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An Investigation of Secondary School Students' Environmental Attitudes and Opinions about Environmental Education (EE)

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Abstract

The purpose of this study is to determine the environmental attitudes of secondary school students and their opinions about environmental education (EE). It also aims to make recommendations in order to give more importance to studies on this subject in Turkey based on the findings obtained. The research problem is 'What are the opinions and attitudes of secondary school students towards environmental awareness and education?' In the study descriptive method and quantitative and qualitative research techniques were used. An attitude scale was developed to determine the students' attitudes towards the environment. On this scale the necessary validity and reliability studies were carried out. The final attitude scale was administered to 408 secondary school students in the city centre of Niğde in the academic year 2016-2017. In addition, a semi-structured interview was conducted with 71 students in order to determine the views of students on EE. The quantitative data obtained from the attitude scale were compared in terms of variables such as gender, class level and school type. Interview data were divided into categories through content analysis, and frequencies were calculated and tabulated. When the attitude scale scores were examined, significant differences were revealed for gender and school type, whereas no difference was found regarding class level. Based on the data obtained from the interviews conducted with the students, recommendations were made for schools to organize the activities that will promote environmental awareness and EE.

Keywords

Environment, Environmental Education, Environmental Awareness, Environmental Attitudes

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The population growth worldwide and the rapid development of science and technology increase the requirements of people. There is an increase in the negative effects of the uncontrolled use of the technology developed to address these needs on natural resources (Özer, 1991; Aydınalp, 1997; Yılmaz, Morgil, Aktuğ & Göbekli, 2002; Güney, 2002; Özey, 2004; Baykal & Baykal, 2008; Tıraş, 2012; Sönmez & Yerlikaya, 2017a; Artvinli & Demir, 2018). The basis of the sociological reason that causes environmental problems to arise forms the behaviour and attitudes of people towards the nature (Sönmez & Yerlikaya, 2017b). Therefore, the negative environmental impacts of technology developed to meet the needs of people in this century bring the necessity of raising environmentally conscious individuals in order to enable future generations to live in a healthier and safer environment (Şahin N. F., Cerrah, Saka & Şahin B., 2004). In this case, the importance of environmental education (EE) is increasing to raise environmental awareness and sensitivity among people.

Environmental Education (EE)

The purpose of EE is to help people understand their place in the world they live in, to develop their view that they can live in harmony with the planet they are in, and to acquire the necessary skills for a healthier generation (Bozkurt, 2006). In other words, EE includes the processes of informing, awareness-raising, warning, balancing, improving, protecting and etc., and aims to create such behaviour in people (Güler, 2010). Magnus, Martinez & Pedauye (1997) also pointed out that the main objective of EE is to make assessments of environmental issues, to find feasible solutions to the problems that they have identified, and to create environmentally friendly behaviour. For this reason, it becomes necessary to include more environmental activities in order to adequately inform individuals on environmental issues, and to improve their environmentally conscious behaviour (Hungerford & Volk, 1990). Besides, EE is aimed at raising individuals who have environmental awareness, are environmentally sensitive and have gained positive behaviour towards the environment (Ministry of Environment and Forestry, 2004).

Environmental Education (EE) and Education for Sustainable Development (ESD)

There are similarities and differences between EE and ESD. These similarities and differences can be expressed as follows (Mckeown & Hopkins, 2003): They are both discrete, yet complementary. They have separate agendas, priorities, and programmatic development. They will influence one another, and each will benefit from the independent growth of the other. The two integrate each other. According to Tanrıverdi (2009: 89), EE becomes an important tool in the promotion of sustainable development. ESD is continually claimed despite the acknowledgement by many of the same authors of the definitional problems of the term 'sustainable development' (SD), principally its fuzziness or ambiguity which has led to multiple, often contradictory interpretations (Stevenson, 2006: 277). ESD is a vision of education that seeks to balance human and economic well-being with cultural traditions and respect for the Earth's natural resources (Zenelaj, 2013: 228). According to Little and Green (2009: 172), ESD is

essentially a call for change in the way we educate our children and ourselves with the express purposes of ensuring a sustainable future. It is a strategy and action plan to better equip people with the skills knowledge, and motivation to handle environmental problems.

According to a phenomenographic study of discourses and practices in EE, there are six paradigmatic conceptions of the environment. The effect of these different conceptions can be observed in the pedagogical approaches and strategies suggested by different authors or adopted by educators (Sauvé, 1996: 10-13):

- Environment as nature ... to be appreciated, respected, preserved
- Environment as a resource ... to be managed
- Environment as a problem ... to be solved
- Environment as a "place to live" ... to know and learn about, to plan for, to take care of
- Environment as the biosphere ... in which we all live together, into the future
- Environment as a community project ... in which to get involved.

Three important documents define goals and outline EE and ESD (Mckeown & Hopkins, 2003: 117-118):

- Belgrade Charter that is found in the Final Report of the International Workshop on EE which was held in Yugoslavia in 1975
- Tbilisi Declaration that is part of the Final Report of the Intergovernmental Conference on EE held in Tbilisi, USSR in 1977
- Agenda 21 that is the document resulting from the United Nations Conference on Environment and Development (UNCED), also called the Earth Summit, held in Rio de Janeiro, Brazil in 1992.

The four driving forces of ESD for which UNESCO was designated as Task Manager, identify four overarching goals which can be listed as follows (Little & Green, 2009: 172; UNESCO, 2009: 7):

Promote and improve the quality of education: The aim is to refocus lifelong education on the acquisition of knowledge, skills and values needed by citizens to improve their quality of life.

Reorient the curricula: From pre-school to university, education must be rethought and reformed to be a vehicle of knowledge, thought patterns and values needed to build a sustainable world.

Raise public awareness of the concept of sustainable development: This will make it possible to develop enlightened, active and responsible citizenship locally, nationally and internationally.

Train the workforce: Continuing technical and vocational education of directors and workers, particularly those in trade and industry, will be enriched to enable them to adopt sustainable modes of production and consumption.

EE should be given starting from a young age, as in other educational issues. In this way, individuals who are environmentally conscious and will develop positive attitudes and behaviour in environmental protection can be raised. According to Özer (1993), EE is a continuous and multidisciplinary process. From an interdisciplinary point of view, Erten (2005) explains that EE is an educational field that concerns the whole society as in the following:

> The greatest feature of environmental problems is that they are not local but global. These environmental problems affect everyone without exception like religion, language, race, old-young, male-female, rich-poor, academic-farmer, peasant-urbanite, science or music teacher, mathematics, chemistry or physics teacher. Therefore, environmental protection is not only the duty of environmentalists, and environmental education is not the duty of environmental educators. Protecting the environment is the duty of all of us. In all courses, a link must be established between the subject courses and the protection of the environment (Erten, 2005: 92).

Starting EE from primary school is considered to be important for students to understand natural life, to contribute to their experiences in order to gain scientific qualification and to develop positive attitudes towards the environment (Yaşar, Gültekin & Anagün, 2005). In the "Intergovernmental Conference on Environmental Education" held in Tbilisi in 1977, it was proposed that EE should be systematically included in elementary and secondary schools (Kleber, 1993, cited in Hesapçıoğlu, 1994). Ünal and Dımışkı, (1999: 142) stated that the roots of EE were based on the education of conservation of nature and natural resources. In addition, they added that EE focused on protecting and improving the whole environment, including biosphere, biomes and ecosystems, in addition to improving and protecting natural resources such as land, water and forests.

It is very important to understand the necessity of attitudes towards the environment in order to develop environmentally conscious behaviour as behavioural change is the objective in the EE (Artvinli & Demir, 2018). Arcury (1990) conducted a study that found a direct relationship between environmental attitudes and environmental knowledge. Since EE programs are generally aimed at the cognitive field, it is necessary that more activities should be provided for the affective field. Direct experiences will also play an important role in developing environmental attitudes as they affect the formation of attitudes in the affective field (Pooley & O'Connor, 2000). EE should not only give information and create a sense of responsibility, but also change human behaviour. To this end, educational activities should include more audio and visual materials, and practical activities. In a study conducted on university students, it was found that education based on knowledge did not reach a sufficient level in EE and in the formation of environmental awareness, however, it was also revealed that the students who were learning actively by using their own creativity and skills developed more positive attitudes towards the environment (Şahin, et al., 2004).

According to Morgil, Yılmaz and Cingör (2002), one of the goals of EE provided for children is cultural accumulation, and the other one is to determine the responsibilities of children in solving environmental problems. In the studies carried out for this

purpose, environmental attitude scales are developed, administered, and then interpretations and opinions are presented. Despite the enormous amount of environmental problems in Turkey, the studies carried out to raise environmental awareness are very limited. Arkış (1992), Dogan (1999) and Tican (1996) also investigated the environmental consciousness of secondary school students and made various recommendations (cited in Morgil et al., 2002). In the light of this information, the purpose of the present study is to determine the attitudes of secondary school students towards the environment and their views on EE, and to make recommendations about EE which is of particular concern to Turkey as well. In accordance with this purpose, the research problem was determined as 'What are the attitudes of the secondary school students towards the environment and their opinions about EE?'. The sub-problems to be answered under this problem statement are as follows;

1. What are the overall distribution of the secondary school students' scores on the attitude scale towards the environment?
2. Is there a significant gender difference between the attitudes of the secondary school students towards the environment?
3. Is there a significant difference between the attitudes of the secondary school students towards the environment regarding grade level?
4. Is there a significant difference between the attitudes of the secondary school students towards the environment regarding the school they study at?
5. What are the opinions of secondary school students about environment and environmental education?

Methodology

Research Design

Quantitative and qualitative research techniques were used in this descriptive study. Davies (2000) suggests that combining a qualitative and quantitative methodology in a single study helps explain the various aspects of the event being investigated, by providing a more holistic understanding, better informed education policy. The research employed a mixed method research design in which qualitative and quantitative research methods are used together. Cresswell (2008) defines mixed method as a mixed procedure for collecting and analyzing qualitative and quantitative data in the course of the relevant research process to completely understand a research problem. Mixed method is comprehensive, pluralistic, and complementary and provides the researcher with an eclectic approach to plan the conduct of the research and method selection. Many research questions can be answered entirely with the solution of mixed method (Johnson & Onwuegbuzie, 2004). The most commonly used mixed method designs in educational research are classified into four as embedded mixed method, explanatory mixed method, exploratory mixed method and parallel mixed method. In this study, explanatory mixed design was preferred because firstly quantitative data were collected and then qualitative data were collected to explain the quantitative data (Fırat, Yurdakul & Ersoy, 2014).

Study group

The universe of the study comprised secondary school students in Niğde. The study group was selected through stratified sampling method. For this, the schools located in Niğde were stratified according to the results of 2016 National High School Placement Exam in Turkey. According to their success rates, two schools from each group were randomly included in the sampling among low-performing, moderately performing and high-performing schools. The attitude scale was administered to a total of 408 students from the 5th, 6th, 7th and 8th grades in the selected schools. In order to obtain more in-depth information, interview was conducted with 71 students ($f_{\text{low-performing}}=21$, $f_{\text{moderately performing}}=27$, $f_{\text{high-performing}}=23$) selected randomly from the most successful, the least successful and moderate successful students in the study group. Some demographic features of the students in the study group are presented in Table 1.

Table 1
Some Demographic Features of the Students in the Study Group

Features		**f**	**%**
Gender	Female	222	54,4
	Male	186	45,6
Grade	5th (11 years old)	108	26,5
	6th (12 years old)	104	25,5
	7th (13 years old)	102	25
	8th (14 years old)	94	23
School Level (According to their success rates)	Low	145	35,5
	Moderate	139	34,1
	High	124	30,4
Total		408	100

Data Collection Tools

Attitude Scale. The researchers developed the environmental attitude scale as 5-point Likert-type scale. Firstly, researchers searched the literature to form the scale items. While the literature was being scanned, the studies that had been taken before and the measurement tools used in different studies were examined. Additionally, 12 students at secondary school level were asked open-ended questions about EE and were asked to express their emotions and thoughts. In accordance with the item writing technique, an item pool which had 26 items was created from the statements obtained from the literature, researchers' experience and student opinions. 'After that, a draft scale with 26 items was created by using expert opinions to ensure content validity. With the purpose of determining which of the 26 items on the draft scale worked well, the scale was applied to 262 secondary school students and the item discrimination of each item (item-total correlations) was determined by the factor analysis technique. Since the participant/item ratio was approximately 10:1 and this ratio was supported by the literature, the sample size was considered adequate.

The Kaiser-Meyer-Olkin (KMO) value was found to be 0.87 in the analyses performed to determine the adequacy of the data obtained as a result of the application

for the principal components analysis. Since the KMO value was found close to 1.00 (0.87), explanatory factor analysis was decided to be carried out on the sampling. In addition to being adequate for factor analysis, it is also necessary for the sample to show a normal distribution. Bartlett's test was performed to determine the normality and the data was found to be normally distributed (4344.006, sd: 300, p: 0.00 *).

The item-total correlation accounts for the relationship between the scores obtained from the test items and the total score of the test (Büyüköztürk, 2004). In other words, it indicates that each item in a measurement tool shows similar behaviour. In this context, the item-total correlation is expected to be positive and high. This means that the internal consistency of the measurement tool is high (Fraenkel & Wallen, 2000). In the interpretation of item-total correlation, it is considered that items with an item-total correlation of 0.30 and higher discriminate individuals well in terms of the characteristics tested.

In this study, the item-test correlations, the 1st factor loadings and the item averages were calculated and 12 items whose item-test correlation was significant ($p < 0.5$) and factor loadings in the first dimension of the 0.05 principal components analysis were above 0.30, and which combined after the rotation were included in the scale.

The main goal in developing a scale is to create a reliable and valid measurement tool (Tavşancıl, 2000). Factor analysis is the type of reliability that is often used in scales that are to be developed as a data collection tool in social sciences. This statistical technique aims to bring together the variables that measure the same structure or quality.

The basic assumption of Likert-type scales is that each item measures a single attitude (Tavşancıl, 2000). In this context, in order to examine the internal consistency of the scale developed and to provide another evidence of reliability, the Cronbach Alpha internal consistency coefficient of the final scale that got its final shape after performing factor analysis was found to be 0.78. This coefficient is within the accepted values in the literature.

Interview Form. In this research, semi-structured interview technique was used to understand in more detail the attitudes of the students towards the environment and their level of knowledge about EE. Since semi-structured interview was more systematic and flexible, it was found suitable to determine the views of students about EE. For this, the researchers prepared a 9-point interview protocol, and expert opinion was consulted for validity. While preparing the interview protocol, it was noted that easy, clear and alternative questions must be created, and directing interviewees must be avoided, as stated by Yıldırım & Şimşek (2005: 227).

Apart from this, since the concept of validity and reliability is used in relation to the researcher, attention was paid to each person interviewed during the application to ask the same question with the same words and in the same way. The interview with students was conducted following the implementation of the attitude scale.

For the reliability of the interview, the consistency in the narrative process of writing the speeches recorded in the interview process is of great importance. For this reason, part of the casual talk was resolved at two different times, looking at the consistency of both analysis processes. For reliability, the data obtained after parsing the conversations in the cassettes were encoded in certain categories. The coding process was repeated by researchers at different time intervals.

To ensure validity, confidence was established before the interview that accurate and real information would be given by the intervieewes about themselves, and then the information recorded on a tape was trancripted correctly, and the non-verbal behaviors that could not be recorded on the tape were added in the transcript.Apart from this, students' attitude scales were examined and the validity of the data obtained was tested.It was assumed that the answers given to the data collection tools in the survey reflected the true opinions of the study group. Especially during the interviews, it was also assumed that the researcher had an equal attitude towards the persons.

Data Analysis

Quantitative data obtained from the study were analyzed in SPSS 24.0 and Minitab Statistical Programs and Cronbach Alpha reliability, item analysis, factor analysis, principal components analysis, t-test and analysis of variance were performed as analysis techniques. In this way, a reliable and valid scale was established, and student attitudes were evaluated in terms of various variables.

In the analysis of the data obtained from the interview form, content analysis was used. According to Yıldırım & Şimşek (2005: 227), the basic process in content analysis is to bring together similar data within the framework of certain themes and concepts, and to interpret them in a way that the reader understands. Within the context of content analysis, the following stages were followed (Yıldırım & Şimşek, 2005: 227):

- Coding the data
- Finding categories
- Arranging and defining data according to codes and categories
- Interpretation of findings

Within the scope of the research, the data obtained by the interview records were coded by descriptive approach and content analysis method and divided into categories and handled one by one.In addition, frequency values were calculated and tabulated.

Findings

Findings Related To the 1st Sub-Problem

The first sub-problem of the research is "what are the overall distribution of the secondary school students' scores on the attitude scale towards the environment?"". In order to find an answer to this question, the arithmetic mean and standard deviation values of the scores obtained by the students from the scale are given in Table 2.

Table 2

Overall Distribution of the Students' Scores on the Attitude Scale

	n	Minimum	Maximum	$\overline{X}$	sd
All Scale	408	24,25	55,42	43,94	5,82

Since the scale is 5-point Likert-type, the lowest attainable score on the attitude scale is 12 and the highest score is 60. The arithmetic mean of the students' scores is 43,94. In this case, students'' attitudes towards the environment seem to be positive.

Findings Related To the 2nd Sub-Problem

This sub-problem is stated as "Is there a significant gender difference between the attitudes of the secondary school students towards the environment?". Since the distribution was found to be normal as the result of the Levene analysis, the students' attitude scores were compared for gender variable through independent t-test. Findings obtained are presented in Table 3.

Table 3

T-Test Results for the Attitude Scores of Students according to Gender

Gender	n	$\overline{X}$	ss	sd	t	p
Female	222	44,88	5,36	556	4,08	,000*
Male	186	42,88	6,14	556		

*p<.001

As seen in Table 3, there is a significant gender difference in the students' environmental attitudes in favour of female students. This suggests that female students' attitudes towards the environment were more positive.

Findings Related To the 3rd Sub-Problem

3rd sub-problem is stated as "Is there a significant difference between the attitudes of the secondary school students towards the environment regarding grade level?" For this purpose, the mean and standard deviation values of the scores of the 5th, 6th, 7th and 8th grade students are illustrated in Table 4.

Table 4

The Mean and Standard Deviation Values According to Students' Grade Levels

Class Levels	n	$\overline{X}$	sd
5th grade	108	44,37	5,80
6th grade	104	44,63	5,78
7th grade	102	43,76	5,79
8th grade	94	43,29	5,83
Total	408	43,94	5,82

Table 4 shows that the arithmetic mean values of the students' scores on the scale were close to each other. The results of the analysis of variance showing the significance level of the difference between the mean values are presented in Table 5.

Table 5

Results of Analysis of Variance for the Attitude Scores of the Students according to Grade Levels

Source of variance	Sum of squares	sd	Mean Square	F	p
Between Groups	174,404	2	87,202	2,593	,076
Within Groups	18662,759	555	33,627		
Total	18837,162	557			

As seen in Table 5, there is no significant difference between the attitudes of the students towards the environment and their grade level. In this case, it can be stated that the students had similar attitudes towards the environment based on class level.

Findings Related To the 4th Sub-Problem

4th sub-problem is stated as "Is there a significant difference between the attitudes of the secondary school students towards the environment regarding the school they study at?". For this purpose, the scale developed was administered in 6 different schools at 3 different levels, as low-performing, moderately performing and high-performing according to the results of the 2016 National High School Placement Exam in Turkey. The mean and standard deviation values of the students' attitude scores in these schools are given in Table 6.

Table 6

Mean and Standard Deviation Values according to Students' Schools

School	n	$\overline{X}$	sd
1st school (low) (1)	69	42,20	6,19
2nd school (high) (2)	74	44,32	5,24
3rd school (low) (3)	76	44,65	5,10
4th school (moderate) (4)	71	42,77	6,48
5th school (moderate) (5)	68	45,88	4,71
6th school (high) (6)	50	43,91	6,83
Total	408	43,94	5,82

In Table 6, when the scores of the schools with low, medium and high success rates are examined, it is seen that there was not a big difference between the scores. Findings from the analysis of variance performed to determine whether there was a difference between the students' attitudes in these schools towards the environment are shown in Table 7.

Table 7

Analysis of Variance Results for the Difference between the Students' Attitudes towards the Environment based on Their Schools

Source of variance	Sum of squares	sd	Mean Square	F	p	Groups differences
Between Groups	841,18	5	168,237	5,16	,000*	1-5
Within Groups	17995,98	552	32,601			4-5
Source of variance	18837,16	557				

*p<.001

According to the findings in Table 7, there was a significant difference between the schools. In order to find out between which schools the difference was revealed, Scheffe test was performed. According to the results of the test, a difference was observed between the 1st school, which was determined to be low successful, and the 5th school, which was determined to be moderately successful. The test also revealed a difference in favour of the 5th school between the 4th school, which was determined to be moderately successful, and the 5th school, which was determined to be moderately successful.

It is seen that the differences obtained in the research according to the school type are not systematic. In this case, it can be said that there is no direct relation between academic achievement and attitude towards the environment.

Findings Related To the 5th Sub-Problem

The 5th sub-problem of the research is expressed as "What are the opinions of secondary school students about the environment and EE?". Within the framework of this sub-problem, semi-structured interviews were conducted with a total of 71 5th (f = 15), 6th (f = 23), 7th (f = 18) and 8th (f = 15) grade students who were studying at the schools that made up the study group and who were selected randomly from the group. The frequencies of the generated categories for the answers given by the students to the interview questions are given in Table 8, Table 9, Table 10, Table 11, Table 12, Table 13, Table 14, Table 15 and Table 16.

Table 8

Students' Opinions about the Question "What Are the Factors that Pose Danger to the Environment?"

	5th grade	6th grade	7th grade	8th grade	Total
Categories	f	f	f	f	f
Air pollution (cigarettes, fuel fumes, exhaust, etc.)	11	22	14	13	60
Factory wastes and harmful	7	23	8	8	46

wastes					
Wastes/ Trash like plastic, glass, etc.	5	19	13	4	41
Noise pollution	2	7	5	4	18
Water pollution	1	6	4	1	11
People	-	4	2	1	7
Waste batteries	2	3	2	-	7
Natural disasters (erosion, earthquake etc.)	1	4	-	-	5
Nuclear waste	-	1	2	2	5

Table 8 shows that the majority of the students listed air pollution (f = 60), factory wastes (f = 46), garbage and similar wastes (f = 41) etc. as the most dangerous factors to the environment. In addition to these responses, light pollution, visual pollution and soil pollution were emphasized to be dangerous for the environment by three 6th grade students, one for each.

Table 9
Students' Opinions about the Question "What kind of Pollution Can Be Addressed within the Scope of Environmental Pollution?"

	5th grade	**6th grade**	**7th grade**	**8th grade**	**Total**
Categories	f	f	f	f	f
Air pollution	7	20	8	12	47
Waste pollution	1	19	17	7	44
Soil pollution	10	20	4	1	35
Noise pollution	3	17	4	5	29
Water pollution	4	16	3	6	29

In Table 9, students named mostly air (f = 47), waste (f = 44) and soil (f = 35) pollution within the scope of environmental pollution.

Table 10
Students' Opinions about the Question "What are the Negative Impacts of Environmental Pollution on Human Life?"

Categories	**5th grade**	**6th grade**	**7th grade**	**8th grade**	**Total**
	f	f	f	f	f
Occurrence of health problems	8	23	11	7	49
Lack of Oxygen - fresh air	3	6	2	4	15
Disturbance in the natural balance - inability to meet natural needs	-	3	7	3	13

Table 10 reveals views that environmental pollution would lead to health problems (f = 49), and cause lack of oxygen and fresh air (f = 15), and therefore result in the disturbance of natural balance (f = 13).

Table 11
Students' Opinions about the Question "Which of the Waste Left in the Environment Can Be Used via Recycling?"

	5th grade	6th grade	7th grade	8th grade	Total
Categories	f	f	f	f	f
Plastic products	9	22	10	8	49
Paper products	4	19	9	13	45
Glass products	1	19	13	11	44
Waste batteries	2	1	3	2	8
Metals	-	3	1	-	4

As seen in Table 11, students at all grades indicated plastic (f = 49), paper (f = 45) and glass (f = 44) products as highly recyclable waste. However, the fact that some students at 6th grade reported wood (f = 2), sun (f = 1), air (f = 2), soil (f = 1), water (f=1), forest (f=1) as recyclable waste suggests that there is some misinformation about recycling among students, especially at this level.

Table 12
Students' Opinions about the Question "What Do You Think About the Use of Paper Bags Instead of Plastic (Nylon) Bags in Shopping?"

	5th grade	**6th grade**	**7th grade**	**8th grade**	**Total**
Categories	f	f	f	f	f
Paper products can be recycled, but plastic products cannot.	5	9	9	4	27
Nylon bags are more useful because they are more durable.	5	5	3	-	13
Nylon bags can be harmful for health since they are made from petroleum.	3	5	-	2	10
I think it should be paper.	-	1	3	6	10

When the answers given by the students in Table 12 are examined, it is seen that these answers contradict the student responses in the previous question. While plastic products were described as recyclable waste in the previous question, 5 of the 5th graders, 9 of the 6th graders, 9 of the 7th graders and 4 of the 8th graders emphasized that plastic products could not be recycled in this question. It is believed that what students want to emphasize here is that it takes plastic products longer to decompose in nature

compared to paper products. It is interesting that some of the 8th grade students approved the information in the question without expressing an opinion.

Table 13
Students' Opinions about the Question "If you were the Minister of the Environment, What Kinds of Activities Would You Organize to Build a Sound Environmental Awareness in People?"

	5th grade	**6th grade**	**7th grade**	**8th grade**	**Total**
Categories	f	f	f	f	f
I would inform people through panel, conference, and seminar	8	10	10	10	30
I would organize events at schools like theatre, play, etc.	12	5	1	2	20
I would have posters, brochures, banners, TV programs, etc. prepared	1	5	1	4	11
I would apply fines to people who pollute the environment	-	4	2	3	9
I would establish secret environmental volunteers-police squads	-	1	1	2	4

The answers in Table 13 show that almost half of the students or more than half of them at each class level found informing people by verbalizing appropriate. Apart from this, when the other categories were examined, it was stated that environmental awareness would be created through activities in which visualization such as posters, brochures, banners, television broadcasts, theatre, and plays was at the foreground. The reason why 5th grade students emphasized activities like theatre, play, etc. as the most common answer (f = 12) could be that they just moved from the elementary school to the secondary school and that they generally took part in such activities more intensively in primary school.

Table 14
Students' Opinions about the Question "Can You Give an Example of the Environmental Practices Done in Your School?"

	5th grade	**6th grade**	**7th grade**	**8th grade**	**Total**
Categories	f	f	f	f	f
We took part in tree-planting campaigns	12	17	8	3	40
We collect garbage in some classes and during the breaks	7	9	1	4	21
Seminars and theatres were organized	9	4	1	5	19
Waste battery collection campaign was made	6	5	1	-	12
Environmental volunteers were selected in	-	-	2	4	6

the environmental club					
More bins (recycle) were placed in the school	-	1	2	2	5
We prepared environmental projects	-	2	2	-	4

Table 14 shows that tree-planting campaigns were emphasized by the students at the highest rate. In addition, activities like garbage and waste battery collection, seminars, theatre, etc. were also listed by the students.

Table 15
Students' Opinions about the Question "Which Courses Do You Think Environmental Education Should Be Given in?"

	5th grade	6th grade	7th grade	8th grade	Total
Categories	f	f	f	f	f
Sciences	10	23	14	11	58
Social studies	7	16	6	2	31
Turkish	-	9	4	-	13
Counselling	-	5	4	-	9
A separate environmental course	-	3	3	3	9
Life sciences	2	3	2	1	8
It should be included in each course	-	1	2	5	8

According to Table 15, a total of 89 students stated that environmental education should be given within the scope of Sciences and Social Sciences courses. This response is a consequence of the fact that EE gains are found in elementary and secondary school programs, especially in sciences and social sciences. However, students stated that EE could be provided in other courses as well as these. There are also students who stated that EE should be given in every course. Apart from this, students' opinion on the establishment of a separate environmental course were discussed in the next question.

Table 16
Students' Opinion about "A Separate Environmental Course for Environmental Awareness and Environmental Education in Schools"

	5th grade	6th grade	7th grade	8th grade	Total
Categories	f	f	f	f	f
It is necessary, people become aware of the (ir) environment	10	21	14	11	56
It is unnecessary	5	2	4	4	15

The majority of the students indicated that a separate environmental course was necessary for people to become conscious (Table 16). The fact that the theme environment was addressed in certain units at secondary school and that this was inadequate was only stated by one 7th and one 8th grade student. The students emphasized that having a separate environmental course would result in people to become more careful about keeping the environment clean.

Conclusion and Discussion

This study aimed to determine the environmental attitudes of the 5th, 6th, 7th, and 8th grade secondary school students and their opinions about EE. The arithmetic mean of the students' scores on the attitude scale applied was identified as 43,94. Since the highest attainable score on the attitude scale is 60, it indicates that students' attitudes towards the environment are positive. Similarly, Gökçe, Kaya, Aktay and Özden (2007) also found high student attitudes towards the environment. In a study conducted by Yalçınkaya (2012), students' awareness levels of environmental problems were found to be high. In addition, Atasoy and Ertürk (2008) carried out a study which aimed to determine the environmental attitudes and knowledge of 6th, 7th and 8th grade students, and revealed that the students did not have a sufficient level of environmental knowledge and attitude. Arcury (1990) stated that environmental attitudes changed with the increase in environmental knowledge. In the interview findings obtained without the research, it was seen that the students had knowledge about the pollutants of the environment and could bring suggestions about the improvement of the environment. It can be said that the level of knowledge about the environment and attitudes of students are in parallel with each other.

It is believed that the reason why the students' scores on the attitude scale were high and close to each other may have resulted from the EE they received in primary and secondary schools by taking into account the academic year when the study took place. Primary and secondary school students get information about the environment and EE in courses, especially in life sciences, sciences, and social studies. In addition, environmental attitudes of students can be improved through educational environmental activities arranged in other courses, too.

The study concluded that students' gender had a significant effect on their environmental attitudes. There was a significant gender difference in the environmental attitudes of the students in favour of the female students. Similar results were revealed in many studies on environmental attitudes (Erol & Gezer, 2006; Gökçe, et al., 2007; Kahyaoğlu, Daban & Yangın, 2008; Meydan & Doğu, 2008; Ek et al., 2009; Kaya, Akıllı & Sezek, 2009; Nalçacı & Beldağ, 2012; Zengin & Kunt, 2013; Gök & Afyon, 2015; Önder, 2015; Sönmez & Yerlikaya, 2017b). There are also studies in which a significant difference in the level of environmental knowledge was also found in favour of girls (Gök & Afyon, 2015; Sönmez & Yerlikaya, 2017b).

The attitudes of students towards the environment did not differ according to their classes. In the studies done by Sağır, Aslan and Cansaran (2008), Zengin and Kunt (2013), Gök and Afyon (2015), it was revealed that class level did not affect environmental attitudes. On the other hand, in the study conducted by Nalçacı and

Beldağ (2012), a significant difference was found between class level and environmental attitudes.

The study group included students who attended schools with different success rates. At the end of the study, although the students' attitudes towards the environment differed significantly based on the schools they attended; it was found that this difference was not directly related to the success of the schools. In parallel with the success rates of the schools, it was expected that the students attending these schools would also differ in their attitudes towards the environment. However, it was found that there was no such parallelism. The fact that not many questions about the environment were included in examinations that showed the success rates of schools can be considered as the reason for this situation. Besides this, the locations of the schools, the environmental activities in the schools, the factors that originated from the family and the teacher may have affected this result, too. Ünal and Dımışkı (1999) also emphasized the importance of EE in the family and in the schools in terms of creating environmental awareness in the individual. Unlike this finding, Sağır, Aslan and Cansaran (2008) found significant differences in the environmental knowledge and attitudes of the students according to schools. It was determined that students' participation in environmental activities was at a very low level and that they were inadequate to recognize the environmental problems in the place where they lived and to bring solutions to them.

Factory wastes and hazardous wastes were indicated by the entire 6th grade and approximately half of the 7th and 8th grade students to be the leading factor causing environmental pollution. The fact that news and programs in printed and visual media indicated that harmful wastes from factories brought about environmental pollution may have influenced the students. Students mostly expressed air pollution and waste pollution as well as soil pollution within the scope of environmental pollution.

It can be stated that the students were well informed about the possible adverse effects of environmental pollution. It was particularly noted by the majority of the students at all class levels that environmental pollution was likely to cause health problems in humans. This awareness is considered an important point of action in the development of environmentally sensitive behaviour.

The responses given to the question about recycled items are inconsistent with each other. Whereas plastic products were described as recyclable waste in the previous question, the students emphasized that plastic products could not be recycled in the subsequent question. It is believed that what students actually wanted to express here was that plastic products decompose in nature later than paper products. It is remarkable that some of the 8th grade students approved the information in the question without expressing an opinion. It is suggested that the students who have not had sufficient EE at early ages have difficulty in acquiring conceptual information about environmental issues (Uzun & Sağlam, 2005).

Considering the answers given to the question "If you were the minister of the environment, what kind of activities would you organize to create a sound

environmental awareness in humans?", it was observed that more than half of the students at all class levels preferred expressive ways such as panels, conferences, seminars as a way of informing people. Apart from this, when the other categories were examined, it was stated that environmental awareness would be created through activities such as posters, brochures, banners, television broadcasts, theatre, and plays in which visualization was at the foreground. The recommendation of students to help people gain environmental awareness through various promotional programs in general is consistent with the views stated in the report by the Ministry of Environment and Forestry (2004) on the acceptance of environmental protection by all segments of society and the achievement of public participation in the solution of environmental problems.

The students gave various examples of the environmental practices in their schools. As one of the principal examples, participation in tree-planting campaigns draws attention. When all the answers were examined, it was seen that many activities for environmental awareness in our schools were done especially lately, and these activities left positive effects on the students. In recent years, it has been thought that the increase in teachers' environmental awareness and positive attitudes towards environmental issues has been influential in the inclusion of more environmental activities in schools. This supports the view of Ünal & Dımışkı (1998) that teachers should be trained so that they can give EE in order to raise individuals with environmental awareness.

Majority of the students stated that EE should be given under Sciences and Social Studies courses. This response is a consequence of the fact that EE gains are found in secondary school programs, especially in Sciences and Social Sciences courses. However, the students stated that EE could be provided in other courses as well as these. In a project on creating environmental awareness in students through music, Sungurtekin (2001) emphasized that in the music lesson various musical instruments could be made by using various waste materials, and thus students' hand skills could be improved in addition to their environmental consciousness. Furthermore, an important part of the students seemed eager for a separate environmental course in secondary school. Students' suggestion shows similarities with the findings of the research (Kıyıcı et al., 2005), which was conducted with teacher candidates and in which EE course was recommended to be taught within the scope of other courses as well as a separate course.

Suggestions

It is essential not to limit EE to specific courses. It requires a multidisciplinary approach. All courses should include activities that enhance students' environmental awareness.EE should be given both theoretically and practically. While curricula are being prepared, this issue should be taken into account in environmental and educational issues.Gains for multi-dimensional thinking about the environment should be included, especially in the curricula of the Sciences and Social Sciences courses.Teacher training should also be attached importance, and for this purpose in-service teacher training programs should be prepared.

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Appendix

Interview Questions

- What are the factors that pose danger to the environment?
- What kind of pollution can be addressed within the scope of environmental pollution?
- What are the negative impacts of environmental pollution on human life?
- Which of the waste left in the environment can be used via recycling?
- What do you think about the use of paper bags instead of plastic (nylon) bags in shopping?
- If you were the minister of the environment, what kinds of activities would you organize to build a sound environmental awareness in people?
- Can you give an example of the environmental practices done in your school?
- Which courses do you think environmental education should be given in?
- What do you think about a separate environmental course for environmental awareness and environmental education in schools?

Attitute Scale

	Items	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

1	To me, every person should be informed about the environment.					
2	I think my friends are ignorant about the environment.					
3	I do not think my family is sensitive to the environment.					
4	It is not possible to have knowledge of the environment with the education I receive at school.					
5	I am interested in the activities about the environment in our school.					
6	I do not want to participate in the work that the clubs like Cleanliness, Environment, The Green Crescent do.					
7	If I find a book about the environment, I will read it right away.					
8	To me, more activities about the environment should be done in schools.					
9	Publications related to the environment do not attract me any interest.					
10	I think that the programs on environmental protection have not been broadcasted sufficiently on television and radio.					
11	In my opinion, the knowledge about the environment should be given in each course.					
12	I would like to have a separate environmental course at school.					