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Examine preservice elementary school teachers' perceptions about soil science during community service learning**

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Abstract

The purpose of this study is to examine preservice elementary school teachers' perceptions about the topic of soil through attending "Soil Science School" as part of the Community Service Practices Course. Qualitative method was used for data analysis. In line with obtained results, it has been observed that the perceptions of preservice elementary school teachers consist of 3 main themes in the form of "Soil Knowledge", "Impact of the Soil Science School", "Cooperation of the Faculties of Education and Agriculture".

Keywords: Soil, community service practice course, elementary science, preservice teachers, qualitative study

1. Introduction

The ever increasing world population has led the way to the necessity of the more efficient utilization of nonrenewable natural resources, primarily soils (Şenol et al, 2010). "Soil is a natural mass that is formed within a certain period of time with the seperature and fracture of its main materials due to the impact of living things, climate, and topography, which consists of air and water at certain rates, and also harbors living things" (Toprak-Teşekkülü Tanım ve Tarifler, 1988; cited by. Güler and Çobanoğlu, 1997, 12). Soil is a natural entity and is a scarce resource that can disappear in a short period of time, has no substitute, and vital for life (Bahtiyar, 2011). It is evident that damages to soil, which is vital for humans, are caused by lack of knowledge and unawareness (Bozkurt, Akın, and Uşak, 2004). The conservation of soil, which is so vital for our lives, is a social responsibility at the same time. With the inclusion of the "Community Service Practice" course in the teaching programs of faculties of education in our country by the Council of Higher Education in 2007, it has been aimed to have preservice elementary school teachers, who shall especially educate the children of the future, interact more with social matters. Preservice teachers must have the awareness of being able to contribute to the economic and social welfare level of the community in which they live in, while they develop their level of knowledge (Coşkun, 2009).

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The concept of Community Service Practice was used for the first time in its current state by Robert Sigmon and William Ramsey in 1967 (Uğurlu and Kıral, 2011, 722). Its basic purpose is to address the needs of humans and focus on the development of humans (United Nations 1999, Cited by Sönmez, 2010). It basically appears to us as activities conducted with the cooperation of university students, the government, and non-governmental organizations (Uğurlu and Kıral, 2011). In addition to this, in many countries, primarily the United States of America, it is practiced in other faculties of universities in addition to education faculties and even at all stages of education starting from elementary education (Uğurlu and Kıral, 2011). As stated by Konza, Kiggins, and Brown (2007), in educational settings where programs on community service are implemented, there are favorable outcomes such as academic, social and emotional gains, and citizenship and community responsibility.

Recently in our country, as it is in other countries, the relation of universities with the community and their impact on the community has begun to be investigated in more detail. Inclusion of the Community Service Practice course in the program of education faculties by the Council of Higher Education in the 2006-2007 academic year is an important step regarding this matter (Elma et al, 2010).

In conducted studies, Community Service Practices appear to be some sort of experimental education and cooperation based learning-teaching strategy (Uğurlu & Kıral, 2011). Thanks to this, the individual participates in one-to-one activities in relation to the society s/he lives in. The individual so to say considers the society s/he lives in as a laboratory and has the opportunity to practice like a responsible person in a laboratory (Sönmez, 2010). In addition to the developing of the sense of responsibility of the individual, such activities also have a positive impact on their personal development (Hismanoğlu, 2011).

From the point of the Council of Higher Education including the Community Service Practice course in the program, in this study preservice teachers have had the opportunity to analyze the topic of soil, which is substantially significant in social terms in many aspects. When responsibilities of teachers in a community such as guiding the community, being a leader, and integrating with the community are taken into consideration, it is relatively important for preservice teachers to participate in this project for the purpose of having them undertake responsibility in community service and community related matters prior to starting their profession. In line with this, as a result of preservice elementary school teachers participating in activities at the Soil Science School under the scope of the Community Service Practice Course, the analysis of their perceptions on soil has been aimed. This study is multidimensional and here there is only a proportion present.

2. Methodology

The study has been conducted with 12 preservice teachers registered to the 'Community Service Practice' course during the 2010-2011 academic year at the Department of Primary Education. As part of the Community Service Practice course, preservice teachers visited to the Soil Sciences School established under the Department of Soil Science and Plant Nutrition of a university in the province of Ankara for twice and participated in activities related to soil. The Soil Sciences School was established in 2007 with the cooperation of the Faculty of Education and Faculty of Agriculture. The purpose of establishment of this school is particularly the gradual loss of the significance of soil in recent years and the need to explain the significance of soil to children. The target group of the Soil Sciences School is elementary school students and daily education is provided to students for this purpose.

After the one day training from the Soil Sciences School, the preservice teachers assisted the staff of the Soil Sciences School in the training of elementary school students visiting the Soil Sciences School. In this part of the study, the aim was to enhance the knowledge level of preservice teachers on soil and improve their awareness of soil. In the second part of the study, students were expected to open stands at three different locations for the purpose of enhancing soil awareness in the community. These locations are a primary school, the central square of a university, and a city center. With the stands they prepared, the students aimed to both inform three different groups of the community on soil and improve their awareness of soil. The preservice teachers also distributed the educational brochures they had prepared.

In the data collection instrument, in addition to the demographic data of preservice teachers, 7 open ended questions were asked. Open ended questions were prepared in line with the opinions of two science teaching experts

and two science experts on soil. Based on the expired opinion revision were made before administered to the preservice teachers. The purpose of the prepared questions was to determine the experience acquired by preservice teachers, their level of knowledge concerning soil, their expectations from the Soil Sciences School, the contribution of the Soil Sciences School to them, their opinions on the cooperation of the Faculties of Education and Agriculture, and the path to be followed in teaching soil, which is a subject of science and technology, to elementary school teachers.

The response of preservice teachers to the open ended questions was analyzed through the quantitative analysis technique. Response of preservice teachers to each of the questions was analyzed separately by two researchers and themes, subthemes and categories were formed. After an agreement was reached upon between the two researchers, the data were reanalyzed and coding was performed.

3. Findings and results

In line with their responses to questions asked for the purpose of investigating the experience acquired by preservice teachers, three prominent themes were determined: “*Soil Knowledge*”, “*Cooperation of the Faculties of Education and Agriculture*” and “*Impact of the Soil Sciences School*”. Under the theme of “*Soil Knowledge*” the subthemes of ‘*Biological and Physical Structure of Soil*’, ‘*Conservation of Soil*’ and related subthemes, under the theme of “*Cooperation of the Faculties of Education and Agriculture*” the subthemes of ‘*Training Individuals with Awareness*’, ‘*Environmental Awareness*’, and ‘*Specialized Training*’, and under the theme of the “*Soil Sciences School*” the subthemes of ‘*Teaching Soil in the Science and Technology Lesson*’, ‘*Attitude towards Soil*’ and ‘*Attitude towards Science*’ were obtained. In this section, there are percentage-frequency distributions of composed themes and subthemes and sentences of preservice teachers repeated the most in relation to the theme. Preservice teachers have been coded as T1-T12. Frequency and percentage distributions of preservice teachers with regards to determined themes and subthemes have been provided in Table 1.

Table 1: Frequency and Percentage Distributions with regards to Themes and Subthemes

Theme name	f	%
Soil Knowledge		
<i>Characteristics of Soil</i>		
• Structure of soil	6	50
• Soil analysis	6	50
• Soil types	3	25
Total	15	100
<i>Living things in soil</i>		
• Worms	3	25
• Fungi and Lichen	1	8.33
Total	4	100
<i>Soil Conservation</i>		
• Erosion	7	58.33
• Waste substances	6	50
Total	13	100
Impact of the Soil Sciences School		
<i>Teaching soil in Science and Technology education</i>		
• Permanent and significant learning	9	75
• Learning through practice-experience	8	66.66
• Experiment-activity based learning	7	58.33
Total	24	100
<i>Attitude towards soil</i>		
• Being aware	7	58.33
• Creating awareness	5	41.66
• Being aware at an early age	5	41.66
Total	17	100
<i>Attitude towards science</i>		

• Positive attitude	8	66.66
• Making learning fun	8	66.66
• Interest and curiosity arousing	2	16.66
Total	18	100
Cooperation of the Faculties of education and Agriculture		
<i>Significant partnership</i>	8	66.66
<i>Creating environmental awareness</i>	6	50
<i>Creating awareness for soil</i>	5	41.66
<i>Conscious individuals</i>	5	41.66
<i>Specialized training</i>	2	16.66
Total	26	100

The sample participant expressions of most frequently repeated subthemes and categories with regards to the “Soil Knowledge” theme are as follows:

“I had never seen how soil analysis was conducted before. After the pH analysis was conducted, by looking at the pH table indicating which crops could be grown, the plant seeds suitable for the pH value of the soil were selected and planted. However, I had no idea on how this was done, I found it out.” [T6]

“The activity I liked the most at the Soil Sciences School was the activity where the students made a worm shelter. They put soil and worms in a container and sprinkled water on it. I was touched by the excitement of the children. They were excited at seeing a living animal.” [T5]

“While explaining the topic of erosion, when we say ‘erosion is damaging. If we do these, we shall prevent it’ the information is ungrounded; however, at the Soil Sciences School they see all this information practically. The students see that these events happen actually in that manner. They learn everything related to soil through practice-experience. Due to these reasons, I would like to contact this school and see my students go there in the future.”[T2]

The sample participant expressions of most frequently repeated subthemes and categories with regards to “Soil Sciences School” theme are as follows:

“Such centers provide students the opportunity to reinforce their learning through experiments-observations-analyses in the Science and Technology lesson. Students, who find the opportunity to learn in such a manner, achieve permanent and more significant learning.” [T7]

“I believe that the impact of such centers on science and technology lessons shall be positive. Many concepts that are desired to be explained are acquired to the student through activities. As students make associations with daily life, they obtain more permanent information.” [T1]

The sample participant expressions of most frequently repeated subthemes and categories with regards to “Cooperation of the Faculties of education and Agriculture” theme is as follows:

“I considered this activity conducted with the “partnership of the Faculty of Education and the Faculty of Agriculture” to be very significant. I believe such institutions have a structure that may set an example.” [T10]

4. Discussion and Suggestions

In this study, investigating the perceptions of preservice elementary school teachers, who attended the Soil Sciences School for a period of two weeks with regards to soil, has been aimed. In line with obtained results, it has been observed that the perceptions of preservice teachers consist of three themes, which are “Soil Knowledge”, “Cooperation of the Faculties of Education and Agriculture”, and “the Impact of the Soil Sciences School”. When such themes and their subthemes are examined, the perceptions of preservice teachers have been associated the most with “*permanent and significant learning*” related to the subtheme of “Teaching on soil in the Science and Technology lesson” under the theme of the impacts of the Soil Sciences School (f=9) and the least with “Fungi and Lichen” related to the subtheme of “Living things in soil” under the theme of soil knowledge (f=1).

The Soil Sciences School project aims to teach researching, basic concepts related to soil, problem solving, communication, familiarization with nature, and developing positive attitudes and values towards nature (Arcak, Sözüdoğru Ok, Gelbal & Hakverdi, 2010). It has been observed that as a result of the preservice teachers' attendance at the Soil Sciences School, their knowledge on soil grouped under the titles of the structure of soil, living things in soil, and the conservation of soil. "The "Soil Sciences School Project" conducted together by the Faculties of Education and Agriculture, has been assessed by preservice teachers as being a considerably significant project. They have emphasized the need for such science schools that children can attend at early ages for the purpose of raising individuals that are particularly environmentally aware. Another important finding is them considering persons attending the "Soil Sciences School" to be more aware towards soil. "It has been observed that the "Soil Sciences School", which is an experiment and activity based school, ensured that the Science and Technology lesson is perceived to be more fun. It has been concluded that more positive attitudes have been developed towards science through one-to-one activities.

In light of findings obtained in the study, the following suggestions can be made:

When it is considered that the first location preservice elementary teachers are assigned are rural areas, we are once again confronted with the significance of the topic of soil. While some preservice teachers are not aware of the structure and importance of soil, it is not meaningful to expect them to explain the topic of soil effectively when they begin service. When the preservice teachers begin service, having them ensure that students learn the topic of soil through practice-experience and become aware at an early age shall be beneficial in terms of future generations. In this study preservice teachers have attended the "Soil Sciences School" for only two weeks. In future studies preservice teachers can attend this science school for a longer period and their opinions can be taken. A similar study can be conducted with elementary school teachers and their opinions can be analyzed. The impacts of the "Soil Sciences School" on elementary school students, who are the target group, may be investigated in detail. Another dimension of the study is proceeding with elementary school students.

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