



An investigation of prospective teachers' awareness toward environmental issues

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Abstract

A society with high environmental awareness could only be possible through having teachers with a high level of environmental awareness. Therefore, identifying the level of environmental awareness among prospective teachers during their education process is important for training teachers with a greater sense of environmental awareness. For this reason, a descriptive survey study was conducted to measure the level of awareness of prospective teachers pertaining to environmental issues. The participants of the study consisted of 470 prospective teachers in the junior and senior classes of the faculty of education at a state university (256 juniors and 214 seniors) in Turkey. Participants were selected randomly from 8 different departments namely; Computer Education and Instructional Technology, English Language Teaching, French Language Teaching, German Language Teaching, Preschool Teaching, Primary School Teaching, Social Studies Teaching, and Turkish Language Teaching. The "Awareness Scale for Environmental Issues", which consists of 44 items with a 3-point Likert type scale, was used as the data collection tool for this study. Survey items were grouped into 6 factors. Cronbach Alpha reliability for this scale was calculated to be .806. Descriptive statistics were calculated during data analysis; however, because the data was not normally distributed, Mann-Whitney U tests were used for academic year and the Kruskal-Wallis test was used for academic departments. Results suggest that the general awareness level of environmental issues among prospective teachers was above average. Also, when the data were analyzed by academic year and department of study, results indicate a significant difference between prospective teachers' level of awareness regarding environmental issues.

Keywords: Prospective teachers; awareness; environmental issues; environmental education

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1. Introduction

Technological developments, rising standards of living, and an increase in population and industrialization in recent years have led to an increase in production and marketing activities, which have also resulted in the extensive use of natural resources (Diken &

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Çıbık, 2009). This increase in both use and consumption has raised various questions pertaining to environmental issues (Altuntaş & Turan, 2016; Pradhan, Jena & Behera, 2015). As a result of this cycle, the amount of environmental waste generated has reached a life threatening level for both human and other living creatures in nature. In addition, this mass use and consumption has not only disrupted the current ecological balance but has also resulted in a reduction of sustainable agricultural land, nuclear danger, soil loss, poverty, the extinction of species, desertification, and air pollution (Uyanık, 2017; Erkol & Erbasan, 2018; Erhabor & Don, 2016). Insensible consumption of natural resources and dense environmental pollution have disrupted the ecological balance and raised attention to important environmental issues. While acknowledging that environmental issues are not only a matter of concern for individual countries, it is imperative to understand that this issue has been a universal problem since the 20th century and various solutions generated and implemented at resolving them (Dresner & Blatner, 2006; Kim, 2003).

Within this framework, many international meetings have been held since 1992 (1992 Rio de Janeiro UN Conference on Environment and Development; 1997 Thessaloniki International Environment and Society Conference; 2002 UN World Sustainable Development Summit; 2015 Paris Agreement on Climate Change; and 2019 UN Climate Conference). The goal of these meetings was to develop common policies addressing measures of waste detection and solutions pertaining to alleviating environmental issues. While it is widely known and accepted that human behavior is the one of the primary factors that result in the development these issues, environmental education has been underlined as a key solution for its reduction. In addition, it has also been emphasized that solving these issues with just technology and/or legal action are not sufficient; therefore, individual awareness along with changing individual behaviors are also imperative tools required to tackle these issues (Erkol & Erbasan, 2018; Yılmaz, Bolat & Gölcük, 2020). Environmental awareness requires individuals to have a substantial amount of environmental knowledge (DiEnno & Hilton, 2005), which underlines the importance of environmental education in reducing the negative effects of human behavior on the environment (Kıışoğlu, Yıldırım, Salman & Sülün, 2016).

Many definitions exist in attempting to explain what environmental education is. In one definition, Doğan (1997) defined environmental education as the most appropriate way to make people conscious of their responsibilities towards the environment and to ensure their participation in the solution towards the environmental issues they have created. In another definition, environmental education is defined as a continuous learning process that creates awareness for the individuals around them while providing them with the knowledge, skills, values, and experience to solve environmental issues for a more healthier and permanent environment (Vaughan, Gack, Solorazano & Ray, 2003). Havlick and Hourdequin (2005) also defined environmental education as a process that aims to raise individuals sensitive to the environment.

The common denominator to raising environmentally conscious people is embedded in the necessity of making quality environmental education widely available. For society to cope with environmental issues, not only should individuals have the basic knowledge and awareness regarding the environment, but should also be aware of themselves and be sensitive to environmental issues as well. In addition to families, the utter most

responsibility in instilling this information rests upon teachers at every level of education (Oncu & Unluer, 2015; Dada, Eames & Calder, 2017). Ateş and Öner (2020) have suggested that teachers are the ones who will be the primary guides in raising conscious and sensitive citizens with a high level of environmental awareness.

According to the Professional Teachers' Competencies in Turkey, which is organized by the Ministry of National Education, among other qualifications, teacher candidates are expected to be individuals who are sensitive towards environmental protection and conservation (Ministry of Education, 2017). The assumption for this underlying expectation rests in the prime understanding that a society with high environmental awareness is only possible through teachers who have a high environmental awareness (Martínez-Borreguero, Maestre-Jiménez, Mateos-Núñez & Naranjo-Correa, 2020). With this in mind, it is important to consider the significant role universities play in the training of both future teachers and environmentally conscious individuals while underlining the necessity of environmental education programs to be offered at the university level (De Andrade, et al., 2018).

Studies have shown that the teachers have the tendency to reflect their level of environmental awareness in both their lesson plans and classroom activities (Carroll, 2020; Marpa, 2020; Panganiban-Lualhati, 2017; Kumar & Rani, 2018). Therefore, by identifying the current level of environmental awareness, existing deficiencies, and potential solution suggestions among prospective teachers during their university training, it may be possible to address, shape and structure the current environmental framework of teachers in training them into becoming more environmentally sensitive, aware with a conscious framework (Güven & Aydoğdu, 2012). As a result, when designing teacher training curriculums, the significance of environmental education and its fundamental role in shaping the awareness of future generations must not be ignored nor left out in training activities (De Andrade, et al., 2018). In order to determine if this educational and training process is actualized at the targeted level or not, it is crucial to determine the levels of environmental awareness of prospective teachers. To do this, the level of awareness, existing informational deficiencies, and existing solutions pertaining to environmental issues of prospective teachers in training should be examined. This study aims to measure the abovementioned awareness levels among prospective teachers and determine any existing differences between levels, academic departments, and academic year.

2. Method

2.1. Research design

The researcher utilized a descriptive survey method aimed at determining the levels of environmental awareness of prospective teachers pertaining to environmental issues. The survey method was selected as the primary methodology as it allows to make a general judgement about the population, which consisting of many elements and can reach a large group of participants at any given time. In addition, the survey methods

allows for mass data collection, which is not possible through any other methodology (Karasar, 2005).

2.2. Participants

The participants of this study consisted of 256 junior and 214 senior (in total 470 participants) prospective teachers in the faculty of education at a state university in Turkey. Because the academic curriculum is different, only juniors and seniors were included in the sample. Juniors and seniors were particularly selected because they were considered to be prospective graduates and early teaching career candidates. Participants were selected randomly and on voluntary basis. The sample for this study included students from the following academic departments: Computer Education and Instructional Technology, English Language Teaching, French Language Teaching, German Language Teaching, Preschool Teaching, Primary School Teaching, Social Studies Teaching, and Turkish Language Teaching. Although the study was intended to be carried out on all departments, data could only be collected from the above listed departments. Sample distribution by department can be found in Table 1 and distribution by academic year can be found in Table 2

Table 1. Sample Distribution by Academic Department

Department	N	%
Computer Education and Instructional Technology	67	14.26
English Language Teaching	36	7.66
French Language Teaching	32	6.80
German Language Teaching	76	16.17
Preschool Teaching	52	11.06
Primary School Teaching	117	24.90
Social Studies Teaching	50	10.64
Turkish Language Teaching	40	8.51
Total	470	100

Table 2. Sample Distribution by Academic Year

Grade	N	%
Juniors	256	54.5
Seniors	214	45.5

2.3. Data collection tools and methods

The “Awareness Scale for Environmental Issues, developed by Güven and Aydoğdu

(2012), was used as the data collection tool for this study. The scale consists of 44 items grouped into 6 factors with a 3-point Likert type scale. Scale responses and item scoring are as follows: 2 = Yes, 1 = I have no idea, 0 = No. While the lowest score on the scale is 0, the highest attainable score is 88. The higher the score, the higher the level of environmental awareness. Cronbach's Alpha for the scale was found to be .90. For this study, the Cronbach Alpha was found to be .806, which is within an acceptable range. Cronbach's Alpha values for each of the factors are .75, .80, .77, .82, .79 and .83 respectively.

While the survey was administered to participants, they were given sufficient time to complete it. Data collection process lasted approximately 6 months.

2.4. Data Analysis

The frequency, means, and standard deviations were calculated during data analysis. Prior to examining any differences between groups, normality tests were conducted. For this sample size, the Kolmogorov-Smirnoff test values were taken into account. Normality test results suggest that the distribution was not normal ($p=0.000$, $p>0.05$). Normality test results are presented in Table 3.

Table 3. Normality Test Results

	Kolmogorov-Smirnoff			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Awareness scale for environmental issues	.101	470	.000	.947	470	.000

Because the data were not normally distributed, the Mann Whitney U test was used to examine any existing differences between academic years and the Kruskal-Wallis test was used to examine any differences between academic departments.

3. Results

This study aimed to determine the level of environmental awareness of prospective teachers pertaining to environmental issues. Results are given below according to the sub-problems of the study.

3.1. Descriptive results pertaining to the level of environmental awareness of prospective teachers on environmental issues

Descriptive statistics regarding prospective teachers' level of environmental awareness pertaining to environmental issues are given in Table 4.

Table 4. Scale Descriptive Statistics

	N	Min	Max	Mean	Std. Deviation
The level of awareness towards environmental issues	470	2.00	88.00	57.86	9.80

According to the descriptive results, the mean level of environmental awareness was found to be $X = 57.86$. Although no specific value range is defined, regarding high or low levels of awareness, and considering that the highest attainable score on the scale is 88, it is possible to say that the prospective teachers' scores on the scale for environmental issues are above average.

Table 5. Descriptive Statistics by Academic Year

	N	Min	Max	Mean	Std. Deviation
Junior	256	2.00	88.00	56.70	0.59
Senior	214	31.00	87.00	59.24	0.69

When the data are examined by academic year in Table 5, the mean score for juniors is 56.70 and the mean score for seniors is 59.24.

Table 6. Descriptive Statistics by Academic Departments

	N	Mean	Std. Deviation
German Language Teaching	76	54.87	0.85
Computer Education and Educational Technology	67	60.82	1.24
French Language Teaching	32	63.13	2.09
English Language Teaching	36	54.42	1.90
Preschool Teaching	52	53.75	0.78
Primary School Teaching	117	56.50	0.70
Social Studies Teaching	50	61.94	1.56
Turkish Language Teaching	40	61.65	1.93

In Table 6, mean scores from highest to lowest by academic departments are as follows; French Language Teaching ($X = 63.13$), Social Studies Teaching ($X = 61.94$), Turkish Language Teaching ($X = 61.65$), Computer Education and Instructional Technology ($X = 60.82$) Primary School Teaching ($X = 56.50$), German Language Teaching ($X = 54.87$), English Language Teaching ($X = 54.42$), and Preschool Teaching (53.75).

3.2. Results regarding prospective teachers' environmental awareness levels pertaining to environmental issues by grade and department

Table 7. Mann-Whitney U test Results

	Grade	N	Mean Rank	Sum of Ranks	U	Asymp. Sig. (2-tailed)
Awareness Level of Environmental Issues	3rd Grade	256	221.20	56628.00	23732.0000	0.012
	4th Grade	214	252.60	54057.00		
	Total	470				

In Table 7, the differences in levels of environmental awareness on environmental issues by academic year was examined using the Mann-Whitney U non-parametric test. Results suggest a significant difference between academic years ($U=23732$; $p=0.012$; $p<0.05$). According to these results, seniors appear to be more environmentally aware of environmental issues ($X=252.60$) than juniors ($X=221.20$).

Table 8. Kruskal-Wallis H Test Results

	Department	N	Mean Rank	X ²	P
The level of awareness towards environmental issues	German Language Teaching	76	193.75	40.19	0.000
	Computer Education and Educational Technology	67	274.47		
	French Language Teaching	32	296.47		
	English Language Teaching	36	209.47		
	Preschool Teaching	52	176.47		
	Primary School Teaching	117	224.83		
	Social Studies Teaching	50	282.73		
	Turkish Language Teaching	40	273.11		

In Table 8, the differences in levels of environmental awareness on environmental issues by academic departments was examined using the Kruskal-Wallis H non-parametric test. Results indicate a significant difference in environmental awareness levels among the academic departments ($X^2(7)=40.19$; $p=0.000$; $p<0.05$). These findings suggest that students in the French Language Teaching program ($X=296.47$) have a higher level of environmental awareness than students in the other departments. Mean rankings of the other academic departments, from highest to lowest, are as follows: Social Studies Teaching ($X=282.73$), Computer Education and Instructional Technology ($X=274.47$), Turkish Language Teaching ($X=273.11$), Primary School Teaching ($X=224.83$), English Language Teaching ($X=209.47$), German Language Teaching ($X=193.75$), and Preschool Teaching ($X=176.47$).

4. Discussion and Conclusions

It is a widely accepted fact that many factors such as school, teacher, family, media, and environment play an important role in our children’s development especially in them becoming aware and sensitive individuals towards environmental issues. Therefore, the knowledge, awareness, attitudes and behaviors of the prospective teachers included in this study become of great importance as these qualities will also influence and shape the attitudes, characteristics, and behaviors of the young students they will teach, especially regarding environmental issues. Erhabor and Don (2016) stated that environmentally conscious individuals are potentially very important for the long-term protection and management of the environment. With this in mind, teachers are the most important guides to raise conscious and sensitive individuals with a high level of environmental awareness (Ateş & Öner, 2020). Dada, Eames, & Calder (2017) and Lateh & Muniandy (2010) stated that prospective teachers taking environmental education is

critical as this helps them to be confident and competent in providing environmental education in schools. At the same time, research has noted that teachers play an important role in the implementation of environmental education (Bergman, 2016; Nazarenko & Kolesnik, 2018; Stern, Powell & Hill, 2014). Factors such as environmental concern, environmental awareness, and environmental attitudes are especially important for teachers in shaping their decisions on delivering environmental education (Ernst, 2009). This study was conducted to determine the level of environmental awareness of prospective teachers pertaining to environmental issues. In addition, differences between prospective teachers' academic year and departments were also examined.

Findings from this study suggest that the level of environmental awareness of prospective teachers pertaining to environmental issues was above average. One possible reason for obtaining such a result may be due to the fact that students studying in Primary School Teaching and Social Studies Teaching participate in lectures and activities directly related to the environment while other departments include environmental issues in their curriculum. Erökten & Durkan (2010) and Bradley, Waliczek, & Zajicek (1999) examined the attitudes and behaviors of prospective teachers towards the environment before and after taking an environmental education course. Findings from these studies indicate positive changes in the attitudes and behaviors of students towards the environment after taking an environmental education course.

Another finding from this study suggest that there is a significant difference in levels of awareness when academic years were compared. Seniors had higher levels of environmental awareness than juniors did. Adejoke, Mji, and Mukhola (2014) concluded that students differed in their attitudes and awareness towards environmental problems according to their age and grade level. Çimen et al. (2011) findings suggests that the prospective biology teachers' behaviors towards the environment differs according to their academic year, which is consistent with the findings of this study. Similarly, Çabuk and Karacaoğlu (2003) examined students' views on environmental awareness and found that senior level prospective teachers had a higher level of environmental awareness than other prospective teachers. In another study, levels of sensitivity towards environmental issues was examined between sophomores and seniors. Results from this study indicated that seniors were more sensitive to environmental issues compared to sophomores (Yıldırım, Bacanak & Özsoy, 2012). The findings from this study, where seniors scored higher than juniors, can be considered as a positive result because seniors are aspiring and prospective teachers who are about to graduate while junior level teachers' education is still in progress. As a result, because the education process continues for juniors, this could be utilized as an opportunity to raise their awareness levels even more concerning environmental issues.

Another finding from this study is regarding the differences in environmental awareness levels among academic departments. Students studying in the French Language Teaching department had the highest level of environmental awareness regarding environmental issues; however, despite the fact that environmental education is included in the academic curriculum, students studying in Primary School Teaching did not score as high. In addition, the Social Studies Teaching programs also have an environmental education component embedded in their curriculum, which also explains the high environmental awareness scores. High scores of environmental awareness can

be associated with the fact that academic curriculums of teaching programs contain an environmental education component. Similar findings (Köse & Mamak, 2019; Yenice & Tunç, 2018) have also reported differences in academic departments where either a high or positive awareness towards environmental issues existed among prospective teachers. Kaur (2017) reported that different departments affect the levels of environmental awareness. Itasanmi (2020) revealed that social studies teachers had positive attitudes towards environmental education.

Contrary to these findings, Singh (2020) found no significant differences in levels of environmental awareness among geography teachers. Also, Chauhan (2020) found that both male and female in-service secondary school teachers had similar levels of environmental awareness and attitudes. In this study, students studying in the Primary School Teaching program had lower levels of environmental awareness than expected. Alvarez-Garcia, Sureda-Negre & Comas-Forgas (2018) concluded that prospective teachers had insufficient levels of environmental knowledge. One possible explanation for the lack of sufficient knowledge may be associated with course content, study plan, course materials, course duration, teaching methods, etc. Mingazova (2014) examined the methods used to deliver environmental education in Russian universities. Findings suggest that game situations, role-playing, and simulation training games were among the most effective methods used in environmental education. For academic departments that do not have an environmental education component embedded in their curriculum, it appears that family, media, social and cultural environments may play an important role in the development of this awareness (Sadık & Sadık, 2014). In addition, these findings may also be the result of implicit learning acquired by the students studying in departments with environmental education topics embedded in their curriculum.

This study offers vital information that can be utilized in curriculum development aimed at improving prospective teachers' levels of environmental awareness studying in teaching programs. The results from this study can serve as a baseline that reveals the current situation in education faculties. Future studies should examine how the level of environmental awareness among prospective teachers' is reflected and manifested in their environmentally conscious behaviors.

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