

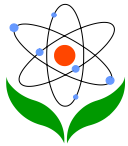
Turkish pre-service primary school teachers' environmental attitudes: Effects of gender and grade level*

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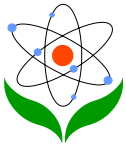
Abstract

The purpose of this study was to explore Turkish pre-service primary school teachers' attitudes towards environment. Besides, it aimed to investigate how pre-service primary school teachers' environmental attitudes change with grade level and gender. A total of 2067 pre-service teachers attending to primary school education departments of nine different universities in Turkey participated in the study. The results of the study showed that the pre-service primary school teachers have a high level of environmental attitudes ($M = 152.62, SD = 13.18$). The results also revealed that there is a statistically significant mean difference ($t = 2.03, p = .04$) between males and females in favor of females with a large effect size ($\eta^2 = .99$). The results also showed that there are no significant differences ($F_{(3,2063)} = 1.676, p = .170$) between pre-service teachers enrolling to different grades with respect to their environmental attitudes.

Keywords: pre-service primary school teachers, environmental education, attitudes toward environment, gender difference, grade level difference

Introduction

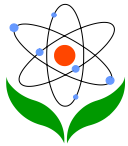
The developments in science and technology throughout the last 200 years are the reason for the raise in the life standards of human beings. With these developing life standards, the human population has increased exponentially. As a result, in today's world, human beings are consuming natural resources faster and unconsciously to meet their excess needs. With the rising population's pressure on the world's natural resources, the nature has been affected negatively and



environmental problems started to increase. Environmental problems the Earth is facing today such as global warming, air, water and soil pollution, destruction of rainforests, ozone layer depletion and loss of biodiversity, have reached an unprecedented scale and complexity in the world history (Dunlap, Van Liere, Mertig, Catton & Howell, 1992).

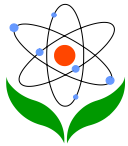
With the 19th century, human beings realized that consuming natural resources in an unplanned way causes degradation on environment and threatens the environment on which human beings' existence depends. With the realization of the effects of environmental problems on human wellbeing, issues relating to environment, conservation and management have emerged on the world's policy stage (Palmer, 2003). To determine the current situation of the planet Earth and find ways to solve the environmental problems and to prevent possible problems that may occur in the future many meetings have been held with the participation of attendees from different countries. In most of the international meetings many administrative and forensic precautions have been taken to find solutions to the environmental problems. And also, for the application and achievement of these precautions, it is realized that there is a need for individuals who are knowledgeable about and conscious of the environmental concepts and also who show environmentally responsible behaviors. In all major conferences, the role of education as a fundamental tool to improve environmental situation of the Earth has been emphasized and the purpose, goals and principles of environmental education have been determined through these conferences (Scoullas & Malotidi, 2004).

'International Working Meeting on Environmental Education in the School Curriculum' held in 1970 at Nevada by International Union for Conservation of Nature and Natural Resources (IUCN) was the greatest landmark in the history of attempts to define the term 'environmental education' (Palmer, 2003). In this meeting the term 'environmental education' was defined and formulated as "the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture, and his bio-physical surroundings." (IUCN, 1970, n.p.). The next major contribution was made in 1975, with the Belgrade Charter, which was the beginning framework for a global environmental education program. In this declaration a draft vision for environmental education was built up. The Belgrade Charter was the first international declaration to define objectives of environmental



education. The charter identified six objectives for environmental education as; to create awareness, to acquire knowledge about environmental problems, to develop attitudes, values and behaviours that respect the environment, to acquire problem solving skills, to develop capabilities to assess situations, and to participate in implementing the solution to environmental problems (United Nations Educational, Scientific and Cultural Organization [UNESCO], 1975). Two years later, in 1977, in the Tbilisi Declaration the urgent need for worldwide environmental education was declared (UNESCO, 1977). As a result of the declaration, in conjunction with the United Nations Environment Programme [UNEP], a document that is including the roles, goals, objectives, characteristics and guiding principles of environmental education was published. According to the Tbilisi Declaration, environmental education has three primary goals: firstly “to foster a clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas”, secondly, “to create new patterns of behaviour of individuals, groups and society as a whole towards the environment” and lastly, “to provide every person with opportunities to acquire the knowledge, values, attitudes, skills, and commitment needed to protect and improve the environment” (UNESCO, 1977, p.15). After the Rio Conference in 1992, in the 36th chapter of the *Agenda 21*, the term ‘education for sustainable development’ was defined. In the same document the question of how education should be for providing sustainable development was discussed. In these conferences the ultimate goal of environmental education is expressed as ensuring that we should be able to live in a healthy and a sustainable world. To achieve this, environmental education seeks to “enhance a person’s understanding of natural world and to impact positively on attitudes, values and behaviours” and environmental education must develop an “environmentally literate and concerned citizenry who will relate to the natural world in a responsible and caring manner” (Wilson, 1994, p.5).

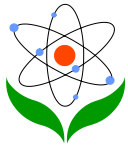
The global decisions taken in the international conferences will only fulfill its tasks if these decisions are supported by people who are environmentally aware and showing responsible behaviors towards environmental problems. It has been known that people’s irresponsible behaviours are one of the basic reasons of environmental problems. To solve the environmental problems, individuals should be aware of environmental problems and importance of reducing or eliminating these problems. Furthermore, individuals should have knowledge about environment and environmental problems, show positive attitudes toward environment and they should make an effort to show responsible behaviours toward environment.



Education is a crucial mean of providing values, attitudes, skills and behaviors for achieving sustainable development (Orr, 1994; UNESCO-UNEP, 1976, 1978, 1992, 1995). Environmental education should be a part of the lives of all people, and should start with preschool (UNESCO, 1977). Environmental education provided in primary schools should focus on improving children's environmental knowledge, attitudes and behaviour. As Wilson (1994) states "helping young children grow in their understanding and appreciation of the natural world...has the potential of enhancing the human-earth relationship" (p.23). Improving children's environmental attitudes are particularly important because as the scientists, policymakers, consumers and voters of the future, they will be responsible for providing solutions to environmental problems arising from today's actions.

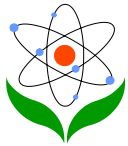
Teachers are the key actors to form an environmentally informed, committed and active citizenry [World Commission on the Environment and Development (WCED), 1987]. As Wilke (1985) stated "the key to successful environmental education is the classroom teacher. If teachers do not have the knowledge, skills or commitment to environmentalise the curriculum, it is unlikely that environmentally literate students will be produced by our schools" (p.63). Turner et. al. (2003) argued that teachers will provide students who are environmentally literate when they are themselves environmentally knowledgeable, have positive attitudes towards the environment and show concern for environmental problems. Thus, inadequate teacher training will cause problems in the implementation of environmental education in primary school (Cutter & Smith, 2001; Disinger & Howe, 1990; Gabriel, 1996; Knapp, 2000; McKeown-Ice, 2000; Spork, 1992; UNESCO, 1977). Therefore, determining and improving pre-service teachers' environmental knowledge, their environmentally responsible behaviors and their attitudes toward environment is one of the major challenges which environmental education faces today.

Over the past 20 years, researchers have explored in-service and pre-service teachers' attitudes toward environment using various types of national surveys (Esa, 2010; Oerke & Bogner, 2010; Taylor, Doff, Jenkins & Kennelly, 2007; Than, 2001; Watson & Halse, 2005). There are also several studies conducted to measure and analyze Turkish pre-service teachers environmental attitudes (Erol & Gezer, 2006; Sama, 2003; Tuncer, Sungur, Tekkaya & Ertepinar, 2007). In their study Erol and Gezer investigated primary school pre-service teachers' attitudes toward environment and how gender and socio-economic properties affect their attitudes.



In their study, researchers found that gender is one of the demographic characteristics affecting environmental attitudes. Researchers reported that there is a significant difference between female and male pre-service teachers in favor of females. Additionally researchers found that pre-service teachers' attitudes improve with increasing age. Besides, they found that some demographic characteristics such as father's and mother's graduation level, father's occupation, enrolling an environmental education course do not affect pre-service primary school teachers' attitudes toward environment. In another study, Sama investigated pre-service teachers' attitudes toward environmental problems. In the study 442 pre-service teachers attending different departments of education faculty participated in the study. The researcher applied 22-item Likert type questionnaire to determine participants' environmental attitudes. Sama reported that gender, father's graduation level, father's occupation and income levels are affecting pre-service teachers' attitudes toward environmental problems. Additionally, Tuncer, Sungur, Tekkaya and Ertepinar (2007) conducted a research to compare pre-service teachers' and elementary school students' attitudes toward environment. The researchers collected the data of the study from 1 235 elementary school students from different grade levels and 334 pre-service teachers by a 45-item 'Environmental Attitude Questionnaire' consisting of four dimensions; awareness of environmental problems, national environmental problems, solutions to the problems and awareness of individual responsibility. In the study researchers found that although pre-service teachers had significantly higher environmental attitudes than elementary school students both groups got moderate scores from the instrument.

The present study focuses on Turkish pre-service primary school teachers' attitudes toward environment and presents the results of the data obtained from a questionnaire applied nationwide. There are several reasons why authors of this study collected and analyzed Turkish primary school pre-service teachers' environmental attitudes. First, related literature revealed that there is a positive correlation among environmental knowledge, environmental attitudes and environmentally responsible behaviours. Furthermore attitude is a very important factor influencing behaviour (Newhouse, 1990). They can easily be used to predict behaviours. Since it would be very difficult to observe whether pre-service primary school teachers' show environmentally responsible behaviours, we preferred to determine their environmental attitudes. We believe that although focusing on environmental attitudes, the results of this study will provide clues for pre-service



teachers' environmentally responsible behaviours. Second, we chose primary school teachers as a sample of this study because we strongly believe that especially primary school teachers have influence on shaping children's environmental attitudes and the quality of environmental education in primary schools depend on primary school teachers' awareness about and attitudes toward environment (Than, 2001). The reason for choosing pre-service teachers' is to determine whether environmental education is given effectively at teacher education programmes. With this respect, in the present study answers were sought to the following questions:

1. What are primary school pre-service teachers' environmental attitudes?
2. Are there differences between male and female pre-service teachers' attitudes toward environment?
3. Are there differences among pre-service teachers attending different grade levels with respect to their environmental attitudes?

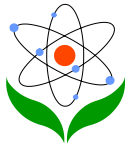
Method

Research Design

The present study is dealing with Turkish pre-service primary school teachers' environmental attitudes and how their attitudes change with gender and grade level. For the study, survey method was utilized, since this method allows determination of sample characteristics for a large group in a very short time. Besides, surveys can be used effectively to determine "the attitudes, opinions and perceptions of persons of interest to the researcher" (Borg, Gall & Gall, 1993: p.21). The data obtained from this study will provide a picture of Turkish pre-service primary school teachers' environmental attitudes.

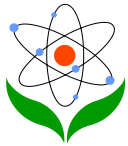
Sample

A total of 2067 pre-service primary school teachers (1296 females and 771 males) attending primary school departments of nine universities in Turkey participated in the study. The sample consists of 629 first year, 510 second year, 500 third year and 428 fourth year students. When considering the mother's level of education, the descriptive analysis revealed that the most common level of education is primary school education ($f = 1172$, 56.7%) and high school graduation ($f = 230$,



11.1%). Besides, 17.9% of pre-service teachers responded that their mothers are not literate. While statistics change for father's level of education the general picture does not change too much. Primary school graduation ($f = 806$, 39.0%) is still the most common level of education, followed by high school graduation ($f = 470$, 22.7%) and university graduation ($f = 361$, 17.5%). The demographic characteristics of participants are summarized in Table 1.

Characteristics	f	P
<i>Gender</i>		
Male	771	37.3
Female	1296	62.7
<i>Grade Level</i>		
1st Grade	629	30.4
2nd Grade	510	24.7
3th Grade	500	24.2
4th Grade	428	20.7
<i>Mother's Graduate Level</i>		
Not Literate	368	17.9
Primary School Graduate	1172	56.7
Secondary School Graduate	183	8.9
High School Graduate	230	11.2
University Graduate	102	4.9
Post-Graduate	2	.1
<i>Father's Graduate Level</i>		
Not Literate	78	3.8



Primary School Graduate	806	39.0
Secondary School Graduate	330	16.0
High School Graduate	470	22.7
University Graduate	361	17.5
Post-Graduate	15	.7

Table 1. Demographic Characteristics of Participants

Research Instruments

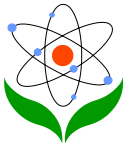
Environmental Attitude Questionnaire. Turkish pre-service primary school teachers' environmental attitudes were determined by administering 'Environmental Attitude Questionnaire' developed by Tuncer, Ertepinar, Tekkaya and Sungur (2005). This questionnaire includes 45-Likert-type questions dispersed into 4 subscales; awareness of environmental problems (AEP) includes 12 questions, general attitudes towards solutions (GAS) includes 15 questions, awareness of individual responsibility (AIR) includes 13 questions, and awareness of national environmental problems (ANEP) includes 6 questions. Tuncer et al. reported the internal consistency of item sets to be .58, .65, .77, .55, respectively, using Cronbach alpha. In the present study the Cronbach alpha values are calculated as .65, .72, .70, .58 for each subscale respectively.

Procedure

Data of the study were collected from the participants on a voluntary basis during the fall semester of 2010-2011 academic year. At all occasions, the researchers were present throughout the data collection process. After a brief introduction to research, the questionnaires were distributed to participants. Participants were instructed to think about each question before answering them. It took approximately 25 minutes to complete the questionnaire.

Data Analysis

Primary school pre-service teachers responded to EAQ using a five-point scale of strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5). The

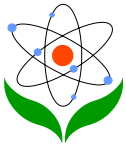


scores from the items on each component were aggregated to provide individual scores on each component. As for the statements representing a negative attitude, the scores were reversed. For the representation of the data the 'strongly agree' and 'agree' responses, 'disagree' and 'strongly disagree' responses were combined to give the proportions of students who affirmed the data. Statistical analyses included tabulation of frequency distributions and descriptive statistics of pre-service teachers' responses to the EAQ. Independent samples t-test and analysis of variance were conducted to examine the difference between genders and grade level, respectively.

Results

Research Question 1: What are primary school pre-service teachers' environmental attitudes?

Descriptive statistics concerning Turkish pre-service primary school teachers' responses to the EAQ are represented in Table 2. The results of descriptive statistics showed that from the questionnaire pre-service primary school teachers obtained a mean score of 152.62 with a standard deviation of 12.17. Based on this result, it can be concluded that pre-service teachers have a high attitude toward environment. When considering the scores obtained from the subscales of EAQ, it can be easily seen that pre-service teachers have a moderate awareness of environmental problems ($M = 35.81, SD = 5.08$), have a high attitude toward solutions ($M = 51.30, SD = 5.89$), have a high awareness of individual responsibility and attitude through changing lifestyles ($M = 49.83, SD = 5.65$) and a moderate awareness of national environmental problems ($M = 18.64, SD = 2.57$).

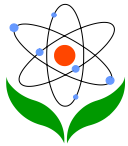


	<i>N</i>	Min.	Max.	<i>M</i>	<i>SD</i>
AEP	2067	15.00	65.00	35.81	5.08
GAS	2067	18.00	81.00	51.30	5.89
AIR	2067	20.00	68.00	49.83	5.65
ANEP	2067	6.00	31.00	18.64	2.57
Total	2067	60.00	237.00	152.62	12.178

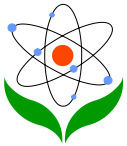
Table 2. Descriptive Statistics for four subscales of EAQ

Descriptive statistics showed that majority of pre-service primary school teachers do not believe that environmental pollution is a temporary problem ($f= 1521$, 73.6%), mankind is very adaptive so there is no need to be concerned about his survival in a polluted environment ($f = 1748$, 84.6%). Based on these results it can be said that the pre-service teachers are aware of environmental pollution and effects of pollution on human beings survival. The frequency and percentages of disagreement to the statement “environmental problems have always existed, and been solved, so there is no need to worry about the nature” ($f= 1768$, 85.5%) and the agreement to the statement “society should encourage the conservation of nature” ($f= 1698$, 82.1%) are the signs of high attitudes toward solutions to environmental problems.

Almost all of the pre-service primary school teachers agreed with the statements representing their awareness toward individual responsibilities such as “we must conserve our resources for future generations” ($f= 1865$, 90.2%), “individual responsibilities are very important in protecting the environmental pollution ($f= 1900$, 92.0%) and “the hole in the ozone layer will never stop growing if we continue to operate as we do now” ($f= 1814$, 87.7%). Besides, pre-service primary school teachers agreed with the statements such as “there are many plant and animal species in our country that are at the edge of extinction” ($f= 1722$, 83.3%), and the solution of environmental problems in Turkey is closely related with raising environmental awareness” ($f= 1747$, 84.5%).



Sub-scales	Items	Disagree		Undecided		Agree	
		<i>f</i>	<i>P</i>	<i>f</i>	<i>P</i>	<i>f</i>	<i>P</i>
AEP	3- Environmental pollution is a temporary problem.	1521	73.6	198	9.6	331	16.0
AEP	6- Mankind is very adaptive so there is no need to be concerned about his survival in a polluted environment.	1748	84.6	109	5.3	183	8.9
AIR	14- We must conserve our resources for future generations.	142	6.9	42	2.0	1865	90.2
GAS	16- Environmental problems have always existed, and been solved, so there is no need to worry about the nature.	1768	85.5	112	5.4	167	8.1
ANEP	23- There are many plant and animal species in our country that are at the edge of extinction.	145	7.0	89	4.3	1722	83.3
AIR	24- Individual responsibilities are very important in protecting the environmental pollution	100	4.8	50	2.4	1900	92
AIR	25- The hole in the ozone layer will never stop growing if we continue to operate as we do now.	136	6.6	68	3.3	1814	87.7

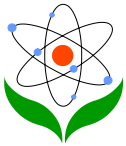


GAS	40- Society should encourage the conservation of nature.	167	8.1	164	7.9	1698	82.1
ANEP	42- The solution of the environmental problems in Turkey is closely related with raising environmental awareness.	164	7.9	119	13.7	1747	84.5
AIR	44- Economical use of water and energy is important for the sustainable use of natural resources.	115	5.6	90	4.4	1832	62.6
AIR	45- Everybody has a part in environmental degradation but it changes according to the individual consumption patterns.	138	6.7	166	8.0	1701	82.3

Table 3. Frequencies and percentages of responses to selected items of EAQ

Research Question 2: Are there differences between male and female pre-service teachers' attitudes toward environment?

To show whether there are significant differences between male and female pre-service teachers with respect to their attitudes toward environment independent samples t-test were run. The results revealed that there was a statistically significant mean difference ($t = 2.03, p = .04$) between males and females in favor of females with a large effect size ($\eta^2 = .99$). This means that the result is both statistically and practically significant. Considering the subscales of EAQ, significant mean differences were found between males and females for GAS ($t = 2.63, p = .01$) and AIR ($t = 4.90, p = .00$) in favor of females. For the subscales of AEP ($t =$



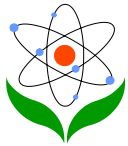
-1.77, $p = .07$) and ANEP ($t = -1.50, p = .133$) no significant differences were found with respect to the gender (see Table 4).

Variable	Group	<i>N</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>
AEP	Females	1296	35.66	4.63	-1.77	.07
	Males	771	36.06	5.74		
GAS	Females	1296	51.57	5.49	2.63	.01
	Males	771	50.86	6.50		
AIR	Females	1296	50.30	5.22	4.90	.00
	Males	771	49.04	6.24		
ANEP	Females	1296	18.58	2.37	-1.50	.13
	Males	771	18.76	2.88		
Total	Females	1296	153.08	11.78	2.09	.04
	Males	771	151.83	15.22		

Table 4. The results of *t*-test analysis

Research Question 3: Are there differences among pre-service teachers attending different grade levels with respect to their environmental attitudes?

To investigate whether there are significant mean differences among pre-service primary school teachers attending different grade levels, ANOVA was run. The results showed that there were no significant differences ($F_{(3, 2063)} = 1.676, p = .170$) between pre-service teachers based on grade level variable with respect to their environmental attitudes.

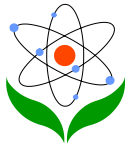


Conclusion and discussion

Today, it is known that the Earth is the only planet, where mankind can live. From the very beginning of their existence, humans have given the impression of an enemy to natural environment (Hadisuwarno, 1997: as cited in Quablan, 2005). Paradoxically, they are the key actors to solve the environmental problems. To solve the environmental problems, humans need to develop an understanding about the actions that causes the deterioration of the environment. For an understanding of global environmental problems, it is necessary to develop a consciousness of the environment, because environmental consciousness is a general condition for changing environmental habits (Brunold, 2006).

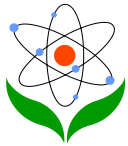
Attitudes toward the environment begin to evolve at very young ages. While environmental education should be provided to people of all ages with formal and informal education, children are the most important target audience of environmental education. Today's children are individuals who will experience the environmental problems of future and who will try to solve those problems. With their future vocational positions they will make decisions and so they will have important roles on environmental politics and the applications related to environment. Moreover, they will have a right to say about the usage of natural resources. Because of these, it will be an important investment for the future to brought up children as knowledgeable about environmental issues, conscious of, sensitive to environmental problems and willing to solve those problems even beginning from their school years. Teachers are the major agents for educating students with these characteristics. Than (2001) emphasized that teachers play the pre-eminent role in determining the quality of environmental education in primary schools. Thus, if teachers don't have positive attitudes toward environmental issues, they won't be able to educate children having desired characteristics. For this reason, determining pre-service teachers' attitudes toward the environment appears to be an important subject to be examined.

With this respect, the purpose of this study was to determine primary school pre-service teachers' attitudes toward environment and how gender and grade level affects their environmental attitudes. The descriptive results of the study revealed that Turkish pre-service primary school teachers have favorable attitudes toward environment. Pre-service teachers have a moderate awareness of environmental problems ($M = 35.81$, $SD = 5.08$), have a high attitude toward solutions ($M =$



51.30, $SD = 5.89$), have a high awareness of individual responsibility and attitude through changing lifestyles ($M = 49.83$, $SD = 5.65$) and a moderate awareness of national environmental problems ($M = 18.64$, $SD = 2.57$). These results are not consistent with the previous research studies (Tuncer, Sungur, Tekkaya & Ertepinar, 2007). In their study, authors reported that pre-service teachers' environmental attitudes cannot be evaluated as positive. Moreover, they seem to be undecided about the statement representing their attitudes toward solutions and their individual responsibilities. The inferential statistics showed that there is a significant mean difference between female and male pre-service teachers. In the literature, gender difference in favour of females is reported in many of research studies (Davidson & Freudenburg, 1996; Gardos & Dodd, 1995; Huang & Yore, 2004; Tikka, Kuitunen & Tynys, 2000). Similar results are also reported in studies conducted with Turkish samples (Erol & Gezer, 2006; Sama, 2003; Tuncer et al., 2005; Tuncer, et al., 2007; Tuncer et al., 2009; Yilmaz, Boone & Andersen, 2004). The gender differences found may be because of traditional gender roles. Regarding the gender roles, females are usually responsible for nurturing their family and protecting their children (Blocker & Eckberg, 1997; Gilligan, 1982) and males are responsible for providing the economic wealth of their family. Based on these gender roles, males tend to master nature and derive benefits from natural resources whereas females are concerned about environmental issues and take a more emotional attitude toward nature (Kelert & Berry, 1987; Caro, Pelkey & Grigione, 1994). Based on these roles, females are more likely to show positive attitudes toward environmental issues. As Tikka et. al. states that (2000) "the concern felt by women for nature and environment could be seen as a way of taking care of their offspring, because a clean and safe environment was a precondition for welfare and survival." (p.18).

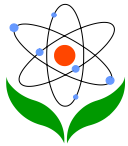
The results also revealed that primary school pre-service teachers attending to different grades of teacher education programme do not differ from each other with respect to their environmental attitudes. Age, in this case grade level, is reported as one of the important variables affecting environmental attitudes (Malkus & Musser, 1997). In Turkish education system, pre-service teachers take an environmental education course in the second year of undergraduate education. Considering this situation, it was expected first grade students' will have the lowest environmental attitude scores and the fourth grade students' will have the highest ones. Although pre-service teachers have high environmental attitude scores, do not finding a significant difference among them is a thought-provoking situation. Based on these



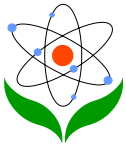
results it can be concluded that environmental education course provided in undergraduate education does not affectively change primary school pre-service teachers' environmental attitudes. Primary school students see their teachers as the embodiment of knowledge. Teachers are usually the role models for children. Thus it is very important for a teacher to have high qualities. To educate environmentally literate students, teachers should be knowledgeable about environmental issues and show positive attitudes toward environment. For this reason, it is very important to improve in-service and pre-service teachers' attitudes toward environment. To do this, the number of courses focusing on environmental education should be increased and gender difference should be eliminated through education. Since, theoretical courses may not be enough to improve their attitudes toward environment, more practical environmental education courses should be provided for pre-service teachers in their undergraduate education. These courses can provide real-life situations that they can be involved easily and thus may be more effective than the theoretical ones. Moreover, interdisciplinary courses addressing the relationship between the science-technology-environment and society approach can challenge pre-service primary school teachers to promote effective environmental education within their future professional work lives. Intensive energy should be spent to improve pre-service teachers' environmental attitudes because; teachers with positive environmental attitudes are the guarantee of having environmentally aware citizens showing environmentally responsible behaviours.

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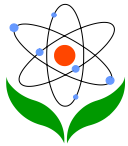
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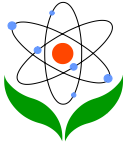
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