

Teachers Candidates' Awareness of Sustainable Development

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Abstract

Today, it is known that rapidly developing industrialization and urbanization seriously threaten the future of humanity. This situation brings to mind the concept of 'sustainable development'. The aim of this study is to determine the "Sustainable Development" awareness of prospective teachers in different branches. Survey method was used in the study. The sample of the study consists of 175 pre-service teachers who study in five different branches of the Faculty of Education of a university located in the Eastern Anatolia region in the fall semester of 2018-2019 academic year. 35 students from each of the departments of Science Teaching, Primary School Teaching, Elementary Mathematics Teaching, Preschool Teaching and Social Sciences Teaching participated in the study. The data of the study were collected with a 5-point Likert scale type of 21 items. Prior to this study, the pilot study was conducted with 121 pre-service teachers from different branches of the sample and the cronbach's Alpha reliability coefficient was found 0,81. From the parametric tests One way ANOVA and Tukey tests were used to analyze the data obtained from the study. As a result of the study, it was determined that the highest mean score in terms of sustainable development awareness belongs to the prospective teachers studying in the Science Teaching Department and the lowest mean score belongs to the prospective teachers studying in the Mathematics Teaching Department. In the study, it was found that there was no statistically significant difference between the sustainable development awareness of Science, Classroom and Social Studies teacher candidates. Adding courses related to sustainable development to the pre-service teachers' curriculum are among the suggestions of the study.

Keywords: Sustainable development, Sustainable development concept awareness, Prospective teachers

Introduction

Nowadays, by being parallel with the increasing human demands and needs, environmental problems are increasing and these problems are being discussed globally. Especially the rapidly developing industrialization and urbanization, modernization in agriculture, the developments in technology and economy disrupting the resource-need balance and the efforts to obtain and increase social welfare seriously threaten the future of humanity. However, the individual, society and nature are ecologically connected. From this point of view, individuals should lead an ecological life and not consume more than what can be reproduced (Öztürk Demirbaş, 2015). This situation reveals the concept of 'sustainable development' (Baikal and Baikal, 2008). When the concept of 'sustainable development', which is perceived as a simple concept at first glance, is examined in all its dimensions, it is seen that it is an important concept for the future of humanity (Gürlük, 2010). Sustainable development is defined as protecting the interests of future generations and balancing the satisfaction of people's present interests (Collin, 2004).

The most widely used definition of sustainable development belongs to the World Commission on Environment and Development (WCED). According to this definition made in 1987, sustainable development; ‘meeting the needs of the current generation without eliminating the ability of future generations to meet their own needs’ (Kaypak, 2011; Altuntas and Turker, 2012). In the related literature, different dimensions of sustainable development are mentioned (Ozturk Demirbas, 2015; Altuntas and Turker, 2012). Nevertheless, it is stated that the most important components of sustainable development are the environmental, economic and social components, and they cannot be handled independently (Ozturk Demirbas, 2015; Altuntas and Turker, 2012).

One of the most important ways to contribute to the sustainable development process is the education of individuals (Lucerne Declaration, 2007). The subject is quite suitable for Science course in terms of its dimensions (Petersen and Applause, 2009). And with effective science education, students can gain the necessary information for a sustainable world (Er Nas and Şenel Çoruhlu, 2017). However, it is known that the concept of ‘sustainability’ is not included in the 2005 curriculum of science and technology course (Tanrıverdi, 2009). Following 2013 and 2018 science curriculum, one of the general objectives of the course was determined as ‘recognizing the interaction between the individual, environment and society and developing sustainable development awareness regarding society, economy and natural resources’ (MoNE, 2013; MONE, 2018a). In addition, in the updated 2018 science curriculum, the subject was included as one of the six sub-learning areas of the ‘Science-Engineering-Technology-Society-Environment’ dimensions with the title ‘Sustainable development awareness’ (MONE, 2018a). In this respect, the subject was given in the 6th unit of eight grades’ curriculum with the title of ‘Sustainable development’. As a sub-topic of this subject, the concepts of ‘sustainable living, saving resources, recycling’ were given with four achievements and the duration of the lesson was determined as 6 hours. Therefore, the level of awareness of science teachers or prospective teachers who will teach related subjects is very important.

Because the high level of awareness about the concept and subject that teachers will tell, facilitates the correct understanding of the subject by students (Demir et al., 2007). On the other hand, it is possible to include issues related to sustainable development in the content of Life Science, Social Studies and Environmental Education courses (Tanrıverdi 2009; Türer, 2010; Bulut, and Çakmak, 2018). When the curriculums of these courses are examined, compared to the past programs it is seen that the subjects related to sustainable development take place more than the previous programs (MoNE, 2015; MoNE, 2018b; MoNE, 2018c). This point makes it important for the prospective science teachers as well as the awareness levels of prospective teachers in different branches.

When the related literature is examined, it is seen that the studies conducted in the field of sustainable development are limited (Kagawa, 2007; Gürbüz, Kışoğlu and Erkol, 2007; Tuncer, Ertepinar and Şahin, 2008; Şahin, Ertepinar and Teksöz, 2009; Türer, 2010; Aydın, 2010; Öztürk Demirbaş, 2015; Er Nas and Şenel Çoruhlu, 2017; Bulut and Çakmak, 2018). Among these studies, the number of prospective teachers on determining sustainability awareness level is quite limited. Öztürk Demirbaş (2015) conducted a study to determine the sustainable development awareness levels of prospective teachers in different branches. In his study conducted with 504 pre-service teachers, it was determined that the sustainable development awareness levels of pre-service teachers in Computer and Instructional Technologies, Guidance and Psychological Counseling and Turkish Teaching departments were significantly higher than those of pre-service teachers in Social Studies and Pre-School Education departments. In the study conducted by Türer, (2010), it was aimed to determine the awareness of science and social studies teacher candidates about ”Sustainable Development..In the study, it was determined that preservice teachers did not show statistically significant difference in terms of general, environmental and economic dimensions in terms of sustainable development awareness, but social dimension sustainable development awareness was higher than science teacher candidates.

The importance of the subject in the light of the literature given above, its place in today’s curriculum,

the fact that the people who will bring the subject to the teachers are teachers and the studies that reveal their awareness about the subject are limited increases the importance of the results of this study.

Method

In this research, survey method was used. Survey studies, which are widely used in the literature and allow the study of large groups, are studies that aim to describe the researcher as having no interventions on the independent variable and a situation that existed in the past or present. (Karasar, 2012; Büyüköztürk, 2012).

Sample

The sample of this study consisted of 175 randomly selected prospective teachers studying in five different branches of the Faculty of Education of a university located in the Eastern Anatolia region. 35 prospective teachers studying in the last year of each of the departments of Science Teaching, Primary School Teaching, Elementary Mathematics Teaching, Preschool Teaching and Social Sciences Teaching participated in the study.

Data Collection Tool

In this study, research data were collected with the ‘Sustainable Development Awareness Determination Questionnaire’ developed by Türer (2010). The Cronbach’s Alpha Reliability Coefficient of the 21-item questionnaire, which covers the social, economic and environmental dimensions of sustainable development, was reported to be 0.856. The questionnaire was designed as a 5-point likert.

A pilot study was conducted with 121 pre-service teachers from different branches of the education faculty. The cronbach’s Alpha reliability coefficient was found .81. In the study, as in Türer (2010), while the expressions were coded, the expression ‘strongly agree’ took the value of five while the negative question ‘strongly disagree’ took the value of five.

One-way analysis of variance (ANOVA) and Tukey test were used in the analysis of the data obtained from the study.

Findings

In this part of the study, the findings obtained from the “ ‘Sustainable Development Awareness Determination Questionnaire” of prospective teachers from different branches were examined separately. While entering the data, it was coded as Classroom Teaching 1, Science Teaching 2, Social Studies Teaching 3, Preschool Teaching 4 and Mathematics Teaching 5.

Table 1 Mean Values between the teacher Candidates Studying in Different Branches

	N	Mean	Std. Deviation	Std. Error
1	35	71,94	8,871	1,500
2	35	72,83	7,294	1,233
3	35	72,60	6,335	1,071
4	35	67,23	6,992	1,182
5	35	58,03	10,237	1,730
Total	175	68,53	9,776	,739

When the average scores of the prospective teachers in different branches in the Table 1 given above are examined; It is seen that science teacher candidates have the highest average with 72.83. The lowest score belongs to prospective mathematics teachers with 58.03. Levene homogeneity test was used to determine whether the distribution of the scores of prospective teachers in different branches was homogeneous or not. Table 2 below presents the findings obtained from the Levene test.

Table 2 Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
2,388	4	170	,053

p>.05

In the study, the homogeneity of variance which is one of the variance analysis assumptions was evaluated by Levene test and it was determined that the variances could be homogeneous (Levene = 2.38, df1 = 4, df2 = 170, p = 0.53). In the study, Kolmogorov-Smirnov test was used to determine whether the data were distributed normally in the groups, and there was no statistically significant

difference between the groups. In addition, the skewness and kurtosis values of the data in the groups were found to be between + 1 and -1.

Table 3 ANOVA Test Results of Teacher Candidates

	Sun of Squares	df	Mean Square	F	Sig.
Between Groups	5553,234	4	1388,309	21,312	,000
Within Groups	11074,400	170	65,144		
Total	16627,634	174			

When Table 3 above was examined, it was seen that the difference between the groups is significant ($p < .05$). Tukey test was used to determine which branches were statistically significant. Table 4 below presents the findings of the Tukey test.

Table 4 Tukey HSD Test Results of Teacher Candidates

(I) Groups	(J) Groups	Mean Difference (I_J)	Std. Error	Sig.
1	2	-,886	1,929	,991
	3	-,657	1,929	,997
	4	4,714	1,929	,109
	5	13,914*	1,929	,000
2	1	,886	1,929	,991
	3	,229	1,929	1,000
	4	5,600*	1,929	,034
	5	14,800*	1,929	,000
3	1	,657	1,929	,997
	2	-,229	1,929	1,000
	4	5,371*	1,929	,047
	5	14,571*	1,929	,000
4	1	-4,714	1,929	,109
	2	-5,600*	1,929	,034
	3	-5,371*	1,929	,047
	5	9,200*	1,929	,000
5	1	-13,914*	1,929	,000
	2	-14,800*	1,929	,000
	3	-14,571*	1,929	,000
	4	-9,200*	1,929	,000

* . The mean difference is significant at the 0,05 level.

When the Tukey test findings in Table 4 are examined; It was seen that the mean scores of sustainable development awareness scores of the prospective teachers studying in the Department of Primary School Teaching were significantly different from those of the elementary school mathematics teachers ($\bar{x} 2,72.83$; $\bar{x} 5,58.03$; $p = .000 > 0.05$). In addition, as it can be seen from the table, it was found that the sustainable development awareness average points of the pre-service teachers in the Department of Science Teacher Education were significantly higher than the sustainable development awareness average points of the pre-school and primary school

mathematics teachers respectively ($\bar{x}2, 72.83$; $\bar{x}4, 67.23$; $\bar{x}5, 58.03$; $p = .034 < .05$; $p = .000 < .05$).

When the findings obtained from Table 5 were examined in terms of prospective teachers studying in the Social Studies Teaching Department; It is seen that there was a significant difference in favor of Social Studies Teachers between the sustainable development awareness average points of the students of this department and the sustainable development awareness average points of the prospective teachers studying in the Department of Mathematics and Preschool Education. ($\bar{x}2, 72.83$; $\bar{x}4, 67.53$; $\bar{x}5, 58.03$; $p = .047 < .05$; $p = .000 < .05$).

When the findings obtained from Table 5 are examined in terms of prospective teachers studying in the Social Studies Teaching Department; It was seen that there was a significant difference in favor of the prospective teachers of the Department of Social Studies Teacher Education between the sustainable development awareness average scores of the prospective teachers studying in the Department of Primary Mathematics Teacher Education and the Preschool Teaching Department and the sustainable development awareness average points of the prospective teachers studying in the Department of Social Studies Education (\bar{x}_2 , 72.83; \bar{x}_4 , 67.53; \bar{x}_5 , 58.03; $p = .047 < .05$; $p = .000 < .05$).

Results and Discussions

In this study conducted to determine the awareness of Sustainable Development of pre-service teachers in different branches, it was determined that pre-service science teachers had the highest score with 72.83 and pre-service mathematics teachers had the lowest score with 58.03. This can be explained by the fact that the subjects of sustainable development in science teaching undergraduate courses are given more attention. In a study conducted by Nas and Çoruhlu (2017), it was emphasized that 38% of prospective science teachers were able to explain the concept of sustainability in a holistic way in accordance with the purpose of the concept and this explanation may be related to the courses they referred to at the undergraduate level. In addition, the topic of sustainable development is one of the six sub-learning areas of the-Science-Engineering-Technology-Society-Environment "dimension of the Science course with the title 'Sustainable development awareness' in the 2018 science curriculum (MONE, 2018a). This makes issues related to sustainable development awareness also important for science teachers.

When the findings obtained from the study were examined in terms of different branches; It was determined that sustainable development awareness of primary school teacher candidates was higher than that of mathematics teacher candidates and science teacher candidates' awareness of sustainable development was higher than Preschool and Mathematics teacher candidates' awareness of

sustainable development. When the findings obtained from the study are examined in terms of Social Studies teacher candidates; it was determined that the students 'awareness of sustainable development was higher than the mathematics and preschool teacher candidates' sustainable development awareness.

In a study conducted by Öztürk Demirbaş (2015), the prospective teachers in eight different branches of the faculty of education were evaluated for sustainable development awareness and it has been reported that prospective teachers studying in Computer and Instructional Technologies, Guidance and Psychological Counseling and Turkish Language Teaching departments have significantly higher levels of sustainable development awareness than the prospective teachers of Social Studies and Preschool Education departments.

In this study, it was determined that between the sustainable development awareness difference of science, classroom and social studies teacher candidates were not statistically significant. It is known that sustainable development consists of three main dimensions: Ecological sustainability, Social and cultural sustainability and Economic sustainability (McIntyre et al., 1993). The fact that sustainable development and its dimensions are given more attention in the undergraduate courses of Science, Classroom and Social Studies teachers may be the reason of that the prospective teachers' awareness of sustainable development is statistically close to each other. In the study conducted by Çobanoğlu and Türer (2015), it is stated that there is no significant difference in terms of sustainable development awareness of science and social studies teacher candidates. Therefore, it can be said that the findings obtained from the study are supported by the literature.

When the findings obtained from the study were examined, it was concluded that the pre-school (\bar{x}_4 , 67.53) and mathematics teacher candidates (\bar{x}_5 , 58.03) had lower awareness of sustainable development than the prospective teachers in other branches. This can be explained by the fact that these two departments do not include the subjects of sustainable development in the undergraduate courses. In another study conducted by Öztürk Demirbaş (2015) to determine the sustainable

development awareness levels of prospective teachers, it was determined that the lowest awareness level belongs to pre-school teacher candidates. Therefore, it can be said that this result obtained from the study is in parallel with the literature.

As a result of this study, it was determined that the prospective teachers' pre-school and mathematics teachers' pre-service teachers' awareness of sustainable development was low. The inclusion of courses on the subjects of sustainable development in undergraduate courses in all departments of the faculties of education can significantly raise the awareness of prospective teachers on sustainable development. Furthermore, sustainable development education starting from preschool can also contribute to raising awareness of the individuals constituting society.

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