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Determination of Teacher Candidates' Awareness of Environmental Ethics*

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Abstract

The aim of this study is to determine the awareness levels of teacher candidates about environmental ethics. A survey model from quantitative research methods was used to determine the environmental ethics awareness levels of teacher candidates. An environmental ethics awareness scale was used as the data collection tool, and the working group of the study consisted of all teacher candidates studying in the Faculty of Education of a state university in the Western Black Sea region of Turkey. The data collected were analyzed in terms of statistical methods, including arithmetic means, standard deviations, the Kruskal Wallis H test, and the Mann Whitney U test. According to the findings of the study, environmental ethics awareness levels of teacher candidates were higher than average. Furthermore, there were no differences for gender, maternal education, paternal education, high school graduated from, department of study, monthly income of the family, class level, or residence of the student prior to university.

Keywords: Environmental ethics, Environmental ethics awareness, Environmental awareness, Teacher candidate

Introduction

The environment can be defined as the area in which all living beings carry out all their vital activities on Earth, where inanimate elements such as soil, air, and water complement each other and often provide resources. This concept may be given different definitions according to various branches of science, as well as different areas that can be described as environmental in light of scientific developments (Ağbuğa, 2016). When we look at the components of environmental concepts, it is seen that the environment can only survive with the harmony of these components. The way to achieve such harmony is through the regulation of human activities, because the most important factor affecting environmental dynamics both directly and indirectly is human activity. At this point, in addition to creating environmental awareness by explaining what environmental problems are, it is necessary to combine this with the concept of value and address the conscience as well as the mind. Awareness should be combined with giving importance and value so that disruptive activities can be prevented. Today, the concept and approach of 'environmental ethics', which blends environmental knowledge with an ethical approach, pursues this mission. Being aware of this has also given rise to the concept of 'environmental ethics awareness'.

Environmental crises such as the threat of global desertification, the increasing carbon footprint, and the sudden emergence of environmental problems as never before have laid the groundwork for the development of the concept of environmental ethics (Hens & Susanne, 1998: 116). The main aim of environmental ethics is to guide and shape attitudes and behaviors that will guarantee the protection of all living creatures' habitats (Kılıç, 2008). Environmental ethics also brings a new and deeper perspective on the environment, distinguishes itself from traditional ethics by being extensible, and exposes environmental problems beyond individual societies and nations by being global in scope (Yang, 2006: 23-24). According to environmental ethics, nature should be perceived as a moral partner (Nasibulina, 2015: 1080). Indeed, to preserve such ethics, individual-environment relations today, and the future security of environmental assets, conscience and harmony with regulating concepts such as responsibility (Kaypak, 2010) are required while examining the natural environment and environmental behaviors that protect the value of the field, and this is a growing topic of research (Gül, 2013). Environmental issues are being explored in depth by examining solutions to develop interdisciplinary works by raising awareness of 'practical ethics' in the field (Oguz et al., 2005). The general form of expression is the

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systematic examination of the moral relations between humans and their natural environment (Des Jardins, 2006: 46). Accordingly, environmental ethics examines the moral basis of environmental responsibility by asking questions about humans and their environment (Ojomo, 2011: 573).

Innovations in the current curriculum of teacher education were required in Turkey, and the Board of Higher Education has gradually implemented such change from the academic year of 2018-2019 within the undergraduate curriculum for faculties of education in the field of teacher training. With these changes to the content of the curriculum, the most noticeable change has been in the primary education section (Yurdakal, 2018). In this context, based on awareness of environmental ethics, the chain is so important (2018a), the new approach to teacher training in degree programs is organized as follows: "In today's higher education in the field of Educational Sciences and for teachers in the field of education, increasingly ethical, moral, and cultural issues and the importance of these issues are increased significantly". "The renewed licensing program for teacher candidates in terms of professional knowledge and skills related to the field, in addition to adequate equipment in terms of social, cultural, moral, and intellectual aspects of personality, will aid in having a sophisticated, well-equipped, more humane, and virtuous country and the world will take an active role in the construction of moral and cultural values needed among those to be trained as leaders." In addition to courses that directly address the concepts of ethics and values, such as character and value education, or ethics and ethics in education, for example, "environmental sensitivity and studies related to environmental sensitivity in the world" will be provided in the context of environmental education. Similarly, "rethinking human-nature relations on the sustainability axis" (YÖK, 2018b) in sustainable development and education courses is another important subject in this field. In this context, it is important for educators to have good morals and ethical and professional values, and to have thoroughly assimilated these into their lives. It will be possible for us to avoid human and moral breakdowns and problems with educators who will be role models in these issues.

The literature includes studies with different contents and sizes on environmental ethics. For example, some studies analyzed the attitudes of students and teacher candidates and environmental biocentrism, ecocentrism, anthropocentricism, and techno-centric approaches while performing research domestically and abroad (Erten, 2007; Erten, 2008; Saka, Sürmeli, & Öztuna, 2009; Karakaya, 2009; Erten & Aydoğdu, 2011; Çobanoğlu, Karakaya, & Türer, 2012; Karakaya & Çobanoğlu, 2012; Sürmeli & Saka, 2013; Cappellaro, 2016; Thompson & Barton, 1994; Thompson, 1998; Schultz & Zelezny, 1999; Kortenkamp & Moore, 2001; Casey & Scott, 2006; Özdemir, 2014; Kasalak, Yurcu, & Akıncı, 2018; Bozdemir & Faiz, 2018). In addition to those studies, students' awareness and perceptions about environmental ethics (Özdemir, 2012; Bülbül, 2013; Özer, 2015; Gerçek, 2016; Sungur, 2017; Dikicigil, 2018) and their environmental sensitivities (Kiper, Korkut, & Topal, 2017) have also been explored in some works. Other works in the literature have addressed students' values in relation to the nature of their orientation, the nature of their choices of study (Dervişoğlu & Kılıç, 2013), patterns of moral reasoning on environmental issues among socio-scientific program students (Uzel, 2014), the necessity of bioethics education (Bakar, 2010), attitudes towards environmental ethics and sustainable environment (Tunç & Yenice, 2017), and knowledge of environmental ethics (Wongchantra & Nuangchalerm, 2011).

When the studies conducted with the participation of teacher candidates are examined, other factors found to have impacts on environmental knowledge, attitudes, and behaviors have included the gender factor (Şama, 2003; Çabuk & Karacaoğlu, 2003; Deniş & Genç, 2007; Manzaral, Barreiro, & Carrasquer, 2007; Erten, 2008; Kahyaoğlu, Daban, & Yangın, 2008; Karakaya, 2009; Şenyurt, Temel, & Özkahraman, 2011; Wongchantra & Nuangchalerm, 2011; Çobanoğlu, Karakaya, & Türer, 2012; Kiper, Korkut, & Üstün Topal, 2017; Karakaya & Yılmaz, 2017), the licensing department (Şama, 2003; Çabuk & Karacaoğlu, 2003; Kahyaoğlu, Daban, & Yangın, 2008; Karakaya, 2009; Saka, Sürmeli, & Öztuna, 2009; Şenyurt, Temel, & Özkahraman, 2011; Can, 2012; Kiper, Korkut, & Üstün Topal, 2017), class level (Çabuk & Karacaoğlu, 2003; Manzaral, Barreiro, & Carrasquer, 2007; Can, 2012; Sungur, 2017), place of residence (Şama, 2003; Karakaya, 2009), education status of the father (Şama, 2003), enrollment in courses on the environment (Deniş & Genç, 2007; Saka, Sürmeli, & Öztuna, 2009; Bakar, 2010; Bayık Temel & Özkahraman, 2011), and family income level (Şama, 2003). In the literature, to assess teachers candidates' environmental ethics awareness, gender, environmental ethics, the department of study, grade level, university region (Bülbül, 2013; Özer, 2015; Dikicigil, 2018; Sönmez, 2018) have been demonstrated to be effective variables.

As a result, when the field is examined, it is seen that the research conducted to date is generally oriented towards determining the participants' approaches, attitudes, knowledge, and perceptions of the environment. There are a limited number of studies examining environmental ethics awareness, including the concept of environmental valuation. In addition, it is observed that studies on environmental ethics awareness are usually conducted with only undergraduate students from a single department and that they incorporate a small number of variables. Therefore, it is necessary to contribute to the literature with research that will be conducted with different undergraduate departments and that will take into account a larger number of variables thought to be

related to environmental ethics awareness.

In this study, it is aimed to provide data on the environmental ethics awareness levels of teacher candidates and on the relationships of the variables that are thought to have an effect on this awareness. This study and similar studies for raising awareness and gathering data on environmental ethics in terms of activities to contribute to environmental training programs to improve the content of higher education courses will help improve the thinking on environmental ethics in the future.

The Aim of Research

The aim of this study is to determine the environmental ethics awareness levels of teacher candidates in the Faculty of Education and to investigate whether their environmental ethics awareness levels are related to some specified variables. For this purpose, the answers to the following questions were sought:
1- What is the level of environmental ethics awareness of teacher candidates?
2- Is there a significant difference between the awareness levels of environmental ethics in terms of the personal characteristics of teacher candidates (gender, parents' education levels, place of residence before coming to university, high school type, level of study, department of education)?

Method

Research Model

The research was designed in descriptive design as defined by (Fraenkel, Wallen & Hyun, 2012) as a kind of general research types. Descriptive studies are generally carried out to clarify a given situation, to make assessments in line with standards, and to reveal possible relationships between events (Çepni, 2007). In addition, descriptive research is defined as research that describes a given situation as fully and carefully as possible (Büyüköztürk et al., 2010).

Study Group

The study group consists of a total of 871 teacher candidates from the Faculty of Education of a university in a province of the Western Black Sea region of Turkey. Since it was possible to reach the teacher candidates who made up the population of the research, no sampling method was selected. Of the 871 data collection tools distributed to the students, 38 forms were excluded from the evaluation because they were not filled out properly and 833 forms were thus taken for evaluation. Of the individuals who participated in the study, 78% were female (655 participants) and 21% were male (178 participants). All departments of the faculty and all grade levels were included in the study, and the participants' personal characteristics are shown in Table 1.

Table 1. The demographic features of participants

	Demographics	Number	Percent (%)		Demographics	Number	Percent (%)
Gender	Female	655	78.6	Type of High School	Religious Vocational High School	54	6.5
	Male	178	21.4		Vocational High School	53	6.4
Education Level of Mother	Primary	502	60.3		Other	182	21.8
	Secondary	125	15	Class Level	1st Year	245	29.4
	High School	134	16.1		2nd Year	206	24.7
	University	44	5.3		3rd Year	210	25.2
Education Level of Father	Primary	319	38.3		4th Year	172	20.6
	Secondary	157	18.8	Department	Science Teaching	121	14.5
	High School	219	26.3		Preschool Teaching	61	7.3
	University	127	15.2		English Teaching	57	6.8
Residence Before University	Village	102	12.2		Turkish Teaching	100	12
	Town	291	34.9		Psychological Counseling and Guidance	267	32.1
	City	437	52.5		Classroom Teaching	227	27.3
Type of High School	Anatolian High School	523	62.8				
	Science High School	14	1.7				

Data Collection

In order to collect data, a 10-item personal information form was prepared and the Environmental Ethics Awareness Scale was used. Expert opinions were obtained from two specialists in the field of educational

sciences and one in a science field, and 8 variables regarding personal information were included in the study accordingly. These variables are gender, class level, department, family income status, mother's education level, father's education level, place of residence before coming to university, and the type of high school that the participant graduated from. As another data collection tool in the research, the Environmental Ethics Awareness Scale developed by Özer and Keleş (2016) was used after obtaining the required permission. This scale contains 23 questions and was prepared as a 5-point Likert-type scale. The question groups formed by grouping 23 items constitute the sub-dimensions of the scale. The first sub-dimension is "Definition of Environmental Ethics" (DEE) (questions 1-7), the second sub-dimension is "Aim of Environmental Ethics" (AEE) (questions 21-23), the third sub-dimension is "Reasons for the Emergence of Environmental Ethics" (REEE) (questions 16-20), and the fourth sub-dimension is "Measures to be Taken for Environmental Ethics" (MTEE) (questions 8-15). Each question on the scale could be given the highest score of 5 and the lowest score of 1. Upon selecting these data collection tools, necessary permission was obtained from the Dean of the Faculty of Education.

The Cronbach alpha coefficient (α) for the overall scale was calculated to ensure the reliability of the data obtained. It was calculated as 0.944. In relation to the sub-dimensions, for "Definition of Environmental Ethics" α was 0.913; for "Aim of Environmental Ethics" it was 0.902; for "Reasons for the Emergence of Environmental Ethics" it was 0.781; and for "Measures to be Taken for Environmental Ethics" it was 0.842.

To ensure the validity of the scale, confirmatory factor analysis (CFA) was also applied over the data obtained. Accordingly, the alignment indices of the model were examined and it was determined that chi-square/cf = 1184.892/224 = 5.736. It was observed that the value obtained from this calculation fit well. Values of DFA = RMSEA = 075, NFI = 0.90, RFI = 0.89, IFI = 0.92, TLI = 0.90, and CFI = 0.92 were also observed to coincide with the alignment index values of the scale.

Data Analysis

Data were analyzed using a statistical package program. The mean values of the study were defined as 'strongly disagree' for 1 to 1.79, 'disagree' (low level) for 1.80 to 2.59, and 'neutral' (middle level) for 2.60 to 3.39. They were defined as 'agree' between 3.40 and 4.19 and 'absolutely agree' (high level) between 4.20 and 5.00. Frequency (f) and percentage (%) were also used for descriptive statistical analyses of the demographic information of the participants. The distribution of the dataset was examined with the Kolmogorov-Smirnov test to determine the tests to be used to compare the environmental ethics awareness of the teacher candidates according to the overall scale and sub-dimensions. Nonparametric tests ($p > 0.05$) were used because the variables in the lower problems of the scale were not normalized. The Mann-Whitney U test and the Kruskal-Wallis H test were used for the gender variable because the environmental ethics awareness dataset did not show normal distribution. The Mann-Whitney U test was used to test the differences between the categories of the Kruskal-Wallis H test.

Findings

In this section, analyses performed to determine the students' awareness of environmental ethics are presented within the subcategories of the environmental ethics awareness levels of teacher candidates and the comparison of the environmental ethics awareness levels.

A- Environmental Ethics Awareness Levels of Teacher Candidates

The results of the analysis to determine the environmental ethics awareness levels of the teacher candidates are shown in Table 2 below.

Table 2. Environmental ethics awareness levels of teacher candidates

Dimensions	N	Mean	SD
DEE	833	4.64	0.58
AEE	833	4.72	0.57
REEE	833	4.40	0.59
MTEE	833	4.42	0.55
Environmental Ethics Awareness	833	4.52	0.51

According to Table 2, environmental ethics awareness levels were higher than average (mean > 4.20) overall and in terms of sub-dimensions among the teacher candidates participating in the study. According to the findings, it can be said that the teacher candidates have an awareness of environmental ethics.

B. Comparison of Environmental Ethics Awareness Levels of Teacher Candidates

In this section, a comparison of environmental ethics awareness of teacher candidates is made based on the following variables: 1. Gender, 2. Monthly income level of the family, 3. Education level of the mother, 4. Education level of the father, 5. Residence before coming to university, 6. Type of high school that the participant graduated from, 7. Year of education, 8. Mann-Whitney U and Kruskal-Wallis H test results.

1- Comparison of Environmental Ethics Awareness of Teacher Candidates According to Gender

Table 3. Mann-Whitney U test results on teacher candidates' awareness of environmental ethics in terms of gender

Dimensions	Group	N	Mean Rank	Rank Sum	U	p
Environmental Ethics Awareness	Female	655	431.97	282940.00	48490.00	0.001
	Male	178	361.91	64421.00		
DEE	Female	655	431.71	282767.5	48662.50	0.000
	Male	178	362.88	64593.5		
MTEE	Female	655	427.65	280107.50	51322.50	0.014
	Male	178	377.83	67253.50		
REEE	Female	655	432.26	283132.00	48298.00	0.000
	Male	178	360.8	64229.00		
AEE	Female	655	428.75	280829.00	50601.00	0.001
	Male	178	373.78	66532.00		

$p < 0.05$

According to Table 3, environmental ethics awareness and its sub-dimensions differ significantly according to gender ($p < 0.05$), and the averages of female participants are significantly higher than the averages of males. According to this, we can say that females have higher levels of environmental ethics awareness than males.

2- Comparison of Teacher Candidates' Environmental Ethics Awareness in Terms of Their Parents' Monthly Income Levels

Teacher candidates' environmental ethics awareness levels did not differ significantly according to their parents' monthly incomes ($\chi^2 = 4.825$ and $p = 0.185 > 0.05$). DEE did not differ significantly among the sub-dimensions of the scale ($\chi^2 = 4.272$ and $p = 0.234 > 0.05$). The values for MTEE ($\chi^2 = 4.721$ and $p = 0.193 > 0.05$), REEE ($\chi^2 = 4.318$ and $p = 0.229 > 0.05$), and AEE also did not differ significantly ($\chi^2 = 3.273$ and $p = 0.251 > 0.05$).

Accordingly, it can be said that the monthly income of the family is not a factor affecting the environmental ethics awareness of the teacher candidates both in general and on the basis of the sub-dimensions.

3- Comparison of Environmental Ethics Awareness of Teacher Candidates According to Maternal Education Level

Table 4. Kruskal-Wallis H test results of environmental ethics awareness of teacher candidates in terms of maternal education level

Dimensions	Education Level of Mother	N	Mean Rank	Chi-square	df	p	Difference
Environmental Ethics Awareness	Primary School (1)	502	415.76				
	Elementary	125	392.57	5.255	3	0.154	

	School (2)						
	High School (3)	134	383.12				
	University (4)	44	347.64				
DEE	Primary School (1)	502	418.24	8.425	3	0.038	1-3 1-4
	Elementary School (2)	125	395.21				
	High School (3)	134	375.18				
	University (4)	44	336.01				
REEE	Primary School (1)	502	411.08	3.797	3	0.295	
	Elementary School (2)	125	386.65				
	High School (3)	134	405.63				
	University (4)	44	349.23				
MTEE	Primary School (1)	502	412.16	2.673	3	0.445	
	Elementary School (2)	125	395.42				
	High School (3)	134	388.34				
	University (4)	44	364.68				
AEE	Primary School (1)	502	414.67	6.449	3	0.092	
	Elementary School (2)	125	397.88				
	High School (3)	134	368.88				
	University (4)	44	388.36				

$p < 0.05$

As shown in Table 4, environmental ethics awareness did not differ significantly according to the maternal education level ($\chi^2 = 5.255$ and $p = 0.154 > 0.05$).

DEE values differed significantly among the sub-dimensions of the scale ($\chi^2 = 8.425$ and $p = 0.038 < 0.05$). In terms of the differences between the types of schools from which participants' mothers graduated, the findings were found to be in favor of primary school graduates (U = 30037.500, p = 048 < 0.05) between primary school and university and in favor of primary school graduates (U = 2349.000, p = 020 < 0.05). This means that the awareness levels of the children of mothers who graduated from primary school are significantly higher. Families whose education level is at the primary school level can be said to have used their resources more painstakingly given their professional and economic situations.

Among the sub-dimensions of the scale, MTEE ($\chi^2 = 2.673$ and $p = 0.445 > 0.05$), REEE ($\chi^2 = 3.797$ and $p = 0.295 > 0.05$), and AEE ($\chi^2 = 6.449$ and $p = 0.092 > 0.05$) did not differ significantly.

4- Comparison of the Environmental Ethics Awareness of Teacher Candidates According to Paternal Education Level

Table 5. Kruskal-Wallis H test results for environmental ethics awareness of teacher candidates according to paternal education level

Dimensions	Education Level of Father	N	Mean Rank	Chi-square	df	p	Difference
Environmental Ethics Awareness	Primary School (1)	319	435.38	7.046	3	0.070	
	Elementary School (2)	157	417.06				
	High School (3)	219	385.86				
	University (4)	127	388.85				
DEE	Primary School (1)	319	429.58	5.006	3	0.171	
	Elementary School (2)	157	419.94				
	High School (4)	219	388.83				
	University (4)	127	394.76				
REEE	Primary School (1)	319	439.58	9.060	3	0.029	1-3
	Elementary School (2)	157	411.11				
	High School (3)	219	390.79				1-4
	University (4)	127	377.15				
MTEE	Primary School (1)	319	431.05	5.532	3	0.137	
	Elementary School (2)	157	420.07				
	High School (3)	219	385.81				
	University (4)	127	396.11				
AEE	Primary School (1)	319	424.94	2.639	3	0.451	
	Elementary School (2)	157	408.58				
	High School (3)	219	400.41				
	University (4)	127	400.49				

$p < 0.05$

As shown in Table 5, environmental ethics awareness did not differ significantly according to paternal education level ($\chi^2 = 5.255$ and $p = 0.154 > 0.05$).

REEE values did not differ significantly among the sub-dimensions of the scale ($\chi^2 = 4.272$ and $p = 0.234 > 0.05$). As a result of the test findings, the difference between school types; Elementary School – High School, between primary school graduates in favor of fathers (U =30776.500 p = 017 <0.05 to P); Primary School between elementary school and university were in favor of the dads (U =17172 p = 011 <0,05 p). In this context, it can be said that fathers with higher educational levels cannot provide their children with the necessary guidance on environmental issues.

Again, the DEE ($\chi^2 = 5.006$ and $p = 0.171 > 0.05$), MTEE ($\chi^2 = 5.532$ and $p = 0.137 > 0.05$), and AEE ($\chi^2 = 2.639$ and $p = 0.451 > 0.05$) sub-dimensions did not differ significantly.

5- Comparison of Teacher Candidates' Environmental Ethics Awareness According to Residence of the Student Prior to University

Environmental ethics awareness did not differ significantly according to the residence of the student before coming to university ($\chi^2 = 3.70$ and $p = 0.168 > 0.05$).

DEE values did not differ significantly among the sub-dimensions of the scale ($\chi^2 = 4.272$ and $p = 0.234 > 0.05$). There were also no significant differences for the sub-dimensions of MTEE ($\chi^2 = 3.889$ and $p = 0.143 > 0.05$), REEE ($\chi^2 = 2.094$ and $p = 0.351 > 0.05$), or AEE ($\chi^2 = 3.538$ and $p = 0.171 > 0.05$).

It can be said that none of the sub-dimensions of the Environmental Ethics Awareness Scale were affected by the places of residence of the teacher candidates before they came to university.

6- Comparison of Environmental Ethics Awareness of Teacher Candidates According to the High School That They Graduated From

Table 6. The results of the Kruskal-Wallis H test for environmental ethics awareness of teacher candidates according to the high school type from which they graduated

Dimensions	Graduated High School	N	Mean Rank	Chi-square	df	p	Difference
Environmental Ethics Awareness	Anatolian High School (1)	523	402.21	5.381	4	0.250	
	Science High School (2)	14	341.43				
	Religious Vocational High School (3)	54	436.22				
	Vocational High School (4)	53	439.74				
	Other (5)	182	437.11				
DEE	Anatolian High School (1)	523	406.86	9.802	4	0.044	
	Science High School (2)	14	303.39				1-4
	Religious Vocational High School (3)	54	398.63				2-4
	Vocational High School (4)	53	488.44				3-4
	Other (5)	182	423.65				
REEE	Anatolian High School (1)	523	402.76	5.690	4	0.224	
	Science High School (2)	14	336.57				
	Religious Vocational High School (3)	54	450.98				
	Vocational High School (4)	53	427.26				
	Other (5)	182	435.14				
MTEE	Anatolian High School (1)	523	405.71	2.559	4	0.634	
	Science High School (2)	14	389.25				
	Religious	54	429.82				

	Vocational School (3)	High					
	Vocational School (4)	High	53	405.42			
	Other (5)		182	435.25			
AEE	Anatolian School (1)	High	523	404.13	5.072	4	0.280
	Science School (2)	High	14	370,00			
	Religious Vocational School (3)	High	54	445.31			
	Vocational School (4)	High	53	440.62			
	Other (5)		182	426.43			

$p < 0.05$

As shown in Table 6, environmental ethics awareness did not differ significantly according to the type of high school from which the participants graduated ($\chi^2 = 3.381$ and $p > 0.05$). The values of REEE ($\chi^2 = 5.690$ and $p > 0.05$), MTEE ($\chi^2 = 2.559$ and $p > 0.05$), and AEE ($\chi^2 = 5.072$ and $p > 0.05$) also did not differ significantly.

DEE values differed significantly among the sub-dimensions of the scale ($\chi^2 = 4.272$ and $p = 0.234 > 0.05$). The difference between the type of graduated high school Anatolian High School and vocational school accessed as a result of the test between the findings in favor of Vocational High School (U =111333.500 p =015 <p 0,05); between the high school and vocational school in favor of Vocational High School of Science (U =about 193,000 p =004 <0.05) and between high school vocational high school Religious Vocational High School were in favor of (U=1106.000 p=034<0,05 p).

In this context, it can be said that the school activities and projects completed by students of vocational high schools supported the students' awareness of environmental ethics.

7- Comparison of Environmental Ethics Awareness of Teacher Candidates According to Year at University

The students' awareness of environmental ethics did not differ significantly by year of study for the overall scale ($\chi^2 = 2.840$ and $p = 0.417 > 0.05$). The sub-dimensions of DEE ($\chi^2 = 4.690$ and $p = 0.196 > 0.05$), MTEE ($\chi^2 = 5.067$ and $p = 0.167 > 0.05$), REEE ($\chi^2 = 656$ and $p = 0.884 > 0.05$), and AEE ($\chi^2 = 431$ and $p = 0.934 > 0.05$) also did not differ significantly. Thus, there was no significant difference between the environmental ethics awareness levels of the teacher candidates in different years of study.

8- Comparison of Environmental Ethics Awareness of Teacher Candidates According to the Departments

Table 7. The results of the Kruskal Wallis H test for the environmental ethics awareness of teacher candidates according to the departments.

Dimensions	Department	Mean Rank	Chi-square	df	p	Difference
Environmental Ethics Awareness	Science Teaching (1)	458.26	17.285	5	0.004	
	Preschool Teaching (2)	469.99				1-5
	English Teaching (3)	401.56				5-6
	Turkish Teaching (4)	409.30				2-6
	Psychological Counseling and Guidance (5)	373.98				
	Primary School	438.63				

	Teaching (6)					
DEE	Science Teaching (1)	441.40	15.972	5	0.007	1-5
	Preschool Teaching (2)	477.39				2-4
	English Teaching (3)	435.99				2-5
	Turkish Teaching (4)	401.49				5-6
	Psychological Counseling and Guidance (5)	376.78				
	Primary School Teaching (6)	437.13				
REEE	Science Teaching (1)	449.68	12.265	5	0.031	1-5
	Preschool Teaching (2)	479.00				2-3
	English Teaching (3)	385.86				2-5
	Turkish Teaching (4)	412.95				
	Psychological Counseling and Guidance (5)	387.20				
	Primary School Teaching (6)	427.34				
MTEE	Science Teaching (1)	458.83	17.297	5	0.004	
	Preschool Teaching (2)	448.18				1-5
	English Teaching (3)	404.35				2-5
	Turkish Teaching (4)	410.80				5-6
	Psychological Counseling and Guidance (5)	372.41				
	Primary School Teaching (6)	444,68				
AEE	Science Teaching (1)	448.26	9.180	5	0.102	
	Preschool Teaching (2)	436.04				
	English Teaching (3)	376.9				
	Turkish Teaching (4)	403.47				
	Psychological Counseling and Guidance (5)	400.7				
	Primary School Teaching (6)	430.43				

$p < 0.05$

As shown in Table 7, there was a significant difference in environmental ethics awareness according to the departments in which the participants were studying ($\chi^2 = 17.285$ and $p < 0.05$). As a result of the findings about the differences between the departments, the following observations can be made.

Of Science Lecturer - Psychological Counseling and Guidance Teaching, the value in favor of the Departments of Science and Technology Teaching (U=12918.500 p<0.05); of Psychological Counseling and Guidance Teaching - Primary School Teaching, the value in favor of Primary School Teaching (U = 25695.500 p<0.05); of Pre-school teaching - Psychological Counseling and Guidance Teaching, value in favor of Pre-school Teaching (6279.000 p<0.05) was found.

The test results for the DEE sub-dimension of the scale also showed significant differences (χ^2 = 15.972 and p < 0.05). As a result, Of Science Teaching - Psychological Counseling and Guidance Teaching, the value in favor of the Departments of Science and Technology Teaching (U = 13560.500 p<0.05); of Preschool Teaching - Turkish Language Teaching, the value in favor of Preschool Teaching (U = 2455.500 p<0.05); of Pre-school Teaching - Psychological Counseling and Guidance Teaching, the value in favor of Preschool Education (U=6206.000 p<0.05); and of Psychological Counseling and Guidance Teaching and Primary Education, the value in favor of Primary Education (U=26018.000 p<0.05) was found.

The reason why students in the Departments of Science Teaching and Primary School Teaching have higher levels of environmental ethics awareness than students of other departments may be related to the fact that environmental science and environmental education courses are offered in both of those departments.

The test results for the REEE sub-dimension of the scale also showed significant differences (χ^2 = 15.972 and p < 0.05). As a result, it can be concluded that of Science Teaching - Psychological Counseling and Guidance Teaching, the value in favor of Science Teaching (U = 13738.500 p<0.05); of Preschool Teaching - English Teaching, value in favor of Preschool Teaching (U = 1356.000 p<0.05); Psychological Counseling and Guidance Teaching among them, it was found to be in favor of preschool teaching (U=6374.000 p<0.05).

The test results for the MTEE sub-dimension of the scale also showed significant differences (χ^2 = 17297 and p < 0.05). As a result, it can be concluded that of Teaching of Science - Psychological Counseling and Guidance Department, the value is in favor of Science Teaching (U=12839.500, p<0.05); of Preschool Teaching and Psychological Counseling and Guidance the value is in favor of Preschool Teaching (U=6652.000 p<0.05); of the Psychological Counseling and Guidance Teaching - Primary School Teaching, the value is in favor of the Primary School Teaching (U =25140.500 p<0.05). The test results for the AEE sub-dimension of the scale did not show significant differences (χ^2 = 9.180 and p > 0.05).

The reason for these findings may be that environmental education courses are included in the education programs of the Science and Primary Education Departments, as well as the Department of Preschool Education. It may also be that the course content on environmental and nature activities are concentrated in units on science education in early childhood, while courses on environmental education are not included in the Turkish and PDR teaching departments.

Discussion and Conclusions

Based on the findings, the teacher candidates' environmental ethics awareness was found to be higher than average based on both the overall scale and its sub-dimensions, and it was thus concluded that they had environmental ethics awareness. Similarly, Çolak (2017: 1672), in his research on science teacher candidates, found the environmental ethics awareness levels of teacher candidates to be very high. He commented that they were "more aware of the environment, defending the rights of future generations and demonstrating their opposition to the concept of unlimited exploitation for the protection of nature".

It was concluded that the level of environmental ethics awareness of female teacher candidates was significantly higher than that of male candidates, both for the overall scale and for its sub-dimensions. Therefore, the gender factor can be said to make a significant difference in environmental ethics awareness. Özer (2015), Sönmez (2018), & Dikicigil (2018) also found environmental ethics awareness to be higher among females, which supports the results obtained in our study. A significant difference was observed in the students' perspectives, attitudes, sensitivity, and awareness (Şama, 2003; Deniş & Genç, 2007; Karakaya & Yılmaz, 2017; Fernandez-Manzanal, Rodriguez-Barreiro, & Carrasquer, 2007; Wongchantra & Nuangchalerm, 2011; Alpak, 2016; Uitto et al., 2011). Sadık & Sarı (2007) found that there were differences in the environmental behavior subscale in favor of female students and in the environmental thinking subscale in favor of male students. On the contrary, however, some studies have concluded that students' perceptions of environmental ethics do not change according to gender (Sungur, 2017; Özdemir, 2012; Gerçek, 2016).

It was concluded that the environmental ethics awareness of the teacher candidates was not affected by the family income level for either the overall scale or its sub-dimensions. Similarly, in the study of Erol and Gezer (2006), students' attitudes towards the environment and environmental issues did not vary according to family income or status, and in Erol's study (2005) of students in the primary school teaching environment and environmental problems, interests, and attitudes, a significant relationship was not observed in terms of the level of the family's income. Şenyurt, Temel, and Özkahraman (2011) concluded that the income level of the family is not a sociodemographic factor affecting attitudes towards environmental problems. On the other hand, Şama (2003) concluded that students whose parents had middle and middle income levels developed more positive attitudes than those from families with low incomes.

Awareness of environmental ethics is significantly higher among the children of primary school graduates than high school and university graduates; that is, the higher the mother's education level, the lower the child's environmental ethics awareness. On the contrary, in a study by Arı (2015), which examined the relationship between environmental thinking and behaviors of university students, it was concluded that students with mothers having postgraduate education were more sensitive to environmental thinking than other students. On the other hand, in the study conducted by Erol and Gezer (2006) to determine the attitudes of teacher candidates towards the environment and environmental problems, maternal education levels did not make any significant difference.

It was further concluded that the awareness of environmental ethics among the children of fathers with primary school education is significantly higher than that of the children of fathers with high school and university education; that is, the higher the paternal education level, the lower the child's environmental ethics awareness. On the contrary, Sadık and Arı (2007) stated that there were no significant differences between the environmental knowledge and attitudes of primary school teacher candidates towards environmental problems in terms of paternal education levels. In the study of Erol and Gezer (2006), there was again no significant difference between the attitudes of teacher candidates towards the environment and environmental problems according to the level of the father's education. On the other hand, Şama (2003) found differences between environmental attitudes and paternal educational attainment in favor of those whose fathers graduated from high school or higher levels of education.

The environmental awareness levels of the teacher candidates do not differ for the overall scale or its sub-dimensions according to the students' residence prior to university. It was concluded that there was no difference between previous rural residents and urban residents in terms of environmental awareness. In other words, it has been concluded that environmental ethics are independent of place of origin in terms of rural versus urban locations. Dikicil (2018) also stated that there was no effect of the variable of residence on environmental ethics awareness levels of teacher candidates in a social studies teaching department. Similarly, in a study by Malkoç (2011), prospective teachers' attitudes towards environmental issues were examined and there was a significant difference in terms of the settlement types in which they had lived the longest. The data obtained by Yalçın (2009) also showed no statistically significant difference between teacher candidates' environmental awareness levels in terms of their places of residence. Erol and Gezer (2006) found no significant difference between the rates of teacher candidates noticing environmental problems relative to their residential areas, but they concluded that residents of large cities had more positive attitudes than those living in smaller cities.

Looking at the environmental ethics awareness levels of teacher candidates, it was concluded that the graduates of vocational high schools had significantly higher levels compared to the other types of high schools. Tuncer et al. (2005) studied students from private and public schools and found that students' awareness levels varied according to the type of school. In contrast, a study conducted by Kahyaoğlu, Daban, and Yangın (2008) found no significant relationship between the attitudes of primary school teachers towards the environment and the type of high school from which they graduated. In the study by Ekici (2005), the attitudes of high school students towards environmental education were examined in terms of some variables and it was determined that they did not differ according to the type of high school.

It was also found in the present study that the students' environmental ethics awareness was not significantly affected by their class level. Similarly, Aslan, Sağır, and Cansaran (2008) showed no difference in the environmental attitudes of students according to class level. Similar situations were also revealed in the studies by Gerçek (2016) and Deniş and Genç (2007). On the contrary, Sönmez (2018) evaluated the environmental ethics awareness of teacher candidates in different faculties according to class level and found that 4th year and 1st year students' awareness of environmental ethics was higher than that of students at primary school teaching department. This finding was associated with the teaching of environmental education in the 6th semester, i.e. in the 3rd year. The study by Özer (2015) also looked at environmental ethics awareness of science teacher candidates in the 3rd and 4th years, with the conclusion that their awareness of environmental ethics was higher than that of the students at primary school teaching department, and that may have been due to the environmental education course that the 3rd year students took in the 6th semester.

When we look at the environmental ethics awareness of the teacher candidates, it is concluded that the departments in which they are studying significantly affect their environmental ethics awareness level. It was concluded that the environmental ethics awareness of science teacher candidates is significantly higher than that of psychological counseling and guidance students, while primary school teaching teacher candidates and preschool teacher candidates also have higher levels than the students of psychological counseling and guidance; in other words, the curriculum applied for some students builds a higher level of environmental ethics awareness. Sönmez (2018) also found that there was no impact of the faculty being studied in for the environmental ethics awareness levels of higher education students, but the department being studied in had an

impact. It was concluded that there was no difference between the environmental ethics awareness levels of science education teacher candidates and primary school teaching teacher candidates due to the fact that environmental courses are taught in both departments. In the study by Dalbudak (2013) comparing 1st year students in biology and physics teaching departments to explore the differences between attitudes and behaviors of students towards the environment, it was concluded that the attitudes and behaviors of students of biology education were more positive than the attitudes and behaviors of students of physics education.

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