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Examining Teacher Candidates' Environmental Awareness in Terms of Different Variables

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Abstract

In this study, it is aimed to examine teacher candidates' environmental awareness in terms of various variables. Environmental awareness was examined in terms of whether or not they received environmental education, gender, class level, parents' education level, place of residence and age. In addition, whether the teacher candidates show awareness to air pollution, water pollution, soil pollution and ecological balance are among the main topics examined in the study. The sample of the research was composed of 146 (86 females, 60 males) prospective science teacher of the faculty of education of a state university located in the Middle Black Sea in Turkey, in 2015-2016 the academic year. As a result of the study, it has been determined that there is a significant difference in favor of female students between students' environmental awareness in terms of gender variable. In addition to these findings, it has been determined that the awareness level of the teacher candidates towards air, water, soil pollution and ecological balance has been at a moderate level. Within this context, suggestions have been made to protect the environment, to analyze environmental problems in all dimensions and to improve the environmental awareness of teacher candidates in a positive way.

Key Words: Environmental education, environmental problems, environmental awareness

Öz

Bu araştırmada öğretmen adaylarının çevresel duyarlılıklarının çeşitli değişkenler açısından incelenmesi amaçlanmaktadır. Çevresel duyarlılık; çevre eğitimi alıp almama, cinsiyet, sınıf seviyesi, anne-baba eğitim durumları, yaşadıkları yer ve yaş değişkenleri açısından incelenmiştir. Ayrıca öğretmen adaylarının; hava kirliliği, su kirliliği, toprak kirliliği ve ekolojik dengeye karşı duyarlılık gösterip göstermedikleri de araştırmada incelenen temel konular arasındadır. Araştırma 2015-2016 eğitim öğretim yılında Türkiye'de Orta Karadeniz Bölgesi'nde yer alan bir devlet üniversitesinin eğitim fakültesi fen bilgisi öğretmenliği ABD'da öğrenim gören toplam 146 öğretmen adayı ile yürütülmüştür. Çalışma sonucunda, cinsiyet değişkeni açısından öğrencilerin çevre duyarlılıkları arasında kadın öğrencilerin lehine anlamlı bir farklılık oluşturduğu tespit edilmiştir. Bu bulgulara ek olarak öğretmen adaylarının hava, su, toprak kirliliği ve ekolojik dengeye karşı duyarlılık düzeylerinin orta düzeyde olduğu tespit edilmiştir. Bu bağlamda çevrenin korunması, çevre sorunlarının tüm boyutları ile analiz edilmesi ve öğretmen adaylarının çevresel duyarlılıklarının olumlu yönde geliştirilmesine yönelik önerilerde bulunulmuştur.

Anahtar Kelimeler: Çevre eğitimi, çevre sorunları, çevre duyarlılığı.

1. Introduction

Environment is a natural habitat where living and non-living beings live. In the deterioration of this natural habitat, the relationship between humans and the environment is one of the most important balances. On the other hand, global warming, depletion of the ozone layer, air, water, soil, light, sound pollution, and the danger of extinction of living creatures are environmental problems that have become the common problem of the whole world. However, the increasing need for raw materials and the unconscious consumption of natural resources draw attention to environmental problems and become the common problem of all humanity. Education has an important place in the solution of environmental problems. The most important reason for people's indifference and unawareness to environmental problems is their lack of sufficient environmental knowledge, environmental consciousness and awareness. The most effective way of raising awareness and sensitization of individuals is a qualified environmental education. Environmental education can give the individual the determination to take action to solve environmental problems. The individual, who understands his effects on ecological balance and the causes and consequences of his interaction with the environment, can have sufficient awareness to protect the environment.

Environmental awareness can be expressed as a form of willingness for a sustainable world that produces constructive solutions to environmental problems. The relationship between environmental education, environmental problems and environmental awareness is very strong and individuals' environmental awareness can be determined by looking at their behavior regarding environmental pollution, population growth and ecological balance (Çabuk & Karacaoğlu, 2003). Therefore, the individual's environmental awareness and education are directly effective in solving environmental problems. Environmental education is very important in raising individuals with knowledge, attitude, behavior, and environmental awareness, who can work towards solving today's problems and preventing the future and who are aware of environment and environmental problems. Within this context, an education that will change people's perspective on nature and gain environmental awareness is important in preventing environmental problems.

When the related literature is examined, many studies have been conducted on the environmental attitudes and awareness of the students (Atasoy & Ertürk, 2008; Hsu, 2004; Gökçe, Kaya, Aktay & Özden, 2007; Francis & Greer, 1999; Kilbourne, Beckmann, Lewis & Dam 2001; Koballa, 1995; Littledyke, 1997; Uzun & Sağlam, 2007; Özmen, Çetinkaya &

Nehir, 2005; Tuncer, Sungur, Tekkaya & Ertepınar, 2004; Tikka, Kuıtunen & Tynys, 2000; Thompson & Gasteiger, 1985; Yalmancı & Gözüm, 2011). As a result of these studies, it is emphasized that environmental education is very important in raising the awareness of the individual. The basis of raising individuals with sufficient environmental awareness is to provide individuals with positive attitudes towards the environment and to ensure that individuals are sensitized by providing the necessary environmental education (Pooley & O'connor, 2000). When the studies are examined as a whole, the studies on teacher candidates who will become teachers in the future and will give the individuals environmental education and environmental awareness are limited, therefore, this study, in which environmental awareness are examined in terms of many different variables, is considered to be important. The most important role in the success of environmental education is the teacher. If the teacher has the knowledge and responsibility to prepare the lessons for the environment, it will be possible to raise students with high environmental awareness. Education faculties are the most important place in the training of teachers and teachers have the most important role in raising future generations because it is teachers in all academic disciplines that have primary importance in conveying environmental awareness and consciousness to students (Esa, 2010; Hardy, 1973; Öztürk, 2019). In addition, this study is also important in determining the opinions of prospective science teachers whether the environmental education they get is sufficient in their behavior towards the environment. In this respect, it is thought that the research carried out will guide the future research and shed light on the necessity of environmental education and the studies to be done to solve environmental problems.

Purpose

The general purpose of this study is to statistically examine whether the environmental awareness of prospective science teachers makes a difference in terms of various variables. Environmental awareness has been examined in terms of whether or not they received environmental education, gender, class level, parents' education status, place of residence and age. In addition, it has been tried to determine whether the students show awareness towards air pollution, water pollution, soil pollution and ecological balance.

2. Method

The study conducted with the aim of examining the environmental awareness of prospective science teachers in terms of different variables (whether they received environmental education or not, gender, in which grade they were educated, parents' education status, place of residence and age) and whether the science teacher candidates show awareness towards air, water, soil and ecological balance, is a descriptive survey model. Survey model is collecting data to determine certain characteristics of the group (Büyüköztürk, Çakmak, Akgün, Karadeniz & Demirel 2010, p.16). The event, individual or object subject to research is tried to be defined in its own conditions and as it is.

Study Group

The study was conducted with second, third and fourth year 146 prospective teachers enrolled in the department of science education, faculty of education of a state university located in Central Black Sea Region in Turkey. Due to the availability of the population, sampling was not used and data collection tools were applied in all classes in the department of science education. Table 1. below contains information on the distribution of students participating in the study by gender.

Table 1.

Distribution of the Students Participating in the Study by Gender

	Female		Male		Total	
	f	%	f	%	f	%
Study Group	86	58.9	60	41.1	146	100

When the data in Table 1 is examined, it is seen that 86 (58.9%) of the 146 students who participated in the study were female students, while 60 (41.1%) were male students.

Table 2.

Distribution of the Students in the Study Group by Grade

	1.Grade		2. Grade		3. Grade		4.Grade		Total	
	f	%	f	%	F	%	f	%	f	%
Study Group	40	27.4	37	25.3	33	22.6	36	24.7	146	100

In the study group, 40 (27.4%) students are in the first grade, 37 (25.3%) students are in the second grade, 33 (22.6%) students are in the third grade, and 36 (24.7%) students are in the fourth grade.

Data Collection Tools

A questionnaire was used as a data collection tool to determine the opinions of prospective science teachers about their environmental awareness. The questionnaire used in the study consists of two parts. In the first part, a personal information form that includes information on whether students have received environmental education, gender, in which grade they were educated, parents' education status, and age, and in the second part, the questionnaire developed by Çabuk & Karacaoğlu (2003) to determine the opinions of university students on environmental awareness is used. The necessary permission was obtained from the researchers who developed the scale for the usage rights of the questionnaire. The questionnaire consists of 24 questions. For this research, the preliminary reliability studies of the questionnaire were conducted on 200 students and Cronbach's Alpha value was examined, as a result, 6 items were removed from the questionnaire and the questionnaire was reduced to 18 questions. An 18-question questionnaire was applied to prospective science teachers. The Cronbach Alpha reliability coefficient of the measurements obtained from the questionnaire was calculated as 0.78. In order for the reliability coefficient to be acceptable, the critical alpha value is usually 70 and above (Cronbach, 1951). Accordingly, it can be said that the measurements in this study are reliable.

Data Analysis

The findings obtained from the data collection tool results used in the study were analyzed using the SPSS 20 program. The frequency and percentage values are given in the questions in the questionnaire used. Independent Samples T-test was conducted to see whether gender, age, environmental education or not making a difference in environmental awareness. OneWayAnova (one-factor analysis of variance) was conducted to examine whether the place where they lived and their education in the classroom, and whether their parents' education status made a difference in their environmental awareness.

3. Findings and Interpretation

There are 4 main topics in the questionnaire, which was applied to examine the behaviors of science teacher candidates about environmental awareness. These are air pollution, water pollution, soil pollution and ecological balance. Student views on these topics were evaluated separately. The distribution of the opinions of science teacher candidates on air pollution awareness is given in Table 3.

Table 3.

Distribution of Student Opinions According to Their Awareness towards Air Pollution

Items	Always		Sometimes		Never	
	F	%	f	%	f	%
Do you pay attention not to use consumer goods (deodorants and other sprays) that contain substances harmful to the ozone layer?	24	16.4	98	67.1	24	16.4
Even if you have your own vehicle, do you use public transport, taking into account not to cause air pollution?	31	21.2	67	45.9	48	32.9
Do you pay attention that other people are not affected while talking and using various tools?	85	58.2	61	41.8	0	0
Do you warn people to be aware of air pollution?	55	37.7	83	56.8	8	5.5

When the data in Table 3 are examined; 98 (67.1%) of the students sometimes use consumer goods containing substances harmful to the ozone layer in their daily life, and 24 (16.4%) of the students always or never use them. Considering not to cause air pollution, 31 (21.2%) students who always pay attention to use public transportation and 48 (32.9%) who stated that they never use public transportation. 85 (58.2%) of the students are always careful and sensitive not to affect other people while talking and using various tools, besides, 61 (41.8%) of the students sometimes pay attention to this issue. While 8 (5.5%) of the students stated that they never warned people to be sensitive about air pollution, 83 (56.8%) stated that they sometimes warned them. The distribution of the opinions of science teacher candidates regarding their awareness towards water pollution is given in Table 4.

Table 4.

Distribution of Student Opinions According to Their Awareness towards Water Pollution

Items	Always		Sometimes		Never	
	f	%	f	%	f	%
Do you buy cleaning agents while paying attention to whether they contain harmful chemicals?	40	27.4	85	56.2	24	16.4
Are you frugal in all matters of water use?	67	45.9	73	50	6	4.1
Do you take care that harmful chemicals such as engine oil and paint do not mix into the sewer?	60	41.1	68	46.6	18	12.3
Do you warn people to be sensitive about water pollution?	73	50	70	47.9	3	2.1

As seen in Table 4, 82 of the students (56.2%) bought the cleaning agents, sometimes paying attention to whether they contain harmful chemical substances,40 of them (27.4%) stated that they have always been aware of this issue. Regarding the issue of whether or not to be frugal about water use, half of the students 73 (5o, 0%) stated that they were sometimes aware of the water use, 6 (4.1%) of them stated that they were never aware of it.68 (48.6%) of the students sometimes and 60 (41.1%) of the students stated that they are always aware of taking care not to mix harmful chemicals into the sewer.73 (50.0%) of the students stated that they always warned people to be aware of water pollution and 70 (47.9%) of them stated that they sometimes showed awareness. Are you always frugal in water use? " and 45.9% of the students showed awareness. "Would you warn people to be aware of water pollution?" 3 students were unaware with 2.1%. The distribution of the opinions of science teacher candidates regarding their awareness towards soil pollution is given in Table 5.

Table 5.

Distribution of Students' Views According to Their Awareness towards Soil Pollution

Items	Always		Sometimes		Never	
	f	%	f	%	f	%
Do you take care to use both sides of the paper when you write?	104	71.2	33	22.6	9	6.2
Are you frugal in all circumstances when using paper napkins?	75	51.4	51	34.9	20	13.7
Do you plant saplings taking into account the appropriate conditions for it to grow?	39	26.7	77	52.7	30	20.5
Do you take care that the wastes reach the garbage can?	97	66.4	44	30.1	5	3.4
Do you throw waste into suitable recycling bins so that they can be recycled?	67	45.9	69	47.3	10	6.8
Do you classify the garbage when disposing of it?	35	24.0	82	56.2	29	19.9
Do you warn the people around you to be aware of soil pollution?	54	37.0	77	52.7	15	10.3

When Table 5. is examined, the items that the teacher candidates show the least awareness, the item “Do you plant saplings taking into account the appropriate conditions for it to grow?”, 30 (20.5%) of the students and “Do you classify the garbage when disposing of it?” item, 29 (19.9%) of the students answered never. In this case, it can be shown as a proof of unawareness towards recycling. When Table 5 is examined, the item that students are aware of soil pollution is " Do you take care to use both sides of the paper when you write?" and 104 students (71.2%) showed awareness to this item. The distribution of the opinions of science teacher candidates on their awareness to ecological balance is given in Table 6.

Table 6.

Distribution of Student Opinions According to Their Awareness of Ecological Balance

Items	Always		Sometimes		Never	
	f	%	f	%	f	%
If you were / are married, would you pay attention to population planning, taking into account the ecological balance?	71	48.6	54	37.0	21	14.4
Do you consider it appropriate for humanity to conduct any kind of experiment on humans and animals?	10	6.8	47	32.2	89	61.0
Do you warn the people around you to be aware towards the preservation of ecological balance?	51	34.9	86	58.9	9	6.2

When Table 6. is examined, the item that students are the most aware of ecological balance is "If / if you were/are married, would you pay attention to population planning considering the ecological balance?" and 71 students (48.6%) showed awareness.

Asked about animal rights, which is a very important issue of our day, the item "Do you consider it appropriate for humanity to conduct any kind of experiments on humans and animals" appears as another item of which they show awareness, and 89 students (61%) answered "never". The last item of the questionnaire, " Do you warn the people around you to be aware towards the preservation of ecological balance?" 86 students showed moderate level of awareness by giving the answer “sometimes”. "Independent samples t-test" was conducted to determine whether the opinions of science teacher candidates on environmental awareness differ significantly according to the "gender" variable and the results are shown in Table 7.

Table 7.

T-test Results of Prospective Teachers' Opinions About Their Environmental Awareness According to the Gender Variable

Gender	N	$\overline{X}$	S	t	p
Female	86	23.2	.238	3.44	.001
Male	60	21.5	.342		

As seen in Table 7, there is a significant difference between students' environmental awareness according to their gender [t (144) = 3.44, p <.05]. The arithmetic mean of female

students ($\overline{X}$ = 23.2) is higher than male students ($\overline{X}$ = 21.5). It can be said that female students behave more environmentally aware than male students. This finding is similar to the studies in which many researchers (Barret, 2010; Gök, 2012; Mercan, 2013; Varlı, 2014) concluded that environmental awareness shows a significant difference in favor of women by gender. "Independent samples t-test" was conducted to determine whether the opinions of science teacher candidates about environmental awareness differ significantly according to taking environmental education course and the results are shown in Table 8.

Table 8.

Difference Between Environmental Awareness of the Students in the Study Group According to Taking Environment Education Lesson

Taking Environment Lesson	N	$\overline{X}$	S	T	P
Yes	64	22.7	.30	.759	.449
No	82	22.3	.28		

As can be seen in Table 8, no significant difference was found between the environmental awareness of the students according to environment lesson they take [t (144) =. 759, p> .05]. Accordingly, it can be said that taking environmental lessons in this study is not a factor affecting environmental awareness. Similarly, Erol and Gezer (2006) and Deniş and Genç (2007) stated that environmental awareness did not make a significant difference between students who took and did not take environmental courses. "Independent samples t-test" was conducted to determine whether the environmental awareness of the science teacher candidates differed significantly according to their "age" and the results are shown in Table 9.

Table 9.

Difference Between Environmental Awareness of the Students in the Study Group According to Their Ages

Age	N	$\overline{X}$	S	t	P
20 years and under	61	22.4	.30	.28	.780
21 years and older	85	22.6	.29		

As can be seen in Table 9, no significant difference was found between students' environmental awareness according to their ages. [t (144) =. 28, p> .05]. According to this, it can be said that age is not a factor affecting environmental awareness. Çabuk and Karacaoğlu (2003) also did not find a significant difference between students' environmental awareness

according to age groups. "One-Way Analysis of Variance (ANOVA)" was conducted to determine whether the environmental awareness of science teacher candidates showed a significant difference according to the "grade level" variable and the results are shown in Table 10.

Table 10.

Difference Between the Environmental Awareness of the Students in the Study Group by Grade Level

	Grade	N	$\overline{X}$	S	p
Environmental Awareness	1	40	22.5	.35	.623
	2	37	22.1	.22	
	3	33	23.0	.30	
	4	36	22.5	.28	

When Table 10 is interpreted regarding the OneWayAnova result made to examine the difference between the environmental awareness of the students in the study group according to their classes, no significant difference was found between the students' environmental awareness according to their grade levels (p> .05). Anova was performed to determine whether the environmental awareness of the science teacher candidates showed a significant difference according to the "place of residence" variable and the results are shown in Table 11.

Table 11.

Difference Between Environmental Awareness of Students in the Study Group According to Where They Live

	Place of residence	N	$\overline{X}$	S	p
Environmental Awareness	Village	12	23.3	.08	.585
	District	65	22.4	.03	
	Province	42	22.7	.03	
	Metropolis	27	22.0	.07	

When the table 11 regarding the OneWayAnova result made to examine the difference between the environmental awareness of the students in the study group according to where they live, no significant difference was found between the environmental awareness of the students according to the place they live (p> .05).

"One-Way Analysis of Variance (ANOVA)" was conducted to determine whether the opinions of prospective teachers on environmental sensitivities differ significantly according to the "mother's education level" variable. The results of this analysis are given in Table 12.

Table 12.
Anova Results of the Opinions of the Students in the Study Group on Environmental Awareness According to the Variable of the Mother's Education Level

	Mother's Education Level	N	$\overline{X}$	S	P
Environmental Awareness	Primary school	85	22.9	.288	.146
	Secondary school	36	21.9	.335	
	High school	24	21.9	.239	
	Universty	2	25.2	.274	

When the table 12 related to the OneWayAnova result made to examine the difference between the environmental awareness of the students in the study group according to the education level of the mother was interpreted, no significant difference was found between the students' environmental awareness according to the education level of the mother (p> .05).

Anova was conducted to determine whether the opinions of prospective teachers on environmental awareness differ significantly according to the variable of "father's education level". The results of this analysis are presented in Table 13.

Table 13.
Anova Results of the Opinions of the Students in the Study Group about their Environmental Awareness According to the Variable "Father's Education Level"

	Father's Education Level	N	$\overline{X}$	S	p
Environmental Awareness	Primary school	41	22.7	.271	.898
	Secondary school	37	22.2	.357	
	High school	42	22.6	.261	
	Universty	26	22.6	.305	

When the table 13 regarding the OneWayAnova result made to examine the difference between the environmental awareness of the students in the study group according to the education level of the fathers was interpreted, no significant difference was found between the

environmental awareness of the students according to the education level of the father (p>.05).

4. Conclusion and Recommendations

In this section, suggestions are given in line with the results and results obtained from the research conducted in order to examine the environmental awareness of the teacher candidates in terms of various variables and to examine whether the teacher candidates show awareness to air, water, soil and ecological balance.

In the questionnaire, which was applied to examine the behaviors of science teacher candidates on environmental awareness, students' views on air pollution, water pollution, soil pollution and ecological balance were evaluated separately. It was determined that the prospective teachers showed a medium level of awareness regarding air, water, soil pollution and ecological balance. In the study, it was found that there is a significant difference between students' environmental awareness according to gender. Environmental awareness of female students is higher than male students. This result is similar to some studies in the literature (Barret, 2010; Çabuk & Karacaoğlu, 2003; Fortmann & Kusel, 1990; Gök, 2012; Öztürk, 2019; Varlı, 2014). Within this context, male students should be encouraged to participate in voluntary environmental studies at the university level. No significant difference was found between students 'environmental awareness according to age groups. There is no significant difference between students' environmental awareness according to their classes. However, there is no significant difference between the environmental awareness of the students according to the place they live. No significant difference was found between the environmental awareness of the students according to their parents' educational status. Similarly, there is no significant difference between the environmental awareness of the students according to environmental courses they take. In line with this finding, we can say that taking environmental lessons is not a factor affecting environmental awareness. Similarly, Erol & Gezer (2006) and Deniş & Genç (2007) found in their research that environmental awareness does not make a significant difference between students who take environmental courses and those who do not. In addition, this result draws attention to an important point and shows the inadequacy of the environmental education course in gaining environmental awareness. Environment courses in higher education should include trainings aimed at raising awareness, attitude, awareness and behavior as well as knowledge. This result is similar to

studies in the literature that emphasize increasing student-centered activities such as laboratory practices and open field studies in environmental education (Uzun & Sağlam, 2007; Velempini, 2016; Yavetz, Goldmanand Peter, 2009; Zareieve Navimipour, 2016). Research on improving the content of environmental education courses given at universities can be suggested as another research topic. In addition, in order to provide a quality environmental education in universities, the content of environmental education should be reviewed and seminars and trainings on environmental awareness should be organized. When the results of the research are evaluated in general, taking into account the insufficiency of the education they receive in the environmental awareness of science teacher candidates, measures should be taken to increase the quality of the education received. Among these measures, the ones that increase the interest and motivation of the teacher candidates should be emphasized. For example, university-science and nature camps that will be realized by integrating with nature can be useful in this regard, as they are based on learning by doing and living. Within this context, it is necessary to include trainings aimed at raising awareness, attitude, awareness and behavior as well as knowledge in environmental courses in higher education. Research on improving the content of environmental education courses given at universities can be suggested as another research topic. When the findings of the study are examined as a whole, more time should be devoted to environmental research, the dimensions of the studies in this field should be expanded, and the number of studies on the environment should be increased for humanity, for all living things and for a more livable world. News and trainings that increase environmental awareness in social media, written and visual media should be made widespread.

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