

Teaching Preschool Children About Nature: A Project to Provide Soil Education for Children in Turkey

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Abstract In terms of gaining environmental awareness and sensitivity, preschool is the most important period in an individual's life. Preschool education enables lasting steps to be taken towards sustainable development, which has become widespread issue of increasing importance in recent years, and whose importance continues to increase. There is a need for studies that establish environmental awareness and support sustainable development throughout the world, especially in developing countries, such as Turkey. Taking this need into consideration, the purpose of this study is to introduce the results of the “Learning about soil with Tipitop and his friends” project, a project organized within the scope of the project group activities of the Scientific and Technological Research Council of Turkey (TUBITAK) Schools of Nature and Science (4004). The aim of the project was to introduce soil and concepts related to soil conservation to preschool children between 5 and 6 years of age. The sample group of the project was comprised of 180 children (90 experimental, 90 control) between the ages of 5 and 6, attending the kindergarten of primary schools, affiliated to the National Ministry of Education, located in the province of Denizli. Research findings demonstrated that the soil-related knowledge scores of children in the experimental group of the project increased in a statistically significant way, in comparison to those of children in the control group.

Keywords Soil education project · Preschool children · Education for sustainable education · Inclusion of soil · Soil conservation

Introduction

Erosion

As it is throughout the world, erosion is one of the oldest environmental problems in Turkey, as well as in many countries. While 2.5 cm thick soil takes 200–1,000 years to form, erosion is the reason why nearly 700 million tons of soil is lost in Turkey every year (Yüksel 2006). Studies indicate that there are various reasons why such a considerable amount of soil is exposed to erosion in Turkey (Kiziltas et al. 2009). In fact, erosion is an environmental problem not only in Turkey, but also in many countries. Every year, there is a huge amount of soil loss worldwide. The importance of soil for human beings and the effects people had on the soil were discussed at the V. International Congress of the European Society for Soil Conservation, which took place in Palermo, Italy in 2007. It was mentioned in the Congress that soil was misused in a substantial part of the world, and that the 2 m soil loss would take 20 years (Skeffington 2010), or more, to reform. Mostly countries where loss of soil is extensive mostly implement soil conservation policies. Among these policies, education on “land literacy” has drawn the most attention (Fullen 2003). One of the most effective ways to conserve soil, and thereby the environment is to educate young children. Education regarding sustainable development programs directed at farmers and individuals interested in soil is insufficient (Reith and Blakewood 2002).

Education for Sustainable Development (ESD)
and Early Childhood Education (ECE)

Some projects that support the multi-dimensional development of children helped to develop policies related to

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young children's participation in education for sustainable development. For example, the United Nations proclaimed 2005–2014 as the decade of education for sustainable development; the overall goal was to integrate the principles, values, and practices of sustainable development into all aspects of education and learning. The main purpose of the education for sustainable development movement is to help inform all individuals, who have access to education and learning, about the ways to utilize natural resources, and how to live a sustainable life style. Its long-term aim is to generate social transformation. Individuals need to be aware of social and environmental issues and acknowledge them in order to live a sustainable life.

Sustainable development is a vision of development that encompasses populations, animals and plant species, ecosystems, and natural resources, and integrates concerns such as the fight for gender equality, human rights, education for all, health, human security, intercultural dialogue, and against poverty, etc. Education for sustainable development aims to help people develop the attitude, skills, and knowledge required to make decisions for their own benefit, and the benefit of others, now and in the future, and to act upon these decisions (United Nations Educational, Scientific and Cultural Organization-UNESCO 2007). An important element of sustainable development is early childhood education (ECE). More individuals and organizations are realizing the importance of developing sustainability programs and initiatives that specifically target the early childhood sector. There is awareness that research, resources, training, policy and regulatory standards are needed to ensure that all early childhood services operate sustainably, and provide an everyday environment for learning, where children are immersed in education for sustainability (Hughes 2007, p. 7). For years, numerous countries throughout the world have stated the important role that preschool education plays in sustainable development nationwide. For example, the World Bank took the actions in relation to Early Child Development after the Rio Conference (The Earth Summit) held in 1992; its project was "Early childhood development: investing in the future," within scope of which it organized a variety of childhood development programs that educated people in the various fields of early childhood education such as the theory, the economy, applying and budgeting early childhood education. The training programs also presented instruments that would help in increasing the effectiveness of these programs (The World Bank 1997). The "Taking Children Seriously—How the EU Can Invest in Early Childhood Education for a Sustainable Future" report was submitted at a seminar held on the 17th December 2010, by the EU, at Brussels. The report emphasized, once again,

that sustainable development and early childhood education were disciplines that need to work in collaboration. The report also put forth that knowing children, understanding their needs, being aware of their rights, and supporting their development are necessary in terms of the social, economic, and ecological dimensions of sustainable development (Early Childhood Education and Sustainable Development 2011). In addition to movements like sustainable development, the rapid, short, and long term effects of preschool education have given rise to the thought that young children should be included in education for sustainable development. Namely, researchers stated that environmental knowledge and attitudes towards the environment start taking shape during preschool, and that the environmental awareness gained during preschool plays an important role in developing positive attitudes towards the environment (Akçay 2006; Grodzinska-Jurczak et al. 2006; Robertson 2008; Smith 2001; Taşkın and Şahin 2008; Wilson 1996). Basile (2000) emphasized the fact that education for sustainable development should start in preschool. Harlen and Qualter (2009) stated that future generations formed of children that had no knowledge about the environment, and who did not interact with the environment would lead to communities that were unable to implement and maintain environmental protection initiatives. The value of starting education for sustainability at an early age is becoming much clearer, even if the practice and research has yet to fully emerge (Davis 2009).

The key to teaching young children the importance of sustainability is through environmental awareness. There are various elements of modern life that make education for sustainable development important for young children: one of the reasons behind education for sustainable development is the number of electronic devices around children, and the fact that many grow up in urban areas away from the natural environment. Within this context, young children acknowledging soil, and understanding the importance of its conservation could help them in becoming aware of an important environmental problem. Additionally, studies that put forth the importance of preschool education in terms of sustainable development continue to increase in large countries throughout the world every year. However, in developing countries such as Turkey, or undeveloped countries there is a need for these types of studies, in order to increase the quality of preschool education, as they often are countries that experience severe environmental issues such as erosion, environmental pollution, and drought. This is why these countries require training programs and projects directed for young children, and training programs and projects that focus on the importance of environmental issues. These types of studies need to be supported.

The Soil Education Project

The “Learning about soil with Tipitop and his friends” project was prepared with a constructivist approach, and based on experiential learning. Experiential learning is an effective way of learning; children learn by observing, examining the actual circumstances in their natural settings, and participating in the process (Poudel et al. 2005). On the other hand, the constructivist approach took place in various developmental theories. Piaget (1947) stated that children’s direct interaction with the environment enabled them to construct the knowledge (cited in Gülay and Akman 2009; Robertson 2008). In the same way, Bandura (1977) also stated that the mental and linguistic development is rapid among children aged between 2 and 6 although they were egocentric; but, the activities carried out with adult guidance would develop the children’s mental skills. Vygotsky (1934) argued that novel behavior and skills could be taught through experiences carried out with adults, which involved active participation. Bandura (1977) stated that there existed a mutual interaction between people and the environment, and behavior took shape through observations and experiences. Dewey (1938), educational reformist and philosopher, also asserted that knowledge and skills were only possible through combining all areas of life. As illustrated, developmental theories emphasize the importance of the environment in human life, using various shapes. The aim of the project in the light of the constructivist approach is that children gain experience through doing and living, and with activities they participate in actively, and the guidance of their teachers and parents. The objective of the project in terms of the constructivist approach, and the “gaining experience by doing and living” principle is:

To teach children between the ages of 5 and 6, attending preschool, about soil and all related concepts.

The sub-objectives determined to achieve the objective of the project are:

to teach children between the ages of 5 and 6,

- The properties of soil, the organisms that live on/under the soil, the importance of soil,
- What erosion is, the reasons of erosion, the results of erosion, the issues that arise from these results, and
- To understand and acknowledge their environment under these terms, and to increase their sensitivity to environmental issues.

The program is designed in line with the children’s developmental characteristics, the opinions of theorists such as Bandura, Vygotsky, and Piaget, and the development principles both near to far, and simple to difficult. Thus, there are 29 activities during the 10-day pilot program, which enables children to learn while experiencing and

living, as well as enjoying and reinforcing the natural environment. In an effort to bring to life the reference points in the program stated above, there are various types of activities such as observation, experiments, drama, games, stories, trips, songs, and puzzles. Tipitop, the main character of the project, is the soil itself. A character has been drawn to illustrate the soil in order to attract the children’s attention, to objectify the subject, make the process entertaining, and simplify the learning process. Its body is formed of soil, and its head and fingers are formed of grass and flowers. Tipitop’s friends (a bird called Şenşakrak, humus soil called Humiş, clay called Kiloş) accompany him in his stories about different subjects. The activities are explained to the children using Tipitop puppets, and illustrations of Tipitop and his friends. The children carry out the activities accompanied by these characters. This helps the children to connect with the project, enables them to be sympathetic, and makes what they learn memorable.

Seventeen of the 29 activities are carried out outdoors, in an effort to support learning through experiencing and living. Outdoor activities took place at the Piney Forest and Recreation Area, Çamlık Zoo, the biology laboratory at Pamukkale University, and the greenhouse at Pamukkale University, which are all located in the city center. Indoor activities took place at the children’s schools. Parallel to the subjects, the activities were prepared taking various approaches into consideration such as easy to difficult, near to far, specific to general. As well as special activities (concept maps, establishing a soil corner, etc.) to recap what the children have learnt within the project, the project also offered family participation activities in line with activities carried out every day.

The aim of family participation activities was not only to increase the knowledge level of the children, but also to draw the families’ attention to the subject and develop their environmental awareness. Families are informed about the aim of the program, its contents, its scope, and its activities before the program is implemented. The family participation activities are explained and given individually to the families by the kindergarten teacher and the project team at the end of every day. The family participation activities are collected from the families the next day.

The project team comprised of 13 lecturers from Pamukkale University and Marmara University, whose area of expertise was preschool education and environmental education, a biology teacher from Adana Science and Art Centre, a forest engineer, a nurse, and kindergarten teachers. The project activities were carried out by the lecturers and the biology teacher. A training group formed of a lecturer, the biology teacher, or the forest engineer was constantly present for every activity. All project costs were covered by TUBITAK (Scientific and Technological Research Council of Turkey).

Hypotheses

Hypotheses of the study on the effectiveness of the soil education program were as follows:

There is no significant difference between the means of pre-test scores of the experimental and the control groups.

There is a significant difference between the means of post-test scores of the experimental and the control groups that is in favor of the experimental group.

There is a significant difference between the means of follow-up test scores of the experimental and the control groups that is in favor of the experimental group.

Method

In this study, an experimental method was used for the experimental and the control groups, in order to investigate the effects of soil education on children aged between 5 and 6. Four different groups were included in soil education applications during the school year of 2009–2010. Project studies, including the pre-test, pilot activities, the program application, the post-test, and the follow-up test applications, for each group lasted for 19 days. Before the initiation of project activities, parents and teachers were informed about the objective and contents of the project, and its activities. Pre-tests were applied to the children in order to determine their level of knowledge regarding the subject. Prior to the project studies, pilot activities were applied (conversation, puppet show and drama) in order to introduce the children to Tipitop—the main character of the project, and thereby to the project, and the educators. The activities prepared, with respect to the project, were carried out for 9 days by the educators with the help of the counselors. About 2–3 activities were conducted every day. Activities were mostly carried out in the kindergarten classes attended by the children, the Biology Laboratory of Pamukkale University, the Greenhouse of Pamukkale University, and the Piney Forest and Recreation Area. Once the activities were completed, post-tests were applied to the children. A follow-up test was applied to the children 2 weeks after the post-test, in order to determine the permanence of the acquired information. The pre-tests, the post-tests, and the follow-up tests were applied by the lecturers on the project team, individually, at the schools attended by the children.

Participants

In order to evaluate the efficiency of the project, control groups were selected from other kindergarten classes, which did not participate in the project, from the same schools from which experimental groups were selected.

The experimental and control groups were comprised of children from the same school, but attending different kindergarten classes. The experimental group was formed of those attending in the morning (08:00–12:30), and the control group was formed of those attending in the afternoon (13:00–17:30). These groups were not given any information about the project. None of the children in the experimental and the control group had participated in an environmental education project. The children came from families with a low socio-economic level, whose monthly average income was 500 EURO. Only the pre-tests, the post-tests, and the follow-up tests were applied to the control groups simultaneously with the experimental groups.

The Project (Experimental) Group and the Control Group

The experimental group of the “Learning about soil with Tipitop and his friends” project included 41 girls (45.5%) and 49 boys (54.5%), who attended the morning kindergarten class of primary school. The mean of the children’s ages was 5 years, 7 months, 5 days (not less than 4 years, 8 months, 6 days; not more than 6 years, 3 days). The control group of the project included 43 girls (47.8%) and 47 boys (52.2%). The mean of the children’s ages in the control group was 5 years, 4 months, 20 days (not less than 4 years, 10 months, 17 days; not more than 6 years, 1 month, 5 days).

Measures

The Personal Information Form

The personal information form, prepared for the children, and the achievement test, prepared for measuring information in the pre-post tests, were applied in order to collect data for the project. The information form for the children consisted of questions regarding the demographic characteristics of them and their families. The forms, made up of thirteen questions, were filled out by the parents.

The Achievement Test

The second data collection tool was the achievement (information) test used in the pre- and post-tests of the project. The aim of the pre-post tests was to reveal the children’s level of knowledge about the project topic, and the effects the project had on their level of knowledge. The achievement test used in the pre- and post-tests was a computer based test. There were twelve questions in the test, containing photographs and pictures to accommodate to the children’s literacy levels. Questions were prepared according to the subtopics of the project (structural

characteristics of the soil, living organisms on and under the soil, the benefits of soil, the functions of soil, the protection of soil, erosion).

Procedures

Pre- and post-tests were administered to children by specialized staff before the initiation, and after the completion, of the project, individually, in a classroom environment. Specialized staff showed slides to the children, and asked questions. Children used the mouse of the computer to answer the questions. The test was completed by an audio warning, received for wrong and correct answers. Seven of the 12 questions in the test consisted of 3 close-ended questions. One of the remaining questions was open-ended, one of them required finding the differences, one of them required listing a sequence of events, and two of them required descriptions of events. Each slide introduced one question. The score of each question ranged between 0 and 6. Total test scores were calculated adding the score values of each question. The lowest and highest scores achieved from the test were 0 and 41, respectively. In the slides introducing open-ended questions, children were asked the questions and their answers were recorded using a sound recorder. Questions and answer options of pre-post tests were prepared by the project coordinator, and the test was formed in an electronic environment by specialized staff. A follow-up test was applied 2 weeks after the application of the post-test in order to determine the permanence of the acquired information. Within the framework of this research, findings of the pre-post tests, and the follow-up test obtained from the project groups and the selected control groups are presented below under the relevant headings. Pre-post tests and the follow-up

test results of the children were analyzed using SPSS 15.0. One-way ANOVA was used for repeated measures in order to determine the differences between the means of the pre-test, the post-test and the follow-up test scores of the experimental and control group. Two-way ANOVA was used for mixed measures in order to compare the means of the group scores with each other.

Results

Table 2 illustrates that there was a significant difference between the means of the pre-test, post-test, and the follow-up test completed by the children in the experimental group [$F(2,178) = 132.185$; $p < .001$]. Table 1 illustrates that the mean score of the post-test ($\bar{x} = 28.01$), and the mean score of the follow-up test ($\bar{x} = 28.21$) were lower than the mean score of pre-test ($\bar{x} = 20.51$). There was no significant difference between the mean scores of the post-test and the follow-up test.

There was a significant difference between the mean scores of the pre-test, the post-test, and the follow-up test completed by the children in the control group [$F(2,178) = 10.64$; $p < .001$]. The mean score of the post-test ($\bar{x} = 20.44$) and the mean score of the follow-up test ($\bar{x} = 20.61$) were lower than the mean score of the pre-test ($\bar{x} = 19.27$). There was no significant difference between the mean scores of the post-test and the follow-up test (Table 3).

According to Table 4, there was a significant difference between the mean scores of the pre-test, the post-test, and the follow-up test for the control group and the experimental group [$F(1,178) = 68.81$; $p < .001$].

Table 1 The means and the SDs of the achievement tests belonging to the experimental and control groups

Groups	Pre-test			Post-test			Follow-up test		
	N	$\bar{x}$	S	N	$\bar{x}$	S	N	$\bar{x}$	S
Experimental	90	20.51	4.87	90	28.01	6.11	90	28.21	6.20
Control	90	19.27	4.60	90	20.44	4.57	90	20.61	4.71

Table 2 The ANOVA results of the mean scores of the pre-test, the post-test, and the follow-up test completed by the experimental group

Source of variance	Sum of squares	df	Mean square	<i>F</i>	<i>p</i>	Significant difference
Between subjects	6,539.867	89	73.482			
Measurement	3,467.400	2	1,733.700	132.185*	.000	2–1, 3–1
Error	2,334.600	178	13.113			
Total	12,395.867	269				

1 Pre-test, 2 post-test, 3 follow-up test

* $p < .001$

Table 3 The ANOVA results of the mean scores of the pre-test, the post-test, and the follow-up test completed by the control group

Source of variance	Sum of squares	df	Mean square	<i>F</i>	<i>p</i>	Significant difference
Between subjects	4,943.333	89	55.543			
Measurement	95.000	2	47.500	10.64*	.000	2–1, 3–1
Error	794.333	178	4.463			
Total	5,832.666	269				

1 Pre-test, 2 post-test, 3 follow-up test

* $p < .001$

Table 4 The ANOVA results of the mean scores of the pre-test, the post-test, and the follow-up test completed by the experimental and the control groups

Source of variance	Sum of squares	df	Mean square	<i>F</i>	<i>p</i>
Between participants	15,517.6	179			
Group (individual/group)	4,034.400	1	4,034.400	62.53*	.000
Error	11,483.200	178	64.512		
Within participants	6,691.333	380			
Measurement (pretest–posttest–follow-up test)	2,352.700	2	2,352.700		
Group × measurement	1,209.700	2	1,209.700	133.84*	.000
Error	3,128.933	356	8.789	68.81*	.000
Total		559			

* $p < .001$

Discussion

Results of the soil education project indicated that the level of knowledge relating to soil increased in children between the ages of 5 and 6. The results obtained justified all hypotheses. Children learned about soil with its various features through the soil education program. They were informed about its color, its tissue, the living organisms on/under it, its importance for living organisms, and its functions. Additionally, they were informed about the importance of conserving soil, and how this is achieved. In general, at the end of the project, the children knew about soil, and were informed about the importance of conserving it. The study also developed the knowledge and awareness children had regarding the environment. Moreover, kindergarten teachers also gained experience regarding the teaching methods used for soil education; and thereby professional development in sustainable development. It is thought that these experiences might affect their educational activities in years to come. The family participation activities attracted the attention of parents towards protecting the environment, in particular soil. Thanks to the activities, they also gained experience with regards to what they could do with their children and how they could spend time with them. There are limited environmental education studies directed at preschool students in Turkey, and worldwide. There is no existing soil education project

available aimed at this age group; therefore, we are unable to compare a study to other studies carried out in Turkey, and in many developing countries. However, this means that this project and its conclusions will set an example for many countries. A pilot study was accomplished for an environmental education project, which had already been carried out on undergraduate students at the University of Louisiana. In the pilot study, 81 children enrolled in the 1st and 5th grades of primary school participated. This education for sustainable development project consisted, of hands-on activities, and information on soil science, soil conservation, the quality of water, and botany. Active participation was supported with activities that lasted for almost 25 min. The results of the pilot study revealed that the environmental knowledge of the students increased, and they enjoyed the learning process (Poudel et al. 2005). In Suan Phung Nature Education Park, in Thailand, primary and secondary school students were given effective education for sustainable development over 3–4 days, with long camps on the current environmental problems (forest cleaning, mining, unsustainable agricultural practices, and erosion). The conclusions of the study indicated increased knowledge scores on environmental information among students who participated in these camps during the summer of 2006 (Finch et al. 2006). Nature education, that includes preschool children, has been spreading rapidly. A related example is the Kerry Wood Nature Center, located in Red

Deer, Canada, which provides children aged between 3 and 5 nature education at its Nature Kindergarten. Children are introduced to natural life through drama, stories, creative activities, art, and games during 22.5 h weekly programs between September and May. In a study (Robertson 2008) that examined the longitudinal effects of this program, 27 children that received this education during preschool enjoyed playing outdoors, loved dogs, and interacted with the environment more when they attended the 4th and 6th grades at primary school in comparison to their peers, who had not received this education. Children between the ages of 6 and 8 participated in the Forests Schools Project, which started in England, in 2003. The project was composed of games, problem solving, and creative thinking activities that were designed according to the children's developmental stages. In the project, all the activities were carried out in the forest; its aim was to support the children's self development, as well as introducing them to their environment and developing their social relationships (Swarbrick et al. 2004). The studies showed that the children's environmental knowledge and their sensitivity towards the environment increased as a result of the activities they completed doing and living. Wilson (1994) stated that supporting children to get to know their environment would contribute dramatically to the human-environment relationships. UNESCO highlighted the fact that education should start during preschool in order to achieve sustainable development. It was mentioned that a part of the preschool education program should aim to prioritize education for sustainable development, support children to increase their knowledge, observe, and talk about their environment (Samuelsson and Kaga 2008). The Citizen Science Program is a 4-week environmental education program, regarding birds and nature, prepared by the University of South Australia, for children between the ages of 6 and 8. The program has six fundamental lessons. At the end of the program, the conclusion was that the children knew a lot more about the environment, and they enjoyed their experiences (Alexander and Russo 2010). One study (Lee and Ma 2006) contains university-kindergarten partnership project with teachers in four kindergartens to participate in four 3 h workshops and then to develop their own school-based environmental programs. The four teaching themes of the programs were "animals and plants" (caring, rearing), "food and green angels" (conservation of resources, green life). In each kindergarten, a group of staff was established to examine the design, implementation and evaluation of the school-based curriculum. After the programs were completed, questionnaire surveys and interviews were undertaken to collect feedbacks and opinions from teachers and parents on the school-based programs and the perceived changes in environmental attitudes and behavior of their children.

When compared, there are important common points between our study and this study in terms of enabling university-kindergarten collaboration. There are also common points regarding the subjects addressed (animals, food, and plants). Little Green Steps, an initiative of Gosford City and Wyong Shire Councils, is a sustainability education program for early childhood centers and preschools located on the Central Coast of New South Wales. The program was developed in response to an identified lack of environmental education resources and support available to local early childhood services for communicating sustainability messages to very young children (aged 3–5 years). This program has supported sustainability education in local early childhood services by: developing resource kits on the topics of water, waste, wildlife, energy and stormwater, providing in-service training for early childhood educators through professional development workshops, producing a bi-monthly newsletter offering centers with up-to-date information on a range of topics relating to sustainability and environmental education, and providing on-going support to centers in relation to sustainability education and initiatives. The evaluation demonstrated that participants had a high level of involvement with initiatives promoted through the program, and were implementing many positive changes in regard to the sustainability of their centers (Hughes 2007, p. 14). Little Green Steps is applied more commonly in comparison to the project we have developed. In terms of subject, Little Green Steps addresses water, waste, wildlife, energy, and stormwater, in addition to soil. While our project is directed at 5–6 year olds, Little Green Steps is directed at children aged between 3 and 5. Three student-driven training programs for sustainability projects (EfS), on the issues of concern to young children, were completed in Western Australia. These projects were located at the school, and in the nearby wetlands: biological survey, reed planting, and turtle nest-watch. A biological survey aimed to investigate the extent of biodiversity around the school and wetlands. Reed planting revealed concerns about pollution of the lake environs. Turtle nest-watch involved concern about turtles in the local wetland. Findings indicated that participation in EfS projects was an effective, meaningful approach to achieve potent, enjoyable, meaningful approach, hands-on action in real-life local contexts (Lewis et al. 2010, pp. 97–99). There are common subjects between the three projects conducted in Western Australia and our Project (biodiversity, water, turtle nest). The results of our study are in line with the results obtained by similar studies. All studies, in various countries, prepared for young children, and aimed to provide environmental education, have something in common; they want to increase the knowledge and awareness of children. The point that draws attention in all studies is the fact that projects

directed at soil education specific training is not common. The number of projects related to more than one subject such as water, animals, and recycling are higher. Environmental education projects prepared for young children are more common in developed countries. Projects that focus on just one subject, such as Learning about soil with Tipitop and his friends, should be developed as well as projects that address more than one subject. It is necessary to promote environmental education programs in developing countries, and countries where environmental issues are increasing. At this point, it becomes obvious how important it is to increase the number of studies directed at young children throughout the world. Alongside the positive results, the project has some limitations. One of these limitations is the fact that the project lasts 9 days. The fact that long-term monitoring cannot be carried out is another limitation. The study was limited to 90 children, and only two groups; the experimental group and the control group.

Conclusion

Results of the Soil Education Project indicated that the level of knowledge relating to soil increased in children between the ages of 5 and 6. In general, at the end of the project, the children knew about soil, and were informed about the importance of conserving it. The study also developed the knowledge and awareness children had regarding the environment. In light of these findings, educational policies should be developed that introduce soil to children, and allow them to understand the importance of its conservation. Future studies, keeping in mind the limitations experienced with the current study, should provide the opportunity for long-term monitoring studies. Projects that last longer should be developed. More children should be included in future projects. To assess the effects of family participation, future projects should have experimental groups, where family participation is present, and unavailable, in addition to control group. These policies should include educational programs for all children, especially the young ones, the farmers, and individuals related to the issue. The educational programs should be composed of projects that support active participation, and permanent learning. The effects of the projects should be observed in the short term, and over the long term. Moreover, educational programs for other environmental problems should be developed. Parent participation should be included in projects prepared for young children. Besides, pre-service teachers should be informed about environmental education to be applied to young children.

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