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Children in need of protection and learning about the soil: A soil education project with children in Turkey

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Abstract

The objective of this study is to introduce the results of a project entitled We are learning about the soil with Tipitop and his friends 2. This project aimed to provide education for 7-13 year old children who are in need of protection, in order to introduce them to the concepts of soil and erosion. The research findings demonstrated that the soil-related knowledge scores (relating to the characteristics of soil, its benefits, living beings on and under the soil, their functions, soil protection and erosion) attained by children in the experimental group of the project increased by a statistically significant amount compared to those of the children in the control group.

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1. Introduction

We are learning about the soil with Tipitop and his friends 2

The objective of the study entitled “We are learning about the soil with Tipitop and his friends 2” was to introduce soil and soil-related concepts to 7-13 year old children who were receiving primary school education and living in Denizli Children’s Home, which is affiliated with the Turkish Social Services and the Child Protection Institution. In line with this objective, 7-13 year old children in need of protection were provided with knowledge and an awareness of the environment, the characteristics of soil, and the living beings on and under the soil, the importance of soil, and the causes and consequences of erosion.

The project included a nine-day programme consisting of several activities based around the aforementioned topics (the characteristics of soil, living beings on and under the soil, the importance of soil and the causes and consequences of erosion). The children in need of protection, who constituted the target population of the project, had previously not received any education and had not participated in any activities on topics such as soil, erosion and the environment. Thus, the children were given an opportunity to participate in different and instructive educational activities. In order to enable the children to learn about these concepts through self-experience and entertainment, various activities (based on art, the Turkish language, science and nature) and different teaching

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methods (drama, play, excursion-observation and experiments) were prepared in accordance with the children's developmental characteristics. Different types of activities were used in order to support multi-dimensional development. The emphasis was placed on preparing interesting activities that would encourage the children to ask questions. Homework was included in the project to ensure the continuity of the education being provided. In the course of the project, the children did homework in the evenings at Denizli Children's Home in order to reinforce the activities carried out in their educational environment during the day. The first part of the project conducted by the Department of Preschool Education in the Faculty of Education at Pamukkale University was performed in the 2009-2010 academic year with 5-6 year old children living in the city centre of Denizli with families of a low socio-economic level (Gülay, Yılmaz, Turan-Güllaç, & Önder, 2010). Academics from Pamukkale University and Marmara University, a teacher from Adana Science and Art Centre, an executive from Denizli Regional Directorate of Forestry, and nursery class teachers from the project group and a nurse from Pamukkale University Hospital were included in the project team as coordinators, specialists, educators, counsellors and nurses.

2. Material and method

The experimental method was used in this study in order to assess the effects of soil education on 7-13 year old children in need of protection. The project lasted for 20 days, including the pre-test, pilot activities, the programme application, post-tests and repeated posttest applications. A pre-test was applied to determine the children's level of knowledge about the subject. Before the initiation of the project, pilot activities (conversations, puppet shows and drama) were applied in order to introduce the children to Tipitop (the main character of the project), the educators and the general scope of the project. The activities, which were applied over nine days (two to three activities per day) by the researchers with the help of the educators, took place in the nursery class, the biology laboratory of Pamukkale University, the greenhouse of Pamukkale University, the pine forest and the recreation area. These activities were performed in accordance with the soil-related topics specified for the project (stories, plays, drama, songs, riddles, excursions-observations, experiments and art). Post-tests were applied to the children after the completion of the activities. The post-tests were repeated two weeks after the original post-tests so as to assess the permanence of the knowledge acquired.

A control group was selected from among the primary school students in order to determine the efficacy of the project. The children in the control group lived with their families. As the experimental group consisted of all of the 7-13 year old children in need of protection in the city centre of Denizli, the children to be included in the control group were chosen from among those who lived with their families. The control group was not given any information about the project and they did not participate in any of the activities. Pre-tests, post-tests and repeated post-tests were applied to the control group concurrently with the experimental group.

2. 1. Project group and control group

The control group of the project entitled "We are learning about the soil with Tipitop and his friends 2" included three girls (16.7%) and 15 boys (83.3%) who lived in SHÇEK Denizli Children's Home and were continuing their elementary education. The average age of the children was nine years, eight months and eight days (their ages ranged from seven years, five months and 10 days to 13 years and one day). The control group of the study included three girls (16.7%) and 15 boys (83.3%), all currently receiving elementary education. The age average in the control group was nine years, three months and 25 days (their ages ranged from seven years, two months and 20 days to 13 years and one month).

2. 1. 1. Measurements

Pre-test, post-test and repeated posttests were used as data collection tools. Pre-test, post-tests and repeated posttests on the subject of the project, as secondary data collection tool, were applied in order to determine the children's level of knowledge about the subject and to establish the effect of the project on the children's level of knowledge. These tests differed according to the age groups. The pre-test, post-tests and post-retests prepared for the 7-8 year old age group included 12 questions to be answered in an electronic environment, which consisted of photographs and pictures. The questions were prepared in line with the sub-headings of the project (the structural characteristics of soil, living beings on and under the soil, the benefits and functions of soil, soil protection and

erosion). The pre-tests and post-tests were applied individually in Denizli Children's Home and at the school by the researchers before and after the initiation of the project. The specialised personnel showed the slides to the children and asked them the questions. The children answered the questions using the computer mouse. The test was completed by an audio warning which was given for right and wrong answers. Seven of the 12 questions in the test consisted of multiple-choice questions, while one question was open-ended, one question asked the children to spot the differences, one question asked them to place events in a sequence and two questions asked them to describe a series of events. Each question was introduced on a slide. The score value of each question varied between 0 and 6. The total score was calculated by adding the scores obtained for each question together. The lowest and highest scores which could be obtained from the test were 0 and 41 respectively. In the slides for the non-multiple choice questions, the children were asked the questions and their answers were recorded on a voice recorder. The pre-test, post-test questions and answer options were prepared by the coordinator and the test was composed by a specialist in an electronic environment. The tests prepared for the 9-10 and 11-13 year old age groups were paper-and-pencil tests and consisted of questions under the sub-headings of the project (the structural characteristics of soil, living beings on and under the soil, the benefits and functions of soil, soil protection and erosion). The test for the 9-10 year old age group included seven questions. The total test score was obtained by adding the score values from each question together. The lowest and highest scores which could be obtained from the test were 0 and 19 respectively. The test for the 11-13 year old age group included nine questions. The total test score was obtained by adding the scores for each question together. The lowest and highest scores which could be obtained from the test were 0 and 23 respectively. Paper-and-pencil tests were given to the children individually. The post-test was repeated after two weeks in order to assess the permanence of the knowledge acquired.

2. 1. 1. 1. Data analysis

The findings of the children's pre-test, post-tests and repeated posttests were analysed using the SPSS 15.0 software package. The Wilcoxon signed-rank test was performed in order to determine the relationship between the application of the pre-test, post-test and the repeated posttest in the experimental and control groups before and after the project. The Mann Whitney U-test was performed in order to compare the results of the pre-test, post-test and the repeated posttest in the experimental and control groups.

3. Results

Table 1. The Wilcoxon signed-rank test results for the experimental group regarding their mean pretest-posttest scores obtained before and after the project

Posttest-pretest	n	Mean rank	Total rank	z	p
Negative rank	2	2.00	4.00	3.199	.001
Positive rank	13	8.92	116.00		
Equal	3				

According to the Wilcoxon signed-rank test results, a significant difference was detected between the mean scores for the children's knowledge about soil in all of the age groups in the experimental group before and after the project ($z = 3.199$, $p < .001$). The mean post-test score obtained at the end of the programme was higher than the mean score in the pretest.

Table 2. The Wilcoxon signed-rank test results for the experimental group regarding their mean posttest and repeated posttest scores obtained before and after the project

Repeated posttest-posttest	n	Mean rank	Total rank	z	P
Negative rank	3	4.00	12.00	.351	.726
Positive rank	4	4.00	16.00		
Equal	11				

According to the Wilcoxon signed-rank test results, no significant difference was detected between the mean posttest and repeated post-test scores for the children's knowledge about soil in all of the age groups in the experimental group ($z = .351$, $p > .05$).

Table 3. The Wilcoxon signed-rank test results of the experimental group regarding their mean pretest and repeated posttest score obtained before and after the project

Repeated posttest-pretest	n	Mean rank	Total rank	z	p
Negative rank	1	4.00	4.00	3.317	.001
Positive rank	15	8.80	132.00		
Equal	2				

According to the Wilcoxon signed-rank test results, a significant difference was detected between the mean pretest and repeated posttest scores for the children's knowledge about soil in all of the age groups in the experimental group after the project ($z = 3.317, p < .001$). The mean repeated posttest score obtained at the end of the programme was higher than the mean pre-test score

Table 4. The Wilcoxon signed-rank test results for the control group regarding their mean pretest and posttest scores obtained before and after the project

Posttest-pretest	n	Mean rank	Total rank	z	p
Negative rank	4	3.50	14.00	.574	.566
Positive rank	4	3.50	22.00		
Equal	10				

According to the Wilcoxon signed-rank test results, no significant difference was detected in the control group between the mean pre-test and post-test scores for the children's knowledge about soil before and after the project ($z = .574, p > .05$).

Table 5. The Wilcoxon signed-rank test results for the control group regarding their mean posttest and repeated posttest scores obtained before and after the project

Repeated posttest-posttest	n	Mean rank	Total rank	z	p
Negative rank	2	2.50	5.00	.680	.496
Positive rank	3	3.33	10.00		
Equal	13				

According to the Wilcoxon signed-rank test results, no significant difference was detected in the control group between the mean post-test and repeated posttest scores for the children's knowledge about soil after the project ($z = .680, p > .05$).

Table 6. The Wilcoxon signed-rank test results for the control group regarding their mean pre-test and repeated posttest scores obtained before and after the project

Repeated posttest-pretest	n	Mean rank	Total rank	z	p
Negative rank	3	3.83	11.50	.935	.350
Positive rank	5	4.90	24.50		
Equal	10				

According to the Wilcoxon signed-rank test results, no significant difference was detected in the control group between the mean pre-test and repeated posttest scores for the children's knowledge about soil after the project ($z = .935, p > .05$).

Table 7. The Mann Whitney U-test results for the experimental and control groups regarding the pre-test score averages obtained before the project

Group	n	Mean rank	Total rank	U	p
Experimental	18	18.72	337.00	158.000	.898
Control	18	18.28	329.00		

According to the Mann Whitney U-test results, no significant difference was detected between two (the experimental and the control) groups regarding the mean pre-test score for the children's knowledge about soil before the project ($U = 158.000, p > .01$).

Table 8. The Mann Whitney U-test results for the experimental and control groups regarding their mean posttest scores obtained after the project

Group	n	Mean rank	Total rank	U	p
Experimental	18	22.00	396.00	99.000	.045
Control	18	15.00	270.00		

According to the Mann Whitney U-test results, a significant difference was detected between two (the experimental and the control) groups regarding their mean post-test scores for the children's knowledge about soil after the project ($U = 99.000$, $p < .001$). The mean score of the experimental group was found to be significantly higher than that of the control group.

Table 9. 1. The Mann Whitney U-test results for the experimental and control groups regarding their mean repeated posttest scores obtained after the project

Group	n	Mean rank	Total rank	U	p
Experimental	18	21.58	388.50	96.500	.037
Control	18	15.42	277.50		

According to the Mann Whitney U-test results, a significant difference was detected between the two (the experimental and the control) groups regarding their mean repeated posttest scores for the children's knowledge about soil after the project ($U = 96.500$, $p < .001$). The mean score of the experimental group was found to be significantly higher than that of the control group.

4. Discussion

It was determined that the education on the subject of soil, which was provided to the children in need of protection in order to provide them with knowledge and an environmental awareness about soil, resulted in a statistically significant increase in the experimental group compared to the control group in terms of the children's scores for their knowledge about soil (the characteristics of soil, the benefits of soil, living beings on and under the soil, the functions of the soil, soil protection and erosion). In addition, the knowledge scores in the experimental group showed an increase at the end of the project. The results obtained demonstrate the efficacy of the project. Our literature survey has not revealed any other projects conducted on the subject of an education in soil for children in need of protection, either in Turkey or abroad.

The studies carried out so far with children in need of protection in Turkey have generally been based on research. This research has focussed on demonstrating the general developmental characteristics and behavioural types of children in need of protection and/or comparing them with children living with their families (Cebe, 2005; Çapri & Çelikkaleli, 2005; Çeliköz et al., 2008; Dizman & Gürsoy, 2005; Gülay, 2004; Şimşek et al., 2008; Üstün & Akman, 2002; Üstüner, Erol, & Şimşek, 2005). As a matter of fact, these studies have been case studies that have examined and compared children's moral development, aggression levels, academic success, social skills and emotional development. None of the available studies involved an education programme which had been applied to these children. In this respect, the "Project of supporting the development of children in need of protection" conducted by Bahçeşehir University has attracted attention as a project that is concerned with social responsibility. The project included 78 children between 3-6 years old who were living in SHÇEK Semiha Şahir Children's Home. Thirty-two undergraduate university students participated in the project as volunteers, and activities were carried out once a week for 12 weeks in order to support the children's development. In addition, seminars were held for the personnel working at the children's home, and the children were given toys. The results of the project indicate an increase in the number of children exhibiting a level of development which is compatible with their age (Özdemir, Sefer, & Türkdoğan, 2008). Furthermore, in a study carried out within the scope of the "Young hearts" project conducted by Koç University, the effects of regular visits paid to 12 children between 12-36 months old living in SHÇEK Bahçelievler Children's Home were examined, and it was concluded that the project had had a positive effect on the general developmental characteristics and social development of the regularly visited children, who showed a significant difference compared to the control group (Levi, 2008). The social responsibility projects which were reviewed focussed on preschool children in need of protection. Another common aspect of these studies is that they were all conducted in big cities and private universities. It has been observed that studies performed with primary school children in need of protection are generally insufficient except on the subject of the environment except subject of environment.

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