**Experimental group**	40	1,98	0	2	8	17	13
	Control group	40	2,40	1	3	7	29	0
18.	**Experimental group**	40	3,15	1	11	22	5	1
	Control group	40	3,82	11	13	14	2	0
19.	**Experimental group**	40	1,52	0	0	1	19	20
	Control group	40	2,45	0	6	11	18	5

20.	**Experimental group**	40	2,15	3	2	9	20	6
	Control group	40	2,52	3	15	16	6	0
21.	**Experimental group**	40	1,80	0	0	8	16	16
	Control group	40	2,52	5	5	2	22	6
22.	**Experimental group**	40	3,15	3	4	29	4	0
	Control group	40	3,80	1	0	13	18	8
23.	**Experimental group**	40	3,55	1	7	13	7	12
	Control group	40	3,18	1	15	8	8	8
24.	**Experimental group**	40	3,92	0	5	14	0	21
	Control group	40	3,72	2	7	8	6	17
25.	**Experimental group**	40	1,55	20	18	2	0	0
	Control group	40	1,88	21	6	10	3	0

Percentage and frequency arithmetic means were calculated for each statement in the scale for both groups and were presented in Table 3 along with the findings of variance analysis. It was investigated whether there was a difference between the development of landscape and natural environment awareness of the children in the control (N: 40) and experimental groups (N: 40), subsequent to the activities organized by the researcher and carried out with two classes in two schools. Table 3 indicates that the p value is larger than 0,05 for the statements 9, 15, 16, 23, 24 and 25 and is smaller than 0,05 for the remaining statements. Therefore, there wasn't statistically significant difference between the control and experimental groups based on the the statements 9, 15, 16, 23, 24 and 25. However, the remaining statements provided statistically significant differences between the two groups. The F values presented in Table 3 indicated that the difference was larger for the 11th and 12th statements. Following these statements, the difference decreased for the statements 8,4,13,1,19,2,6,3,20,14,5,22,18,21,7,17 and 10, respectively (Table 3). In other words, the children in the experimental group had experience in these activities, had more fun and acquired the habit of observing, whereas the control group children, who only observed the activities, had less fun and did not acquire the habit of observing.

Table 3. Variance analysis.

		Sum of squares	**df**	**Mean square**	**F**	**Sig.**
1	Between groups	40,612	1	40,612	41,531	,000
	Within groups	76,275	78	,978		
	Total	116,887	79			
2	Between groups	28,800	1	28,800	29,023	,000
	Within groups	77,400	78	,992		
	Total	106,200	79			
3	Between groups	19,012	1	19,012	21,438	,000
	Within groups	69,175	78	,887		
	Total	88,188	79			
4	Between groups	49,613	1	49,613	48,631	,000
	Within groups	79,575	78	1,020		
	Total	129,188	79			
5	Between groups	8,450	1	8,450	14,235	,000
	Within groups	46,300	78	,594		
	Total	54,750	79			
6	Between groups	16,200	1	16,200	21,862	,000
	Within groups	57,800	78	,741		

	Total	74,000	79			
7	Between groups	2,812	1	2,812	6,081	,016
	Within groups	36,075	78	,462		
	Total	38,888	79			
8	Between groups	52,812	1	52,812	68,457	,000
	Within groups	60,175	78	,771		
	Total	112,987	79			
9	Between groups	,012	1	,012	,016	,900
	Within groups	60,975	78	,782		
	Total	60,988	79			
10	Between groups	4,513	1	4,513	4,573	,036
	Within groups	76,975	78	,987		
	Total	81,488	79			
11	Between groups	12,013	1	12,013	158,676	,000
	Within groups	24,375	78	,312		
	Total	36,388	79			
12	Between groups	66,613	1	66,613	194,053	,000
	Within groups	26,775	78	,343		
	Total	93,388	79			
13	Between groups	17,112	1	17,112	44,829	,000
	Within groups	29,775	78	,382		
	Total	46,888	79			
14	Between groups	7,200	1	7,200	17,660	,000
	Within groups	31,800	78	,408		
	Total	39,800	79			
15	Between groups	,050	1	0,50	,194	,661
	Within groups	20,150	78	,258		
	Total	20,200	79			
16	Between groups	2,112	1	2,112	2,621	,110
	Within groups	62,875	78	,806		
	Total	64,987	79			
17	Between groups	3,612	1	3,612	5,571	,021
	Within groups	50,575	78	,648		
	Total	54,187	79			
18	Between groups	9,113	1	9,113	12,953	,001
	Within groups	54,875	78	,704		
	Total	63,988	79			
19	Between groups	17,113	1	17,113	30,422	,000
	Within groups	43,875	78	,562		
	Total	60,988	79			
20	Between groups	19,013	1	19,013	20,894	,000
	Within groups	70,975	78	,910		
	Total	89,988	79			
21	Between groups	10,512	1	10,512	9,718	,003
	Within groups	84,375	78	1,082		
	Total	94,887	79			
22	Between groups	8,450	1	8,450	13,876	,000
	Within groups	47,500	78	,609		
	Total	55,950	79			
23	Between groups	2,812	1	2,812	1,964	,165
	Within groups	111,675	78	1,432		
	Total	114,487	79			
24	Between groups	,800	1	,800	,508	,478
	Within groups	122,750	78	1,574		
	Total	123,550	79			
25	Between groups	2,112	1	2,112	2,928	,091
	Within groups	56,275	78	,721		
	Total	58,387	79			

4. Discussion and Conclusion

The most significant results of the present research was that the activities such as seed planting, grass cutting, pruning, observing the plant, etc., which could be carried out within the formal curriculum of preschool education, were highly important for the development of environmental awareness, especially towards the natural environment, landscape and the plants that constitute the landscape. Essentially, the control and experimental groups formed within the selected sample group indicated that awareness towards the natural environment developed further once the children directly participated and performed as a part of the activities and developed less once the children only observed these activities, although several positive behaviors were noticed.

Another significant issue is to understand whether the children, who constitute the sample of the present research, previously participated in such activities. Such evaluation was planned inside of the purpose of the present research in order to obtain more reliable results. Given that, it would be possible to indicate the positive attitudes and behaviors on children developed due to the program applied in the present study, only through both groups, who did not have any prior experience with similar activities. In other words, the difference between the two groups was clearer, and was completely dependent on the activities provided by the present study.

The hypotheses, "preschool children, who are provided the opportunity to plan and follow activities such as seed planting and observing them, and to be further engaged with activities such as irrigation, pruning, wiping the leaves etc., these children are expected to exhibit positive behaviors towards the natural environment, especially towards one of the most important components of the landscape, plants," was tested and verified within the present study. Another assumption indicated the difference between being an active participant or an observer, and this assumption was confirmed as well. No significant difference was determined in 6 statements of the 25-item scale, and the remaining 19 items provided significant difference between groups.

Specifically, the statements that yielded no significant difference were that these activities "increased the motivation of the children in courses based on environment", "taught the children the biological richness of Turkey", "provided general culture for the children", "taught that plant leaves could have different sizes and shapes", "taught that flowers of the plants could have various colors, sizes and shapes" and "taught to love the plants and the environment more". Once the statement that these activities "increased the motivation of the children in courses based on environment" was examined it was considered that no significant difference was due to the lack of such courses in preschool education institutions and the unawareness of parents based on the environment. Both groups disagreed with the statement that these activities "taught the children the biological richness of Turkey", since the program was based on raising awareness towards plants rather than providing information about different genera and species. It was also discovered that there was no statistically significant difference for the statement that the activities "provided general culture for the children" and it was considered that the result was due to the parents having no idea on the issue.

There exist several studies in literature focusing on environmental awareness, measuring the attitude towards the environment, environmental knowledge and behavior. Several were summarized as follows: Önder and Kocaeren (2015) determined the environmental attitudes of primary school students with the assumption towards the environment vary by gender. Önder and Kocaeren (2015) studied effects of variables such as gender, presence of a garden at home, presence of pets at home, presence of clubs at school, participation to club activities at school, participation to environmental or scout camps and sapling planting on the environmental attitude of students in primary school. Environmental Attitude Scale (EAS) improved by Atasoy (2005) was used as datum collection tool. To summarize of the study, it was found that the environmental attitudes of female students were more positive compared to the male students, however there were no statistically significant differences based on presence of a garden at home, presence of a pet at home and presence of a club at school. It was concluded that the students attending the club activities had higher attitudes towards the environment than those who did not participate in club activities, participation to environmental or scout camps did not result with a statistically significant difference and there was no difference between the students who planted saplings and who did not.

Sağır et al. conducted a study in 2008 and analyzed the environmental knowledge and attitudes of seventh grade students in primary schools based on several variables. Environmental knowledge and attitude scale developed by Leeming et al. (1995) was used by Sağır et al. (2008). No significant difference was determined for environmental attitudes based on the variables of class level and gender. There was a significant difference in environmental knowledge based on class level, however there was no significant difference based on gender. Students' environmental knowledge and attitudes differed significantly based on their schools. It was found that the level of participation in environmental activities was highly low and the skill of identifying and proposing solutions for the environmental problems in their habitation was inadequate. No significant difference was found in the environmental knowledge and attitudes of the students based on the education level of their parents.

In another study, Erökten (2015) compared the environmental awareness among students based on regions. Although the findings of the study indicated certain differences in the environmental awareness of students in Aegean, Central Anatolia, Southeastern Anatolia and Marmara Regions, no differences were established due to the one-way analysis of variance.

The acquisition of environmental awareness for children depends on the awareness of the families. Due to the lack of environmental awareness in families in Turkey, environmental awareness can only be offered to children through primary education. Yet, studies conducted in Turkey indicated that preschool, primary and secondary school curricula were not adequate for the development of environmental awareness in students (Kiziroğlu, 2000; Külköylüoğlu, 2000; Şimşek, 2001; Ünal & Dımışkı, 1999). Esa (2010) and Dalelo (2009) emphasized that teacher was the most effective person in creating environmental awareness. Education programs should focus on cultivating students who are sensitive to the environment and exhibit positive behaviors rather than solely providing information on the environment (Demirkaya, 2006). It would be more effective to perform activities to acknowledge living and non-living beings though the environmental education, where students would be in direct contact with nature, and understanding the relationship and integrity in nature would be more effective in fostering environmental awareness (Özdemir, 2010). Education programs available in Turkey only cover specific subjects on environment through different units in Life Science, Social Studies and Science and Technology courses. These courses do not address environmental education or sustainability as a separate topic of study. The common objective of the courses focuses on recognizing and understanding the environment, keeping the environment clean, the relationship between the environment and being responsible for the environment (Tanrıverdi, 2009).

In 2009, Kesicioğlu and Alisinanoğlu conducted the study, "Investigation of the environmental attitudes of children between the age of 60 and 72 months based on various variables," to reveal the attitude of pre-school students towards the environment. It was found that the environmental attitudes of student didn't exhibit significant differences based on the place of residence, education level of the mother, education level of the father, monthly income of the family, profession of the mother and the profession of the father, yet there was a significant difference based on gender.

Vural and Yılmaz (2016) asserted that acquisition of a positive attitude and consequently exhibiting attitudes and behaviors that are useful for the nature and environment were the success indicators of environmental education. Vural and Yılmaz (2016) concluded that the share of knowledge in students' positive behaviors was 19% and it was determined that there were different factors that affected the acquisition of the behavior. Initially, they claimed that it was unrealistic to expect positive attitudes from students once they were not provided with suitable environments, i.e. buildings and garden. Therefore, it was essential to make arrangements that refer to environmental awareness in the school buildings, classrooms and gardens. It was emphasized that a set of environmentally sensitive regulations should be adopted, for instance, the classrooms should be equipped by recycling bins, awareness materials such as posters, brochures and slogans supported by cartoon characters should be included in appropriate environments within the school, healthy products and materials should be used in the school, waste of paper should be prevented and measures should be taken for a conscious consumption of natural resources such as electricity and water. Furthermore, it was suggested that arrangements should be made in the school yard to conduced to the environmental and nature awareness of the children. Other suggestions included application gardens, small greenhouses, bird houses, poultry houses, plant growing cases. In addition, the theoretical knowledge provided in the school should be supported through various activities. Examples of such activities include planting trees, caring, observing the environment, visiting parks, gardens and natural areas with the teachers and nature camps. Furthermore, clubs with themes of environmental awareness should be active in schools and students should be encouraged for participation through various rewards. above-mentioned arrangements, which should be made in the school or the garden, are valid suggestions for the present study as well, regarding the development of children's natural environment and landscape awareness and due to the determined impact of the environmental program developed within the goal of the present research. Outside the school, parents should be in certain effort to engage their children in activities that are expected to raise their awareness on the environment and landscape and endorse their participation in such activities. Hence, children would be able to exhibit positive attitudes towards the natural environment, landscape and plants.

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