



## SCIENCE AND TECHNOLOGY PRE-SERVICE TEACHERS' OPINIONS OF ENVIRONMENT AND SCIENCE RELATIONSHIP

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### Abstract

The humanbeing who is in the intensive interaction with the environment sometimes takes what the environment gives him without questioning, sometimes goes into effort searching the underlying facts at the root of this giving's. He often benefits from the science to find solution. For this purpose in this study, the Science and Technology teachers of future at university studying the environment - the relationship of science and technology, as well as awareness of views about solving the current problems related to the environment were tried to determine. The participants of this research are the students of Science and Technology Pre-Service Teachers training college in the Aegean Region. 2 and 3 grade students from the Department of Science Education in University of Adnan Menderes, Celal Bayar University, Dokuz Eylül University and Mugla University, Faculty of Education in the region 2010-2011 academic year, form the sample of this research. Within this study 'the opinion Survey on the Interaction of Environment, Science and Technology ' through Five point Likert Scale was applied to teachers that are studying in these universities. Data obtained from the result of opinion survey analyzed in the SPSS program and evaluated in terms of different variables.

**Keywords:** Environment - Science - Technology Relationship, Current Issues Related to the Environment.

## INTRODUCTION

Up today, the changing life standards have brought new environmental problems and cause problems that cannot be compensated. Human beings as part of that living environment play the most significant role in this process.

In order to evaluate and wholly understand human being as a social and thinking entity one should understand human beings interaction between environments. In nature, the interaction between living things and non-living things help the development of a healthy ecosystem. All the living and non-living things that are part of a healthy ecosystem are connected to each other as bangles of a chain (Erkan, Şafak and Yertutan, 2011). Any kind of problem that can occur in the chain has the potential to affect ecosystem as a whole. One of the most fundamental elements that cause the appearance of environmental problems is human beings activities that give harm to ecosystem (Şafak and Erkal 1999; Nazlıoğlu, 1991). The interaction between human beings and environment has been affected negatively due to human beings attempt to dominate nature. One of the best observable elements of this problem can be seen in rapid industrial growth since 18<sup>th</sup> and 19<sup>th</sup> centuries. Although scientific and technological changes occurred throughout the industrial growth, the reflections of these changes negatively affected nature. In addition, that kind of a rapid growth in industry has caused competition among nations and triggered the changing process of human beings. As a result of industrialization, changes have occurred in nation's habits, their attitudes and economic, cultural forms (Şafak and Erkal 1999; Kozak, 1991). One of the most obvious indicators of human beings misusing nature is demanding more than nature has given them and their consuming resources quickly. For instance, technological goods that are used for farming, unconscious use of pesticide, and the fuel used for vehicles and irregular city planning cause environmental problems. In relation, while focusing on the developments in science and technology, a balance should be created between production and consumption, in order to prevent the rapid consumption of natural resources (Aydın, 2010). In these days, one of the most fundamental aims are preventing, ending, slowing down environmental problems, restoration of earth as much as possible and developing environmental sensitivity and consciousness through national decisions (Duygu, 2008). It is thought that the achievement of these depend upon education on environment.

Human being is a thinking being. One of the factors that positively affect this learning is education. Education is an intentional process that causes changes in human beings life (Demirel, 2003). On the other hand, environmental education helps to build attitudes in order to understand how to protect and improve nature, warn others about environmental problems (Özoğlu, 1993). The most fundamental aim of environmental education is individuals knowing where to gather information about environment and learn where and how to use this knowledge, and creating awareness to understand the significance of this knowledge for the next generations (Nazlıoğlu, 1991). It is thought that the education that is given to pre-service teachers is significant for developing an affective environmental education in schools. That is the reason why in universities pre-service

teachers in science and technology departments have been given courses on environment and environmental education is given. Pre-service teacher's thoughts about the relation between environmental consciousness and Nature-Science and Technology education are quite significant. As a result of that this study aims to investigate whether science and technology pre-service teachers take environment courses, their changing thoughts about the relation between Nature-Science and Technology according to their gender and their consciousness about solving problems on environmental problems.

## PROBLEM SITUATION

The problem sentence of the research is defined as "What are the Science and Technology pre-service teacher's thoughts about the relation between Nature-Science and Technology and their consciousness about solving contemporary problems on environment." The variables are analyzed and sub problems that are related with the variables are given below.

1. **Sub Problem:** "Do pre-service teacher's thoughts about the relation between Nature-Science and Technology and their consciousness about solving contemporary problems on environment causes an obvious change according to their taking environment courses?"
2. **Sub Problem:** "Do pre-service teacher's thoughts about the relation between Nature-Science and Technology and their consciousness about solving contemporary problems on environment causes an obvious change according to their gender?"

## THE METHODOLOGY OF THE RESEARCH

In this research, survey is used as a technique of quantitative research (Çepni, 2007). In survey model, it is aimed to a gather data in order to find out the characteristics of a group that is thought to represent total field under survey (Kothari, 2004; Büyüköztürk, 2009). In relation it is aimed to investigate whether Pre-service teacher's thoughts about the relation between Nature-Science and Technology and their consciousness about solving contemporary problems on environment causes an obvious change according to their gender and their taking environment courses. It is aimed to gather information in relationship with the data that is gathered from the total field under survey.

## PARTICIPANTS

The field of this survey is composed of second and third grade Science and Technology pre-service students in Aegean Region. The sampling of the research is decided through random method and composed of 540 second and third grade pre-service teachers of Adnan Menderes, Celal Bayar, Dokuz Eylül, Mugla Universities Science and Technology Departments. The reason of choosing second and third grade students is their taking environment course while the survey is applied, because 2nd class pre-service teachers haven't taken environment courses and 3rd class pre-service teachers have taken environment courses when applied to scale at the university. The % 37,6' of

the pre-service teachers are studying at Dokuz Eylül, % 27,2 at Celal Bayar, % 22,2'si Mugla and % 13,0'1 Adnan Menderes University. %52, 6 of the pre-service teachers are third graders (who take environment course) and % 47, 4 are second graders (who are not taking environment course).

### **DATA COLLECTION TOOLS**

In the research the survey that is designed for finding out Science and Technology pre-service teachers views on environment and environmental problems is composed of; "Environment consciousness", "Nature-Science-Technology" and "Contemporary issues on Science and Nature" dimensions. As a result of the literature review, according to the Five Point Likert Scale the themes are decided to be written. The prepared survey is presented to experts and according to their views the necessary organizations, corrections are done and while some themes are added to the survey some themes are removed from survey. The final version of the survey is composed of 43 themes of view survey and applied to 540 Science and Technology pre-service teachers to find out their views on environment and environment problems. According to the light of application data, a survey is created that is composed of 21 themes that include the themes that are decided to be wiped out. The reliability of the survey is calculated under the light of the data that is gathered through factor analysis. The sub three parts of the survey is calculated through as The Chronbach's Alpha Reliability Coefficient: Dimension of environment consciousness ( $\alpha$ ) 0,838; Dimension of Science-Technology Relationship ( $\alpha$ ) 0.700 ; Dimension of Contemporary issues on Science and Environment ( $\alpha$ ) 0.724. The Chronbach Reliability Coefficient of the survey is calculated as 0.850.

### **FINDINGS AND INTERPRETATION**

In this part of the study that aims to analyze Pre-service teacher's thoughts about the relation between Nature-Science and Technology and their consciousness about solving contemporary problems on environment causes is reflected through analysis that is the result of data collection tools and is given with tables and the results of the analysis is interpreted.

#### **The Findings and Interpretations of the First Sub Problem**

The first sub problem of the research is defined as "Do pre-service teacher's thoughts about the relation between Nature-Science and Technology and their consciousness about solving contemporary problems on environment causes an obvious change according to their taking environment courses?"

In Table 1 the pre-service teacher's thoughts about the relation between Nature-Science and Technology and their consciousness about solving contemporary problems on environment survey point mean of the interaction between environment, science and technology, the comparison of whether teachers taking environment course is given through unrelated t-test analysis results are reflected.

**Tablo 1.** The Pre-service Teacher's Thoughts about The Comparison of Whether Teachers Taking Environment Course is Given Through Unrelated t-Test Analysis Results

Pre- service Teachers' Opinions about The Interaction Between Environment, Science and Technology of Opinion Survey;	Groups	N	Mean	Std. Deviation	t	P
Dimension of Environment – Science and Technology	Those Who See Environment Education	285	33.32	5.13	0.958	0.338
	Those Who Don't See Environment Education	255	32.94	4.21		
Dimension of Contemporary issues on Science and Environment	Those Who See Environment Education	285	25.44	3.84	2.796	0.005*
	Those Who Don't See Environment Education	255	24.56	3.83		

\*p<0,05 level meaningful

In table 1 it is seen that, as a result of the t-Test analysis that is made to find out the difference between the mean that is gathered from the situation of Pre-service Teachers taking environment course and not taking is whether statistically meaningful or not, it is understood that a meaningful difference is not seen. On the other hand pre-service teacher's consciousness about solving contemporary problems on environment reflects a meaningful difference as a result of the t-test. This difference is in favor of the pre-service teachers who take environment course.

### The Findings and Interpretations of the Second Sub Problem

The second sub problem of the study is defined as "Do pre-service teacher's thoughts about the relation between Nature-Science and Technology and their consciousness about solving contemporary problems on environment causes an obvious change according to their gender?"

In Table 2 t-test results that gives the science and technology pre-service teacher's consciousness about solving contemporary problems on environment and their views on environment in comparison with survey mean points of teacher's views on Science and technology interaction and comparison of thoughts according to gender differences.

**Table 2.** The Pre-service Teacher's Thoughts About The Comparison of Teachers' Gender is Given Through Unrelated t-Test Analysis Results

Pre- service Teachers' Opinions about The Interaction Between Environment, Science and Technology of Opinion Survey;	Groups	N	Mean	Std. Deviation	t	P
<b>Dimension of Environment – Science and Technology</b>	<b>Woman</b>	366	33.59	4.51	3.42	0.001*
	<b>Man</b>	174	32.18	5.01		
<b>Dimension of Contemporary issues on Science and Environment</b>	<b>Woman</b>	366	25.37	3.70	3.23	0.001*
	<b>Man</b>	174	24.28	4.08		

\*p<.05 level meaningful

While analyzing table 2, t-test is used in order to find out whether statistically there is a meaningful mathematical difference in relation with teacher pre-services' views on Environment-Science and Technology relationship. As a result of the t-test it is seen that there is a meaningful difference and this is in favor of the female teacher pre-services. In addition, in table 2, in relation with teacher pre-services' views on their consciousness about solving environment problems, the mean that differs according to gender indicates that there is a meaningful difference. This difference is in favor of female pre-service teachers.

## DISCUSSION, CONCLUSION AND SUGGESTIONS

This study includes the views of second and third grade science and technology teacher pre-services of 2010 – 2011 who are studying at Dokuz Eylül, Mugla, Adnan Menderes and Celal Bayar Universities. In this research it is aimed to analyze whether pre-service teachers views on the relation among Nature-Science and Technology, who are studying at Science and Technology departments, vary in relation with their gender and taking environment course. The first sub problem of the research is defined as: "Do pre-service teacher's thoughts about the relation between Nature-Science and Technology and their consciousness about solving contemporary problems on environment causes a meaningful change according to their taking environment courses?" According to the results, in terms of Nature-Science and Technology Dimension, statistically a meaningful difference is not seen between the pre-service teachers who take environment course and who do not take. This result can be interpreted as pre-service teachers are not much interested in technologies harmful effects to environment while it uplifts the life standards of the individuals. Afacan and Güler (2011) have found out in their study that aims to measure the relation among science, technology and economy in relation with the development of

a country, teachers have some negative attributions and thoughts towards environment courses for a well-balanced environment.

In the first sub problem, in relation with Contemporary issues on the Dimensions of Environment and Science, a meaningful difference occurs in favor of teachers who take environment courses. According to that result, it seen that pre-service teachers who take environment courses follow contemporary issues on environment, and have knowledge about topics on environment-science-technology and at least hold an opinion the interaction among environment-science-technology. However, Kahyaoglu, Daban and Yangin (2008), in their study that is composed of primary school teacher pre-services, indicate that pre-service teachers taking environment courses in high school or in university have higher grades than the ones who do not take. However, this does not create a meaningful difference.

The Second sub problem of the research is defined as: "Do pre-service teacher's thoughts about the relation between Nature-Science and Technology and their consciousness about solving contemporary problems on environment causes an obvious change according to their gender?"

According to the results, a meaningful difference occurs in favor of the female students in two dimensions, in relation with the Dimension of Environment-Science-Technology and Contemporary Issues on Environment and Science. This underlines the fact that female student's consciousness is higher than male students in relation with solving contemporary problems on environment. This can be interpreted as the result of female student's education in family that focuses on house and environment cleaning as a duty of the females and parents bringing up girls much more sensitive to environment. Şama (2003) and Erol and Gezer (2006) have also found out that female students' consciousness on environment is higher than males. Hounshelland and Liggett (1973; Akt: Iozzi, 1989) and Atasoy and Ertürk (2008) have found out that male and female students have environment consciousness and they both have same kind of environment education. However, in spite of these female students have higher consciousness level than males (Iozzi, 1989).

According to the results, the suggestions are;

-In order to create a better environment for living since pre-school education, both male and female education and education milieus should be educated in order to help them to apprehend the relation between environment and science and to follow and suggest solutions to contemporary issues on environment.

-Teachers who will give environment courses should be supported, their sensitivity towards environment should be improved and they should be made conscious of environment (Şahin, Cerrah, Saka and Şahin, 2004). As a result of that, much more environment courses should be given to science and technology pre-service.

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