

The Awareness of Preservice Teachers in Primary School Education Department on Environmental Problems

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Abstract

In the prevention or decreasing of environmental problems, attitudes and awareness of people have been significant. First of all, primary school teachers' awareness and tenderness on this field should be improved. In this study, the awareness of preservice teachers in primary school teaching department on environmental problems is aimed to be declared. This study has been conducted in 2015-2016 semesters. As for research method, in this study, the descriptive model that is a kind of quantitative research method has been preferred. In this sense, 1.,2.,3., and 4. grade university students in 4 different universities in Turkey, totally 742 students, have been determined as the sample of this study. The data of this study has been analyzed via SPSS program and the findings of this study have been presented as related to the aims of this study. As a result of this study, it has been found that the awareness of the students on the environmental problems has been seen as 74 %. Additionally, it has been declared that the students in this study have been answered correctly the questions on "knowledge" step as 69 %; they answered correctly the questions on "comprehension" step as 81%; the questions on "practice" step have been answered correctly for 81 %; on the "analysis" step, there have been 81.5% of the students who have been answered the questions correctly; on the "synthesis" step, there have been 66.6 % of the students who could answer the questions correctly and finally the questions in "evaluation" step have been answered correctly by 73 % of the students.

Keywords: Education Faculty, Environmental problems, Environmental awareness

Introduction

The environment in which people and other species live and interact with each other is a physical, social, economic and cultural setting (Ertekin, 2011). The environment supply the most suitable living conditions for 3.8 billion years as considering the rate and quality of water, suitable temperature, the rate and quality of vegetation cover, natural resources and all of the organisms (Raven, Berg and Hassenzahl, 2012). However, nowadays, environmental problems have been increased and the kinds of those problems have been verified. As for the most significant environmental problems, air, soil and water pollution, acid raining and deformation of ozone could be seen. Because of direct or indirect harming caused by people, both people and other species could be damaged (Farmer, 1997). The environmental problems such as rising soil

lost, extinctions of some species, desertification and radioactive pollution have threatened people (Akkurt, 2007).

According to Akin (2014), the pollutions of some living materials such as air, soil and water can damage the natural balance and it makes hard the living conditions. The natural environment and ecosystem (Yücel, 2006) that is necessary for all species can be directly affected by environmental pollutions. If the environmental problems go on, ecosystem in which not only people but also other species are living cannot supply sustainable living conditions (Titiz, 1995). Accordingly, the natural resources can be damaged because of environmental problems and in this sense there is not a chance to live for rising population (Yücel, 2006).

Defining and understanding the environmental problems have been important for societies in terms of discussing those problems. In this sense, environmental problems have been nearly related to the ideological setting, interests and socio-cultural elements of societies. Therefore, the perspectives of people on environmental problems have a crucial role for solutions of those problems (Buckingham and Turner, 2008). Individuals, even if their governments are not desire to solve some problems, can be a part of some national or international organizations and they can create awareness for those problems (Harris, 2012).

The most important reason of environmental problems and pollution is human (Daştan, 1999). The effect of human-being on the quality of environment and natural resources has been highly pointed. For this reason, people have an important role for life quality and sustainable development for environment (Sneddon, 2000). The most significant way for living healthy is having environmental awareness. People who have environmental awareness can protect the environment and they can make it better (Baykan, 2004). For this process, the process of informing via education has a crucial role (Erdönmez, 1993). In this sense, education helps people to analyze environmental problems and to have necessary precautions (Chauhan, 2008). Hence, the awareness of primary school teachers who are teaching for primary school students has a crucial role for the solution of environmental problems. The aim of this study is revealing the awareness of preservice teachers in Primary School Teaching Education Department on the environmental problems. As regarding to this main aim, the sub-aims that are given below are aimed to be answered:

Is there any mean difference of the awareness of preservice teachers in Primary School Teaching Education Department on environmental problems as for knowledge level?

Is there any mean difference of the awareness of preservice teachers in Primary School Teaching Education Department on environmental problems as for grades?

Is there any mean difference of the awareness of preservice teachers in Primary School Teaching Education Department on environmental problems as for genders?

Methodology

As for research model, the descriptive model that is a subtitle of quantitative research model was determined as a research model for this study. The main reason of determining this model is that the descriptive model is a research method that helps researchers to describe the events both in the past and now apparently. Another reason of using this model is the chance of examining the existing conditions deeply via this model.

Participants

As considering the aim of this study, four different university that have been different levels in terms of the criteria determined by Higher Education Institution were randomly selected for this study. In those universities, students who have been educating in Primary School Teaching Education Department in Faculty of Education were selected in 2015-2016 autumn semester. The first grade students (n=256), the second grade students (n=176), the third grade students (n=186) and the fourth grade (n=124) students were the sample of this study. As for gender differences, there were female students (n=586) and male students (n=156).

Instruments

In this study, for the aim of determining the awareness of pre-service teachers in Primary School Education Department on environmental problems; the scale namely "The Awareness Scale for Environmental Problems" developed by Güven and Aydoğdu (2012) was used. This scale was composed of 44 items via 3 point Likert scale in order to determine the participation rates of participants. Those 44 items was composed of 6 sub-factors. The sub-factors of this scale were determined as *knowledge* "4, 6, 9, 23, 32, 35, 41, 43", *uptake* "2, 11, 13, 16, 20, 25, 33, 40", *practice* "12, 14, 15, 19, 36, 38", *analysis* "1, 8, 10, 21, 22, 24, 28, 31", *synthesis* "5, 17, 18, 27, 39, 42, 44" and *evaluation* "3, 7, 26, 29, 30, 34, 37". At the end of the factor analysis, total variance of sub-dimensions was determined as 68%. According to the data gathered via this scale, it was seen that reliability for sub-dimension was found as *knowledge* .65, *uptake* .70, *practice* .62, *analysis* .68, *synthesis* .73 and *evaluation* .75. The general reliability score of this scale was found as .72.

Data Analysis

Before the data analysis for sub-problems, normal distribution of data was examined and as a result of the Kolmogorov-Smirnov, the data was found as $p > .05$ and it was understood that the data had a normal distribution rate. Since the data had normal distribution, in this study, parametrical tests and analysis method were used. In order to determine the scores for six sub-dimensions of this scale, descriptive analysis was used. For aim of determining the scores of pre-service teachers for each one of the item, frequency and percentage rates were calculated. In order to determine the relationship between sub-dimensions, one-directed variance analysis was used. For gender differences, independent t-test analysis was used.

Findings

Sub-problem: The question asked as "How is the awareness situation of pre-service teachers in Primary School Education Department on environmental problems?" was aimed to be answered. The results of the data analysis which were gathered via "The Scale of Awareness for Environmental Pollution" were given in Table 1.

Table 1.
The Awareness of Pre-service Teachers on Environmental Problems

Level	Item	Yes		No Idea		No		Total	
		f	%	f	%	f	%	f	%
Knowledge	Biomass energy, hydraulic energy, water and wind energy are renewable energy sources.	627	84,5	65	8,8	50	6,7	742	100
	Waste materials and chemical drugs are rented via microorganisms before they can cause water pollution.	102	13,7	128	17,3	512	69,0		
	The effect of greenhouse occurs via absorption of sun lights thanks to gases which are composed of fossil burning.	477	64,3	226	30,5	39	5,2		
	Sustainable development is the process of sustain natural sources for the new generations.	578	77,9	144	19,4	20	2,7		
	Light pollution prevents astronomy researches that are organized via artificial sky brightness.	422	56,9	261	35,2	59	8,0		
	Transformation means recycling of some materials.	277	37,3	440	59,3	25	3,4		
	Radioactive pollution occurs via radiation of radioactive elements by itself.	201	27,1	337	45,4	204	27,5		
	The depletion of ozone-layer is different in different regions such as south or north hemisphere and equator or poles.	388	52,3	275	37,1	79	10,6		
	The solution of environmental problems is possible via environmental conscious and environmental education.	712	96,0	23	3,1	7	0,9		
	Air, water and soil are sources that can adapt themselves and they are no consumable.	467	62,9	59	8,0	216	29,1		
Uptake	Decreasing of CO2 emission highly prevents greenhouse effect and global warming.	460	62,0	253	34,1	29	3,9		
	Nowadays, especially in big cities, noise pollution is one of the environmental problems and it causes a lot of problems.	669	90,2	46	6,2	27	3,6		
	Ozone-layer also depletes because of photochemical	320	43,1	388	52,3	34	4,6		

	reaction after sun efficiency.								
	For the prevention of environmental problems, environmental effect evaluation is an effective method.	584	78,7	138	18,6	20	2,7		
	There is not a cause and effect relationship between dissertation and global warming..	113	15,2	88	11,9	541	72,9		
	Greenhouse effect is a natural process for prevention of global warm and sustaining living activities in the world.	223	30,1	211	28,4	308	41,5		
Practice	Noise pollution can be prevented thanks to afforestation, sound absorbers and mass transits.	442	59,6	105	14,2	195	26,3		
	The use of natural gases and preference of mass transits highly reduces the air pollution.	606	81,7	78	10,5	57	7,7	742	100
	People can live and adapted in polluted areas thanks to their high adaptation ability.	198	26,7	146	19,7	398	53,6		
	Some precautions for water pollution are decreasing waste materials and having more distillation units.	616	83,0	93	12,5	33	4,4		
	Appropriate farming for soil and using sets can be effective for preventing erosion.	620	83,6	86	11,6	36	4,9		
	Environmental problems need changing habits of people for consuming.	576	77,6	127	17,1	39	5,3		
	In this era, air pollution can cause a lot of serious problems such as greenhouse effect, global warming, climate changing and depletion of ozone-layer.	724	97,6	15	2,0	3	0,4	742	100
Analysis	The most important reason of air pollution is the use of fossil fuel and exhaust gases.	618	83,3	76	10,2	48	6,5		
	Some of the environmental problems in those days have been caused by earthquake, flood and volcanic explosion.	312	42,0	156	21,0	274	36,9		
	The reason of radioactive pollution is nuclear weapons and reactions.	552	74,4	147	19,8	43	5,8		
	Global environmental	608	81,9	119	16,0	15	2,0		

	problems are the basic reasons for the extinction of some species.								
	Nowadays, dissertation, soil pollution and partial farming have caused scarcity of food in many countries.	663	89,4	65	8,8	14	1,9		
	The most significant reason of depleting in ozone-layer is chlorofluorocarbon gases.	255	34,4	450	60,6	37	5,0		
	Water pollution causes some changes in species, decreasing bio-equality eutrophication.	570	76,8	141	19,0	31	4,2		
	Environmental problems have been seen since the beginning of the world and ecological balance can solve those problems every time thanks to its natural ability.	256	34,5	170	22,9	316	42,6	742	100
	In order to prevent acidic rains, fossil fuel that consists of alkaline materials should be used.	176	23,7	391	52,7	175	23,6		
	Solid wastes are effaced by microorganisms in soil and those do not cause pollution.	129	17,4	160	21,6	453	61,1		
Synthesis	Environmental problems are boundless and global.	606	81,7	85	11,5	51	6,9		
	The different ways of lighting for big cities and skyscrapers is a sign for development.	248	33,4	119	16,0	375	50,5		
	Global warming, greenhouse effect, climate change and depleting of ozone-layer are natural events that are related to geological time and those are not related to environmental problems.	211	28,4	135	18,2	396	53,4		
	Environmental problems that occurs in which country should be solved by this country.	164	22,1	60	8,1	518	69,8		
	Since noise is not an objective term, it is not named as a pollution type.	70	9,4	82	11,1	590	79,5		
Evaluation	For preventing environmental problems, afford of just one country is not enough and all of the world should afford to solve the problems.	695	93,7	29	3,9	18	2,4	742	100
	Unconsciousness, insensitivity and philistinism of	680	91,6	42	5,7	20	2,7		

people can cause big environmental problems.						
In touristic areas, there is no pollution because of natural features.	120	16,2	99	13,3	523	70,5
Since global warming can help people's warming necessities, it should be supported for people.	139	18,7	80	10,8	523	70,5
An acidic rain is seen just in the areas in which factories and institutions are highly seen.	236	31,8	212	28,6	294	39,6
The environmental problems in these days have been occurred as a result of our era.	462	62,2	111	15,0	169	22,8

When the analysis results which were given in Table 1 were examined, and also pre-service teachers cognitive abilities for environmental problems were discussed; it was seen that 84.5% of pre-service teachers stated the correctness of the item "Biomass energy, hydraulic energy, water and wind energy are renewable energy sources." that was given in "knowledge" step. However, 59.3% of those teachers stated that they did not have any idea about the item "Transformation means recycling of some materials.". 77.9% of the pre-service teachers stated the correctness of the item "Sustainable development is the process of sustain natural sources for the new generations.". When the general results of "knowledge" step were analyzed, it was seen that 69% of the pre-service teachers correctly answered the questions given in this step.

When the analysis results which were given in "uptake" step were examined, it was seen that 96% of pre-service teachers stated the correctness of the item "The solution of environmental problems is possible via environmental conscious and environmental education." that was given in this step. However, 62.9% of those teachers stated that the item "Air, water and soil are sources that can adapt themselves and they are no consumable." was correct. The water problems in many countries are ignored by the pre-service teachers, because they answered this question as "yes". 30.1% of the pre-service teachers answered "yes" for the item "Greenhouse effect is a natural process for prevention of global warm and sustaining living activities in the world." even if it was wrong. When the general results of "uptake" step were analyzed, it was seen that 73% of the pre-service teachers correctly answered the questions in this step.

When the analysis results which were given in Table 1 were examined, it was seen that 83.6% of pre-service teachers stated the correctness of the item "Appropriate farming for soil and using sets can be effective for preventing erosion." that was given in "practice" step. However, 53.6% of those teachers answered "no" for the item "People can live and adapted in polluted areas thanks to their high adaptation ability.", yet 26.7% of those teachers answered "yes" for this item. When the general results of "practice" step were analyzed, it was seen that 81% of the pre-service teachers correctly answered the questions in this step.

When the analysis results which were given in "analysis" step were examined, it was seen that 97.6% of pre-service teachers answered "yes" for the item "In this era, air pollution can cause a lot of serious problems such as greenhouse effect, global warming, climate changing and depletion of ozone-layer.". However, 42% of those

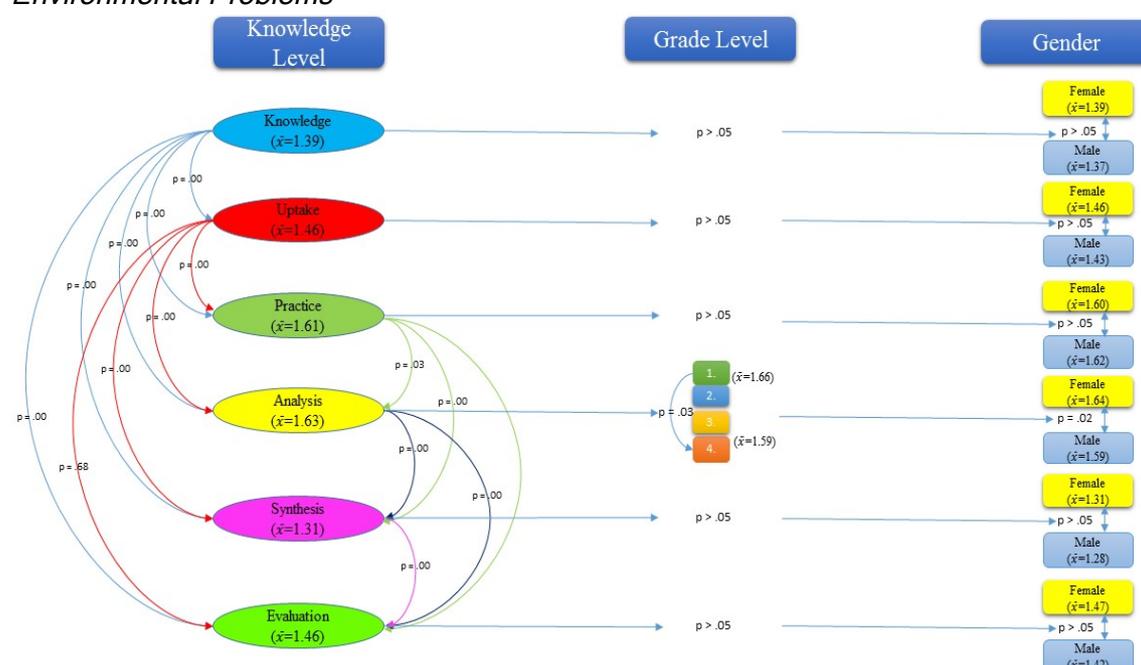
teachers answered “yes” for the item “Some of the environmental problems in those days have been caused by earthquake, flood and volcanic explosion.” and 36.9% of those teachers answered “no” for the same item. 60.6% of the pre-service teachers stated that they did not have any idea about the item “The most significant reason of depleting in ozone-layer is chlorofluorocarbon gases.” When the general results of “analysis” step were analyzed, it was seen that 81.5% of the pre-service teachers correctly answered the questions in this step.

When the analysis results which were given in “synthesis” step were examined, it was seen that 34.5% of pre-service teachers stated the correctness of the item “Environmental problems have been seen since the beginning of the world and ecological balance can solve those problems every time thanks to its natural ability.” even if it was wrong; and 42.6% of the participants answered “no” for the same item. However, 52.7% of those teachers stated that they did not have any idea about the item “In order to prevent acidic rains, fossil fuel that consists of alkaline materials should be used.”. 81.7% of the pre-service teachers stated the correctness of the item “Environmental problems are boundless and global.”. When the general results of “synthesis” step were analyzed, it was seen that 66.6% of the pre-service teachers correctly answered the questions in this step.

In table 1, when the analysis results which were given in “*evaluation*” step, it was seen that 93.7% of pre-service teachers stated the correctness of the item “For preventing environmental problems, afford of just one country is not enough and all of the world should afford to solve the problems.” that was given in “*evaluation*” step. However, 31.8% of those teachers answered “yes” for the item “Acidic rains is seen just in the areas in which factories and institutions are highly seen.”, and 39.6% of them said “no” for the same item. It was observed that pre-service teachers had no idea about acidic rains. 70.5% of the participants stated the incorrectness of the item “In touristic areas, there is no pollution because of natural features.”, however, 16.2% of them stated the correctness of that item. When the general results of “*evaluation*” step were analyzed, it was seen that 73% of the pre-service teachers correctly answered the questions in this step. The total results for the correct answers of the participants were observed as 74%.

Sub- problem: The question asked as “Is there any mean difference between the knowledge, grade and gender of pre-service teachers in Primary School Education Department on the awareness of environmental problems?” was aimed to be answered. The data gathered from the participants were analyzed and the results were given in Figure 1.

Figure 1.
The Differences of gender, grade and knowledge of Pre-service Teachers on the Environmental Problems



When the analysis given in Figure 1 was examined, it was seen that there was mean difference between knowledge and other dimensions. Additionally, although a mean relationship between all categories and sub-categories were found, there was no mean difference between “practice” step and “evaluation” step. As for the result of Dunnett C test that is a kind of Post Hoc test which is used to determine the reason of mean differences, the awareness rates of the pre-service teachers were seen mostly in analysis step ($\bar{x} = 1.63$) and then it was seen in practice step ($\bar{x} = 1.61$). the awareness rate of the pre-service teachers on environmental problems was higher seen in analysis step than the other steps. When the results were examined, it was seen that the results were firstly in support of analysis step and secondly it was seen in support of practice step.

As for grade differences, it was seen that there was a mean difference just for analysis step on the first and fourth grade pre-service teachers. That difference was in support of first grade teachers. There was no mean difference between the other steps such as knowledge, uptake, practice and the grade of the participants. This result showed that there was no development on the awareness of the pre-service teachers on environmental problems when they are going on their education in higher grades. For this reason, there was no mean difference between the grades and awareness of the pre-service teachers.

As for gender differences, the mean difference between male and female participants was seen in just analysis step. This difference was in support of female participants. There was no mean difference between other steps and gender. Therefore, in general, it was found that there was not a mean difference between gender and awareness of the pre-service teachers on environmental problems.

Conclusion and Discussion

At the end of this study, it was seen that 74% of pre-service teachers were aware of environmental problems. Hence, it can be said that the awareness of pre-service teachers on this field was a satisfied level. When the other studies in literature were reviewed, it was seen that the awareness of pre-service teachers in this study were better than the others in other studies. For instance, in a study conducted by Oğuz, Çakçı and Kavas (2010), even if students had a course on environmental issues, their awareness on this field was lower than the expectations. In another study in which the awareness of pre-service teachers in Primary School Education Department on global warming that was conducted by Kahraman, Yalçın, Özkan and Aggöl (2008), it was stated that pre-service teachers has a low awareness level on this issue. In another study conducted by Güven and Aydoğdu (2011), it was found that pre-service teachers in Science Education Department were lowly aware of environmental problems. Similarly, Özdemir, Yıldız, Ocaktan and Sarışen (2004) found that students in Medical Faculty had a low level of awareness for environmental problems.

In this study, it was determined that 69% of pre-service teachers correctly answered the items in “knowledge” step, 81% of them correctly answered the items in “uptake” step; 81% of them correctly answered the items in “practice” step, 81.5% of them correctly answered the items in “analysis” step; 66.6% of them correctly answered the items in “synthesis” step and 73% of them correctly answered the items in “evaluation” step. Hence, it was seen that pre-service teachers had the lowest scores in knowledge and synthesis steps. Those findings were similar the results of other studies in literature. For instance, Yener and Kalıpçı (2007) stated that the knowledge of pre-service teachers on environmental problems was not scientific and they did not have enough knowledge on this issue. Şahin, Ünlü and Ünlü (2016), however, stated that there was a mean difference between grades and awareness of pre-service teachers on environmental problems. Öztaş and Kalıpçı (2009) stated that pre-service teacher in Science Education Department, Biology Education and Chemistry Teaching Department had not enough knowledge on environmental pollution and environmental problems in urban. Güven and Aydoğdu (2011) found that the knowledge level of pre-service teachers in Science Education Department was in a low degree. Bahara (2000) stated that university students had no idea on ozone-layer depletion and greenhouse effect or they had wrong knowledge on these issues. Yılmaz, Morgil, Aktuğ and Göbekli (2002) stated that students in high schools or in higher education had not enough information about environmental issues, they could not learn those issues adequately and they did not know environmental problems. The result on lack of knowledge on environmental problems was similar to the results in international studies. Azapagic, Perdan and Shallcross (2005) found that university students had not enough information about environmental problems.

When the literature was reviewed, it was seen that not only students in higher education but also students in other schools were not aware of environmental problems. For instance, Demirbaş and Pektaş (2009) found that primary school students had not enough information on environmental problems. Additionally, Sadık, Çakan and Artut (2009) stated that the awareness of primary school students on ozone-layer depletion, soil or light pollution and global warming was in a low level. When the international studies were examined, it was seen that there were different results for different schools. According to some findings, the awareness on environmental problems was in a high level, but in some others, that rate was in a low level. When the studies in which low rate of awareness was found, Said et. al. (2002) found that just 10% of secondary school students had knowledge on environmental

issues and they just had knowledge on environmental problems like pollution. Larijani (2010) stated that secondary school student had knowledge on medium level. However, in some studies, it was stated that the awareness of students on environmental problems was in a high level. For instance, Elm (2006) stated that preschool students were aware of environmental problems and they could recognize some environmental dangers. Wong (2010) found that university students in China had a high level of awareness on environmental problems. Shobeiri, Omidvar and Prahallada (2007) stated that high school students in Persia and India had a high level of awareness on environmental issues. Page (2000) discovered that 4-5-year-old children in Australia were aware of environmental problems.

The awareness of pre-service teachers on environment pollution was found as higher rate in analysis step. When the findings were examined, it was seen that the awareness rate was mostly in analysis step and then in practice step. As for analysis step, it was found that 1. and 4. Grade students had higher scores. In literature, there were some studies which stated that environmental awareness was getting higher in old ages. For instances, Aminrad, Zakaria and Hadi (2011) stated that in old ages, environmental awareness was higher. In this study, it was found that there was no gender difference between pre-service teachers on environmental problems. However, in analysis step, it was seen that there was a mean difference in support of female participants. In literature, it was seen that there were some studies which stated a gender difference in support of female participants, however in some studies, it was stated that there was no mean difference between gender and the awareness of environmental problems. For instance, in some studies conducted by Shahnawaj (1990), Gardos & Dodd (1995), Rou, Sabhlok (1995), Patel (1995), Szagun and Pavlov (1995), Davidson & Freudenburg (1996) and Tripathi (2000), it was stated that gender was an effective parameter. Özden (2008) stated that female pre-service teachers were more aware of environmental problems. Özdemir (2003) stated that 8.grade female students were more aware of environmental issues than male students. Larijani (2010) found that secondary school female teachers were more aware of environmental issues. In a study conducted by Yenice, Saracaloğlu and Karacaoğlu (2008), it was seen that there was no mean difference between age, gender and environmental issues of pre-service teachers in Primary School Education Department in terms of having a course on environmental issues. Shobeiri, Omidvar and Prahallada (2007), similarly, stated that gender was not a mean parameter for the awareness of environmental problems. Additionally, it was seen that there was a changing situation for teachers in terms of their working regions. For instance, Rou (1995) and Dinakara (2000) stated that teachers in urban were more aware of environmental issues and the others working in rural regions.

On the other hand, it was observed that pre-service teachers' awareness rates were higher in "*practice*" and "*analysis*" steps. This result showed that pre-service teachers were aware of negative effects of environmental pollution and they were aware of the reasons of environmental problems. This finding can be seen as significant in terms of the awareness of environmental problems. In this sense, some studies in literature stated that attitudes and knowledge on environment may not be turned on actions (Erten, 2005). In a similar study in literature, Hausbeck, Milbrath and Enright (2010) found that even if the knowledge of 11.grade students on environmental issues was in a low level, they had high scores on the awareness and concern on this field.

As considering the findings on the awareness of pre-service teachers in Primary School Education Department on environmental problems, the suggestions given below were stated:

- For the aim of increasing the awareness of pre-service teachers, informative courses and activities should be organized.
- Some activities which will be helpful for pre-service teachers in Primary School Education Department on increasing their awareness for synthesis and evaluation steps should be conducted.

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