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## **The Effect of the Environment Education Program Prepared for 6-Year-Old Children on the Environmental Consciousness of Children**

### **Abstract**

The aim of this research was to find out if the environmental education program prepared for preschool pupils is effective in helping the 5–6-year-old age group gain environmental consciousness. For these purposes, a single group, pretest-final test pattern was used. In the research, “Children’s Environmental Attitudes Scale” was used in the experiment group, before and after application and the data obtained were compared. An educational program of 8 weeks including drama, games and activities, Turkish, music and art activities subjects about air, water, soil, extinction of animal and plant species, climate change and waste problems was applied to the children.

**Keywords:** *environmental consciousness, environmental education, preschool education*

### **1. Introduction**

The level of human comfort brought upon by the global industrialization has also brought the environmental problems everybody complains about today. The last years of the twentieth century are seen as a process of uncertainty, imbalance and rapid evolution. In the whole world, governments are trying to give their populations a more comfortable life through economic growth; but also they are disregarding social and environmental effects while obtaining this developmental level.

While politicians and economists are following paths that assume growth has no boundaries, others think that humans live beyond that understanding. Brown (1992) has voiced serious concerns about “the world being enough for the future population”. Mc Michael (1993) has emphasized that many terrestrial systems that support life are becoming extinct with the global environmental change (cf., Davis 1998). For this reason, people need to be made aware of the environment and environmental problems. The environmental problems are all the factors that create negativities in living beings’ (humans’) behavior and lifestyles. Some of the environmental problem causes and results can be listed like this:

**1. Air pollution**

Reasons: The fossil fuels used, waste burning, radioactive waves;

Results: Acid rains, global warming, ozone layer getting damaged and fog buildup.

**2. Water pollution**

Reasons: Excessive fertilizing, unprocessed domestic and industrial waste waters, tanker accidents, chemicals, all toxicants that are dumped in the ocean;

Results: Pollution of water, mass extermination of water based organisms, pollution of drinking water and increase in epidemics.

**3. Soil pollution**

Reasons: Wastes and waste piles, acid rains, fertilization processes, pesticides;

Results: The density of heavy metals in soil increasing, PH- values in soil changing, spread of ailment inducing factors and loss of aesthetics.

**4. Extinction of animal and plant species**

Reasons: Acid rains, plundering of rain forests, monoculture agriculture and forestry, direct extermination of plants and animals, pesticides;

Results: Extinction of many plant and animal species, destruction of forests and increase in natural disasters due to the change of climate.

**5. Climate change**

Reasons: Extinction of tropical rainforests, endless consumption of fossil fuels, cfc gases being used;

Results: Creation of the greenhouse effect (global warming) and the arrival of harmful rays to the living beings and generally nature.

**6. Waste problems**

Reasons: Being a consumer society, using and disposing of, wastefulness, limited recycling, lack of education;

Results: As a result of energy and raw material wastefulness the exhaustion of these resources, the inability to use underground and over ground water due to pollution, the inefficiency of soil due to corruption created by wastes, air pollution

and epidemic creation. All these environmental problems are making the world an unlivable place as well as harming the human species (Erten 2004). The environmental problems can only be solved by changing individual behavior positively. The change of behavior itself demands the change of information and value judgment. To develop informed judgment about the environment, people have to develop an understanding of the effects of their actions on the environment, the natural processes in the environment, the lives of people in relation to the environment and the importance of efficient environmental management and protection (Vrasidas, Zembylas, Evagorou, Aravive Avraamidou 2007).

Environmental education is an indispensable tool in removing problems that can end the world. With this education the aim is to create individuals that have environmental consciousness. The increase in people who are getting environmental education is very important in protection of the life systems of the world (Carson, 2007). The creation of a positive attitude towards the environment and good value judgments can only happen via environmental education (Erten 2005).

In this regard, with the preparation of a high quality environmental education program, the development of children's information about the environment, attitudes and behaviors must be targeted. When the literature is examined, it can be seen that there is a lack of information about the structure and developmental aspect of preschool children's environmental attitudes and behaviors even if there is a rapidly increasing number of endeavors to develop adults' and school children's behaviors and attitudes toward the environment (Brody et al, 2004; Chatzifotiou 2006, Creel 2005, Dietz et al. 2002, Evans et al. 2007, Flogaitisand Agelidou 2003, Hyun 2005, Fernandez-Manzanal et al. 2007, Nickel 2007). In the few studies that are done on the children's environmental attitudes (Kahn 1999, Evans et al. 2007, Kahn and Lourenco 2002), primarily the perception of nature in children and the creation of ecological belief systems and related moral thinking were focused on. Very little is known about the preschool era environmental attitude levels. There are very few studies abroad, as mentioned above, on determining the level of children's environmental attitudes; and in Turkey, there are only the studies of Kalburan (2009), "Children's Environmental Attitudes Scale" and "The Inspection of Environmental Education Program and the Validity Reliability Study of New Ecological Paradigm Scale". It can be seen that in Turkey, environmental education programs are created with primary school and upper level education in mind. With that in mind, it can be seen that the studies done on the systematic and expansive environmental education program application concerning the preschool children and the determination of its efficiency are mostly deficient. This is why the study is thought to play a great

role in helping preschool children gain environmental consciousness and also in the creation of future studies.

The aim of this study was to inspect the effect of the environmental education program prepared for preschool children of the 5–6 age group in developing environmental consciousness. With that in mind, the answers to these questions were sought:

1. Are there any important differences between preschool students' environmental attitude scale pretest and final test results?
2. Are there any important differences between preschool students' drawings and thoughts about the environment before and after the environmental education program?

## **2. Method**

### **Research Pattern**

The aim of this study was to determine if the environmental education program prepared for 5–6 age group children is efficient in creating environmental consciousness. For this purpose, a single group pretest-final test pattern was employed. In this pattern, the effect of the experimental process was found as a result of the study of one group. There is no randomness or matching. The pattern can also be defined as a single factor in-group or repeated measurement pattern (Büyüköztürk, Çakmak, Akgün, Karadeniz and Demirel 2012).

As this pattern demands, there was a pretest at the beginning of the study just like there was a final test at the end of the study (Kaptan 1998). "Children's Environmental Attitudes Scale" was used before and after the application in the study and the data obtained at the beginning and at the end was compared. Also, the students were expected to draw pictures before and after the application and these pictures were analyzed using thematic analysis. The process can be seen in Table 1.

**Table 1.** Experimental processes applied to the experimental and control groups

<b>Study group</b>	<b>Before application</b>	<b>During application</b>	<b>After Application</b>
5–6 age group N=25	<ol style="list-style-type: none"> <li>1. Children's Environmental Attitudes Scale</li> <li>2. Drawing pictures about environmental pollution</li> </ol>	The application of activities that are suitable for the development of children and their preschool aim and programs (Turkish Language, Games and Activities, Music, Drama, Art Activities)	<ol style="list-style-type: none"> <li>1. Children's Environmental Attitudes Scale</li> <li>2. Drawing pictures about environmental pollution</li> </ol>

### Study Group

The study group was made up of 25 pupils attending preschool in the Agri province Merkez İbrahim Çeçen İlköğretim Okulu in the 2011–2012 school year. As the study group, there was no addition or removal from the class roster. The aim was to inspect the situation with the preschool education program in mind. Because of this, there was no control upon the study group.

**Table 2.** Frequency and percentage values concerning the gender of the children in the study group

	f	%
Female	15	60
Male	10	40

As can be seen in Table 2, 15 of the children in the study group were female (60%) and 10 were male (40%).

### Application Process

During the application, firstly, the aims and acquisitions about the environment in the Preschool Education Program (for children between 36–72 months) were determined. With the aims and acquisitions in mind, activities were prepared. The activities that were prepared were shown to 2 pediatric development experts and an expert psychologist and necessary changes were made to make them suitable. Before the activities were applied, information about the developmental specifications of the class that the study was conducted upon was obtained and the application was done with this information in close consideration. The program was realized on Tuesdays, Thursdays and Fridays for 8 weeks. Without determining a special time range for each activity, it was planned to take from 60 minutes to half a day each time with respect to the specialty of the education situation. Out of the activities that were to be included in the daily program, environmental activities, 10 Turkish Language, 20 Games and Activities, 4 Music, 8 Drama and 15 Drama activities were applied. Some of the activities were applied as merged activities, as foreseen by the program. The activities were prepared in the frame of air, water, soil, the extinction of animal and plant species, climate change, waste problems themes. Also, the activities were created by taking into account the items in “Children’s Environmental Attitudes Scale”. The activities were applied after they were shown to expert academicians and preschool teachers and the necessary changes were

made. At the end of the activities, pictures about the environment were expected from the children. The activities were conducted in the presence of the researcher, a preschool teacher and six observers. The observers were from the child development department. The observers were informed beforehand of the research.

The activities that were used in the research group contained three games that are called Felt Board, Concern Thermometer and the Board Game, which are parts of the Children's Environmental Attitudes Scale used to measure the environmental consciousness in the children in this study. No direction was given to the children concerning the matter of comparison between them, but to keep the children from being affected by each other's drawings, all the drawings were made in solitary rooms separately with the researcher and the observers. After the program, 22 of the children wanted to draw pictures, there was no study conducted on those who did not want to draw and the children who drew pictures expressed their thoughts about the pictures with comparison to each other. It was observed that while drawing their pictures, the children were affected by the games in the "Children's Environmental Attitudes Scale" and they were reflecting this in their pictures.

### **Data Acquisition Tool**

In the research, Children's Environmental Attitude Scale was used as a data acquisition tool.

*Environmental Attitudes Scale:* "Çocuklar İçin Çevresel Tutum Ölçeği (Children's Environmental Attitudes Scale)" was developed by Evans et al. (2007) to evaluate the environmental attitudes of first and second grade children attending public schools in New York (N = 100, M = 6.8 years) and it contains 3 games. In the first and second games there are 3 questions that contain two choices each and in the third game, there are 5 questions. In the first game that takes place in Children's Environmental Attitudes Scale, the researcher and the child are racing to be the first to finish the road on the game board.

The child moves his or her first piece on the board after throwing a dice and the researcher follows. At various points on the board, the child chooses between different options. The options are graphically represented on the board and are read aloud to the child. The options contain watching TV indoors or going out to play, doing artwork on one side of paper or both sides of it, using an electrical leaf blower or using a rake to clean the garden.

Without the child's information, the game is designed to let the child pass every option before the researcher does. The researcher always chooses the same option as the child does.

The second attitude evaluation technique consists of two felt boards that comprise two alternative scenarios about the environment. The child configures the two alternatives in each felt board and then answers the question about how he/she feels about the situation, which is contained on the board he/she will be matching. The environmental dilemmas are as follows: Water pollution harming the environment for a very low amount or a very high amount; not using agricultural chemicals or using agricultural chemicals to destroy the harmful organisms in the garden; getting a teddy bear as a birthday present that is either new but lasts for a short time or old but lasts for a long time.

In the third attitude game, a concern thermometer is used that shows three different facial expressions which are “not concerned, somewhat concerned and very concerned”. These expressions are put vertically in a row with equal distances to each other. The subjects of the concern thermometer contain: air pollution, water pollution in a nearby river or lake, bears not having food due to overpopulation, the spread of the toxic wastes that a neighbor has in his or her land, bulldozing of a forest area to create a road.

The validity and reliability study of the scale in Turkish was done by Kalburan (2009). As a result of an evaluation according to the children’s choices, environmental attitude levels were determined. In an internal consistency reliability analysis on 11 items for the original scale, the Cronbach Alpha value was found to be 0.69; the test repeat test reliability was determined as 0.89 ( $r = .89, p = 0.01$ ).

### **3. Data Analysis**

In the research, SPSS 13.00 package program was used. As the spread of the data showed normalcy, the Paired Samples T-Test was used. The pictures by the students and their opinions about them were analyzed for content after the themes were determined.

#### **Findings**

The research findings, with the aim of finding the effect of “Children’s Environmental Attitudes Scale” Environment Education Program, are listed as follows:

A significant difference can be seen in the students’ environmental consciousness after the environmental education program and the application of the activities,  $t(24) = 12.44, p < .01$ . While the environmental attitude scale point average of the students before the application was  $x = 18.96$ , after the environmental education

program application, it was  $x = 25.68$ . This finding shows that the environmental education program is effective in helping children gain environmental awareness.

**Table 3.** The T-Test Results for the Pretest-Final Test Points Obtained From Children’s Environmental Attitudes Scale

Measurement (CEAS)	N	x	s.s	sd	t	p
Pretest	25	18.96	3.21			
Final test	25	25.68	1.18	24	12.44	.000

The analysis of the symbols used in the pictures about environmental pollution before the program was applied to the preschool pupils is shown below.

### The Symbols Drawn by the Children in Pictures about Environmental Pollution

The pictures that reflect the opinions about environmental pollution before and after the program and the thoughts of the students about what they wanted to express:

1. The pupil drawing the picture did not give an opinion before the program. The opinion after the program was: *“There is the sun, it warms everything up. Clouds are in the sky, birds are flying. A train is going choo-choo. I didn’t draw the smoke of the train. It shouldn’t pollute the air”*.
2. The thought of the pupil about the picture before the program: *“Worms are polluting the water, paper pollutes water, birds pollute the water with their excrements”*. The thought of the pupil about the picture after the program: *“I told about the clean and dirty environments. In the dirty environment, the car gives out gas. Because of the gas the clouds are poisoned and are sad. In the clean environment there is the sun, near the house a girl is baking cookies and cake. In the clean environment the clouds are happy”*.
3. The thought of the pupil about the picture before the Program: *“The kid chopped the tree, the crow and his children have no home now”*. The thought of the pupil about the picture after the program: *“Musa has a plastic bottle in his hand. He throws it in the recycling bin. The sun and the clouds are very happy. Because it comes back recycled”*.
4. The thought of the pupil about the picture before the program: *“The kid has chopped the tree, next to him there is smoke from the acid”*. The thought of the pupil about the picture after the program: *“There is clean air in clean places, no fish die, forests go extinct in dirty places, and animals can’t live. The sun is setting”*.



5. The thought of the pupil about the picture before the program: *“The kid is dumping the paper in the recycling bin”*. The thought of the pupil about the picture after the program: *“The kid has turned the car into a recycling bin. He said: Let’s dump the wastes in it”*.
6. The thought of the pupil about the picture before the program: *“The kid is dumping the sunflower seeds in the garbage can”*. The thought of the pupil about the picture after the program: *“The sun, butterfly and the ladybug are talking in the clean environment because they are very happy. The kids are playing with a healthy ball, they are not dumping on the ground. On the other side, the sun is very sad, it’s crying. Dark clouds are over. The butterfly is dead and dropping, the kid died because of wastes. They didn’t make a grave for the dead fish”*.
7. The thought of the pupil about the picture before the program: *“In a clean environment, the roads are clean, in a dirty environment, the roads are dirty, they dumped garbage, it’s raining”*. *“On one side, there are factories, all the air is dirty. This is why the sun and the clouds are very sad. But on the other side, the air is clean and the kids and the sun are very happy”*.
8. The thought of the pupil about the picture before the program: *“Because of the bad smell, the kids are running away. No one can live in the dirty environment, it smells of smoke, there is garbage. In the clean environment, kids are playing with balls. There are trees. Kids are running, they are happy. I would like to live in a clean environment”*. *“People dumped garbage in the clean environment so all the animals died”*.
9. The thought of the pupil about the picture after the program: *“The girls went to the seaside on holiday, but the air is very polluted and the clouds are very sad. One of the girls is very happy because the air is polluted but the other is very sad”*.

#### **4. Results and Discussion**

A significant difference between the pretest and the final test scores regarding the research about determining if the environmental education program prepared for preschool students is creating environmental awareness in children can be seen. This result shows that the prepared program is effective in helping the children gain environmental awareness. Before the program, 5 students did not want to draw pictures about pollution and 20 students drew pictures, but 8 (eight) of them did not want to comment on them. Before the program, it could be seen that they thought environmental pollution was only garbage on the ground or garbage in nature; and it can be seen and is reflected in their drawings that their information

and awareness on this subject was lacking. It can also be seen that after the program including activities regarding the basic reasons for environmental pollution and activities related to water, air, soil, etc. pollution, the information and awareness levels of the children increased, as reflected in their drawings. It was observed that the children chose to compare a clean and a polluted environment.

Taking the research findings into account, the following can be suggested:

Attention and importance must be given to applications of activities regarding environmental education in preschool education programs. With this in mind, pupil-centric activities should be prepared.

This study was conducted with preschool pupils. The same can also be applied to elementary school students.

A specific program was used in this study and the results were observed. Families can be included in another program prepared for another study and changes can be observed.

Also, the school management should take the environmental education as group work and should create suitable environments for pupils to study and they should act in a motivating and incentivizing manner.

According to the findings obtained, in the program arrangements in future semesters, there can be more of an emphasis on the “environmental education” concept through different aims, gains, concepts and special dates and weeks.

Lastly, it can be stated that the environmental education program prepared for the 5–6 age group is effective in creating environmental awareness in children.

## **References**

- Büyüköztürk, Ş., Çakmak K.E., Akgün, Ö.E., Karadeniz, Ş., Demirel, F. (2012). *Bilimsel Araştırma Yöntemleri*. Ankara: Pegem Yayınları.
- Brody, S.D., Highfield, W., Alston, L. (2004). Does location matter? Measuring environmental perceptions of creeks in two San Antonio watersheds. *Environment and Behavior*, 36(2), 229–250.
- Carson, J.A. (2007). *The ecology of school chance: an Australian primary school's endeavor to integrate concept-based, experiential environmental learning throughout core curriculum*. (Doctoral dissertation, The University of Arizona, USA).
- Chatzifotiou, A. (2006). Environmental education, national curriculum and primary school teacher's findings of a research study in England and possible implications upon education for sustainable development. *The Curriculum Journal*, 17(4), 367–381.

- Creel, M., (2005). The endangered species culture garden: an interdisciplinary environmental art education curriculum for at-risk children. (Doctoral dissertation) The Florida State University, Tallahassee, FL, USA.
- Davis, J. (1998). Young children, environmental education, and the future. *Early Childhood Education Journal*, 26(2), 117–123.
- Dietz, T., Kalof, L., Stern, P.C. (2002). Gender, values, and environmentalism. *Social Science Quarterly*, 83(1), 353–364.
- Erten, S. (2005). Okul öncesi öğretmen adaylarında çevre dostu davranışlarının araştırılması. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 28, 91–100.
- Evans, G.W., Brauchle, G., Haq, A., Stecker, R., Wong, K., Shapiro, E. (2007). Young children's environment attitudes and behaviors. *Environment and Behavior*, 39(5), 636–659.
- Fernandez-Manzanal, R., Rodriguez-Barreiro, L., Carrasquer, J. (2007). Evaluation of environmental attitudes: analysis and results of a scale applied to university students. *Science Education*, 91(6), 988–1009.
- Flogaitis, E., Agelidou, E. (2003). Kindergarten teachers' conceptions about nature and the environment. *Environmental Education Research*, 9(4), 125–136.
- Görmez, K. (1991). *Türkiye'de Çevre Politikaları*. Ankara: Gazi Üniversitesi Yayınları.
- Hyun, E. (2005). How is young children's intellectual culture of perceiving nature different from adults? *Environmental Education Research*, 11(2), 199–124.
- İleri, R. (1998). Çevre Eğitimi ve Katılımın Sağlanması. *ÇEV-KOR*, 7(28), 3–9.
- Cevher-Kalburan, F.N. (2009). "Çocuklar için çevresel tutum ölçeği" ile "yeni ekolojik paradigma ölçeği"nin geçerlik güvenirlik çalışması ve çevre eğitim programının etkisinin incelenmesi (Yayınlanmamış doktora tezi). Gazi Üniversitesi Eğitim Bilimleri Enstitüsü, Ankara.
- Kahn, P.H., Lourenco, O. (2002). Water, air, fire, and earth: A developmental study in Portugal of environmental moral reasoning. *Environment and Behavior*, 34, 405–430.
- Kaptan, S. (1998). *Bilimsel araştırma ve istatistik teknikleri*. Ankara.
- Nikel, J. (2007). Making sense of education 'responsibly': findings from a study of student teachers' understanding (s) of education, sustainable development and education for sustainable development. *Environmental Education Research*, 12(1), 545–564.
- Vrasidas, C., Zembylas, M., Evagorou, M., Avraamidou, L., Aravi, C. (2007). ICT as a Tool for Environmental Education, Peace, and Reconciliation. *Educational Media International*, 44(2), 129–140.