

# Examination of Environment Protection Awareness Levels of Pre-Schoolers in Turkey

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## **Abstract**

In this study, nursery school students were trained on “recycling of solid wastes” to develop their environment protection awareness. The study was designed with a pre-test post-test experimental model with a control group, which is one of the experimental study paradigms. The study involved 6-year old children attending two different nursery schools in Konya city center during 2009-2010 education year in Turkey. One of the two schools is located in a high socio-economic region and the other in a low socio-economic region. The sample group is composed of 120 students of which 60 students in the experimental group come from two classes in one school, and the other 60 students from two classes in the other school. In the analysis of the data, pre-test and post-test average scores of the students on the Recycling Scale and standard deviation of their distributions were calculated, and t-test was administrated to see if the difference is significant. The experimental group was instructed for 5 weeks with various simple environmental protection methods. After the instruction period, it was determined that the students in the experimental group outscored the students in the control group on the post-test. Thus, it was concluded that the instruction given was effective. Besides, it was found that recycling awareness level of students who received environmental education varied according to their socio-economic levels. Students from the school located in high socio-economic region were found to be more successful.

## **Key Words**

Pre-school children, nursery school students, environmental education, recycling of solid wastes, recycling scale, environmental protection values

## Introduction

Environmental pollution is a growing problem in our country and all over the world. There are not only increasing consumption of natural resources by a growing population, but also our modern technology based lifestyle causes much destruction and pollution of the environment. There are of course many sources of pollution. There are also many means of curbing this global menace, but the central as well as the most important first step is a good environmental education. Although municipalities and non-governmental organizations often engage in consciousness raising activities to promote recycling and the topic is taught in environmental courses at schools, many people still drop litter on the streets and continue to pollute nature when they go trekking or go on a picnic.

Since it takes time to form habits, for older people it is difficult to develop and sustain environmentally responsible behaviors. Therefore, environmental education should start in the pre-school period when the brain develops fast and when the learning potential is highest. With education provided in the early years of life, individuals can develop positive attitudes and value judgments towards nature which can then translate into responsible behaviors.

Promoting environmental education in early childhood has many advantages: (1) It is easy to provide a link between the community and the education setting because pre-schools work extremely closely with parents and other community workers. (2) As pre-school teachers are often already involved in projects related to environmental issues including recycling, composting and gardening: They are likely to be receptive to other environmental issues, such as further reducing energy usage, and water conservation. (3) The pre-school environment places emphasis on co-operative learning and is an excellent basis for future studies about the environment that require sharing, co-operating and communicating (Russo, 2001: 35).

The aim of this study has been to determine how an environmental education with the aim of teaching the reason and means of recycling could affect the environmental attitude of six-year-old pre-schoolers. The following hypotheses were developed to realize this general aim.

- Environmental education on solid wastes increases recycling awareness in six-year-old children.
- Environmental education with regard to recycling of solid wastes affects six-year-olds' recycling awareness at different levels depending on the socio-economic environment of their school.

Before we describe the method, the sample of pre-schoolers, and our findings, we will discuss why we have chosen to focus our study on the importance of recycling education for pre-schoolers.

### The Importance of an Education on Recycling

Culturally, childhood is often understood as a time of innocence which can mean that issues such as ecological sustainability are considered too problematic for early childhood practice. But, ecological sustainability involved thinking and talking about global issues, such as how easy it is to consume without considering the cost to others. In this context teachers, parents and children began to talk about plastic in relation to increased landfill, pollution of the oceans, use of fossil fuels, production and recycling of plastic in many countries (Duhn, 2012: 26).

According to Davis (1998: 118, 119) environmental education involves three broad but overlapping approaches – education in, about, and for the environment. The first, which quality early childhood programs have always aimed to do, provides for direct experiences with environments and seeks to

develop positive feelings and attitudes toward nature and natural elements. Providing opportunities for exploration in the outdoors; playing with water, sand, and mud; collecting fallen leaves; creating habitats for birds and lizards; and gardening are all foundational practices for building responsive and earth-nurturing attitudes. Education about the environment encourages learners to understand how natural systems work, to appreciate their complexity and to understand how these and human systems interact. While recycling, composting and keeping earthworms are sound practices from which to build a worthwhile environmental education program, education about the environment requires understanding of the ecological principles that underpin these processes. Children need to understand the concepts associated with the water cycle, the oxygen cycle, recycling matter, how plants grow, the effect of detergents in streams, the importance of clean water for human health, to name a few. Education for the environment adds a more overtly political dimension that is concerned with social critique and social action for change. Education for the environment requires teachers who are environmental advocates; who understand the long-term implications of unsustainable actions; who help children to act collaboratively to be caretakers of each other and protectors of the earth; who actively help children and families resist a focus on consumption and possessions. Education for the environment requires empathy toward people and nature, knowledge about social and ecological processes and commitment to action.

Similarly in pre-school education institutions, environmental education is to be given in stages. First, the child should be taught to develop the feeling of acceptance and understanding of being a part of the environment. In the next stage, feelings of responsibility will accompany the feeling of acceptance and s/he is directed to behaviors to protect the environment. These behaviors include keeping his/her room tidy by picking up his/her toys, keeping the house clean, helping to tidy up the materials after an activity at nursery school (İleri, 1998: 4; Mert, 2006: 12). The preceding two steps have always been part of childhood education to maintain order at home and school.

The next step directly relates to environmental education. It focuses on realizing three general targets that will shape his/her environmental attitude in the future. These can be expressed as 3R rules: "reduce", "reuse" and "recycle". Thus, children understand that waste materials are not actually garbage and most of them can be reused in various ways. They will understand that they are not only protecting natural sources but also saving money (Coronato, 2008: 62; Mert, 2006: 12). In the next stages, the aim is to make the children learn how natural systems work, their relations to human life, and how they can protect nature. For example, children are to be taught basic ecological principles about saving water, oxygen cycle, recycling, how plants grow, and the importance of fresh water sources for human health. However, the learning about the importance of recycling that inculcates the need to prevent waste is an essential first step of learning about environmental protection.

In pre-school educational institutions, there are various opportunities to carry out activities for environmental education. However, a special effort is to be made to teach environment protection concepts. For example, Palmer (1995) examined the level of 168 children aged between 4 and 6 years in terms of understanding and misunderstanding concepts about waste materials. As a result of the study, it was found that six-year-old children were the most knowledgeable about the environment among the other age groups in the study but very few of them could explain why materials are recycled.

## Method

### Study Model

Test model has been used while conducting the study. Pretest and posttest models were used with the experiment group, to which an education about recycling the rigid wastes was given, and the control group to which no such education was given.

### Study Group

Six-year-old students from Şehit Kubilay Kindergarten representing high socioeconomic level in Meram County of Konya Province of Turkey and six-year-old students from Vesile Sağ Ergun Kindergarten representing a lower socioeconomic level in Selçuklu County of Konya have participated in this study. Both schools have classrooms of 30 people for six year age group and all students in these classrooms were included to this study. For this reason, it was not necessary to allocate a separate classroom for education practices. 120 students formed the sample group; experimental group of 60 people formed of 30 students from each school and control group of 60 people formed the same way. 51.7% of the students were male whereas 48.3% of them were female (Table 1).

Table 1. Test design

GROUPS			TEST DESIGN			
	Socioeconomic Level	Class	Number of Students	Assessment Scale	General Procedure	Assessment Scale
Experimental Group	Low SED	age 6	30	Pretest	The group to which education was provided face to face	Posttest
	High SED	age 6	30			
Control Group	Low SED	age 6	30	Pretest	The group to which no education was given	Posttest
	High SED	age 6	30			

The study has been conducted with the age group of six-year-old children not only because they are pre-schoolers but also because their age is closer to age range (7-11) that Piaget found to be the concrete operation period when children learn to apply a perceptual knowledge in a concrete form in their daily lives. Therefore, perceptual thinking structure will rather change in to symbolic thoughts. The child can make generalization from personal experience. He has the structure of thinking more logically and he has conceptual knowledge (John, 199: 184).

Pretest results of "Recycling Scale" given as pretest at the beginning of experimental procedure and as posttest at the end of experimental procedure were taken into consideration in order to determine whether the study groups were equal or not in terms of determined variants. Analyses results were presented below:

Table 2. Comparing pretest knowledge points taken by experiment and control groups with t test in independent groups (n=120)

	<i>GROUPS</i>	<i>n</i>	$\bar{X}$	<i>S<sub>x</sub></i>	<i>t</i>	<i>p</i>
Pretest	Experimental Group	60	0.31 ± 0.02	0.18	1.048	0.297
	Control Group	60	0.27 ± 0.02	0.18		

\*p&lt;0.05

t test was made in order to match the study groups in terms of pretest points. It has been seen that there is no significant difference ( $p>0.05$ ) between pretest point taken by students in experiment ( $\bar{X}= 0.31$ ) and control ( $\bar{X}= 0.27$ ) groups from "Recycling Scale". Therefore, it can be said that students in experiment and control groups started the study with similar knowledge.

### Data Collection Tool

"Recycling Scale" on a website named "Guide for Recycling", which has been established for children in England, has been used in order to measure knowledge level of students regarding recycling of rigid wastes (Guide for Recycle, 2003). While using the scale it has been asked to students whether they will throw each of 17 items, the pictures of which were shown to them (used bulb, used t-shirts, tin boxes, cardboard juice box, broken glass, plastic bottle, glass jar, newspapers, books, old chairs, banana peels, bones, used toothpaste, tin can, cardboard box, used envelopes, plastic bottles) into recycling box or organic trash (kitchen trash) or give them to a person in need. The answered that are given have been assessed by marking true answers as "1 point" and wrong answers as "0 point". The scale has been applied to the students in experiment group and control group twice, once before the education and once after the education.

The scale has been applied to 60 other students in kindergarten in order to determine the reliability of "the Scale for Recycling" At the end of the application, reliability coefficient of the scale for rigid waste recycling, which is formed of 17 articles, has been calculated as Alpha = 0.721. This value has shown that the scale is reliable enough.

### Environmental Education Works Realized in Experimental Group

Education for recycling of rigid wastes have been conducted for three hours a week corresponding to a total of 15 hours in 5 weeks in the second term of 2009-2010 educational year between the dates of March 1st 2010 and April 2nd 2010. The education has been conducted by the students in Department of Preschool Education, Selcuk University. In order to improve children's values regarding environmental protection, "rigid waste" and "recycling" concepts, the importance of recycling and how recycling could be done was emphasized during the education. Different techniques such as reading storybooks with pictures, telling stories, making children watch cartoons, having them make drama practices, working with wastes and forming an organic trash (compost) in the school garden have been used during the education.

Firstly, by using the storybook named "Nature's Recyclers" (Gomoll, 2009), they were told how lichens, fungi, bugs and earthworms turn dead plants and animals into food for new plants and animals. However, it was explained that people prevent this recycling from happening because of the garbage they leave behind in the environment. Organic trash (composite) formation works were started in the school garden the same day in order to make students be able to observe how nature's recycling process functions. An organic trash can, some soil, and food wastes were obtained from

the insertion's kitchen and some earthworms were used for that. This activity was monitored with the students regularly during the education process. A used glass bottle, an aluminum box, a plastic detergent bottle and some paper were brought to the classroom for the next activity and it was explained that these should not be mixed with other trash and must be stored somewhere else. It was explained with pictures how each of these items are taken from the factory containers and what kind of processes they are subjected to and what kind of products are obtained from them (Backer, 1998: 7; Environmental Education for Kids, 1998; Guide for Recycle, 2003; IEPP, 1994: 85-94; Peia, 2008). After that a recycling trashcan was made with colored cardboards and pasteboards in the classroom in order to make the students gain the habit of separating the trash from their resources. On another day, a carton telling about "The story of recycling", which was previously translated into and dubbed in Turkish, was shown to the students (Environmental Education for Kids, 1998: <http://dnr.wi.gov/org/caer/ce/eeek/cool/videoclips.htm>). On the other days, six stories explaining the benefits of consuming as it is required, preferring reusable materials (cloth towel, plastic storage box etc.) instead of disposable materials (towels, napkins and paper dishes etc), making the items they were not using being reused by giving them to people in need and separating the trash from its resources were told to the students. After the stories, students performed short dramas to strengthen the subject that was learned or they were encouraged in some artistic activities.

Only pretest and posttest were applied to the control group and no education regarding the recycling of rigid wastes were given to this group.

### **Analysis of Data**

A "t test in independent groups" was applied in order to determine if the knowledge of students regarding the recycling of rigid wastes changed depending on whether they got the relevant education or not and on the socioeconomic environment that the school was in. A "t test in dependent groups" was used while comparing the pretest and posttest results in the group.

### **Findings**

The findings obtained by analyzing the data collected with the aim of testing the hypotheses are given in this section.

#### **Findings Regarding the First Hypothesis**

First Hypothesis of the study was "Environmental education about recycling the rigid wastes improves the consciousness about recycling in six-year-old children." It was tested whether recycling the consciousness of the student participating in the study in the experiment group were different at the end of the study. For this purpose, the pretest and posttest average points taken by the students in experiment and control group from Recycling Scale were compared and the findings regarding these comparisons were given below.

Table 3. Comparing pretest and posttest points taken by experiment and control groups within themselves with t test in dependent groups (n=120)

GROUPS		<i>N</i>	$\bar{X}$	<i>S<sub>x</sub></i>	<i>t</i>	<i>p</i>
Experiment Group	Pretest	60	0.31 ± 0.02	0.18	10.753	0.0001***
	Posttest	60	0.63 ± 0.02	0.17		
Control Group	Pretest	60	0.27 ± 0.02	0.18	1.503	0.138
	Posttest	60	0.33 ± 0.03	0.21		

\**p*<0.05      \*\**p*<0.01      \*\*\**p*<0.001

It is seen in the findings in Table 3 that there is an increase in posttest points ( $\bar{X}$  = 0.63) compared to the pretest points ( $\bar{X}$  = 0.31) the experiment group took from Recycling Scale. However, no significant difference was observed between the pretest points ( $\bar{X}$  = 0.27) and posttest points ( $\bar{X}$  = 0.33) that the control group students took from assessment scale as it is expected (*p*>0.05). The fact that no difference was observed in the knowledge level of the control group to which education was not given showed that the students in this group were not affected by a resource (family, friends, television etc.) during the study or they had no uncontrollable interactions inside the school with the students in the experiment group. This result was in favor of experiment group and showed the effectiveness of the education that was given and was kind of an answer to the solution stated at the beginning of the study.

Also the question of whether there was a difference between the posttest average points of the experiment and control group was explored in order to test how effective the environmental education that was provided to the experiment group during the study was. Analysis results of the groups' posttest average points were given in Table 4.

Table 4. Comparing posttest knowledge points taken by experiment and control groups with t test in independent groups (n=120)

GROUPS		<i>n</i>	$\bar{X}$	<i>S<sub>x</sub></i>	<i>t</i>	<i>p</i>
Posttest	Experimental Group	60	0.63 ± 0.02	0.17	8.702	0.0001***
	Control Group	60	0.33 ± 0.03	0.21		

\**p*<0.05      \*\**p*<0.01      \*\*\**p*<0.001

When posttest points of experiment ( $\bar{X}$  = 0.63) and control ( $\bar{X}$  = 0.33) groups are compared a statistically significant difference has been determined in favor of the experiment group (*p*<0.001). According to this result, it can be said that the education given in the experimental group was effective and it improved the conscious for recycling for the students (Table 4).

#### **Finding Regarding the Second Hypothesis**

The second hypothesis of the study was "Environmental education about recycling the rigid wastes affects the consciousness about recycling in six-year-old children differently according to socioeconomic environment".

For these purposes, pretest and post results taken from Recycling Scale by the students in Şehit Kubilay Kindergarten representing the lower socioeconomic level and the students in experimental group from Vesile Sağ Ergun Kindergarten were compared and the findings regarding these comparisons are given below.

Table 5. Comparison of the knowledge points experimental group students took from pretests and posttests according to the socioeconomic environment of their current school and the results of t test in independent groups (n=60)

GROUPS	n	PRETEST				POSTTEST			
		$\bar{X}$	S <sub>x</sub>	T	p	$\bar{X}$	S <sub>x</sub>	t	p
High SEL	30	0.39 ± 0.03	0.18	3726	0.0001***	0.75 ± 0.03	0.13	7.517	0.0001***
Low SEL	30	0.23 ± 0.03	0.15			0.51 ± 0.02	0.12		

\*p<0.05

\*\*p<0.01

\*\*\*p<0.001

According to the findings in Table 5 the students in the environmental school representing higher socioeconomic level had more knowledge both before ( $\bar{X}$ = 0.39;  $\bar{X}$ = 0.23) (p<0.001) and after ( $\bar{X}$ = 0.75;  $\bar{X}$ = 0.51) (p<0.001) relevant education was given when compared to the students in environmental school representing lower socioeconomic level. In this case, it can be said that experiences they had with their families and in their immediate environment affected the consciousness of children from the environmental school representing the higher socioeconomic level in terms of being more aware of recycling rigid wastes.

## Discussion

### The Result on the First Hypothesis and the Relevant Discussion

The first hypothesis of the study "Environmental education regarding recycling of rigid wastes will improve the recycling awareness of six-year-old children" was compared with pretest and posttest average points that the students took from Recycling Scale. While no statistically significant difference was observed between the pretest and posttest points of the control group, a statistically significant increase occurred in the pretest and posttest result of the experimental group. Therefore, it was concluded that the environmental education given to experimental group was effective and improved the awareness for recycling in the students. In an experimental study made by Özdemir and Uzun (2006) the effect of science and nature activities conducted based on "Green Classroom Model" on environmental perception of kindergarten students, including processes such as germination, leaf development, blooming, perspiration and decomposition was examined "within the limitation of plants". It was determined as a result of the study that the environmental protection awareness of the experimental group students in green classroom environment, which allows direct interaction with the natural materials, improved in a more significant manner when compared to the environmental perception of the students with whom the science and nature activities were conducted in a traditional classroom environment. In another study conducted by Akdağ and Erdiller (2006) it was determined that the education given to six-year-old preschool students about protecting the underwater life and the seas improved the children's consciousness for protecting the

environment. According to the results of all three studies, it can be said that environmental literacy improved the children's awareness of the need for environmental protection.

When the literature for environmental education for children were examined it was determined that there were more studies for the school age children (Strong, 1998; Ju and Kim, 2011; Lindemann-Mathies, 2006; Malone and Tranter, 2003; Sarıkaya, 2006; Smith, Rechenberg and Cruvey, 1997; Yılmaz, 2006; Basile, 2000; Ballouard, at.al., 2011) and there were only a few experimental studies regarding the children in preschool age (Akdağ and Erdiller 2006; Özdemir and Uzun, 2006).

Davis (2009) reported that during the period 1996–2007 less than 5% of published papers in Australian and international early childhood research journals involved studies concerned with environmental education and early childhood education. Also Elliott and Davis (2009) have also argued that there are very few early childhood centres and/or kindergartens in Australia (and internationally) that are demonstrating exemplary environmental education practice.

In fact, the number of environmental education practices applied in preschool educational institutions in Turkey and the other countries and the number of scientific studies conducted in this subject is quite limited. As a matter of fact, Şimşekli (2001) recommended some activities to 4 kindergarten and 10 primary school administrators and teachers that could be applied during the 2000-2001 educational year in Bursa within the scope of "Practical Environmental Education". Some of the applied practices included collecting recyclable wastes separately, the making of composite and recycling of paper. Later when it was examined how much of these activities were conducted it was determined that the schools did not have the children participate in activities at a level which would be sufficient for a consciousness regarding the environment to be formed.

Akçay (2006) compared Turkey and some other countries in terms of target, purpose and practices regarding environmental education within the scope of preschool education program. He determined that the importance given to environmental education activities among the other educational activities were approximately 100% in Germany, 37% Switzerland, 23% in Turkey, 22% in Japan, 19% in Canada and 14% in United States. This result shows that the amount of environmental education activities in the 2002 preschool program in Turkey was below the average level. In 2006 Turkish preschool program was revised. Later Erdoğan and his colleagues (2012) compared with the 2002 curriculum, number of the attainments associated with the aims of environmental education (34 items: 13 %) increased in the 2006 curriculum, but the percentage was relatively decreased because of the fact the total number of the attainments in 2006 curriculum (total items: 264) is too much increased. Further, the content analysis of the preschool educational program, which was restructured in 2006, was made by Gülay and Ekici (2010). The purposes of environmental education were determined as follows: "Being able to tolerate others", "Being able to respect the different things", "Being able to accept responsibilities in improving and protecting life", "Being able to protect the beauties in the environment" and "Being able to arrange the environment in aesthetical terms". It was determined that only 25.9% percentage of the purposes in the program was environmental purposes. It was determined that the increase regarding environmental education was 15.5% overall. It was also determined that only 29.0% of the concepts in the program and 26.3% of certain days and weeks in the program are related to environmental education. According to these findings it was concluded that the studies of environmental issues in preschool education and the purposes, improvements, and concepts that will facilitate inspection of this subject were insufficient. In his study Buhan (2006) also stated that it was just not enough although the program, renewed in 2006, had more purposes and gained on environmental education compared to that of the 2002 program. It has been stated that making the students acquire the habit

of protecting the environment and preventing the pollution, collecting the usable rigid wastes separately for their resources, and some other recycling subjects, should be added to the relevant targets and behaviors that are expected to be gained with the environmental education during preschool education program.

These inspections regarding preschool curriculum show that the environmental education given in preschool education institutions in Turkey is limited to the curriculum determined by the Ministry of Education. However, it was observed that different programs developed for the environmental education in preschool period were applied abroad (Cohen, S. 1993; Wilson, 1993; Wilson, 1996; Starbuck, Olthof and Midden, 2002). For example Wilson (1996) conducted a study to locate ongoing early childhood environmental education programs and to identify the nature and characteristics of such programs. He defined ongoing programs as programs involving the same group of children over a series of at least three different sessions linked together by some common theme, purpose, or philosophy relating to education about the natural environment. Gurevitz (2000) explored that more affective forms of environmental education, drawing upon the contributions of the arts (e.g. creative writing, poetry, art, music and photography), can engage with children's emotions more directly than can approaches based on scientific knowledge. Edwards and Cutter-Mackenzie (2011) reported the findings from a project aimed at examining play-based learning and the way different types of play can be used as a pedagogical basis for supporting children's learning in early childhood environmental education. Further Cutter-Mackenzie and Edwards (2013) proposed to associate environmental and early childhood education with "open-ended play, modeled play, and purposefully framed play". Thus they consider that in collaboration two fields of education with three different types of plays can provide opportunities for young children and teachers to develop knowledge through experiences about environmental education in early childhood settings.

Also, one of the reasons why the environmental education is applied in a limited manner in preschool institutions may be that it is not taught as a separate lesson in the programs for preschool teacher education. As a matter of fact, Buhan (2006) researched in his study the environmental awareness of preschool teachers according to the sub-dimensions of attitude, knowledge and behaviours, and he also studied how much they included environmental education in their educational programs. According to the findings he obtained, he determined that there were inconsistencies between the knowledge of teachers regarding the environment and their behaviors regarding the environment. For instances, it was determined that the percentage of teachers who knew that buying recyclable papers was important in terms of protecting the environment was 92.4% but the percentage of teacher who behaved accordingly was 15.2%. According to this result, it was suggested that preschool teachers did not have sufficient environmental awareness. It was suggested that this was because no education was given in any preschool teacher-education institutions, they did not have an in-service education regarding environment when they first started teaching and there were no environment-related programs in the schools at which they worked. On top of that, it was underlined that even if it were possible to provide environmental education within the scope of preschool education programs restructured in 2006 it was impossible for this program to be used effectively since the environmental consciousness of our preschool teachers was not sufficient.

In this case, placing environmental education in teacher-education programs may cause teachers to concentrate on environmental applications in their activities. Thus, children may be allowed to learn to improve their values in regards to protecting the environment.

### **Result on the Second Hypothesis and the Relevant Discussion**

Second hypothesis of the study was "Environmental education about recycling the rigid wastes affects the conscious of recycling in six-year-old children differently according to socioeconomic environment." Pretest and posttest point averages taken from Recycling Scale by the experimental group students in both schools were compared in order to test this hypothesis. As a result of the analysis, it was determined that the students in the environmental school representing a higher socioeconomic level started their education with a better knowledge of recycling and improved their consciousness regarding the environment better at the end of the education when compared to the students in the environmental school representing the lower socioeconomic level.

In fact, for the household to recycle their garbage it is not enough to have the relevant education or to have knowledge about the subject; the social factors, which are indicators of culture, (ethnic groups, social class etc.) may also affect the recycling role identity (Collier and Callero, 2005: 55). In other words the family, school and the child's immediate environment are three basic elements in providing environmental education for the child; and the environmental education starts inside the family and goes on with the school (Bener & Babaoğlu, 2008: 5; Kesicioğlu, 2008: 19). In this case, it can be said that experiences they had with their families and in their immediate environment affected the consciousness of children from the environmental school representing the higher socioeconomic level in terms of being more aware of recycling rigid wastes.

The finding of this study is consistent with the findings from the previous studies conducted on children's conscious regarding protecting the environment. For example, in the study conducted by Smith et al (1997) on the effect of paper recycling on knowledge, attitude and behaviors of primary school students it was determined that the children in private schools improved more compared to the students in state schools. It was considered a reflection of socioeconomic difference that the private school students from richer and more homogeneous families display more recycling attitude and behaviors compared to the students in state schools. Similarly, in a study conducted by Haktanır and Çabuk (2000) on environmental perceptions and environmental awareness levels of the preschool children, it was determined that the environmental perception of the children, whose mothers have taken higher education, were higher than the others. In a study conducted by Yılmaz and Andersen (2004) on opinions of primary school and elementary school students on environmental problems based on the knowledge they obtained in science lessons, it was determined that the students who lived in urban areas and who had high levels of family income had more positive attitudes compared to the ones with low level of family income who were living in suburban areas. No difference was determined between children in a study conducted by Kesicioğlu (2008) to reveal the natural environment experience that parents introduced to their children during preschool period and the attitude of children against environment. However, natural environment experience that the families made their children have has varied according to the educational status of parents. As the educational level of parents increase the environmental experience the children had also improved. Since education, like income, is one of indicators of the socioeconomic level, all four study results support the finding that was obtained.

This study showed that environmental education applications made by using different techniques were effective in terms of teaching children the values for protecting the environment. Suggestions regarding practice and further study about environmental education in preschool education institutions are as follows.

### **Suggestions Regarding Practice and Further Study on Environmental Education in Preschool Education Institutions**

Providing permanent solutions for solving environmental pollution problems and using the natural resources without damaging them to have a sustainable environment can only be possible by raising sensitive generations. For this reason, today, as the environmental pollution increases and threatens the lives of all beings in the ecosystem, it has gained importance to provide environmental education starting from the preschool age. As a matter of fact, Phenica and Griffore (2003) determined in their findings that the children in preschool ages did not know enough about the world of nature and stated that the main problem in environmental education is that many children in the west who live in urban areas had very few chances to have a direct experience with nature.

There are two key reasons that help explain why it has taken so long for the early childhood education field to develop traction around sustainability. These are: (1) the sector is not well understood. It provides mainly voluntary (though widely-used) educational services and loses out to the compulsory schooling sector for attention and a cut of the limited resources available for education for sustainability; and (2) there is great diversity and complexity of organizational types, structures, qualifications regimes, and governance arrangement in early childhood education (Davis, 2009: 230).

In fact, environmental education does not require a costly program and a quality preschool educational program could be realized inside the natural environment. It is necessary for the children to love nature for them to protect their environment. As J.J. Rousseau stated in his work titled "Emile", which was published in 1762, it is necessary for children to be raised in unlimited natural environments such as forests instead of closed and limited environments such as rooms and houses and to know other beings in the nature and examine them personally (Cited by Akçay, 2006: 23). Maria Montessori (1870-1952; founder of Montessori Method in education) suggested building the educational institutions inside residences that are mingled with the nature or at least to build them with gardens in order to improve the love of nature in children (Cited by: Akyüz, 1979: 92). Nikolavea (2008: 67) also underlined that it was necessary to prepare a program by using plants and animals in order to provide a basic environmental consciousness in children. She mentioned that ecological areas such as "winter garden", "flower garden", "bird feeding place" and "untouched nature corner" can be established in the kindergarten. Shortly, it will help children develop a sensitive attitude towards the environment to include to school activities outdoor expeditions, making inspections, playing with water, mud and sand, collecting the yellowed and fallen leaves, building nests for birds and growing vegetables. Thus, children can understand that the nature does not belong to humans only; we share it with other creatures and develop a responsible attitude towards nature. Only then they can understand why plants, animals and natural beauties should be protected and what can happen if we pollute the resources (Akkılıç Kansu, 2008: 59; Beder Şen, 2008: 3; Öner Armağan, 2006: 11.19).

There are some projects in Turkey providing environmental education to children mingled with nature and including preschool education. For example, with the "Eco-schools Project" implemented within the cooperation protocol signed between the Ministry of Environment and the Ministry of Education in 1999, it was planned to make preschool education institutions and primary schools include the adoption of educational activities in the subjects of "protecting the environment, preventing the pollution, making students gain positive consumption habits, and collecting the usable rigid wastes separately at their resources and recycling them". The project is still being implemented in 159 primary schools in various cities of our country (İlköğretim Genel Müdürlüğü,

2011; Yüksel, 2009: 37, 39). In addition to that, "Green Classroom Applications" were started in recent years and this teaching model is being used in first and second levels in primary schools. The students are given responsibilities and activities such as seed germination, planting, grafting and cultivating decomposition (mixing organic wastes into soil and observe how they decompose) in "Green Classroom Model". Thus, it aimed to improve the environmental perception of children and to infuse them with a love of nature at an early age (Uzun, 2006: 15). Increasing the amount of such projects and activities means more children having environmental sensitivity.

As a result, it can be said that when environmental education is provided to children in the preschool period by using different educational materials, and especially by doing that in natural environments with properly guided experiences, the consciousness levels of students for protecting the environment improves. However, as Akçay also stated (2006: 120) the activities in preschool education curriculum are open-ended and they are determined by the classroom teacher. For this reason, the activities a teacher makes regarding environmental education may vary on his knowledge of science and nature, his consciousness regarding the environment, his imagination, and the facilities of the institutions. So, cooperation can be facilitated between the Ministry of Education and YÖK (Higher Education Institution). So that the teachers who will work in preschool education institutions can include environmental education during their university education. Environmental-education lessons regarding how teacher candidates can provide their students with environmental-consciousness activities can be added to the curriculum of faculties of education. Current teachers can be provided with in-service environmental education.

In short, individuals need to get the environmental education that will alert them to environmental problems from an early age and cause them to be able to make proper decisions in their immediate surroundings to solve these problems. Environmental education is essential to make children understand the natural environment and develop their values and behaviors regarding environment in a positive manner. Thus, children can develop sensitive attitudes against environmental pollution with the support of adults. However, in order to realize all of these goals in our country where the number of preschool children is less than 20% of the total population of children (UNDP, 2008: 15), first it is necessary to raise awareness of the adults and encourage them to send their children to preschool education institutions. Later, as in the example of Japan in Sancar's (2005: 38, 134) study it is necessary to give importance to school-family cooperation and include parents in environmental education so that the children can apply what they learned about environmental education at home. An organization named the Council for Environmental Education, and cooperation between school-family and region, are mentioned in Sancar's (2005) study. This Council starts courses in the schools where they make these applications, encourage research, and share their findings. The activities organized within the structure of the courses even include works like nature expeditions, cleaning beyond the school precincts, agricultural work, leaving baby salmon back into rivers, monitoring acid rain, and forming flower gardens. In fact, including the family in environmental education will make the things learned at school more readily applied at home and render environmental protection values, such as recycling, permanent.

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