EVALUATION OF ENVIRONMENTAL ATTITUDES OF ELEMENTARY SCHOOL STUDENTS

A THESIS SUBMITED TO
GRADUATE SCHOOL OF SOCIAL SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY
MELTEM TARSUS BAŞ

IN PARTIAL FULLFILMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF SCIENCE
IN
THE DEPARTMENT OF ELEMENTARY SCIENCE AND MATHEMATICS EDUCATION

FEBRUARY 2010

Approval of the Graduate School of Social Sciences

Prof. Dr. Sencer Ayata
Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Science.

Prof. Dr. Hamide Ertepınar
Head of Department

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science.

Prof. Dr. Hamide Ertepınar
Supervisor

Examining Committee Members

Prof. Dr. Ömer Geban	(METU, SSME)	
Prof. Dr. Hamide Ertepınar	(METU, ELE)	
Assist. Prof. Dr. Ceren Tekkaya	(METU, ELE)	
Assist. Prof. Dr Özgül Yılmaz Tüzün	(METU, ELE)	
Assist. Prof. Dr. Gaye Tuncer	(METU, Part Time)	

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Name, Surname: Meltem Tarsus Baş

Signature:

ABSTRACT

EVALUATION OF ENVIRONMENTAL ATTITUDES OF ELEMENTARY SCHOOL STUDENTS

TARSUS BAŞ Meltem
M.S Department of Elementary Science and Mathematics Education
Supervisor: Prof. Dr. Hamide ERTEPINAR
Co-Supervisor: Assist. Prof. Dr. Gaye TUNCER

February 2010, 90 pages

This thesis aimed to assess attitudes of primary school students toward environment by four dimensions; awareness of environmental problems, awareness of individual responsibility general awareness of solutions and awareness of national environmental problems according to gender, grade level, student parents' education level and student parents' occupation.

Data was obtained by the application of Environmental Attitude Questionnaire (EAQ) during 2009-2010 semesters. The sample of the study is comprised of 817 students from seven public schools in Bodrum.

Data were analyzed by using frequency distributions, one-way ANOVA, independent sample t- test, Pearson product-moment correlation (zero order). Findings revealed that, there is a statistically significant effect of grade level, gender, mothers' and fathers' education level on students' attitudes. Moreover, frequency distributions of the student responses indicated that students were aware of general and national environmental problems and individual responsibilities but they were most-

ly undecided about the effects of industrialization on the environment. Besides, they were not aware of the role of science and technology for finding solutions for environmental problems.

Another important finding regarding to local circumstances was that, students living in Bodrum are not aware of the local environmental problems, such as the reasons for sea pollution. It is concluded as a result that, environmental education attempts shall be proceeded in accordance with the local conditions as well as national and global issues and the curriculum should lead students to make relations between life styles and environmental problems.

Keywords: Environmental Education, Environmental Attitude, Sustainability

ÖZ

İLKÖĞRETİM ÖĞRENCİLERİNİN ÇEVREYE KARŞI TUTUMLARININ DEĞERLENDİRİLMESİ

TARSUS BAŞ, Meltem
Yüksek Lisans, İlköretim Fen ve Matematik Alanları Eğitimi Bölümü
Tez Yöneticisi : Prof. Dr. Hamide ERTEPINAR
Ortak Tez Yöneticisi: Yrd. Doç. Dr. Gaye TUNCER

Şubat, 2010, 90 sayfa

Bu çalışma ilköğretim öğrencilerinin çevreye karşı tutumlarını, çevre problemlerine karşı farkındalık, bireysel sorumluluklara karşı farkındalık, çözümlere karşı genel farkındalık, ulusal çevre problemlerine karşı farkındalık olmak üzere dört değişkene bağlı olarak cinsiyet, sınıf, ebeveynlerin meslekleri ve ebeveynlerin eğitim seviyesine göre araştırılmasını amaçlamaktadır.

Veriler, çevre tutum ölçeğinin 2009- 2010 dönemi boyunca uygulanması ile elde edilmiştir. Çalışmanın örneklemi Bodrum'da 7 devlet okulunda öğrenim görmekte olan 817 öğrenciden oluşmaktadır. Elde edilen verilerin analizi frekans dağılımları, tek yönlü ANOVA, bağımsız örneklem t- testi ve Pearson momentler çarpım korelasyonu ile yapılmıştır. Sonuçlar sınıf düzeyinin, cinsiyet farklılığının, anne ve babanın eğitim seviyesinin öğrencilerin tutumları üzerinde istatistiksel olarak önemli olduğunu ortaya koymuştur. Ayrıca, öğrencilerin yanıtlarının frekans dağılımı, öğrencilerin genel, ulusal çevre problemleri ve çevreye karşı bireysel sorumluluklarının farkında olduklarını göstermiştir fakat öğrencilerin endüstrileşmenin çevreye etkileri konusunda kararsız kaldığı, bilim ve teknolojinin

çevre problemlerine çözüm getirmesi konusundaki rolünün ise farkında olmadıkları saptanmıştır.

Diğer önemli bir sonuç ise Bodrum' daki öğrencilerin örneğin deniz kirliliğinin sebepleri gibi bölgesel çevre problemleri hakkında bilinçli olmadıklarını ortaya çıkarmıştır. Sonuç olarak, çevre eğitimi girişimleri ulusal ve küresel konuların yanısıra, yerel koşullara uygun bir şekilde devam etmeli, müfredat, öğrencileri yaşam tarzları ve çevre problemleri arasındaki ilişkiyi kurmaları için yönlendirmelidir.

Anahtar Kelimeler: çevre eğitimi, çevreye karşı tutum, sürdürülebilirlik

To Halil BAŞ

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SYMBOLS

EAQ: Environmental Attitude Questionnaire

AEP: Awareness of Environmental problems

GAS: General Attitude Towards Solutions

AIR: Awareness of Individual Responsibility

ANEP: Awareness of National Environmental Problems

UNESCO: United Nations Educational, Scientific, Cultural Organization

UNEP: United Nations Environment Programme

ANOVA: Analysis of Variance

Df: Degree of Freedom

N: Sample Size

M: Mean

CHAPTER 1

INTRODUCTION

"In this epoch of history, there is one danger that stands out as the most urgent and serious threat to the future of humanity- the threat of ecological disaster" (Oskamp 1995, p.217). In his above sentence, Oskamp (1995) used the term 'ecological disaster' to define conditions of environment and he defined this situation as catastrophe, also emphasizing the prominence of situation and the necessity to do our best to prevent the disaster.

Environmental problems are begun to be stated as one of the major social issues today, as reported by Zeleny and Schultz (2000, p.365), "Of *all the social issues that face us in this millennium, the most daunting are environmental problem"*, although they were sexual harassment, national and international group conflict, tobacco policy, health issues etc. until recently.

In 1970s, when environmental problems began to reach prominent position, most important issues were air and water pollution, loss of aesthetic values and energy conservation. Recent years, although, the pollution is maintaining the importance, environmental problems are not localized, they tend to be more complex, uncertain, doubtful in origin and scattered all over the world like ozone depletion, climate change problems. Their effects are at the global level and their solutions are complicated (Dunlap et al, 2000).

Environmental degradation impacts large population and wide groups, it has not any borders. Air pollution, marine pollution, soil erosion, desertification, deforestation are most important environmental problems at international level. National borders cannot limit the scattering of environmental problems to different natures (Connect, 1992). Global changes cannot be predictable, anticipating and also, it may be not possible to prevent them if they get started (Stern, 2000). It is

obvious that problematic nature of these problems is required to high level of public awareness and understanding. According to Zeleny and Schultz (2000) individual responsibility and behavior change needed to solve environmental crisis. To achieve this requirement, individual change policy or program is required.

Oskamp(1995) put the population growth in the center of the environmental problems and he added that sharp population increase is responsible for ecological disasters. Based on the resources of energy and land usage, Pimentel (1994) estimated that earth can possible to sustain 3 billion humans, nearly half of the present population. Nearly one or two billion humans live in "relative prosperity". They are living in poverty, malnourished, diseased, expecting short life span. The world population is now 5.6 billion and expanding at a rate 1.7%. Also, each day quarter million humans are participated to this number. It means that in 41 years world population will be doubled. In the year 2025, population is expected to reach 15 billion.

According to Gough (2002), scientists in 1960s expressed the concerns about the environmental degradation and the decreasing quality of life. This was the cause of environmental education as a formal education movement. Environmental education defined as a process aimed to supply required knowledge, skills, experiences and consciousness to community towards the environment and resolution to solve environmental problems individually or collectively (UNESCO-UNEP, 1987). Environmental education should promote the sensitivity to environment, awareness and responsibility to solve environmental problems (Jeronen, 2002). Environmental education should investigate to find a way for encouraging people to comprehend and to take action for environmental issues (Stables &Bishop, 2001).

Education is humanity's best hope and the most effective mean to reach sustainable development. Basic education which includes pre-school and primary school should provide a basis for lifelong learning and also it should provide a basis for sustainable development (UNESCO, 1997b). The crucial goal is sustainable

society and the term sustainability which may be defined differently. United Nations' World Commission on Environment and Development defined sustainability as "meeting the needs of the present without compromising the ability of future generations to meet their own needs". Other definition is that sustainability is equity between present and the future and equity between countries, races, classes, ages, continents. It is also, defined as a dynamic balance between factors including social, cultural, economic needs of humanity and the necessity to save natural environment. (UNESCO, 1997)

Bodrum has natural resources, beauties and history places that deserve to be protected. To protect and conserve these values for the next generations, especially young people in Bodrum need to learn sustainable ways of living. Thus, environmental education is the way to achieve this requirement.

1.1 Purpose of the Study

The main purpose of this study is to investigate environmental attitude of 6^{th}, 7^{th} and 8^{th} grade students enrolled in public schools in Bodrum. Attitudes are going to be evaluated through four dimensions general awareness of environmental problems, general attitudes towards solutions, awareness of individual responsibility and attitude through changing lifestyles and awareness of national environmental problems is one of the purposes. In addition, the relationship between dimensions and effects of gender, grade level, parents' education level and occupation status on the students' attitudes will be determined.

1.2 Research Questions

1. What are the elementary school students ' attitudes towards environment according to; awareness of environmental problems, general attitudes toward solutions, awareness of individual responsibility, awareness of general environmental problems?

2. Is there a significant difference between students' environmental attitudes toward environment with respect to grade level, gender, social and economic status of the parents?
3. Is there a significant relationship between students' attitudes toward awareness of environmental problems, general attitudes toward solutions, awareness of individual responsibility, awareness of general environmental problems?

1.3 Significance of the Study

Environmental education should enterprise to generate awareness, teach knowledge, improve skills, habits, values, and provide standards and guidelines for problem-solving, decision-making. Environmental education is not only a transmission of knowledge also, it has affective and 'axiological matters'. Generating appropriate behavior is essential for environmental education to develop quality of environment. Designing research to question attitudes and values towards environment and related problems with different target populations is necessary. (UNESCO-UNEP, 1987).

It was seen as that it is a necessary to design studies to have clearer picture about the role of attitudes and values and their complex nature with different populations. Tuncer et al (2005a) indicated that in spite of great efforts on environmental education. It is still being its 'infancy'. In Turkey situation is at level of 'just beginning'.

The reason why this study was realized in Bodrum is that, Bodrum is a fast growing touristic town and is undergoing unplanned development. Therefore faces with environmental problems resulting from population growth in summer. People confronted with over consumption, waste production, high energy use, sea water pollution, soil, deforestation, noise pollution.

Kocasoy (1989) investigated sea pollution and the public health relation in Bodrum and Çeşme. It is discussed that one of the results of population increase

during summer such as waste water production leads to sea pollution due to insufficient infrastructure. Nowadays, the problems reached at their maximum stage in Bodrum. No preventive strategies are applied and there aren't any projects to protect environment. Therefore, especially young people living in Bodrum need environment education to be aware of the environmental problems to develop positive attitude, sensivity toward environment as stated in UNESCO (1987) reports. It is very important both for the students and individuals that live in Bodrum to be concerned environmental issues and to be knowledgeable about the environment for a sustainable future in Bodrum. As is declared in Tbilisi declaration (1977) carrying investigations about attitude and knowledge of individuals is necessary in order to find a strategy for effective environmental education.

CHAPTER 2

LITERATURE REVIEW

The purpose of this investigation is to assess environmental attitude of pupils in elementary degree. To present a clear picture about the attitude concept towards environment, relevant studies were carefully examined and presented in this section. It is desired to find ways to achieve more effective environmental education. For this reason, goals and principles of the environmental education, definitions, declarations and conference reports, studies about the environmental education, research related to attitudes of students and teachers both in international and national level were analyzed and presented in the following section with the order:

1.) Environmental Education
2.) Environmental Attitude
3.) Research Studies on Environmental Education and Environmental Attitude
4.) Research Studies on Environmental Education and Environmental Attitude in Turkey
5.) Factors Effecting Environmental Attitudes and Environmental Education

2.1 Environmental Education

Improvement and conservation of environment are major issues that influence people and economic development. This is a common desire of humans all over the world and it is a duty of government. "*to defend and improve the human environment for present and future generations has become an imperative goal for humankind"* (UNESCO, 1972). Preservation of environment, improvement quality of environment and quality of life on earth, prevention of world's environmental problems are at the center of the humanity demand. The danger is polluted environment and the need is sustainable economic and social development being harmony with environment. (Connect, 1992).

One of the pillars of sustainability together with legislation, economy and technology is appropriate education and public awareness. Since the frameworks of environmental education developed in Tbilisi, in Agenda 21 and UN conferences, environmental education is referred as education for sustainability (UNESCO, 1997a).

The role of education is defined as crucial for the environmental problems. Environmental education should be placed at all levels of education to provide required values, skills, knowledge's and it should be maintain the public participation to devise solutions of the environmental debate. The ultimate aim of environmental education is to help people for understanding complex nature of the environment and urgency to arrange activities and developments attending to being in harmony with nature (UNESCO, 1978).

Although there is a growing environmental awareness in recent years, during the past three decades, humanity cannot achieve a sustainable life because of overconsumption, energy- inefficient lifestyles, lack of recycling habits. The major reason for this may be the difficulty faced for transforming environmental values to behavior. Environmental education, especially for young is an important tool for achieving a sustainable society. (Youth Report, 2003).

The world's first intergovernmental conference on environmental education was organized by UNESCO in cooperation with UNEP in Tbilisi Georgia. Tbilisi conference established the nature, objectives and principles of environmental education. Also, guidelines were identified for action at national and international level. (UNESCO-UNEP, 1987).

The well known Tbilisi Declaration endorsed the following goals, objectives and guiding principles for environmental education:

The goals of the environmental education are:

- *To foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas;*

- *To provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment;*
- *To create new patterns of behavior of individuals, groups and society as a whole towards the environment;*

  The categories of environmental objectives;

  -Awareness: to help social groups and individuals acquire an awareness of and sensivity to the total environment and its allied problems.

  -Knowledge: to help social groups and individuals gain a variety of experience in, and acquire a basic understanding of, the environment and its associate problems.

  -Attitudes: to help social groups and individuals acquire a set of values and feelings of concern for the environment, and the motivation for actively participating in environmental improvement and protection.

  -Skills: to help social groups and individuals acquire the skills for identifying and solving environmental problems.

  -Participation: to provide social groups and individuals with an opportunity to be actively involved at all levels in working toward resolution of environmental problems. (UNESCO, 1978, p26-27)

There are different views about aims, principles of environmental education. Ballantyne (2001), for example, suggested that the students learning outcome can be increased if affective domain of learning like "enjoyment and emotion" is emphasized in environmental issues.

Palmer and Neal (1994), on the other hand, defined environmental education as

- Education about the environment aimed to develop required knowledge and understanding about values and attitudes

- Education for the environment elevates pupils' awareness about their individual responses and connection between the environment and environmental issues. This is linked to the attitude and value improvement containing necessary understanding and behavior for the development of sustainable environment.
- Education in or through the environment using environment as a source of learning which empower the development of knowledge and understanding and also, skills of research.

Gough (2002, *p.1201*) reported the aims of environmental education as follows:

- *A sense of individual responsibility for the physical and aesthetic quality of the total environment based on a knowledge of general ecological principals*
- *An understanding of the impact of the human society on the biosphere*
- *An awareness of the problems inherent in the environmental change*

2.2 Environmental Attitude

Environmental attitudes research started in 1970s and now it is clearly defined field. (Fernandez-Manzanal et al, 2007). During 1970s, the goals of environmental education changed to underline more clearly attitudes, values, and decision-making skills and action components (Gough, 2002). As stated by Mc Guire (1986), *"Attitude has been the dominant social psychology concept….exercising hegemony over the discipline's imagination for more accured time than any other concept" (*Mc Guire, 1986, *p. 89).*

Similar to the Guire's definition, there are others in the literature. Fernandez-Manzanal (2007), for example defined environmental attitude as follows: "*Environmental attitudes provide a good understanding of the set of beliefs, interests or rules that influence environmentalism or pro-environmental action"* (Fernandez-Manzanal et al, 2007, p.990).

Ajzen's (2001) opinion on attitude, on the other hand, is as follows: "*There is a general agreement that attitude represents a summary evaluation of psychological object captured in such attribute dimensions as good-bad, harmful-beneficial, pleasant-unpleasant, and likable-dislikable"* (Ajzen, 2001, p.28).

Realization of complexity nature of environmental problems such as being global, having uncertain origin, being scattered in all over the world and uncertain effects required high level of understanding and awareness of society. Therefore, researchers began to take the public opinion about the environmental problems into consideration. Moreover, special regard were given to 'newly emerging attitude objects' (Dunlap et al, 2000)

Environmental education is considered as a permanent process to gain awareness of environment and acquired skills, knowledge, values, experiences to solve environmental problems as individually or collectively (UNESCO-UNEP, 1987). Acting is a major goal of environmental education. Environmental education demand action for improvement in conditions of environment; 'ecosystem stability', 'biological diversity and 'abundance' (Short, 2010). The environmental problems are affected by social, economic, cultural factors; therefore they cannot be solved solely by technological ways. The values, attitudes and behaviors' of individuals and groups should be acted in respect to environment (UNESCO-UNEP, 1987).

There are lots of investigations to determine what motivates to people acting to protect environment or what encourage people to have environmentally responsible behavior. Hungerford and Volk (1990) stated that traditional thinking offers that changing individual behavior can be achieved by being more knowledgeable about the environment. Thus, individual become more conscious or individual gain favorable attitudes by the aid of increasing knowledge and this encourage individual to take action.

According to the literature, having more favorable attitude towards environment, attitude and behavior change relation, knowledge and attitudes

correlation is not simple or linear. Attitude concept and related factors are not clear, fully understood and it deserves to investigate its complicated construction.

2.3 Research Studies on Environmental Education and Environmental Attitude

Taylor et al (2007) made an investigation to find pupils' environmental knowledge and attitudes in Fiji. Conditions of Fiji are very similar to Bodrum. Economy of this place is highly depending on tourism and this situation resulted serious ecological problems as increased waste production and over usage of energy. Taylor et.al (2007) studied the level of awareness and understanding of environmental concepts amongst 268 Fiji pre-service teachers and compared with the Indian counterparts. Results showed that pre-service teachers have high level of awareness and majority of them thought that most important problem facing Fiji was environmental degradation. But, authors detected confusion about the hole in ozone layer and greenhouse effect. Also, pre-service teachers in Fiji were not very aware of their individual responsibilities and they did not see the linkage of their consumption pattern and environmental damage. When they were compared with Indian counterparts, general consensuses were found between these two cultural groups.

Worsley and Skrzypiec (1998) studied the environmental attitude of 958 senior students in South Australia. Authors developed a 40 item questionnaire of environmental concern (QEC) based on Herera's questionnaire of environmental beliefs. As a result, students in South Australia were found to be quite pessimistic about environmental issues. Besides, teenage women were found to have negative views about science and technology and no statistically significant sex difference was observed in students' component scores. Moreover, high percentage (75%) of pupils expressed significant concern about environmental issues. When their socio economic backgrounds were taken into consideration, on the other hand, it was seen that students with lower socio economic status tended to be more supportive of environmental exploitation and science solutions than others.

Fernandez- Manzanal et al (2007) designed and developed a new scale to assess learners' attitude towards environment. In the first phase new questionnaire

was validated with 329 university students and application took place in the second phase. Results of the study revealed that, university students' scores were very high and such scores indicated that environmental interest of students increase with education. Authors reported lowest scores for the aspect of intention to behave in sustainable way. Moreover, female students had higher scores than males and girls obtained higher scores in willingness to participate in pro-environmental actions. Besides, findings showed that final year students had more environmental concern compared to final year students.

There are a number of studies related to environmental knowledge and environmental attitude relationship in the literature. There is no reported in these studies. De Chano (2006), for example, attempted to investigate whether the basic assumption about relation between knowledge and attitude is true or false. He obtained data from the final year secondary school students from Chile, England, Switzerland and United States. The results revealed that, student had inadequate knowledge about the environment. Moreover, students from Switzerland and students from England had got the highest scores in the environmental knowledge section. Their knowledge scores were higher compared to those from the USA and Chile counterparts and the lowest scores were obtained by the students from Chile. Nevertheless, none of the groups of student demonstrated positive relation between the environmental knowledge and environmental attitude.

Similarly, Vlaardingerbroek et al (2007) conducted a comparative study to discover environmental knowledge and attitudes of students from Australian and Lebanon. The purpose of the study was to gauge the environmental attitude and environmental knowledge of pre-service Lebanese teachers using equivalent Australian cohort as a reference group. As the results indicated, both samples conflated about global warming and ozone layer depletion, fewer than half recognized biological magnification of toxins ascending food chains and Lebanese student teachers lagged significantly behind their Australian equivalents in terms of knowledge about the global environmental issues. Besides, Lebanese student teachers were seemed less likely to acknowledge the need for people to change their

lifestyles for the sake of the environment. As the authors reported, they thought that technology enable humankind to fix environmental problems. Therefore, it was recommended to develop the profile of the environmental education in Lebanon.

Another study related to knowledge and attitude towards environment was conducted with more than 9000 students from 206 secondary schools in Netherland. It was found as a result that, 57% of the students had an attitude toward environment ranging from positive to very positive, 42 % of students had neutral and only 1 % of them had negative attitude and 35 % of them were willing to make sacrifices. In addition, schools differed greatly in the average knowledge of environmental problems. As the authors reported, environmental knowledge of the students in Netherland was weakly developed in many of the aspects; especially energy usage, soil, air and water pollution, recycling and tourism. Besides, environmentally responsible behaviors of students were reported as inadequate. On the contrary to previous researches, Kuhlemeier et.al, 1999 stated that, knowledge, attitude and behavior relation were not substantial but attitude, willingness to make sacrifices and responsible behavior was found to have correlation in between.

Dimopoulos et al (2003) on the other hand, found a significant positive correlation between the environmental knowledge and environmental attitude. Their study aimed to measure knowledge and attitude towards several aspects including issue understanding and concern, locus of control and verbal commitment related with the sea turtle conservation in Zakynthos Greece. A 32-item instrument was applied to 332 5^{th} and 6^{th} grade students. As a result, no significant correlation was found between gender, fathers' occupation, geographic settings of the school and the four dimension of the subscale. Instead, knowledge, understanding or concern, locus of control dimensions were founded to be correlated significantly..

Another study realized by Makki & Abd-El-Khalick-Boujaoude (2003) aimed to assess secondary school students' environmental knowledge and attitudes in Lebanon. The authors examined the relation between participants' environmental knowledge and attitudes, biographical and academic variable and commitment to environmentally friendly behavior with 660 students from 10^{th} and 11^{th} grades. The

questionnaire used in the study assessed participant knowledge of environmental concepts in broad topics which were related to everyday lives. As a result mean scores of students' environmental knowledge was found as inadequate whereas participants' attitudes were favorable. In addition significant correlations were obtained between environmental knowledge and attitude including beliefs, affect, intentions and behavior. As reported by the authors, participants were willing to take necessary actions to protect environment.

In 1996, Zimmerman (1996) suggested do realize more research to determine how knowledge and attitude influence each other reciprocally. According to the author, positive attitude may encourage learning on environment and it may result with being more knowledgeable. And as reported by the author, some factors like ethnic difference, gender difference, knowledge and television may influence attitude and behavior relationship and it was also stated that television effect should not be ignored, because that ability of television to change attitude is obvious and it has defined long time ago.

Bradley et al (1999) assessed environmental attitude and knowledge relationship by means of conducting a 10-days course with 475 students from 9^{th} and 12^{th} grades. Results of the study showed that attitude and knowledge scores were changed in a favorable way. Besides, both pretest and posttest scores showed that students having higher knowledge scores showed favorable attitudes toward environment. The authors reported as a conclusion that, 10 days course was effective on the attitudes' of students who were enrolled to environmental science course. The researcher underlined that this study was important to encourage educators that attitude can be influenced by what is thought in classroom.

Mangas et al (1997) measured the effect of an elective course on biology students' attitudes and knowledge in University of Alicante. Results were obtained according to surveys applied on the first and the last days of the course. As a result, most important environmental problems were not seen in the pre-test but in the post-test it was seen that the students realized the important environmental problems.

Authors concluded as a result that, increase in the students' environmental knowledge results change in the students' attitudes in favorable way.

Oskamp (1994) evaluated recycling habits and its relevance to the knowledge on recycling. The study was comprised of an application of a mail survey related to attitude and knowledge about recycling. It was found as a result of answers obtained from 603 households that, recycling knowledge and attitudinal measures were seen as significant predictors of recycling.

2.4 Research Studies on Environmental Education and Environmental Attitude in Turkey

Research related to environmental education has been begun in the beginning of 21th century in Turkey. Tuncer et al (2004) studied the effects of living area and socioeconomic background on the pupils' environmental attitude. This study aimed to supply accurate picture of students' environmental attitudes with respect to selected variables. Frequency and one-way MANOVA used as statistical analysis. Data were obtained from 6^{th} graders in rural area and urban area schools. Clear distinctions were found between students from different areas. In rural areas, 9% of the fathers have university degree whereas in urban areas percentage was 41%. Most of the mothers in rural areas were unemployed and majority of them worked in governmental sector in urban areas. Some students' responses were similar in both areas. For example, they agreed that environmental pollution is not a temporary problem and society should encourage the natural conservation. Most of the differences were seen industrialization subject. In urban area, students thought that environment should not sacrifice to industrial development. In rural area students did not have any idea and they pointed mostly undecided response. İnvestigation pointed that students from urban area were more aware of socioeconomic aspects and industrialization effects. On the contrary, rests of them from rural area were unsure on these aspects. This indicated that a positive correlation between social status and environmental awareness.

Tuncer et al (2005b) performed a survey about the young people who has special responsibility with regard to environment. 1497 students from 6^{th}, 7^{th}, 8^{th} and 10^{th} grades participated this study from Ankara. 22 questions were selected from 45-item questionnaire developed by Worsley and Skrzpiec. The test had two dimension; general awareness on sustainability concept (GASC) and general attitude on the relation between concept and the life style (GALS). Frequency distribution and one-way MANOVA were applied as statistical techniques. For the first dimension, young people awareness toward general environmental problems and sustainability were found to be positive. In the second dimension, although young people agreed on the importance of individual responsibilities and its relation to over usage of resources and consumption, they confused to link these with every-day life style. Besides, gender differences were found. Girls showed more positive attitudes than boys which means that girls are more aware of sustainability. As a conclusion of the study, it was suggested that to gather well-equipped young people that is more active toward environmental concerns can be achieved by effective environmental education.

Alp et al (2006) aimed to examine the attitude and knowledge relation according to variables; grade level and gender. Besides, how environmentally responsible behavior is connected with knowledge, affects, behavioral intents and demographic variables. 1977 6^{th}, 8^{th}, 10^{th} grade students applied to Turkish version of Children's Environmental Attitudes and Knowledge Scale (CHEAKS). Findings pointed out that grade level have an impact on the attitudes. Data for all students in environmental knowledge showed that mean scores ranging from 47 to 61.9 increased across the level. Furthermore, gender differences were found only in attitude scores. Female has favorable attitudes than mans but, their knowledge scores were similar. Linear combination of four predictor; behavioral intentions, environmental affects, gender and age was significantly related to students' environmentally responsible behavior. Girls appeared to act more friendly toward the environment. Age was negatively related to the responsible behavior. The researcher underlined the relatively low mean scores on knowledge that can be

interpreted as an indication of inadequacies of implications of environmental issues in formal science curriculum.

Özden (2008) purposed to measure the student teachers' environmental attitudes, awareness and their relation to gender, academic major, grade level, region, family income, education and occupation of the parents in Adıyaman University. Likert-type questionnaire developed by the researcher was applied 830 pre-service teachers. Results of data showed that these variables had an impact on the attitudes. T-test results showed that female had higher scores on each scale than male students. Rich student teachers have more positive attitudes towards environmental issues than poor or the average ones. Student teachers having fathers graduated from university and high school had more positive attitudes than others. Fourth year students upon first year student, students in elementary teaching upon students in mathematic or social teaching, students living in big cities upon students living in cities and villages were found to have more positive environmental attitudes. Researcher concluded that the school curriculum needs to change and develop more environmental friendly attitudes and lessons about the environment should be increased. Different regional environmental education strategies need to be established.

Another investigation was made by Kasapoğlu (2008) to explore the relation between environmental attitude and behavior of 8^{th} grade students. The data obtained from socioeconomically different districts of Ankara. General attitudes of them were found positive towards the environment. They were aware of importance of energy saving and caring plants, animals. Also, they stated that they never scatter the rubbish. On the other hand, students know popular environmental issues but they do not have adequate knowledge about scientific and technological issues. Contingency coefficients used to detect correlation between students environmental attitudes and responsible behavior. The results showed that students' positive attitudes were not reflected as a behavior. The researcher revealed that knowledge and attitudes were not enough to behave responsibly.

Erdoğan et al (2009) discussed the evaluation of a course titled education and awareness for sustainability. Method was consisted of three parts; needs assessment (NA), formative evaluation (FE) and summative evaluation (SE). This course aimed to develop environmental awareness and environmental sensivity. Obvious from the results of the NA and SE, to make students feel comfortable and to develop sense of responsibility key point is integrating subject with real life. Visiting university recycling center and making stand in festival were students most popular activities. They became very sensitive about solid wastes and recycling. Also, according to reports of SE, students started to become aware and interested in news and discussions on media. Generally course positively affected individuals' thinking on the sustainable ways of living.

Tuncer et al (2007) made a comparative study on pre-service and elementary students' attitudes towards the environment. 1235 elementary students and 334 pre-service teachers from department of elementary education of METU were participated to study. As the answers of both group showed that they accepted environmental pollution is a serious problem and it will not diminished in the future. Both groups were unclear about the solutions; changing life styles, consumption patterns and individual responsibilities. The researcher implied that a high percentage of undecided responses especially in science and technology role mean lack of environmental knowledge. Reducing uncertainty of the subjects may solve the lack of believe to science and technology as environmental saviour. It was suggested interdisciplinary course to explain the relationship between the environment, education and development to promote sense of individuals' environmental care in their future.

2.5 Factors effecting environmental attitudes and environmental education

'Attitude strength' rather claims of the being 'unitary construct' were discovered as being related with some factors such as education, sex difference, race. (Ajzen, 2001). The investigations in this area showed that attitude may be affected by some variables. Zimmerman (1996) aimed to construct a scale to assess environmental values of adults and children He used pastoralism, urbanism and

environmental adaptation as the subscales from the Children's Environmental Response Inventory (CERI). The CERI, on the other hand, was developed to focus on values related conservation, pollution and urban natural environments. Zimmerman (1996) applied the form to 79 undergraduates from psychology courses at the University of New Mexico. Although he found no gender differences on pastoralism and urbanism scale, men presented agreement on the beliefs that humans have the right to dominate nature. As a result the author concluded that, males had more negative environmental attitudes compared to females and ethnic differences were observed in relation to environmental attitudes and values; Hispanic women for example were reported as less positive toward environment than other ethnic group.

Skelly et al (2007) searched impacts of school gardens on students' attitudes and responsibility toward environment. The authors classified school garden types as flower, vegetable etc. As a result, 427 3rd grade students' participation to garden-related activities were determined as low, medium and high in each school and it was found that, students' responsibility scores were very high regardless of the garden-types and environmental attitude scores were high and no significant differences were found relative to typology and garden types.

In their study, Ma et al (1999) identified the relation between attitude towards science and attitude towards environment. The study was conducted with 1011 students from British Columbia and 3 domains of knowledge were measured; interest, utility and importance. There are 2 domains assigned for the attitude towards environment as natural resources and environmental protection. Ma et.al found statistically significant connections were found and findings implied that students who had favorable attitude towards environment also showed favorable attitudes toward science and the authors concluded that students had conflicting beliefs about science and environment.

Ewert & Baker (2001) investigated a relation between attitudes and beliefs about environment among different academic majors and the impacts of sex, age and place of residence. The authors applied New Environment Paradigm (NEP) in the

University of Northern, Columbia. Results showed that, females regardless of major and older students displayed higher in pro-environmental scores and forestry and business administration students got lower scores compared to their counterparts from other majors.

Knapp (2000), on the other hand, claimed that achieving desirable environmental behavior was not an easy process. The author offered distinct environmental education course and defined in-service and pre-service training as crucial to obtain teacher effectiveness.

Michail et.al (2007) conducted a research on the Greek primary school teachers' understanding of three current environmental issues; acid rain, ozone layer depletion and greenhouse effect. The authors used both quantitative and qualitative approaches using questionnaire and interviews were involved. Majority of the 155 primary teachers of the study showed enhanced interest in environmental issues, but many of them were found to have misconceptions about ozone layer depletion and greenhouse effects.

Lane (1994) assessed teacher competencies and attitudes with 1545 elementary and secondary education teachers. He found as a result that, teachers' overall attitudes toward environmental education were positive but 30% of them indicated that they do not teach environmental concepts.

Similar investigation was realized by Smith (1997) by means of assessing Illinois school teacher's attitudes and portion of infusion of environmental concepts into their teaching and the results were compared with the Wisconsin study inference. It was found as result that, overall attitudes of the teachers were positive towards environment, but 68 % of the respondents reported that they were not currently infusing environmental concepts into teaching. The reasons for not infusing the subjects of environment into teaching were the same as Wisconsin study; there were some barriers and obstacles reported in both states such as; inadequate resources, preparation time, knowledge and class time.

CHAPTER 3

METHOD

This study was designed through the environmental attitude Questionnaire (EAQ) to assess students' attitudes toward environments according to four dimensions; awareness of environmental problems (AEP), general awareness of solutions (GAS), awareness of individual responsibility (AIR) and awareness of national environmental problems (ANEP). Study was aimed to provide a better understanding of students' attitude so that it can supply important information for planning environmental education strategies for Turkey. This chapter involves information about population, description of the variables, instruments, procedure and statistical techniques to analyze data, instrument and assumptions.

3.1 Population and sample

The target population of this study was primary school students (6^{th}, 7^{th}, and 8^{th} grades) studying in public schools in Bodrum. Convenience sampling method integrated with purposive sampling was followed to obtain representative sample of populations. The participants enrolled in 7 public schools one from center and others from villages of Bodrum to ensure regional representation. The sample population consisted of 292 6^{th} graders, 294 7^{th} graders and 231 8^{th} graders. The mean age of the participants were 13.02 and ages ranged from 11 to 16. There were 25 primary schools in Bodrum with a total of 14163 students and the total numbers of 6th, 7th and 8th grade students were 4881. The accessible population for the study was calculated to be 5.8 %; the number of students completed questionnaires (817) divided by the total number of students enrolled in public schools at the time (14163). The number of students completed questionnaire were 817 (n= 442 girls, n= 361 boys and n= 14 gender not provided). Percentages of the girls were 54.8 % and percentages of the boys were 45.2.The percentages of mothers graduated from

primary school was 49.7, those graduated from secondary school, high school and university were 14.0 %, 25.5% and 10.8 % respectively. Students' father graduated from primary school was 37.2 % and those graduated from secondary school, high school and university were 23.2 %, 24.3 % and 15.3 % respectively. Mothers occupied in public institution and private sectors were 6.4 % and 17.3 %, respectively. Percentage of mothers who have business for own account was 12.1 and that of not working was 64.1. Percentage of occupation of fathers working in public institutions, on the other hand, was 15.9, and that of occupied in private sector was 40.3. The percentage of fathers who have business for own account was 39 and the percentage for those who are not working were 4.8. Information on the demographic characteristics of the sample and schools has been shown in Table 1.

Table 1: Information about the participants of this study

Variables	**Gender**		**Total**	**Percentage**
Places	**Female**	**Male**		
Merkez	66	61	127	15.5 %
Bitez	149	130	279	34.4 %
Gündoğan	80	53	133	16.4 %
Yalıkavak	96	69	165	20.3 %
Pınarlıbelen	39	34	73	9.1 %
Yalıçiftlik	11	15	26	3.3 %
Gökçebel	3	4	7	0.9 %
Grade				
6	158	131	289	35.7 %
7	159	133	292	36.0 %
8	127	102	229	28.3 %

3.2 Variables

In this study variables are labeled as independent and dependent variables.

3.2.1 Independent variables

There are four independent variables in this study. Students' parents educational background, their employment, students' gender and grade level were set up as the independent variables

3.2.2 Dependent variables

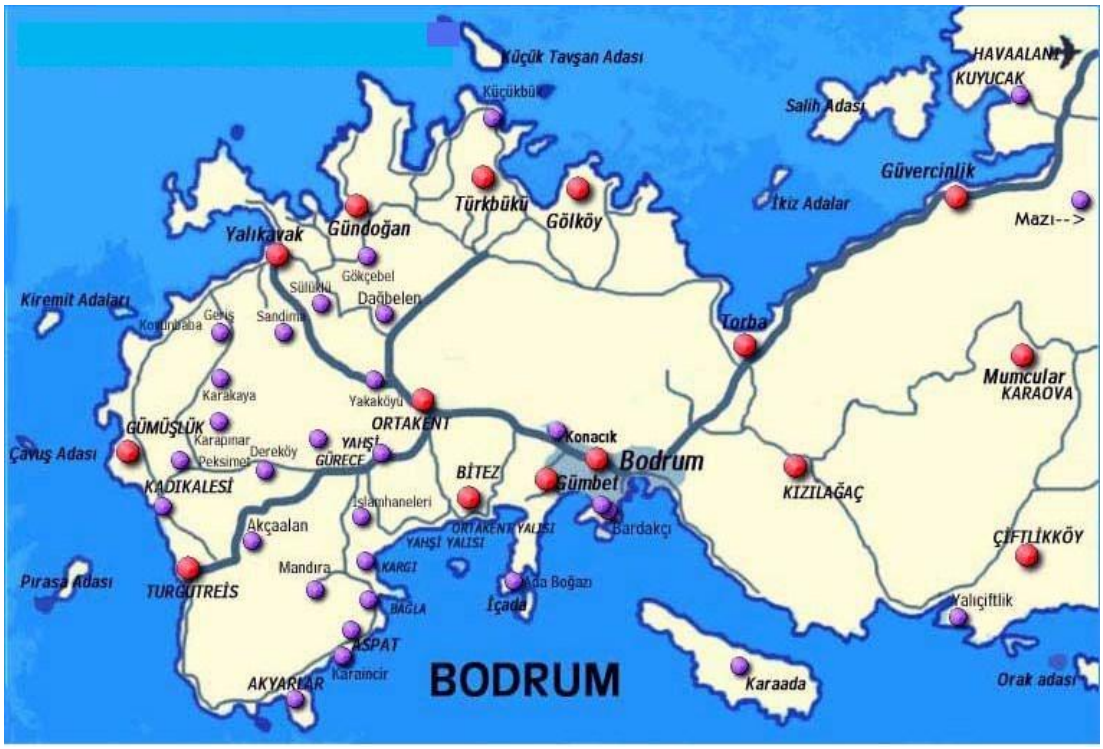
This study includes one dependent variable; students' attitude towards environment. Four dimensions of environmental attitudes were measured to investigate effect of independent variables. Environmental attitude questionnaire was used to obtain pupils' environmental attitude scores.

3.3 Procedure

In this research study, the effect of gender, grade level, student parents social and economic status on students' environmental attitudes according to four dimensions, AEP, GAS, AIR, ANEP were examined. Moreover, relationships between the dimensions of the EAQ were investigated. Thus, the design of the study was both cross-sectional survey and correlational study. Firstly, this study began with literature review concerning environmental attitude. Ebscohost, Science Direct, Kluweronline Databases, Google Scholar, thesis and other studies done in Turkey were searched by the help of keyword. After selection of the appropriate instrument measuring environmental attitude of students, participant schools and subjects of the study were determined. Seven public primary school students involved in the study and after receiving permission from the ministry of education the application was realized in 2008-2009 academic year. The research was conducted in different places of Bodrum. One public school selected in the center and the rest of were selected among villages of Bodrum, such as Bitez, Gündoğan, Kızılağaç,

Pınarlıbelen (village in Mumcular), Yalıkavak, Gökçebel (village in Yalıkavak) (Figure 1). The students completed the instrument in their classrooms. Participation was voluntary and students' responses were considered confidential. Students were informed about the research and provided with an explanation of the instrument. Teachers generally were not present in the classroom during the completion of the instrument. The average time to complete instrument was 30-40 minutes.

Figure 1: Map of the Bodrum



(Source: Retrieved January 12, 2010, from
www.discoverbodrum.com/images/bodrum_yarimada.jpg)

3.4 Statistical techniques

Research questions were investigated through different statistical techniques. Descriptive statistics, frequency distributions, were used for the first question which is intended to discover students' environmental attitude according to four dimensions of the questionnaire.

Independent t-test was used to investigate the impacts of gender, grade level, parents' occupation and parent's education on students' attitude towards environment by taking "gender" as categorical independent variable and "environmental attitude" as continuous dependent variable. In addition, inferential statistics, one way ANOVA, post hoch multi comparison test was applied to measure the relation between students' environmental attitude and grade level, education level of parents and occupation of parents.

The last question, which is devoted to assess relationship between the four dimensions, was investigated through Pearson product- moment correlation (zero order).

3.5 Instrument

A 45 item Environmental Attitude Questionnaire (EAQ) was applied to measure for components of environmental attitudes. For the questionnaire section concerning respondents' environmental attitudes, students' answer on a 5-point-Likert-type scale from " I strongly agree" to " I strongly disagree" including " I don't know". For the positive statements representing positive attitudes toward the environment, 5 points were assigned to " strongly agree", 4 to " agree", 3 to "undecided", 2 to " disagree", 1 to " strongly disagree" and zero to " I don't know". Score was reversed for the negative statements, The EAQ which was originally developed by Herera's (1992) and it was adopted by Worsley and Skrzypiec (1998). During the preparation, items about the general environmental issues such as overpopulation, ozone layer were kept and items concerning sustainable use of natural resources, changing lifestyles and national environmental issues were added. It was translated into Turkish. Validity of Turkish version of the questionnaire was established through review by three experts in the field of science education. Internal consistency of questionnaire was found to be .87 using Cronbach alpha (Tuncer & Ertepınar & Tekkaya & Sungur, 2005a).

Dimension of EAQ are;

- Dimension 1: General awareness of environmental problems – AEP

  Target: Students' awareness of environmental problems

  Related items: 1, 3, 5, 6, 9, 27, 28, 33, 35, 36, 37, 39

- Dimension 2: General attitude towards solutions-GAS

  Target: Students’ opinions on the solutions

  Related items: 2, 7, 8, 11, 12, 13, 16, 17, 18, 21, 22, 34, 38, 40, 43

- Dimension 3: Awareness of individual responsibility and attitude through changing lifestyles-AIR

  Target: Students’ awareness of their responsibilities for the solutions and their awareness of the relation between lifestyles and environmental problems

  Related item: 10, 13, 14, 15, 19, 14, 25, 30, 31, 32, 44, 45

- Dimension 4: Awareness of national environmental problems-ANEP

  Target: Students' awareness of national environmental problem

  Related items: 4, 20, 23, 26, 29, 42

Sample items of the dimensions of EAQ are given in Table 2.

Table 2: Sample items of the dimensions of the environmental attitude questionnaire

Dimensions	Sample items
Dimension 1: AEP	*Environmental pollution is not at the dangerous level all over the world* *Environmental pollution is a temporary problem* *Humanity is abusing the environmental* *Over next ten years environmental problems will diminish*
Dimension 2:GAS	*Environmental problems have always existed and been solved, so there is no need to worry about the nature* *Society should encourage the natural conservation activities* *The ultimate solution for environmental problems depends on drastic changes in our lifestyles*
Dimension 3:AIR	*If we do not change the current consumption patterns, land degradation and topsoil loses will increase to the point where they can no longer support crops.* *We can accept to change our lifestyles to protect natural resources* *Environmental protection is a governmental responsibility*
Dimension 4:ANEP	*Turkey is rich in natural resources; therefore it is not possible to use them up* *Turkey needs to be industrialized; therefore environmental destruction due to industrialization can be discarded* *There is no environmental pollution problem in Turkey*

3.6 Assumptions

1) Sample and conditions of classrooms which the study took place were considered to be equal
2) The students responses to the items of the EAQ instrument were regarded intimately
3) The environmental education backgrounds of students were equal.

CHAPTER 4

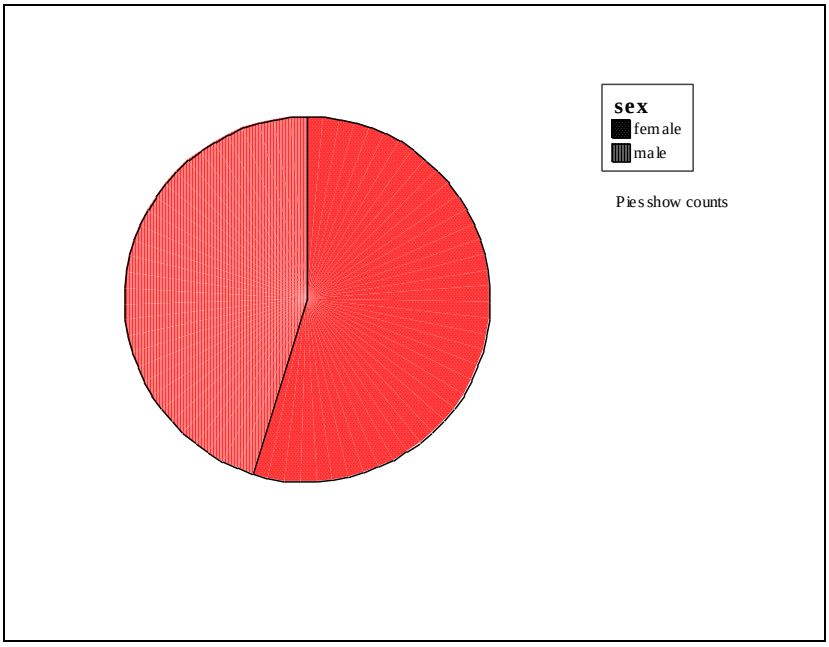
RESULTS

Results of the study are presented in this section by 4 parts as, Sample Characteristics, Descriptive Statistics, Inferential Statistics and Summary of Results.

4.1 Sample Characteristics

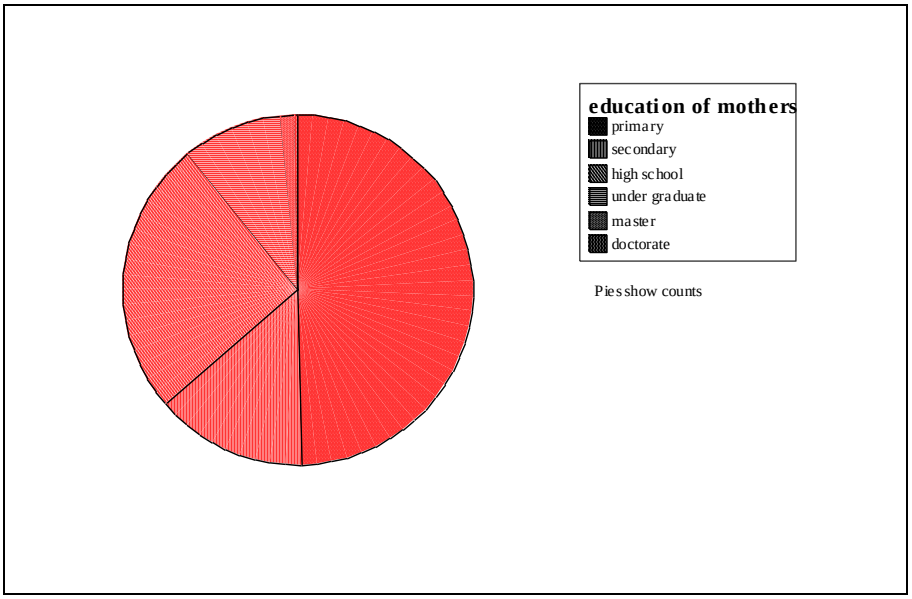
In this part, percentages of participants' gender, parents' education level and parents' occupation are exhibited. Participants' sample characteristics are shown from figure 2 to figure 6.

Figure 2: Gender distribution of the students (%)



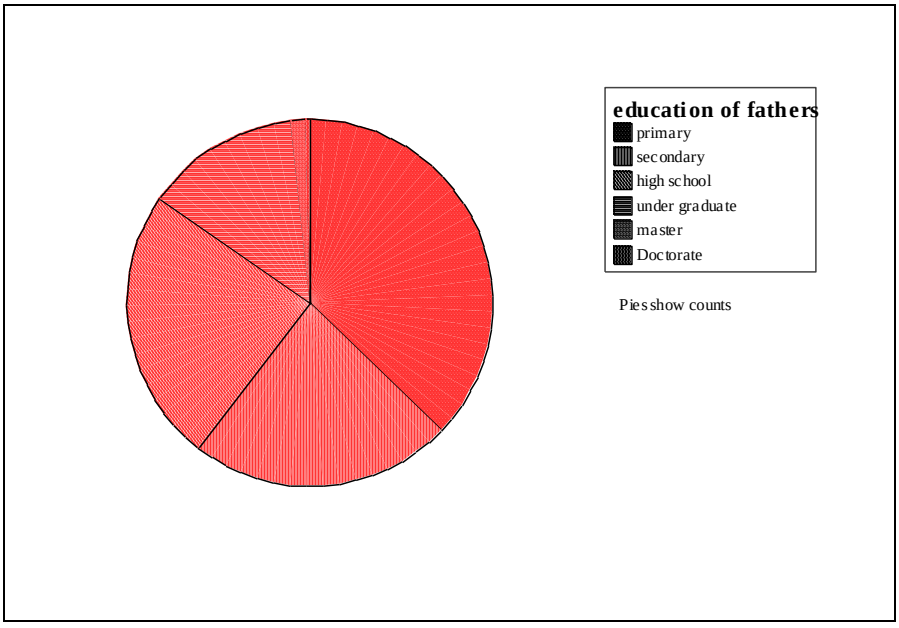
The number of students completed questionnaire were 817 (n= 442 girls, n= 361 boys and n= 14 gender not provided). Percentages of the girls and boys are 54.8 and 45.2.

Figure 3: Distribution of student mothers' education level (%)



Students' mothers' education level distribution is as follows; graduated from primary school 49.7 %, graduated from secondary school 14.0 %, graduated from high school 25.5%, graduated from university 10.8 %.

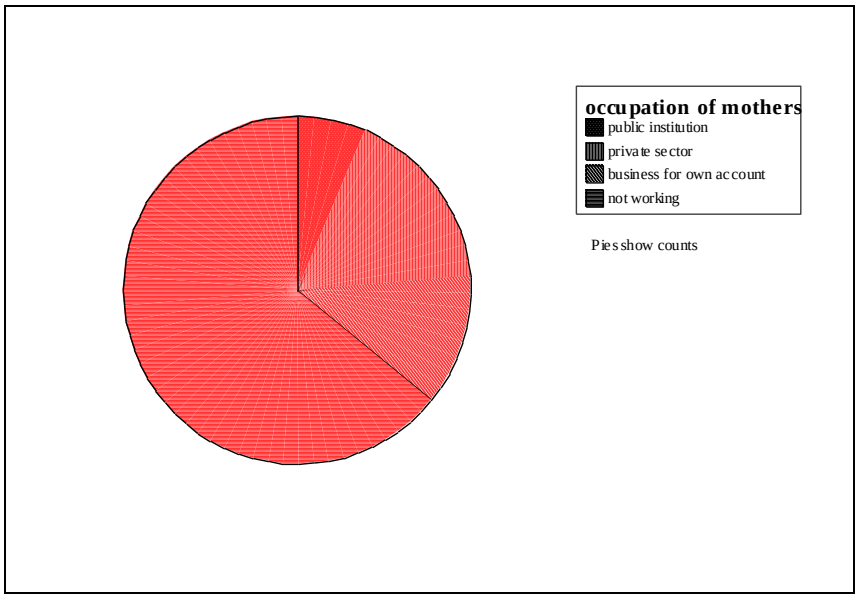
Figure 4: Distribution of student fathers' education level (%).



Students' fathers' education level distribution is as follows; fathers graduated from primary school 37.2 %, fathers graduated from secondary school 23.2 %,

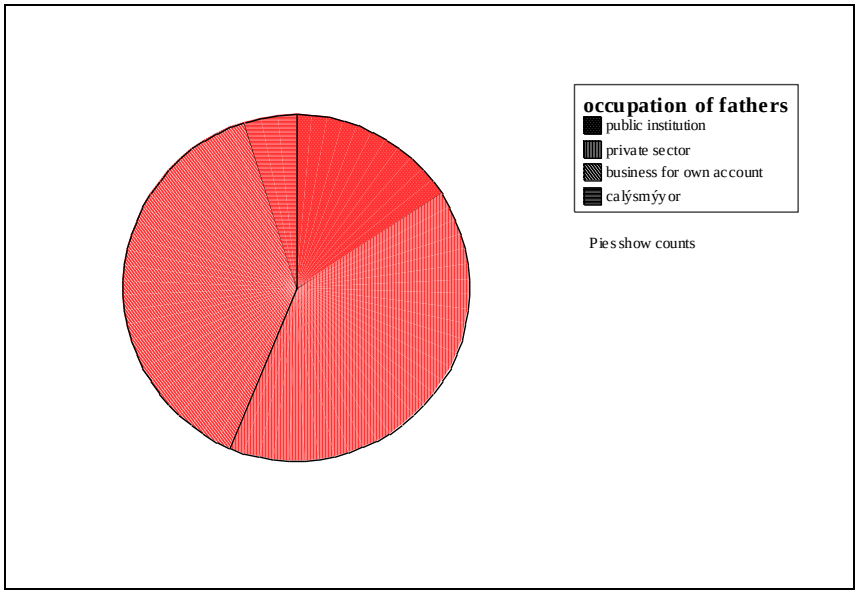
fathers graduated from high school 24.3 %, fathers graduated from university 15.3 %.

Figure 5: Distribution of student mothers' occupation (%).



Students' mothers' occupation are as follows; occupied in public institution 6.4 %, private sector 17.3 %, business for own account 12.1 %, not occupied 64.1%.

Figure 6: Distribution of student fathers' occupation (%)



Students whose fathers working in public institutions were 15.9 %, in private sector 40.3 %, for own account 39 %. Percentages of the not working were 4.8 %.

4.2 Descriptive Statistics

In this section the participants' attitudes toward environment regarding four dimensions of the questionnaire are presented. Results of the descriptive statistics with respect to the four dimensions of the environmental attitude questionnaire are summarized in Table 3.

Table 3: Means and standard deviations of the four dimensions of the questionnaire

	M	SD
AEP	31.33	6.11
GAS	44.09	8.13
AIR	38.81	8.27
ANEP	16.63	3.41

Table 4 shows percentages of student responses with respect to first dimension of the environmental attitude questionnaire.

Table 4: Percentage and frequency distribution of first dimension (AEP)

ITEM NO	Statement	Strongly Agree (%)	Agree (%)	Undecided (%)	Disagree (%)	Strongly Disagree (%)	I don't know (%)
1	*Environmental pollution is not at the dangerous level all over the world*	6.0	8.1	7.7	21.5	55.7	1
3	*Environmental pollution is a temporary problem*	7.0	8.8	15.5	23.1	44.5	4
5	*Industrialized societies give most people who live in them a high standard of living.*	11.4	22.4	28.4	10.3	7,3	19.7

Table 4 (cont'd)

6	*Mankind is very adaptive so there is no need to be concerned about his survival in a polluted environment.*	4.5	5.6	12.7	21.1	50.2	5.9
9	*We are overloading the Earth's natural ability to support life on earth*	11.1	12.5	31.0	12.1	10.3	23.0
27	*Erosion and desertification are a kind of environmental problems*	51.9	25.9	10.4	3.8	4.3	3.7
28	*Humanity is abusing the environment*	34.4	26.3	13.7	8.8	8.9	7.8
33	*Extinction of dinosaurs caused because of natural reasons but decreasing numbers of sea turtle reason is humans*	34.1	21.2	15.8	7.5	8.2	13.2
35	*Environmental pollution has harmful effects on human health.*	54.8	18.2	8.6	4.9	10.0	3.4
36	*Sea pollution is a natural event as cannot swim in it*	13.7	8.1	11.5	14.0	46.4	6.4
37	*The natural sources of energy, such as sun, wind and water, can never be exhausted, so energy will never be scarce on earth.*	6.7	8.9	18.7	16.6	37.7	11.3
39	*Over the next ten years environmental problems will diminish.*	7.2	7.8	17.5	20.8	34.3	12.4

An examination of the frequency distributions exposed that the high percentages of students agreed with statements about the conservation of resources for the future, necessity of living with nature in harmony, aware of the erosion and desertification as environmental problems. 77.8 % of the students were aware the

erosion and desertification problems (item 27). They also did not think that pollution is not at the dangerous level all over the world (item 1). Solely, 14 % percent were optimistic on this belief. In addition, their awareness on the harmful effects of environmental pollution on the human health were high, 73 percentages of them attended this idea (item 35). Parallel with this, they did not agree with the item about human adaptation to polluted environment (item 6). 10 % of them were hopeful that we can adapt the contaminated environment. Furthermore, majority of them did not participated the notion about environmental problems are temporary problems (item3). Closely, 55 % of them did not think these problems will end in several years (item 39).

Almost 61 % of them agreed with the abusage of environment by humanity (item 28). Unexpected result was obtained for the item 36 that states sea pollution as a natural event. 22 % of them thought it is a natural event and 11, 5 % of them undecided on this idea. Moreover, almost 54 % of them thoughtful in the energy problem, in other words, they did not join the idea that energy will never be scarce on earth because of renewable resources such as sun, wind and water (item item37). Optimistic students' percentages on this energy concept were nearly 16 %. Almost 29 % of the students were highly undecided on benefits of the industrialization (item5).

For the first dimension, target was to determine students' awareness toward general environmental problems. Related items included the issues like the erosion, desertification, pollution, energy sources. It was seen that they were aware of the impacts of environmental pollution (Item no: 1, 3, 6, 35, and 36), general environmental problems (item no: 27, 39, 37), human impact on the environmental problems. However, their responses to item 5 which are about industrialization were undecided mostly. Reflecting that, although, they are aware of the environmental problems and the relation between human and environment in general, they have problems in evaluating the reasons of the problems.

Second dimensions' aim was to determine the students' opinion on solutions of environmental problems. The statements were related to economic growth, utility of science and technology as a means of solution for environmental problems and sustainability. The table 5 shows percentages of student responses with respect to second dimension of the environmental attitude questionnaire.

Table 5: Percentage and frequency distribution of second dimension (GAS)

Item No	**Statement**	**Strongly Agree (%)**	**Agree (%)**	**Undecided (%)**	**Disagree(%)**	**Strongly Disagree (%)**	**I don't know (%)**
2	*Humanity should live in harmony with nature*	56.5	25.3	7.1	5.3	4.0	1.7
7	*The ultimate solution for environmental problems depends on drastic changes in our life-style*	29.1	31.3	17.0	8.2	6.0	8.3
8	*Protection of the environment is more important than economic growth*	34.1	19.6	21.9	7.0	8.2	9.2
11	*The benefit of technology greater than its harmful effects.*	16.0	18.4	29.1	16.6	12.0	7.8
12	*It is increasingly likely that a nuclear accident will contaminate the environment.*	36.7	24.4	12.7	8.6	9.1	8.6
13	*The world authorities will find always to decrease population growth, so over-population will not be problem in the future.*	6.7	10.2	26.4	16.8	20.7	19.2
16	*Environmental problems have always existed & solved, so there is no need to worry about the future.*	4.8	5.8	14.8	21.3	46.3	7.1
17	*Science and technology are advancing so rapidly that it will be always in control of any environmental problems that arise.*	14.0	20.8	25.1	17.6	10.0	12.4

Table 5 (cont'd)

18	*Exhaust gases produced by automobiles causes climate changes*	35.4	23.3	13.3	9.1	8.1	10.9
21	*Just as science and technology monitor environmental problems, they also solve them, so such issues will not the points of concern in the future.*	6.9	9.9	22.0	20.4	27.9	12.9
22	*Storing nuclear waste is too dangerous*	37.2	17.9	14.0	5.8	8.4	16.8
34	*Environmental pollution is not related with population growth*	7.5	7.0	12.5	16.0	50.2	6.7
38	*In dealing with any kind of problem we need to first consider how it will affect the environment.*	35.0	28.5	15.5	6.4	5.9	8.7
40	*Society should encourage the conservation of nature.*	38.6	21.1	17.7	7.5	6.2	8.9
43	*The sustainable use of the natural resources means the continuous use of them.*	14.1	18.7	25.9	13.0	10.2	18.1

An examination of the percentages of student responses, it was found that approximately 81.8 % of the students believed necessity of living in harmony with the nature (Item2). Besides, Almost 68 % of them worried about the future because of the environmental problems (item16). Only 10 % of them believed that these problems will be solved so, we do not need to concern about them. 66.2 % of them disagreed with conception about lack of relation between the environmental pollution and population growth (Item 34). The percentage of students who agreed with the idea that we need to consider effects to environment before dealing with any kind of problem was approximately 63 (item38). The percent of students who believed to increase in risk of nuclear plant accident were 61 (item12). Similarly, 55 % of them thought that storing the nuclear wastes is a dangerous process (item22). Also, they knew that they needed to change their life styles for solving the

environmental problems (item7). Meanwhile, almost 60 % of them supported the notion "society should encourage the conservation of nature" (item40).

Although, 55 % of them agreed that conservation of nature has a greater importance than economic development, almost 22% of them were undecided on this (item8). However, the percentages of undecided and I do not know responses were high. Undecided responses greater than 20 % were obtained for the items 11, 13, 43, 17, 18. Therefore, it may be stated that, although the participants are aware that we have environmental problems and such problems are of important concern since they cause natural destruction and impact human health, they do not know or undecided about the solutions of the environmental problems.

The purpose of third dimension was to decide their awareness on individual responsibilities for the solutions of environmental problems and the relation between life style and environmental problems. The table 6 shows percentages of student responses with respect to third dimension of the environmental attitude questionnaire.

Table 6: Percentage and frequency distribution of third dimension (AIR)

ITEM NO	**Statement**	**Strongly Agree (%)**	**Agree (%)**	**Undecided (%)**	**Disagree (%)**	**Strongly Disagree (%)**	**I Don't know (%)**
10	*Environmental protection is a governmental responsibility*	9.9	10.5	9.7	22.9	43.3	3.7
13	*The world authorities will find always to decrease population growth, so over-population will not be problem in the future.*	6.7	10.2	26.4	16.8	20.7	19.2
14	*We must conserve our resources for future generations.*	64.3	16.3	7.1	2.7	7.7	2.0

Table 6 (cont'd)

15	*Fast food consumption is harmful for both ours and nature's health*	40.6	21.4	13.0	8.2	11.0	5.8
19	*If we do not change the current consumption patterns, land degradation and topsoil losses will increase to the point where they can no longer support crops.*	33.8	21.2	18.6	7.8	7.1	11.5
24	*Individual responsibilities are very important in protecting the environmental pollution.*	59.7	17.9	6.6	3.9	7.5	4.4
25	*The hole in the ozone layer will never stop growing if we continue to operate as we do now.*	51.4	20.7	9.4	3.7	6.5	8.3
30	*We can accept to change our life styles to protect natural resources.*	26.2	22.6	19.2	7.2	11.3	13.5
31	*Spending long times in shopping centers is a type of life style that has negative effects on both consumption patterns and the exploitation of the natural resources.*	17.7	17.3	25.7	12.4	11.3	15.7
32	*We should exploit current resources for the benefit of our own generation*	22.8	19.6	16.9	15.7	19.3	5.8
44	*Economical use of water and energy is important for the sustainable use of the natural resources*	49.0	22.2	11.3	5.3	5.4	7.0
45	*Everybody has a part in environmental degradation but it changes according to the individual consumption patterns.*	28.8	24.1	18.5	6.0	6.4	16.3

It was found as a result of examining the percentages of student responses, that, 80.6 % of students agreed with the item 14 which is about the necessity of conservation of natural resources for the future generations. Moreover, high percentages of students were conscious about the personal commitments. For example, 77.6 % of the students agreed the statement that individual responsibilities are important to prevent the environmental pollution (item24). In addition, students' agreement on the statement 'the hole in ozone layer will never stop growing if we continue to operate as we do now' were 72 % (item25). Similarly, 62 % of them thought that fast food consumption is harmful both for us and the nature health (item15). Moreover, 66.2% of the students disagreed with the statement "environmental protection is government responsibility" (item10).

On the other hand, a contradiction has been detected related to concept of sustainability. Although 71 % of the students agreed on the economical use of water and energy for the sustainable use of resources, they seemed that they did not know the meaning of sustainability (item44). Only 23.2 % of them disagreed the idea that "the sustainable use of the natural resources means continuous use of them" (item43). The responses were highly undecided for this item.

Furthermore, students' answers to the items (15, 25, 19, 30, and 45) showed that they were very sensitive to their responsibilities and necessity of changing life styles. Only, for the item 31, they could not make connection between spending time in the shopping center and consumption of resources. There are no big shopping centers in Bodrum like in big cities such as; Ankara, Istanbul. This feature of Bodrum may have affected the students' responses.

Finally, fourth dimension includes items about environmental problems in Turkey to determine the students' awareness of national environmental problems. The table 7 shows percentages of student responses with respect to fourth dimension of the environmental attitude questionnaire.

Table 7: Percentage and frequency distribution of fourth dimension (ANEP)

ITEM NO	Statement	Strongly Agree (%)	Agree (%)	Undecided (%)	Disagree (%)	Strongly Disagree (%)	I don't know (%)
4	*There is no environmental pollution in Turkey*	4.7	2.9	4.8	14.3	71.,5	1.8
20	*Turkey needs to be industrialized, therefore environmental destruction due to industrialization can be discarded*	9.1	10.9	23.5	15.7	28.6	12.4
23	*There are many plant and animal species in our country that are at the edge of extinction.*	57.2	17.9	7.7	5.3	7.5	4.5
26	*As population increases in big cities like İstanbul, İzmir, Ankara, the environmental problems also increase*	52.0	25.9	10.9	4.9	3.9	3.2
29	*Turkey is rich in natural resources; therefore it is not possible to use them up.*	5.6	6.2	17.3	20.6	40.0	10.3
42	*The solution of the environmental problems in Turkey is closely related with raising environmental awareness.*	23.5	22.6	24.2	8.8	5.0	15.8

When the frequencies of the students' disagreement to statements were analyzed, the highest disagreement score (85.8 %) was observed for the item 4. Students disagreed that there is no pollution problem in Turkey (item4). 77.9% of pupils realized that population growth in big cities such as Ankara, İstanbul, İzmir

resulted in increase in environmental problems (item26). According to the frequencies of the item which is about the extinction of animal and plants in Turkey were almost 75 percent (item23). Nearly, 61 % of pupils were pessimistic about the scarcity of the natural sources in Turkey (item29). They thought that natural sources will become exhausted in future. Moreover, students were undecided between industrialization and environment (item20).

As a result of the assessment of the students' "undecided" and "do not know" responses, it is clearly seen that students had lack of knowledge on some issues such as; industrialization, role of technology and science and sustainability. For example, they gave undecided and do not know responses for the item 9 that state that we are overloading the Earth's natural ability to support life on earth. Moreover, they are unaware of the effects of industrialization (item no: 5, 20), science and technology issue (item no: 11, 17, 13), sustainability (item no: 43). Also, they could not make connection between spending time in shopping centers and consumption patterns of resources because of living in a small village that hasn't got big shopping centers.

4.3 Inferential Statistics

4.3.1 Effect of Gender on Students' Environmental Attitudes

T-test was used to determine the effect of gender on students' environmental attitudes. In independent sample t-test scores on each variable should be normally distributed. In order to check normality Q-Q plots, to check outliers' histograms and box plot were examined. Result showed us that scores on each variable distributed normally. Moreover few extreme outliers were detected and omitted.

In independent sample t-test dependent variable must be measured at interval or ratio level. In this study environmental attitude questionnaire has four sub-dimensions and interval scale. Also in t-test, independent variable must be categorical with two levels. In this study independent variable is gender and it has two levels (male-female).

In t-test the populations must have equal variances. To check this assumption "Levene test for equality of variance" was used for each sub-dimension. Results showed that F value is not significant (p> ,005) for each dimension. So it can be said that populations have equal variances for each sub-dimension.

Table 8: Independent t-test scores for AEP, GAS, AIR, ANEP according to gender

	Group	**N**	**M**	**SD**	**Df**	**t**	**p**
Attitudes toward awareness of environmental problems (AEP)	Female	443	30.66	5.96	807	-3.33	.001**
	Male	336	32.09	6.17			
General attitudes toward solutions (GAS)	Female	442	44.00	7.81	805	-.283	.777
	Male	365	44.16	8.49			
Awareness of individual responsibility (AIR)	Female	442	39.88	8.03	805	4.000	.000**
	Male	365	37.56	8.39			
Awareness of general environmental problems (ANEP)	Female	443	16.71	3.34	807	.737	.461
	Male	336	16.53	3.49			

** $p < .005$

Table 8 gives t test scores for AEP, GAS, AIR,ANEP according to gender. Results shows that male students' mean score on (M=32.09) "attitudes toward awareness of environmental problems" dimension is higher than female students' mean score (M=30.66). The difference between mean scores is found as statistically significant, $t(807) = -3.33$ $p < .005$. This means that male students have more positive attitudes toward awareness of environmental problems compared with female students.

According to the table 8 male students' mean score (M=44.16) on "General attitudes toward solutions" dimension is higher than female students' mean score

(M=44.00). This slight differences between mean scores isn't statistically significant t(805) = -.283 p > .005. So we can say that students' attitudes towards solutions about environmental problems don't change according to their gender.

In terms of "Awareness of individual responsibility" dimension female students' mean score (M=39.88) is higher than male students' (M= 37.56). This difference between mean scores is statistically significant, t (805) = 4.000 p <.005. So we can say that female students' awareness of individual responsibility about environmental problems is higher than male students'.

When we focus on the dimension "awareness of general environmental problems" it can be seen that female students' mean score (M= 16.71) is higher than male students' mean score (M= 16.53). But the differences between groups' means scores is not statistically significant t (875) = .737 p > .005. In other words there is no difference between female and male students in terms of awareness of general environmental problems.

4.3.2 Effect of Grade Level on Environmental Attitudes

One-way ANOVA was used to investigate the effect of grade level on environmental attitudes of the students. In order to check normality Q-Q plots, to check outliers' histograms and box plot were examined. Result showed us that scores on each variable distributed normally. Moreover few extreme outliers were detected and omitted.

One way ANOVA has assumption that the samples are obtained from population of equal variances. To check this assumption "Levene test for equality of variance" was calculated for each sub-dimension for each test. Results showed us that F value is not significant (p>.005) for each dimension. So it can be said that populations have equal variances for each sub-dimension.

Table 9: One Way ANOVA Scores for AEP, GAS, AIR, ANEP According to Grade Level

	Group	N	M	SD	Df	F	p	Significant Differences
Attitudes toward awareness of environmental problems (AEP)	6th grade	292	31.13	6.41	2-814	.401	.670	-
	7th grade	294	31.29	6.01				
	8th grade	231	31.61	5.88				
	Total	817	31.32	6.11				
General attitudes toward solutions (GAS)	6th grade	292	44.61	8.49	2-812	1.204	.300	-
	7th grade	293	43.57	7.90				
	8th grade	230	44.12	7.93				
	Total	815	44.10	8.13				
Awareness of individual responsibility (AIR)	6th grade	291	38.60	7.91	2-812	6.445	.002	6-8 7-8
	7th grade	294	37.80	8.58				
	8th grade	230	40.37	8.13				
	Total	815	38.81	8.27				
Awareness of general environmental problems (ANEP)	6th grade	292	16.54	3.41133	2-814	.824	.439	-
	7th grade	294	16.54	3.47149				
	8th grade	231	16.88	3.34524				
	Total	817	16.6389	3.41394				

Table 9 gives one way ANOVA scores for AEP, GAS, AIR and ANEP according to grade level. Results show that 8th grade students' mean score (M=31.61) on "Attitudes toward awareness of environmental problems" dimension is respectively higher than 7th grade (M= 31.29) and 6th grade (M= 31.13) students' mean scores. But those mean differences aren't statistically significant F(2-814) =,401 p>.005. In other words students' attitudes toward awareness of environmental problems don't change according to their grade levels.

Similarly, 6th grade students mean score (M= 44.61) on "General attitudes toward solutions" dimension is respectively higher than 8th grade (M= 44.12) and 7th grade (M= 43.57) students' mean score. But those differences among means are not statistically significant either F (2-812) =1.204 p>.005. This means that students' attitudes towards solutions about environmental problems don't change according to their grade level.

In terms of "Awareness of individual responsibility" dimension 8th grade students' mean score (M=40.37) is respectively higher than 6th grade (M=38.60) and 7th grade (M=37.80) students' mean score. This difference among mean scores are statistically significant F(2-812) =6.445 p< .005. So it can be said that students' awareness of individual responsibilities change according to grade level. Post hoch tests have been calculated to find out statistically significant differences. According to Scheffe test mean differences between 6th grade- 8th grade and 7th grade- 8th grade students are statistically significant. It means that 8th grade students' awareness of individual responsibilities toward solution of environmental issues are more than that for the 7th and 6th grade students'.

Results also show us that 8th grade students' mean score (M=16.88) on "Awareness of general environmental problems" dimension is higher than 7th grade and 6th grade students' mean scores. However 6th grade and 7th grade students have same mean score (M=16.54) on this dimension. Those differences among mean scores are not statistically significant F (2-814) = .824 p> .005.In other words

students' awareness of general environmental problems don't change according to their grade level.

4.3.3. Effect of Parents' Social and Economical Status on Students' Environmental Attitudes

4.3.3.1 Effect of Mothers' Level of Education on Environmental Attitudes

Table 10 gives one way ANOVA scores for AEP, GAS, AIR and ANEP according to mothers' education level. Results show that in "Attitudes toward awareness of environmental problems" dimension mean score of students whose mothers are graduated from high school (M=31.67) is respectively higher than mean scores of students whose mothers are graduated from university (M= 31.65), secondary School (M= 31.65), primary School (M= 30.91). But those mean differences aren't statistically significant F(3-797) =.990 p>.005. In other words students' attitudes toward awareness of environmental problems don't change according to education level of their mothers.

In terms of "General attitudes toward solutions" dimension students whose mothers are graduated from secondary school have the highest mean score (M=46.06). Their mean score is respectively higher than mean scores of students whose mothers are graduated from university (M=44.96), high school (M=44.63) and primary school (M=43.07). Those differences among mean scores are statistically significant F(3-795) =4.948 p< .005. So it can be said that students' general attitudes toward solutions about environmental problems change according to grade level of their mothers. Post hoch tests have been calculated to find out statistically significant differences. According to Scheffe test mean differences between students whose mothers are graduated from primary school and secondary school were found significant. It means that students whose mothers are graduated from secondary school have more positive attitudes toward solutions about environmental problems more than students whose mothers are graduated from primary school.

In terms of “Awareness of individual responsibility” dimension mean score of students whose mothers are graduated from university (M=41.85) is respectively higher than mean scores of students whose mothers are graduated from high school (M=39.02), secondary school (M=38.53) and primary school (M=38.12).Those differences among mean scores are statistically significant F(3-795) =5.004 p< .005. So it can be said that students’ awareness of their individual responsibilities about environmental issues change according to the education level of their mothers. Post hoch tests have been calculated to find out statistically significant differences. According to Scheffe test, the mean differences between students whose mothers are graduated from university-primary school and university- secondary school were found significant. It means that students whose mothers are graduated from university are more aware of their responsibilities about environmental issues more than students whose mothers are graduated from secondary school and primary school.

Results also show that students whose mothers are graduated from high school have highest mean score (M=17.07) for awareness of general environmental problems” dimension. Mean score is respectively higher than mean scores of students whose mothers are graduated from university (M=16.95), secondary school (M=16.91) and primary school (M=16.88). This difference among mean scores are statistically significant F(3-797) = 3.310 p< .005. Post hoch tests have been calculated to find out statistically significant differences According to Scheffe test, the mean differences between students whose mothers are graduated from high school and primary school were found significant. In other words students’ awareness of general environmental problems changes according to education level of their mothers.

Table 10: One Way ANOVA Scores for AEP, GAS, AIR and ANEP according to mothers' education level

	Group	N	M	SD	Df	F	p	Significant Differences
Attitudes toward awareness of environmental problems (AEP)	**Primary School(P)**	398	30.91	6.37	3-797	.990	.397	-
	Secondary School(S)	112	31.65	5.65				
	High School (H)	204	31.67	5.95				
	Undergraduate Graduate (UG)	87	31.65	5.91				
	Total	801	31.29	6.12				
General attitudes toward solutions (GAS)	**Primary School(P)**	396	43.07	8.29	3-795	4.948	.002	P-S
	Secondary School(S)	112	46.06	7.79				
	High School (H)	204	44.63	8.17				
	Undergraduate Graduate (UG)	87	44.96	7.20				
	Total	799	44.09	8.14				

Table 10 (cont'd)

Awareness of individual responsibility (AIR)	**Primary School(P)**	396	38.12	8.24	3-795	5.004	.002	P-UG S-UG
	Secondary School(S)	112	38.53	7.55				
	High School (H)	204	39.02	8.42				
	Undergraduate Graduate (UG)	87	41.85	8.16				
	Total	799	38,81	8,25				
Awareness of general environmental problems (ANEP)	**Primary School(P)**	398	16.25	3.50	3-797	3.310	.020	P-H
	Secondary School(S)	112	16.91	3.47				
	High School (H)	204	17.07	3.36				
	Undergraduate Graduate (UG)	87	16.95	2.84				
	Total	801	16.63	3.41				

4.3.3.2 Effect of Fathers' Level of Education on Environmental Attitudes

Table 11 gives one way ANOVA scores for AEP, GAS, AIR and ANEP according to fathers' education level. Results show that for "Attitudes toward awareness of environmental problems"- dimension mean score of students whose fathers are graduated from university (M=32.34) is respectively higher than mean scores of students whose fathers are graduated from high school (M= 31.37), secondary school (M= 31.25) and primary school (M= 30.86). But this difference is

not statistically significant F(3-799) =1.718 p>.005. In other words students' attitudes toward awareness of environmental problems don't change according to education level of their fathers.

In terms of "General attitudes toward solutions" dimension students whose fathers are graduated from university have the highest mean score (M=45.37). Their mean score is respectively higher than mean scores of students whose fathers are graduated from high school (M=44.96), secondary school (M=44.93) and primary school (M=42.46). This difference among mean scores are statistically significant F(3-797) =6.538 p< .005. So it can be said that students' general attitudes toward solutions about environmental problems change according to grade level of their fathers.

Post hoch tests have been calculated to find out statistically significant differences. According to Scheffe test, the mean differences between students whose fathers are graduated from primary school and secondary school were found significant. It means that students whose fathers are graduated from secondary school have more positive attitudes toward solutions about environmental problems than students whose fathers are graduated from primary school. Also, significant differences are found between students whose fathers graduated from university and primary school. In other words, pupils whose fathers are graduated from university have more positive attitude toward environment than pupils whose fathers are graduated from primary school.

In terms of "Awareness of individual responsibility" dimension mean score of students whose fathers are graduated from university (M=40.88) is respectively higher than mean scores of students whose fathers are graduated from high school (M=39.24), secondary school (M=39.23) and primary school (M=37.65).Those differences among mean scores are statistically significant F(3-797) =4.918 p< .005. So it can be concluded that students' awareness of their individual responsibilities about environmental issues are shaped according to education level of their fathers.

Post hoch tests have been calculated to find out statistically significant differences. According to Scheffe test, the mean differences between students whose fathers are graduated from university-primary school were found significant. It means that students whose fathers are graduated from university are more aware of their responsibilities about environmental issues more than students whose fathers are graduated from primary school.

Results also show that students whose fathers are graduated from high school have highest mean score (M=16.86) respect to "Awareness of general environmental problems" dimension. Their mean score is respectively higher than mean scores of students whose fathers are graduated from university (M=16.70), secondary school (M=16.72) and primary school (M=16.43). Those differences among mean scores are not statistically significant F(3-799) = .675 p> .005. In other words students' awareness of general environmental problems does not change according to education level of their fathers.

Table 11: One Way ANOVA Scores for AEP, GAS, AIR,ANEP According to Fathers' education level

	Group	**N**	**M**	**SD**	**Df**	**F**	**p**	**Significant Differences**
Attitudes toward awareness of environmental problems (AEP)	Primary School (P)	299	30.86	6.42	3-799	1.718	.162	-
	Secondary School(S)	186	31.25	6.16				
	High School (H)	195	31.37	5.88				
	Undergraduate Graduate (UG)	123	32.34	5.64				
	Total	803	31.30	6.13				

Table11 (cont'd)

General attitudes toward solutions (GAS)	Primary School (P)	299	42.46	8.26	3-797	6.538	.000	P-S P-UG
	Secondary School(S)	186	44.93	8.10				
	High School (H)	193	44.96	7.47				
	Undergraduate Graduate (UG)	123	45.37	8.30				
	Total	801	44.08	8.13				
Awareness of individual responsibility (AIR)	Primary School (P)	297	37.65	8.33	3-797	4.918	.002	P-UG
	Secondary School(S)	186	39.23	8.20				
	High School (H)	195	39.24	8.13				
	Undergraduate Graduate (UG)	123	40.88	7.85				
	Total	801	38.90	8.24				
Awareness of general environmental problems (ANEP)	Primary School (P)	299	16.43	3.46	3-799	.675	.567	-
	Secondary School(S)	186	16.72	3.25				
	High School (H)	195	16.86	3.52				
	Undergraduate Graduate (UG)	123	16.70	3.39				
	Total	803	16.65	3.41				

4.3.3.3 Effect of Mothers' Occupation Status on Environmental Attitudes

Table 12 gives one way ANOVA scores for AEP, GAS, AIR and ANEP according to mothers' occupation. For "Attitudes toward awareness of environmental problems"- dimension mean score of students whose mothers are working for public institution (M=32.23) is respectively higher than mean scores of students whose mothers having business for own account (M=31.81), whose mothers are not working (M=31.32) and whose mothers are working for private sector. However those mean differences aren't statistically significant F(3-804) =.848 p>.005. In other words students' attitudes toward awareness of environmental problems don't change according to occupation of their mother.

In terms of "General attitudes toward solutions" dimension students whose mothers are not working have the highest mean score (M=44.51). Other groups having second, third, and forth highest means scores are respectively students whose mothers having business for own account (M=44.16), whose mothers are working for private sector (M=43.41) and whose mothers are working for public institution (M=43.32). On the other hand those mean differences aren't statistically significant F(3-802) =.907 p>.005. It means that students' attitudes toward awareness of environmental problems don't change according to occupation of their mother.

In "Awareness of individual responsibility" dimension mean score of students whose mothers having business for own account (M=39.23) is respectively higher than mean scores of students whose mothers are not working (M=39.02), whose mothers are working for public institution (M=38.90) and whose mothers are working for private sector (M=37.87). But those differences among means aren't statistically significant F(3-802) =.811 p>.005. It means that students' awareness of their individual responsibilities about environmental issues don't change according to occupation of their mother.

In "Awareness of general environmental problems" dimension mean score of the students whose mothers are not working (M=16.77) is respectively higher than the mean scores of students whose mothers are working for private institution,

(M=16.59), whose mothers are working for private sector (M=16.45) and whose mothers having business for own account (M=16.41). On the other hand those differences among means aren't statistically significant F(3-804) =.517 p>.005. It means that students' awareness of general environmental problems don't change according to occupation of their mother.

Table 12: One Way ANOVA Scores for AEP, GAS, AIR and ANEP According to Mothers' occupation status

	Group	**N**	**M**	**SD**	**Df**	**F**	**p**	**Significant Differences**
Attitudes toward awareness of environmental problems (AEP)	Public institution (PI)	52	32.23	5.08	3-804	.848	.468	–
	Private sector (PS)	140	30.86	6.04				
	Business for own account (BO)	98	31.81	5.50				
	Not working (NW)	518	31.32	6.31				
	Total	808	31.36	6.10				
General attitudes toward solutions (GAS)	Public institution (PI)	52	43.32	7.64	3-802	.907	.437	–
	Private sector (PS)	139	43.41	8.57				
	Business for own account (BO)	97	44.16	8.29				
	Not working (NW)	518	44.51	7.93				
	Total	806	44.20	8.07				

Table 12 (cont'd)

Awareness of individual responsibility (AIR)	Public institution (PI)	52	38.90	8.96	3-802	.811	.488	–
	Private sector (PS)	139	37.87	8.18				
	Business for own account (BO)	98	39.23	8.60				
	Not working (NW)	517	39.02	8.00				
	Total	806	38.84	8.17				
Awareness of general environmental problems (ANEP)	Public institution (PI)	52	16.59	3.70	3-804	.517	.671	–
	Private sector (PS)	140	16.45	3.47				
	Business for own account (BO)	98	16.41	3.24				
	Not working (NW)	518	16.77	3.38				
	Total	808	16.66	3.40				

4.3.3.4 Effect of Fathers' Occupation Status on Environmental Attitudes

Table 13 gives one way ANOVA scores for AEP, GAS, AIR and ANEP according to fathers' occupation. For "Attitudes toward awareness of environmental problems"- dimension mean score of students whose fathers having business for own account (M=31.85) is respectively higher than mean scores of students whose fathers are working in public institution (M=31.33), whose fathers are not working (M=30.02) and whose fathers are working for private sector (M=30.92). However those mean differences aren't statistically significant F(3-783) =1.804 p>.005. In

other words students' attitudes toward awareness of environmental problems don't change according to occupation of their father.

In terms of "General attitudes toward solutions" dimension students whose fathers having business for own account obtained the highest mean score (M=45.10). Other groups having second, third, and forth highest means scores are respectively students whose fathers are working for public institution (M=43.92), whose fathers are working for private sector (M=43.42) and whose fathers are not working (M=41.84). This difference among mean scores are found statistically significant F(3-781) =3.317 p< .005. Post hoch tests have been calculated to find out statistically significant differences. According to Scheffe test, the mean differences between students whose fathers are having business for own account and students whose fathers are not working were found significant. It means that students whose fathers are having business for own account have more positive attitudes toward awareness of environmental problems than students whose father are not working.

In "Awareness of individual responsibility" dimension mean score of students whose fathers having business for own account (M=39.35) is respectively higher than mean scores of students whose fathers are not working (M=38.84), whose fathers are working for public institution (M=38.72) and whose fathers are working for private sector (M=38.21). But those differences among means aren't statistically significant F(3-781) =.997 p>.005. It means that students' awareness of their individual responsibilities about environmental issues don't change according to occupation of their father.

In "Awareness of general environmental problems" dimension mean score of the students whose fathers having business for own account (M=16.73) is respectively higher than the mean scores of students whose fathers are working for private institution, (M=16.49), whose fathers are working for private sector (M=16.55) and whose fathers are not working (M=16.28). On the other hand those differences among means aren't statistically significant F(3-783) =.327 p>.005. It means that students' awareness of general environmental problems don't change according to occupation of their father.

Table13: One Way ANOVA Scores for AEP, GAS, AIR and ANEP according to Fathers' occupation status

	Group	N	M	SD	Df	F	p	Significant Differences
Attitudes toward awareness of environmental problems (AEP)	**Public institution (PI)**	125	31.33	6.13	3-783	1-804	.145	-
	Private sector (PS)	317	30.92	6.14				
	Business for own account (BO)	307	31.85	6.07				
	Not working (NW)	38	30.02	5.46				
	Total	787	31.30	6.09				
General attitudes toward solutions (GAS)	**Public institution (PI)**	125	43.92	8.07	3-781	3.317	.019	BO- NW
	Private sector (PS)	316	43.42	7.94				
	Business for own account (BO)	306	45.10	8.10				
	Not working (NW)	38	41.84	9.39				
	Total	785	44.08	8.13				

Table 13(cont'd)

Awareness of individual responsibility (AIR)	**Public institution (PI)**	125	38.72	8.40	3-781	.997	.394	-
	Private sector (PS)	316	38.21	8.27				
	Business for own account (BO)	306	39.35	7.77				
	Not working (NW)	38	38.84	9.94				
	Total	785	38.77	8.19				
Awareness of general environmental problems (ANEP)	**Public institution (PI)**	125	16.49	3.17	3-783	.327	.806	-
	Private sector (PS)	317	16.55	3.52				
	Business for own account (BO)	307	16.73	3.46				
	Not working (NW)	38	16.28	2.76				
	Total	787	16.60	3.41				

4.3.4 Relationship Among Dimensions

For zero order correlation, scores on each variable should be normally distributed. In order to check normality Q-Q plots, to check outliers' histograms and box plot were examined. Result showed us that none of those assumptions were violated however a few extreme outliers were detected and omitted.

Linearity assumption refers to the presence of a straight-line relationship between each pair of variables. Homoscedasticity assumption refers scores for variable X should be similar at all Variable Y. To assess both linearity and homoscedasticity scatter plots were examined. Scatter plots showed us that neither of these assumptions was not violated.

In order to examine the relationship among the variables (AEP, GAS, AIR and ANEP) zero order correlations were computed. Table 14 shows that there is positive, significant and small correlation between AEP and GAS (r = .38, p <.01). The coefficient of determination (r^2=.14) shows that students' awareness toward environmental problems helps to explain 14 per cent of the variance in their general attitudes toward solutions about environmental problems.

Table 14: Correlations among AEP, GAS, AIR and ANEP

	AEP	**GAS**	**AIR**	**ANEP**
AEP	1	.380**	.313**	.342**
GAS	.380**	1	.528**	.395**
AIR	.313**	.528**	1	.403**
ANEP	.342**	.395**	.403**	1

** Correlation is significant at the 0.01 level

Positive, small and significant correlation was found between AEP and AIR (r = .31, p <.01). The coefficient of determination (r^2=.097) shows that students' awareness toward environmental problems help to explain approximately 10 per cent of the variance in their awareness of individual responsibility. Whereas AEP has small significant correlation with ANEP (r =.342, p <.01). The coefficient of determination (r^2=.11) shows that students' attitudes toward awareness of environmental problems helps to explain 11 per cent of their variance in their awareness of general environmental problems.

The highest correlation is found between GAS and AIR (r = .53, p <.01). There is significant and medium relation between two variables. The coefficient of determination (r^2=.28) shows that students' general attitudes toward solutions help to explain approximately 28 per cent of the variance in their awareness of individual responsibility.

The second highest correlation is found between AIR and ANEP (r = .40, p <.01). There is a significant relation between two variables. The coefficient of determination (r^2=.16) shows that students' awareness of individual responsibility help to explain approximately 16 per cent of the variance in their awareness of general environmental problems.

There is a significant and small correlation between ANEP and GAS (r = .39, p <.01). This is the third highest correlation. The coefficient of (r^2=.15) shows that students' awareness of general environmental problems help to explain approximately 15 per cent of the variance in their general attitudes toward solutions.

4.4 Summary of the Results

In the first part, the frequencies of the students were given to determine elementary school students' attitudes towards environment. It was found that generally students agreed with the items about the erosion and desertification; need for living in harmony with nature, conservation of the resources. Almost 82 % of them attributed the need to live in harmony with the nature. Relatively high percentages of students believe for the need for conserving resources for the next generations. They were aware of the impacts of population growth. However, although, they are aware of the relation between the life styles and environmental problems, they are unable to make a relation between those two. Approximately 86 % of them agreed with the idea about having environmental pollution problem in Turkey. 77.2 % of them did not believe that environmental pollution is not at the dangerous level on the earth. 71.3 % of students thought that humanity cannot adapt to polluted environment. The percentages of the students who were optimistic about the solutions of environmental problems in the future were only 10, 6. Almost, 68 %

were worried of the ecological problems in the future which probably they will face with.

In the second part, descriptive statistics displayed to show students' attitudes towards environment according to four dimensions. The most pronounced result of this section was that, most of the students were undecided and do not have any idea about the items in the second dimension; GAS (general attitude for solutions).

In the third part, inferential statistics exhibited to see the relations between AEP, GAS, AIR, ANEP dimensions. Besides, this part is aimed to show differences between students' environmental attitudes toward environment with respect to gender, grade level and socio economic status of parents. Statistically significant differences were found between male and female students- male students have positive attitudes toward awareness of environmental problems more than female students'. On the contrary, female students' awareness of individual responsibility about environmental problems is found to be higher than male students'.

Also, significant differences were found between grades- for the awareness of individual responsibilities. Mean differences between 6^{th} grade- 8^{th} grade and 7^{th} grade- 8^{th} grade students are statistically significant:- 8^{th} grade students are found to be more aware of their individual responsibilities compared to 7^{th} and 6^{th} grade students.

When the relation between the education of the parents and students' attitudes toward environment were examined, mean differences between students whose mothers are graduated from primary school and secondary school were found significant. It means that students whose mothers are graduated from secondary school have more positive attitudes toward solutions about environmental problems compared to students whose mothers are graduated from primary school. Moreover, mean differences between students whose mothers are graduated from university- primary school and university- secondary school were found as significant. It means that students whose mothers are graduated from university are aware of their

responsibilities about environmental issues more than students whose mothers are graduated from secondary school and primary school. Besides, test mean differences between students whose mothers are graduated from high school and primary school were found significant. In other words students' awareness of general environmental problems changes according to education level of their mothers.

In addition, fathers' education level and pupils' attitude relation analyzed. As a results of the post hoch and multi comparison tests, mean differences between students whose fathers are graduated from primary school and secondary school were found significant. It means that students whose fathers are graduated from secondary school have more positive attitudes toward solutions about environmental problems than students whose fathers are graduated from primary school. Also, significant differences are found between students whose fathers graduated from university and primary school. In other words, pupils whose fathers are graduated from university have positive attitude toward environment more than pupils whose fathers are graduated from primary school. Moreover, students whose fathers are graduated from university are more aware of their responsibilities about environmental issues more than students whose fathers are graduated from primary school.

When mothers' occupation variable was analyzed, it was not seen any significant differences for each dimension. On the contrary, statistically significant value obtained from the test according to fathers' occupation. Students whose fathers are having business for own account have positive attitudes toward awareness of environmental problems more than students whose father are not working.

Statistically significant results were obtained as a result of the analysis to find out the relationship between AEP, GAS, AIR, ANEP dimensions. The highest correlation is found between GAS and AIR. There is significant and medium relation between these two variables. The coefficient of determination shows that students' general attitudes toward solutions help to explain approximately 28 % of the variance in their awareness of individual responsibility. This means that the

more students have positive attitudes towards solution of environmental problems, the more they become aware of their individual responsibilities about environmental issues.

CHAPTER 5

DISCUSSION

This study was designed to investigate primary school students' attitudes towards environment according to four dimensions; awareness of environmental problems, general attitudes towards solutions, awareness of individual responsibility and awareness of national environmental problems. Besides, impacts of the selected variables; grade level, gender, parents' education level and parents' occupation upon the attitudes of students were explored. The data was collected from 817, 6^{th}, 7^{th}, 8^{th} grade students in Bodrum/Muğla-Turkey during 2008-2009 academic year. . The accessible population for the elementary students was 5, 8 %. Environmental Attitude Questionnaire (EAQ) which was originally developed by Herera's (1992) and it was adopted by Worsley and Skrzypiec (1998) was applied to the students. The results were discussed in this chapter by considering the results obtained, the related literature and the national and local circumstances related to environmental education in Turkey.

5.1 Discussion

This study on the environmental attitudes of students from public schools in Bodrum showed that, most of the students are aware of the erosion and desertification problems, most of them believe that the environmental pollution is at the dangerous level in the world. Most of the students agree that the environmental pollution affects human health and they think that human cannot adapt to polluted environment. Moreover, the students are pessimistic about the environmental degradation in the future, they think that human is abusing the environment and they think that it is not temporary problem. Results of this part of the study can be compared with those of realized by Negev et al (2008) in Israel. The authors made a national study including 6^{th} and 12^{th} graders and targeted to discover the students' environmental literacy with respect to knowledge, attitude and behavior. Results of

this study indicated that students in Israeli were concerned about two distinct areas; recycle and pollution. Generally, students have realized the importance of environmental pollution problem.

The most interesting results related to frequencies are obtained for the item 36 that states "marine pollution is a natural event". Students of this study were expected to disagree the statement since they live in a coastal area, but they did not. This may be because, they are not aware of the reasons of marine pollution in Bodrum. Similarly, they seemed undecided about the benefits of industrialization. These results correspond to findings of the past researches that revealed undecided status of both elementary students and pre-service teachers on the item about benefits of industrialized society (Tuncer, Sungur, Tekkaya and Ertepınar 2007). Another similar result was obtained by Worsley and Skrzypiec (1998) that, 29 % of girls and 33 % of boys agreed with the idea that "industrialized society give high standard of living to people" where 18 % of them had no idea.

Students of this study are found to be aware of necessity for living in harmony with the nature, they worry about future and they do not believe that "environmental problems have always existed and solved". Besides, they are conscious about the necessity of considering impacts to environment before evaluating any activity. They think that risk of nuclear plant accident is increasing. Majority of them are undecided on the item states that benefits of technology greater than damages of it. Worsley and Skrzypiec (1998) found a similar result in their study that, 9 % female and 18 % male secondary students believed that benefits of technology are greater than harmful effects and 18 % do not know. Moreover, students of the current study were unsure about the development of science and technology to control environmental problems. They were mostly neutral or not have an idea about the problems of population growth in the future. Minority of them believed that authorities will take a precaution to decrease the population growth in future. Worsley and Skrzypiec (1998) found that, 11 % female and 19 % male students agreed with this statement whereas do not know responses were 20 %. Therefore, we can say that, results were very similar for the attitude towards role of science and technology both in Turkey and Australia.

Students in Bodrum are aware of individual responsibilities to protect environment. Most of them believed the requirement of natural source protection for the next generation. Besides, students think that individual responsibilities are important to prevent environmental pollution. Moreover, they participate the idea which states that "if we do not change our consumption habits, the hole in the ozone layer will continue to increase". Correspondingly, results found in the Worsley and Skrzypiec's (1998) study was parallel with those of found in the current study. Taylor et al (2007) studied students' knowledge and attitudes in Fiji. Researchers detected a considerable confusion in greenhouse effect and hole in ozone layer. Also, Vlaardingerbroek et al (2007) made a comparative study, the findings indicated the same confusion. According to these studies, it is obvious that students' attitudes were similar, as far as the lack of knowledge on these issues is considered. Even teachers were reported that they had misconceptions about the global warming and ozone layer depletion according to Michail (2007). On the contrary to their lack of knowledge, many of them identified that these are consequences of human activities.

Students of this study agreed to the economical use of water and energy for the sustainable use of resources. On the contrary, they failed to answer the item related to definition of sustainability.

Depending on the above result related to sustainability, it was not unexpected for students to construct a relationship between life styles and environmental protection. Hence, most of them were undecided about the connection between spending time in the shopping centers and consumption of natural resources. Although this result may also due to the fact that there are no shopping centers in Bodrum, one can also relate the result with the inadequacy of the environmental education content in Turkey. Nevertheless, students showed great agreement with the idea that environmental protection is not governmental but individual responsibility.

Most of students thought that there is a pollution problem in Turkey. Moreover, students agreed with the parallelism between the population increase in

big cities and growth of environmental problems. It was seen from the responses for the item 24, which is about loss of biodiversity; majority of them agreed that there were lots of animals and plants becoming extinct in Turkey. They are pessimistic about the scarcity of the natural sources in Turkey and they think that natural sources will become exhausted in future.

There was one item which was pointed as undecided by pupils. It stated that Turkey needs to be industrialized; therefore environmental destruction due to industrialization can be discarded. Students in Bodrum are away of the industry because of that they may not think on this issue. Similarly, It is found that there was diversity between the urban and rural area students about the industrialization topic. Urban area students were strongly conscious that environment should not be discarded for sake of industrialization however; rural area students were undecided on this issue (Tuncer, Sungur, Tekkaya and Ertepınar 2004). These results were consistent with findings of another study (Tikka, Kuitunen and Tynys 2000). It is suggested that location of hometown is important. Students from metropolitan area had more positive attitudes towards environment. People living in crowded places are most likely to become aware of existing problems. Also, Yılmaz and Andersen (2004) founded that most of the students have difficulty agreeing with that environmental protection might have priority over economic growth, industrialization and right to use land. Attitudinal results suggested that economic conditions in Turkey may affect the students' attitudes toward environmental issues.

5.1.1 Curriculum content and students' environmental attitude

Table 15 demonstrates the environmental concepts in curriculum of 6^{th}, 7^{th} and 8^{th} grade. When curriculum content is examined, the concepts erosion, loss of biodiversity, natural resources, environmental pollution and sustainability are found that they are all covered. But as the results of the current study revealed some of these concepts, such as sustainability have not been understood properly by the students.

Table 15: Environment concepts in the current secondary school curriculum

Grade level	Subjects
6th grade	Organic agriculture, pesticide usage, natural wonders, soil, erosion, fossils, water, underground and surface- water, mine, types of rock
7th grade	Ecosystem (effects of environmental pollution to ecosystems), environmental protection, a-biotic factors, biodiversity, environmental problems in local and global area, universe, earth, moon, sun system and universe pollution, sustainability
8th grade	Adaptation, evolution, biodiversity, energy flow, food chain, matter cycle (water, carbon, oxygen, nitrogen cycle (effects of degradation of cycles), recycling, energy sources (renewable and un-renewable sources), photosynthesis, respiration, matter types, water purification, acid rains, air and soil pollution, earthquake, volcano, wind, tornado, hurricane, storm, climate

Besides, the results of the study revealed that students' awareness is low on the solutions for the environmental problems. They were not being confidential on the role science and technology solves environmental problems. It has to be pointed out at this stage that, there are no sections in the curriculum that attributes to the role of science and technology as a solution for the environmental problems. This is unexpected, since Turkish curriculum for science education accepts and applies the approximation titled "Science - Technology – Society – Environment (FTTÇ). Similarly, students in Bodrum seemed as if they are not familiar with the word industrialization This result may be explained by the fact that, they are not living in a metropolitan area so, it may not be fair to expect them to be familiar with the issue. But, students living in Bodrum were expected to be aware of the reasons for the sea pollution and feel responsibility for the solutions. Whereas, the results were not in line with the expectations. Approximately 22% of them accepted sea pollution as a natural event, and 12 % of them were undecided. Moreover, students in Bodrum were found that they answered incorrectly to common cause of pollution of streams,

rivers and oceans whereas; they were expected to know about marine issues since Bodrum is on the Aegean coast of Turkey. Similar to our thesis results, highest percentages of not concerned response was industrial pollution. Almost all of the responses indicated that students were unsure about industrial pollution with an exception of 10 % (Ökkeşli, 2008). Therefore, it can be easily inferred from this result that, local issues shall be emphasized into the environmental education curriculum.

The results of the data were evaluated by using independent t-test method to discover gender differences according to four dimension; AEP, GAS, AIR, ANEP. Interesting result is obtained in the first dimension. When mean scores were compared, male students' mean score is higher than female students' mean score. This means that male students have more positive attitudes toward awareness of environmental problems compared with female students. On the other hand, in AIR dimension, female students' students' scores were higher than males have in statistically significant level. It means that girls were more aware of their responsibility towards environment. Rests of the two dimension differences according to gender were elusive. As a conclusion, the awareness of environmental problems and awareness of individual responsibilities change with gender.

The correlation between gender and subscales is inconsistent with the findings of the study which was stated no statistically significant sex difference in students' component scores (Dimopoulus & Pantis, 2003). No significant differences were found according to gender in knowledge and attitude dimension in total mean scores. Only tenth grade female students founded to have more favorable attitudes than males. (Makki & Abd-El-Khalick-Boujaoude, 2003)

With respect to other researches, generally girls were founded to have more favorable attitudes towards environment. No significant differences were found in elementary but significant gender differences were observed in middle school students. Female students indicated more concern than male students (Yılmaz & Anderson, 2004). Zimmerman (1996) discovered that no gender differences in two

dimension; pastoralism and urbanism. On the other hand, only in environmental adaptation dimension, male reported more negative feelings than females. Men thought that humanity is right to dominate nature. Worsley & Skrzypiec (1998) founded that women more teenage women expressed more concern than teenage men. Also, women tended to less optimistic not valid for all scores but in some questions and researcher stressed that girls express higher depressive disorder. Fernandez-Manzanal, Rodrigues-Barreiro, Carrosguer (2007) and Baker, Ewert (2001) resulted that female students had higher scores than mans to be willing to participate in pro-environmental actions. Tuncer et al (2005a) and (2005) stated that girls showed more positive attitudes and they were more aware of sustainability. Another study results showed that men had negative attitudes towards environment than women. On the contrary, men answered correctly more often than women. It means men gained higher knowledge than women despite their negative attitude (Tikka & Kuitunen & Tynys (2000). In this thesis, men are found that more aware of environmental problems but females tend to be more aware of responsibilities.

Differences between the 6^{th}, 7^{th}, 8^{th} grade levels with respect to four dimensions were explored by using one way ANOVA statistical techniques. In AIR dimension, 8^{th} grade students' mean score is respectively higher than 6^{th} grade and 7^{th} grade students' mean score. Those differences among mean scores are statistically significant. In other words, students' awareness of individual responsibilities increased with the grade level. This may be caused by the education or may be resulted with growing up. With the increasing in ages, they became more conscious.

This result contrast with results study findings which stated that environmental knowledge scores steadily increases across the grade level but pupils' attitude scores were tended to decrease from 6^{th} to 10^{th} grade (Alp & Ertepınar & Tekkaya & Yılmaz, 2006). Our study is consistent with other investigations. It is showed positive correlation between attitude subscales and grade level (Dimopoulus & Pantis, 2003). Another study demonstrated that older students regardless of major scored higher in pro-environmental items (Ewert & Baker, 2001). Similarly, older

students were found more active and aware of biological and environmental facts (Tikka & Kuitunen & Tynys, 2000). Özden (2008) concluded that fourth year students had more positive attitudes than first year students.

Another variable is education of mothers. University degree percentages were seen behind the other schools degree. Students whose mothers are graduated from primary school and secondary school were found significant in GAS dimension. Those differences among mean scores are statistically significant. It means that students whose mothers are graduated from secondary school have more positive attitudes toward solutions about environmental problems than students whose mothers are graduated from primary school.

Besides, in AIR dimension, students whose mothers are graduated from university are aware of their responsibilities about environmental issues more than students whose mothers are graduated from secondary school and primary school. The outputs indicated that significant results. Also in ANEP dimension, differences were founded between students whose mothers are graduated from high school and primary schools are found significant. So, it is obvious from the results that mothers' education level is an important determining factor on students' attitudes. Tuncer (2004) suggested as women are possible to stop overpopulation by means of education. Educated females tend to have fewer children, so they can be better educated and healthier.

Correspondingly, education level of fathers have an impact on students attitude in two dimension; GAS, AIR. Students' general attitudes toward solutions about environmental problems change according to grade level of their fathers significantly. Moreover, students whose fathers are graduated from secondary school have more positive attitudes toward solutions about environmental problems compared with students whose fathers are graduated from primary school. Besides, pupils whose fathers are graduated from university have positive attitude toward environment more than pupils whose fathers are graduated from primary school.

Parallel with previous findings, students' awareness of their individual responsibilities about environmental issues shaped according to education level of their fathers. It means students whose fathers are graduated from university are aware of their responsibilities about environmental issues more than students whose fathers are graduated from primary school. As it is obtained from the results, fathers' education is another fundamental factor to determine attitudes of students. These results are inconsistent with other research. No significant differences were founded between participant attitude scores and parents' education level however, significant differences were obtained between environmental knowledge of pupils and parents' education level (Makki & Abd-el-khalick & Boujaoude, 2003).

Our study were coherent the past investigations. Özden (2008) indicated that students who have fathers graduated from university and high school have more positive attitudes than others. Tuncer (2004) compared the attitudes' of pupils in rural and urban places. In rural areas, only 9 % of students' fathers had a university degree whereas in urban area percentages increased to 41. Results showed that urban area students had more aware of environment and this indicated social status and education of parents have an impact on environmental awareness.

Another variable is occupation of mothers. No statistically significant differences are obtained according to occupation of mother.

Student fathers' occupation role investigated with respect to four variables. Results exhibited statistically significant scores in GAS dimension. Students whose fathers are having business for own account have positive attitudes toward awareness of environmental problems more than students whose father are not working. Tikka (2000) displayed importance of fathers' occupation. Students who are coming from farming families are the most active.

5.2 Limitations of the study

This study investigated students' attitudes towards environment according to four dimensions with 817 students from seven primary schools of Bodrum. It may

not be a mirror of the primary students at a large. Because, this study conducted by only 6th, 7th, 8th graders, students up to 5th grade were not discovered. This study may be light to further investigations. Many undetermined factors such as; ethnicity, intelligence, motivation, previous knowledge could be impacted this study.

In addition, the assuming equal conditions for the sample and conditions of the classrooms may be a mean for limitation, although teachers were informed about the aims and significance of the study to ensure standard conditions for data collection procedure.

The instrument which was used in this study may not be sensitive enough to measure the selected variables or local differences within Bodrum. Further refinement of the questionnaire and adding some local environmental issues may be required to fully understand the attitudes of students.

5.3 Recommendations for Further Research

This study intended to measure attitudes of primary school students including only 6th, 7th, 8th grade levels in Bodrum. Further research is needed to take a picture of attitudes of primary students including first to fifth grade. Also, similar study can be conducted with private schools to investigate differences between environmental attitudes of the private and public school students.

Also, similar study can be made to discover parents' environmental attitude with respect to their occupation and education level. Moreover, a study can be designed to identify attitudes of elementary school teachers. Comparative studies can be organizes to see regional differences.

A qualitative study may be designed to support quantitative research.

5.4 Conclusion

Environmental education is most effective way for confronting the challenges of the future. Education will shape the world of tomorrow. "Think

globally, act locally" active pedagogy has been developed based on this idea during past two decades. Starting with the primary school, students should be encouraged to examine environmental issue from different perspectives (UNESCO, 1997b). Both for formal and non-formal education are essential to change the individuals' attitudes so they have an ability to assess sustainable development (Agenda 21, chapter36).

In 2005 Ministry of Education developed new curriculum. New curriculum is different from the previous one in that dimensions of technology and environment integrated with science curriculum. Greater attention was paid to environmental knowledge, relatively little attention was given to skills, affective and behavior sub-domain in Turkey. Besides, action component of environmental literacy is helpful to develop students' abilities needed for participation and action but little attention is given or even ignored to action component of environmental literacy (Erdoğan & Kostova & Marcinkowski, 2009).

In this thesis, results showed that students are not confident and mostly undecided on economic growth, industrialization and its consequences to environment. Student-centered methods were offered to increase student awareness about environmental issues. In this way, students may better discuss environmental issues. Also, it was suggested that inquiry learning environment may help students understand environmental and economical issues (Yılmaz & Anderson, 2004).

Alım (2006) compared the newly developed environmental education curriculum with the former one. At the end, researcher concluded the former that one was insufficient to gain pupils high learning outcomes and it underscored the knowledge and comprehension level. Present one aimed to provide education at high levels of learning. Program enriched by activities and tended to become student-centered.

Curriculum refinement suggested developing more environment friendly attitudes. Moreover, it was offered to change and improve. Also, researcher stated that amount of lessons which is devoted to environment should be increased (Özden,

2008). In addition, students reported that they knew popular environmental issues but they did not have sufficient knowledge about scientific and technical issues (Kasapoğlu & Turan, 2008). Interdisciplinary course was suggested to develop a sense between education, development and environment in holistic way (Tuncer & Sungur & Tekkaya & Ertepınar, 2007).

The relatively low knowledge on environmental issues may be indication of insufficient formal science curriculum implications of environmental issues (Alp et al, 2006). There is no environmental education curriculum in Turkey. The pupils' environmental awareness may be possibly caused because of projects or campaigns but these are not sufficient to bring up well equipped children to overcome problems (Tuncer & Ertepınar & Tekkaya & Sungur, 2005a).

In spite of the newly developed science education curriculum, it may be seen from recent studies that it is not enough to develop environmentally literate citizen. These prove the classification of it as a level of 'just beginning'. Developing and implementing a curriculum is not enough. 'Improved inputs syndrome' offered improving inputs leading improvement educational outcomes. Proving knowledge and not fostering creativity, interest of students resulted with lack of motivation and meaningful learning. To prevent this, appropriate curriculum is needed (Makki & Abd-El-Khalick-Boujaoude, 2003). Environmental education is more than specific content of education, it should be considered as an excellent basis for developing a way of living harmony with nature, a new lifestyle (UNESCO, 1997b).

This thesis showed that environmental attitudes of students in Bodrum were positive. They were aware of general environmental problems and national environmental problems, their responsibility to sake of environment. On the contrary to that, they could not be fully developing a sense of relation between industrialization of Turkey and its consequences. Addition to these results, they were mostly undecided on some issues in general awareness of solutions dimension. They did not fully comprehend solutions to environmental problems, especially the role of science and technology. As it is clearly seen from the curriculum subjects,

role of the science and technology on solutions is skipped. Besides, economy, development and industrialization interdependence should be emphasized.

Most important problems in Bodrum can be stated as sea water pollution, solid wastes, unsustainable tourism, and extinction of biodiversity. These environmental problems may change according to different regions in Turkey. Therefore, Province Directorates of the Ministry of Education should determine the local environmental problems and these problems should be emphasized in the schools of the provinces to increase students' awareness of local environmental problems.

Also, in Bodrum students were unaware of sustainability which is needed to be a primary goal of curriculum. Sustainability is defined as a dynamic balance among many factors including social, cultural, economic requirements of humankind and necessity of conserving natural environment (UNESCO, 1997b). Environmental education should be reorganized and shaped to emphasize sustainability which may be helpful for exhibit relation between the economy, culture and protection of environment to be hope for world of tomorrow.

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APPENDIX

ENVIRONMENTAL ATTITUDE QUESTIONNAIRE

Sevgili Öğrenciler,

Bu anket sizin çevre sorunları ile ilgili düşünce ve davranış biçimlerinizi ölçmek amacı ile hazırlanmıştır. Bu sorulara vereceğiniz yanıtlar, araştırma amacıyla kullanılacak, ve gizli tutulacaktır. Yanıtlarınız, Türkiye'de uygulanacak çevre eğitimi ders programları ve öğretmen yetiştirme programlarının geliştirilmesine önemli katkılarda bulunacaktır. Sizlerin görüşleri bizler için çok önemlidir.

Yardımlarınız için teşekkür ederiz.

ODTÜ Eğitim Fakültesi, İlköğretim Bölümü

1. Bölüm: Kişisel Bilgiler

1. Okulunuzun Adı: _____

2. Sınıfınız: □6 □7 □8 □10

3. Cinsiyetiniz: □ Kız □ Erkek

4. Doğum tarihiniz (yıl): _____

5. Not ortalamanız : _____

6. Annenizin eğitim durumu: □İlkokul □Ortaokul □Lise □Üniversite □Yüksek Lisans □Doktora

7. Babanızın eğitim durumu: □İlkokul □Ortaokul □Lise □Üniversite □Yüksek Lisans □Doktora

8. Anneniz çalışıyor mu ? : □evet □hayır

Yanıtınız "evet" ise çalıştığı kurum : : □devlet dairesi □özel sektör □kendi işyeri

9. Babanız çalışıyor mu? : □evet □hayır

Yanıtınız "evet" ise çalıştığı kurum : : □devlet dairesi □özel sektör □kendi işyeri

Aşağıda çevre sorunlarına yönelik düşünceler göreceksiniz. Belirtilen ifadelere ne derecede katıldığınızı yada katılmadığınızı ilgili seçeneği işaretleyerek belirtiniz.

1= Kesinlikle Katılmıyorum	2= Katılmıyorum	3= Karasızım	4= Katılıyorum	5=Kesinlikle Katılıyorum	6 = Bilmiyorum

2. Bölüm : Anket

	Kesinlikle Katılmıyorum	**Katılmıyorum**	**Kararsızım**	**Katılıyorum**	**Kesinlikle Katılıyorum**	**Bilmiyorum**
1. Dünyada çevre kirliliği tehlikeli düzeyde değildir.	1□	2□	3□	4□	5□	6□
2. İnsanoğlu yaşamını sürdürebilmek için doğa ile uyum içinde yaşamak zorundadır.	1□	2□	3□	4□	5□	6□
3. Çevre kirliliği geçici bir problemdir.	1□	2□	3□	4□	5□	6□
4. Türkiye'de çevre kirliliği sorunu **yoktur.**	1□	2□	3□	4□	5□	6□
5. Endüstrileşmiş toplumlar insanlara yüksek yaşam standardı sunar.	1□	2□	3□	4□	5□	6□
6. İnsanlar adaptasyona yatkındır, bu nedenle kirlenmiş bir çevrede yaşamaları problem **olmaz.**	1□	2□	3□	4□	5□	6□
7. Çevre sorunlarının çözülmesi, yaşama alışkanlıklarımızda önemli değişiklikler yapmamızı gerektirir.	1□	2□	3□	4□	5□	6□
8. Çevrenin korunması ekonomik büyümeden daha önemlidir.	1□	2□	3□	4□	5□	6□

9. Dünya'nın yaşamı desteklemekle ilgili doğal yeteneğini aşmak üzereyiz.	1□	2□	3□	4□	5□	6□
10. Çevre kirliliğini önlemek devletin sorumluluğudur.	1□	2□	3□	4□	5□	6□
11. Teknolojini yararları, zararlarından daha fazladır.	1□	2□	3□	4□	5□	6□
12. Nükleer bir kazanın çevreyi kirletme olasılığı gitgide artmaktadır.	1□	2□	3□	4□	5□	6□
13. Dünyadaki yetkililer, nüfus artışını azaltacak önlemler alacak ve nüfus artışı gelecekte problem **olmayacaktır.**	1□	2□	3□	4□	5□	6□
14. Doğal kaynaklarımızı gelecek nesiller için korumalıyız.	1□	2□	3□	4□	5□	6□
15. "Fast food" (hamburger, v.b.) tüketimi hem bizim, hem de çevrenin sağlığı açısından zararlıdır.	1□	2□	3□	4□	5□	6□
16. Çevre sorunları her zaman vardır ve çözülmektedir, bu nedenle gelecekle ilgili kaygı duymaya gerek **yoktur.**	1□	2□	3□	4□	5□	6□

17. Bilim ve teknoloji, herhangi bir çevre sorununu kontrol edebilecek hızla gelişmektedir.	1□	2□	3□	4□	5□	6□
18. Arabalardan kaynaklanan eksoz gazları iklim değişikliklerine yol açmaktadır.	1□	2□	3□	4□	5□	6□
19. Tüketim alışkanlıklarımızı değiştirmezsek, toprak kalitesi ve tarım topraklarının kaybı hiçbir bitkinin yetiştirilemeyeceği duruma gelecektir.	1□	2□	3□	4□	5□	6□
20. Türkiye'nin endüstrileşmeye gereksinimi vardır, bu durumda endüstrileşmenin neden olduğu çevre kirliliği göz ardı edilebilir.	1□	2□	3□	4□	5□	6□
21. Bilim ve teknoloji, çevre ile ilgili problemleri belirler ve çözer; bu yüzden bu konuların gelecekte önemi **kalmayacaktır.**	1□	2□	3□	4□	5□	6□
22. Nükleer atıkları depolamak çok tehlikelidir.	1□	2□	3□	4□	5□	6□
23. Ülkemizde nesli tükenmekte olan birçok bitki ve hayvan türü bulunmaktadır.	1□	2□	3□	4□	5□	6□

24. Çevre kirliliğinin önlenmesinde bireylerin sorumlulukları çok önemlidir.	1□	2□	3□	4□	5□	6□
25. Tüketim alışkanlıklarımızı değiştirmezsek, ozon tabakasındaki deliğin büyümesi devam edecektir.	1□	2□	3□	4□	5□	6□
26. Ankara, İstanbul ve İzmir gibi büyük kentlerde nüfus arttıkça, çevre sorunları da artmaktadır.	1□	2□	3□	4□	5□	6□
27. Erozyon ve çölleşme bir çevre sorunudur.	1□	2□	3□	4□	5□	6□
28. İnsanlık çevreyi sömürmektedir.	1□	2□	3□	4□	5□	6□
29. Türkiye'de doğal kaynak açısından zengin bir ülkedir, bu yüzden doğal kaynakların tükenmesi söz konusu **değildir.**	1□	2□	3□	4□	5□	6□
30. Yaşam tarzımızda değişiklik yapmayı doğal kaynakların yok olmaması için kabul edebiliriz.	1□	2□	3□	4□	5□	6□
31. Alışveriş merkezlerinde uzun zaman geçirmek, tüketimi ve doğal kaynak kullanımını olumsuz yönde etkileyen bir yaşam tarzıdır.	1□	2□	3□	4□	5□	6□

32. Doğal kaynaklarımızı kendi neslimiz yararına kullanmalıyız.	1□	2□	3□	4□	5□	6□
33. Dinozorlar doğal nedenler yüzünden yok oldu ama, deniz kaplumbağalarının sayılarının azalmasının nedeni insanlardır.	1□	2□	3□	4□	5□	6□
34. Çevre kirliliğinin nüfus artışı ile hiçbir ilgisi **yoktur.**	1□	2□	3□	4□	5□	6□
35. Çevre kirliliği insan sağlığını olumsuz yönde etkiler.	1□	2□	3□	4□	5□	6□
36. Denizlerin içinde yüzülemeyecek kadar kirli hale gelmesi doğal bir olaydır.	1□	2□	3□	4□	5□	6□
37. Güneş, rüzgar ve su gibi doğal enerji kaynakları hiçbir zaman **tükenmeyecektir,** bu yüzden dünyada enerji sıkıntısı söz konusu **olmayacaktır.**	1□	2□	3□	4□	5□	6□
38. Herhangi bir aktiviteyi değerlendirirken, herşeyden önce çevreye etkisini göze almalıyız.	1□	2□	3□	4□	5□	6□
39. Önümüzdeki birkaç yıl içinde çevre sorunları sona erecektir.	1□	2□	3□	4□	5□	6□

40. Toplum, doğa korumacı davranışları desteklemelidir.	1□	2□	3□	4□	5□	6□
41. Tüketim alışkanlıklarımızın doğal kaynakların tükenmesi ile ilgisi **yoktur**.	1□	2□	3□	4□	5□	6□
42. Türkiye'deki çevre sorunlarının çözümü ile çevre bilincinin yaygınlaştırılması yakından ilgilidir.	1□	2□	3□	4□	5□	6□
43. Doğal kaynakların sürdürülebilir kullanımı, kaynakların sürekli kullanımı demektir.	1□	2□	3□	4□	5□	6□
44. Su ve elektrik kullanırken tasarruflu davranmak, doğal kaynakların sürdürülebilir kullanımı açısından önemlidir.	1□	2□	3□	4□	5□	6□
45. Herkesin çevre kirliliğine etkisi vardır, ancak bu etki tüketim alışkanlıklarına göre değişir.	1□	2□	3□	4□	5□	6□