A CLOSER LOOK INTO TURKISH ELEMENTARY TEACHERS REGARDING EDUCATION FOR SUSTAINABLE DEVELOPMENT

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Approval of the Graduate School of Social Sciences

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ABSTRACT

A CLOSER LOOK INTO TURKISH ELEMENTARY TEACHERS REGARDING EDUCATION FOR SUSTAINABLE DEVELOPMENT

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The main aims of the current study are five fold (1) to develop a valid scale for measuring beliefs about education for sustainable development, (2) to adapt the values on sustainable development scale to the context of Turkey, (3) to explore elementary teachers' familiarity with and understanding of sustainable development, (4) to determine the elementary teachers' values on sustainable development, (5) to investigate their beliefs about education for sustainable development. In addition, the barriers elementary teachers have perceived regarding education for sustainable development, teaching strategies they have used in education for sustainable development and the possible relationship between barriers they have perceived and their beliefs about education for sustainable development was examined.

The data of this study obtained from 211 elementary teachers who enrolled in the Green Pack and the Eco-Schools projects via direct administration and web-survey data collection methods in May to September 2012. The results revealed that Turkish elementary teachers lack of sufficient understandings of sustainable development. On the other hand, elementary teachers have favorable beliefs about

education for sustainable development and favorable values on sustainable development. In addition, lack of the knowledge about sustainable development and lack of the knowledge about teaching sustainable development were relatively common barriers for these elementary teachers. Lastly, negative correlation between elementary teachers' beliefs about education for sustainable development and barriers they have perceived was found.

Keywords: Sustainable Development, Education for Sustainable Development, Beliefs, Values, Elementary Teachers.

ÖZ

TÜRKİYEDEKİ İLKÖĞRETİM ÖĞRETMENLERİNE SÜRDÜRÜLEBİLİR KALKINMA EĞİTİMİ KONUSUNDA YAKINDAN BAKIŞ

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Beş basamaktan oluşan bu çalışmanın temel amaçları, (1) sürdürülebilir kalkınma hakkında inançları ölçmek için geçerli ölçek geliştirmek, (2) sürdürülebilir kalkınma değerleri isimli ölçeği Türkiye şartlarına uyarlamak, (3) ilköğretim öğretmenlerinin sürdürülebilir kalkınmaya yönelik olarak aşinalığını ve anlayışlarını incelemek, (4) ilköğretim öğretmenlerinin sahip oldukları sürdürülebilir kalkınma değerlerini belirlemek, (5) ilköğretim öğretmenlerinin sürdürülebilir kalkınma eğitimi hakkında inançlarını araştırmaktır. Ayrıca, ilköğretim öğretmenlerinin sürdürülebilir kalkınma eğitiminde kullandıkları öğretim yöntemleri, sürdürülebilir kalkınma eğitimindeki engel algıları ve bu engel algılarıyla sürdürülebilir kalkınma eğitimi hakkındaki inançlarının ilişkisi de incelenmiştir.

Bu çalışmanın verileri Eko-Okullar ve Yeşil Kutu projelerine katılan toplam 211 ilköğretim öğretmeninden mayıs – eylül 2012 döneminde elde edilmiş. Analiz sonuçları ilköğretim öğretmenlerinin sürdürülebilir kalkınma anlayışlarının yetersiz olduğunu ortaya çıkarmıştır. Diğer taraftan, ilköğretim öğretmenleri sürdürülebilir kalkınma eğitimi hakkında olumlu inançlara ve olumlu sürdürülebilir kalkınma

değerlerine sahiptirler. Ek olarak, sürdürülebilir kalkınma hakkında bilgi eksikliği ve sürdürülebilir kalkınma öğretimi hakkında bilgi eksikliğini ilköğretim öğretmenleri tarafından yaygın bir şekilde engel olarak algılamaktadırlar. Son olarak, ilköğretim öğretmenlerinin sürdürülebilir kalkınma eğitimi hakkında inançları ve sürdürülebilir kalkınmaya eğitimindeki engel algıları arasında negatif bir ilişki bulunmuştur.

Anahtar Kelimeler: Sürdürülebilir Kalkınma, Sürdürülebilir Kalkınma Eğitimi, İnançlar, Değerler, İlköğretim Öğretmenleri

To My Family

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CHAPTER 1

INTRODUCTION

Many drastic changes have occurred in our planet since the 20th century depending on human activities. Ozone layer depletion, global warming, water shortage, air pollution, deforestation are common examples of environmental changes. In addition to environmental changes; unsanitary conditions, rapid growth of population, famine, and immigration have become a threat to human beings socially and economically. All these problems are mainly resulted from our relationship with the natural world and our efforts for development. Therefore, a strategy should assure both natural balance and development to provide equal opportunity and prosperity for everyone (United Nation Conference on Environment and Development, 1992). A type of development model entitled "sustainable development" emerged as a consequence of this need. Sustainable development contains two goals; "development" refers to economic and social goals, and "sustainability" refers to ecological goal (Baker, 2006). In addition, sustainable development underlines links between environment, society and economy (World Commission on Environment and Development, 1987). For instance, extensive energy demand of industry triggers needs for new dams. Construction of these dams causes deforestation and immigration of people living in that area. Although constructing new dams assure economic development, it influences both environment and society. Therefore, sustainable development is a model, which provides integration of social, environmental and economic considerations.

UNESCO (2005) describes sustainable development in terms of three key aspects. These three aspects of sustainable development are stated as;

Society: "An understanding of social institutions and their role in change and development, as well as the democratic and participatory systems which give opportunity for the expression of opinion, the selection of governments, the forging of consensus and the resolution of differences."

Environment: “An awareness of the resources and fragility of the physical environment and the effects on it of human activity and decisions, with a commitment to factoring environmental concerns into social and economic policy development.”

Economy: “A sensitivity to the limits and potential of economic growth and their impact on society and on the environment, with a commitment to assess personal and societal levels of consumption out of concern for the environment and for social justice” (p. 5).

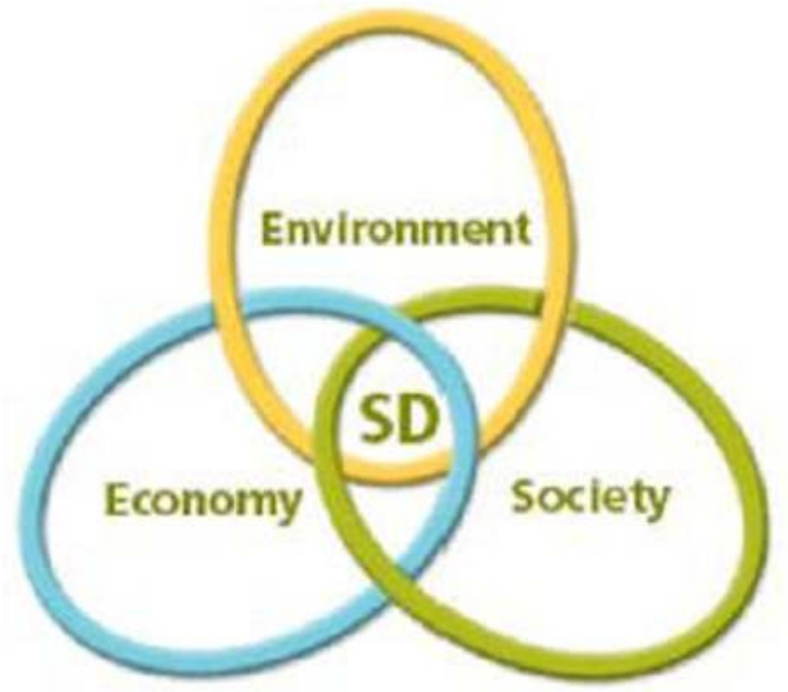

Figure 1.1 Three aspects of sustainable development

As it is presented in Figure1.1, three components of sustainable development are integrated into each other. Haubrich, Reinfried and Schleicher (2007) clarify sustainability of each component. Accordingly, sustainable development of environment means controlling both the consumption rates of natural sources and activities harmful for environment. Sustainable development of economy refers to equal job opportunity for citizens and the goal of increasing life standards. Lastly, sustainable development of society is described as an equal life chance for people. As a result, sustainable development is formed with environmental,

economic and societal sustainability which means changing lifestyles, consumption patterns and produce manufacturing process.

Since it is at the same time a social project, there are researchers who focus on the social concerns related to sustainable development. For instance, According to Gough (2002), sustainable development has been portrayed as directing natural sources reasonably for constant economic development while protecting human health and well-being. Therefore, sustainable development supports society's culture, economy and social aspects, and supports nature in terms of ecology (Altunbaş, 2002).

Beyond having social, economic and environmental aspects, sustainable development is a political concept. Some commentators (e.g., O'Riordan 1985; Jacobs 1995) of sustainable development are of the opinion that sustainable development is a reflection coalescence of some political concepts such as democracy, liberty and social justice. In addition to this idea, sustainable development assures balance between different approaches such as anthropocentric and eco-centric positions. While politics stemming from the anthropocentric approaches focuses on economic growth and ignores environment, the eco-centric approaches focus on small-scale community and limited usage of natural sources. However, the central point of sustainable development is neither economic growth nor the environment. The main motivation for sustainable development is human welfare, therefore both the protection of nature and economic growth are important. Accordingly, economy and social policies handle environmental policies in all steps of sustainable development.

Hopwood, Mellor and O'Brien (2005) argue that although the common term sustainable development is used by many people, there are variety of meanings, methods and goals related to this concept. These differentiations result from the complexity of issues concerning environment and development (Meadowcroft, 1999). For that reason instead of defining sustainable development, Sauvé (1996) emphasizes the necessity of possible outcomes. For instance, Scott and Gough (2004)

mention lifelong learning, which is seen as a one of the basic outcome of sustainable development.

In order to understand the necessity of sustainable development, unsustainable conditions of the world should be taken into consideration. Examination of scientific researches, data and evidences assures the variety of clues concerning the necessity of sustainable development. For instance, when compared to the beginning of the 20th century, today the world is 0.75 ^{0}C warmer. Human activities are accepted as a basic reason for this increase. Burning fossil fuels, deforestation and manufacturing cement and other similar human activities raise carbon emission. High concentration of carbon and other greenhouse gasses in the world's atmosphere cause global warming and then climate change. Consequently, people will face with natural disasters, sea level rise and change in temperature of the planet. Unfortunately, it is reported that only 2.5 % people aware of climate change and its possible negative effects in the worldwide (UNDP, 2011).

Examination of recent reports indicates that the number of the people affected by poor water sources and insufficient sanitation are much greater than people affected by wars and similar violence. According to World Health Organization (WHO), 11% of the world still could not access any types of water supply. In terms of basic sanitation, 38% of the world population could not have these facilities. Inappropriate sanitation conditions, lack of hygiene and unsafe water increase the number of the people suffer from diarrhoea, schistosomiasis, trachoma and intestinal helminths. These infectious diseases unfortunately end up with death particularly in Africa and some part of South-East Asia (WHO, 2012).

As to education, one of the fundamental human rights, it is estimated 67 million primary school age children in all over the world devoid of any opportunity to carry on their education. More than half of these children live in Africa, the south and west of Asia. . Insufficient incomes, child labours, natural disasters, migrations, gender and many other factors are pointed as reasons for this problem. Considering the schools' roles in protecting children, fighting towards famine, disease and socialization, the importance of education become more obvious (UNESCO, 2011).

In addition to these problems, extinction of species, unfair distribution of wealth, different types of pollutions and deforestation can be exemplify for unsustainable conditions of our planet. Taking into account of all these phenomena; it is revealed that issues are generally linked to the ecology or socioeconomic structures. Therefore sustainable development has been emerged as a comprehensive solution for both ecological and socioeconomic challenges.

Since education is a unique way to change human behaviour, to develop reasoning and judgment abilities and to teach concepts, all these unsustainable conditions can be eliminated by means of education. There are many commentators of sustainable development supporting this idea. For example, McKeown (2002) and Wingerter (2000) pointed out unsustainable condition of current development tendencies and emphasized the role of the public awareness, education, and training for acting in a sustainable way. Furthermore, Agenda 21, well known action plan for sustainable development declared by the United Nations, also emphasizes the importance of education. According to the report, education promotes sustainable development and improves understanding of individuals concerning environment and development issues (UNCED, 1992).

Council for Environmental Education (1998) describes education for sustainable development as a way to improve humans' knowledge, values, and skills in order to improve the life standards without damaging the planet. However, classic environmental education is limited to achieve these goals (Taylor, Nathan and Coll, 2003). In addition, Rost (2002) stated that environmental education lacks motivating students, overcome complexities, values education, system thinking, creating goals, and developing skills and comprehensive knowledge (as cited in Özdemir, 2007). In this context, the present study focused on education for sustainable development instead of environmental education.

Education for sustainable development corresponds to more than knowledge of social, environment and economy aspects. It also contains values, problem solving skills, critical thinking skills, and local and global viewpoints towards issues. Moreover, education for sustainable development focuses on the importance of

democracy and participation of people in democratic societies. Thus, McKeown (2002) stated five components of education for sustainable development which are knowledge, skills, perspectives, values, and issues. These components are clarified as the following.

Knowledge: Since sustainable development includes mutual effects of environment, society, fundamental knowledge sources for ESD base from natural sciences, social sciences, humanities and economics.

Issues: Education for sustainable development generally focuses on problems which are threats for future of our planet. These issues are very complex since environmental, economic and social aspects of sustainable development integrate each other.

Skills: Education for sustainable development should assure some skills, which contributed lifelong learning, and sustainable livelihood and life styles. With respect to Byrne (2000), these skills are “analysis skills”, “communication skills”, “cooperation skills”, “deep thinking skills”, “decision making skills”, “use of appropriate technology skills”, “planning skills”, “action taking skills”, “conflict management skills” and “multiple perspective skills”.

Perspectives: There are different perspectives of towards sustainable development; therefore, issues are examined taking into account different perspectives and viewpoints.

Values: Values are important part of education for sustainable development, since they contributed to a sustainable future. Understanding values of other people assure understanding of different viewpoints and different perspectives.

It is revealed that implementation of education for sustainable development is not easy considering different characteristic of ESD. To achieve successful implementation of education for sustainable development, teachers should have some specific competencies. According to Curriculum Sustainable Development Competences Teacher Training Project (CSCT), knowledge, system thinking,

emotions, values and ethics, and action are five domains related teacher competencies.

Teachers' knowledge domains stem from three sources. The first is content knowledge, which refers to understanding of sustainable development and knowledge about challenges such as environmental pollutions, deforestation, etc. The second of them is not directly related to sustainable development. It is entitled as pedagogical knowledge, which refers to teachers' knowledge about teaching methods. The last is pedagogical content knowledge, which refers to transforming specific content concerning sustainable development to the student via using appropriate teaching strategies.

Values are defined as "the principles and fundamental convictions which act as general guides to behaviour, the standards by which particular actions are judged as good or desirable" (Halstead, Taylor, & Taylor, 2000). In other words, values specify rights and wrongs. Therefore, acting right refers to ethical behaviors and acting wrong refers to unethical behaviors (CSCD, 2004). Values are also an important component of sustainable development. It is stressed that change in the human values is a requirement for reaching goals of the sustainable development (National Research Council, 1999). In this vein, teachers have a crucial mission to promote human values on sustainable development. Therefore, teachers should have some competences regarding values. Basically, they should be aware of their own values. In addition, teachers should be a role model for values and they should be able to help students develop their values (CSCD, 2004).

Sustainable development is constituted with three systems such as society, economy and environment. These three systems include many sub-systems, which are associated with each other (Wheeler, 2000). According to Vester (2004), system thinking which refers to examining links between elements of the systems is necessary in order to understand the complex structure of sustainable development. (as cited in CSCD, 2004). With respect to teachers, they should be able to examine interactions, relationships and influences of systems associated with their pedagogy.

Another component for teachers is emotions which are described as "rapidly-changing states of feeling experienced consciously or occurring preconsciously or unconsciously during activities" (DeBellis & Goldin, 2006). As to education for sustainable development, teachers should have abilities to improve students' motivation on cultural, economic, ecological and social issues. In addition, teachers should design independent classroom environment so that students develop their own values (CSCD, 2004).

The last teacher competence of education for sustainable development is the action. This domain merges previous four competences. In other words, teachers use their values, knowledge, emotions and system thinking abilities for acting. In a classroom environment, teachers are supposed to create local or global action opportunities for students.

Considering these five competencies for education for sustainable development, it is emerged that teacher values on sustainable development are one of the crucial components. Favorable values of teachers are a necessity in order to promote sustainable development via formal education system. Therefore, it is important to explore teachers' values on sustainable development.

Although it is not a part of competencies, teacher beliefs are also important for education for sustainable development. Previous studies emphasized that teachers' beliefs influence their classroom activities, learning and teaching process (Richardson 1996; Thompson 1984; Pajares 1992). In general, beliefs have cognitive, affective and behavioural components, influence knowledge, acts and feelings (Johnson, 1999). According to Pajarez (1992) all teachers have beliefs concerning their teaching, their students, their studying fields and their responsibilities. In addition, these beliefs influence students' learning (Orton, 1996). Teachers' beliefs regarding sustainable development are also important, since teachers are agent for supporting community participation to sustainable development (Taylor, Nathan and Coll, 2003).

As emphasized earlier, sustainable development includes controversial issues and complex system; therefore, teachers need a wide range of teaching approaches for education for sustainable development. With respect to Cotton and Winter (2010), strategies for sustainable development should support students' active and experiential learning, interdisciplinarity and locality. In previous studies (eg., Björneloo 2004; Corney and Reid 2007; Corney 2006; Englund 2006; Warburton 2003) many strategies are suggested for education for sustainable development. Role-plays, simulations, group discussions, stimulus activities, debates, critical incidents, value-based learning, case studies, problem based learning, and fieldworks are prominent strategies for education for sustainable development. The common points of these strategies are that they are learner-centered and interactive. Therefore, they help students improve their skills for sustainable development (Cotton & Winter 2010). All these different approaches and strategies on education for sustainable development require remarkable preparation time, which leads to limitation for education for sustainable development. Barriers teachers face are not limited by lack of time. The studies (e.g., Corney 2006, and Summers, Childs, & Corney, 2005) point out that teachers perceive lack of knowledge, lack of supports of the heads of the schools, inconsistency between teaching academic fields and sustainable development, and their personal characteristics as a barrier towards education for sustainable development. To overcome these barriers, non-governmental organizations such as Turkish Environmental Education Foundation and The Regional Environmental Center (REC) contributed to not only students' improvements but also teachers' professional repertoire. For instance, Green Pack Project includes materials which involve syllabuses for teachers' use, games, information documents for students, and visual materials for education for sustainable development. Teachers are informed how to use these documents and how to integrate them their own lessons. In addition content of the Eco-School project assures cooperation between teachers and manager of schools, and school and private and public sectors.

Taking into account the literature review, the role of the teachers for education for sustainable development is underlined. Therefore, current study

focuses on elementary teachers. It is stressed that values on sustainable development is important to reach goals of sustainable development, and values are one of the teachers' competence for education for sustainable development. On the other hands, the literature review indicates that teachers' beliefs are an indicator about teacher's classroom activities. Therefore, elementary teachers' beliefs about education for sustainable development and their values on sustainable development is a major concern of the current study.

In addition to elementary teachers' beliefs about education for sustainable development and values on sustainable development, teaching strategies elementary teachers have used and barriers they have perceived regarding education for sustainable development are also investigated.

1.1 Purpose of the Study

The aims of the current study are (1) to develop a valid scale for measuring beliefs about education for sustainable development, (2) to adapt the values on sustainable development scale to context of Turkey, (3) to explore elementary teachers' familiarity with and understanding of sustainable development, (4) to determine the elementary teachers' values on sustainable development [VSD], (5) to investigate their beliefs about education for sustainable development [BESD]. In addition, the present study also aims (6) to investigate barriers they have perceived in terms of education for sustainable development, (7) to explore strategies they have used for education for sustainable development and (8) to examine possible relationship between barriers elementary teacher have perceived and their beliefs about education for sustainable development.

1.2 Research Questions and Hypothesis

Research questions of the current study are;

1. How familiar are Turkish elementary teachers with the term 'sustainable development'?

2. What are Turkish elementary teachers' understandings of sustainable development?
3. What are Turkish elementary teachers' values on sustainable development (VSD)?
4. What are Turkish elementary teachers' beliefs about education for sustainable development (BESD)?
5. Which strategies have been preferred by Turkish elementary teachers in terms of education for sustainable development?
6. Which contextual variables have been perceived as barriers by Turkish elementary teachers?
7. Is there a statistically significant relationship between Turkish elementary teachers' beliefs about education for sustainable development and the barriers they have perceived in terms of education for sustainable development?

H_o: There is no statistically significant relationship between Turkish elementary teachers' beliefs about education for sustainable development and the barriers they have perceived in terms of education for sustainable development.

1.3 Definitions of Important Terms

Sustainable Development: "The development that meets the needs of the future generation without compromising the ability of future generation to meet their own needs" (WCED, 1987).

Education for Sustainable Development (ESD): "All aspects of public awareness, education and training provided to create or enhance an understanding of the linkages among the issues of sustainable development and to develop the knowledge, skills, perspectives and values that will empower people of all ages to assume responsibility for creating sustainable futures" (Ravindranath, 2007).

Values: "the principles and fundamental convictions which act as general guides to behaviour, the standards by which particular actions are judged as good or desirable" (Halstead, Taylor, & Taylor, 2000). In the current study, values

refer to fundamental values of sustainable development (freedom, solidarity, respect for nature, shared responsibility, equality and tolerance), which held by elementary teachers. These values are determined considering elementary teacher's judgement about specific sustainable and unsustainable situations, which is directed via values on the sustainable development instrument.

Beliefs: "beliefs are thought of as psychologically held understandings, promises, or propositions about the world that are felt to be true" (Richardson, 1996). In this study, beliefs refer to elementary teachers thought about education for sustainable development. The Beliefs about Education for Sustainable Development Instrument was utilized to measure beliefs.

Elementary Teachers: Elementary teachers work as educators in the fields of psychical education, religious culture, science and technology, foreign language, music, elementary mathematic, pre-school, counseling, social science, classroom teaching, Turkish language, information technology, technology design and visual arts teachers in public and private schools in Turkey.

Perceived Barriers: The factors influence teachers' decision not to carry out education for sustainable development.

1.4 Significance of the Study

The Brundtland Report specifies teachers' roles as making essential social changes for achieving goals of sustainable development (WCED, 1987). Therefore, all teachers have responsibilities to reflect issues concerning sustainable development in their teaching fields. In the present study, elementary teachers' values on sustainable development are examined since teachers' values act protecting ecological sources, acquiring wide perspective social and environmental justice and improving their pedagogical skills or knowledge associated with sustainable development (Huckle, 2003). In addition, teachers should have values of sustainable development to teach these values or to be a role model for their students. Therefore, analysis of the elementary teachers' values on sustainable development is an indicator of efficacy of teachers in terms of education for sustainable development.

On the other hand, Thomson (1992) is of the opinion that teachers' awareness of their values guides them in designing their activity. In this regard, the results of this study also give opportunity to teachers organize their classroom activities in terms of sustainable development.

Since previous studies point out the importance of belief construct with regards to education, worth of teacher beliefs about ESD could not be ignored. For instance, some of the studies (e.g., Cronin-Jones, 1991; Mitchener & Anderson, 1989) indicate that there is a significant relationship between teachers' beliefs and teaching practices of teachers. In other words, teachers' beliefs are significant predictors for their teaching activity in their classroom (Thompson, 1984; Pajares, 1992; Richardson 1996; Beck, Czerniak, & Lumpe, 2000; Haney, Lumpe, & Czerniak, 2003; Boz & Uzuntiryaki 2006). In addition, teachers' beliefs could be regarded as an important factor in students' learning. There are many research studies conducted to examine teachers' beliefs and their roles in teaching (e.g., Boz & Uzuntiryaki, 2006; Bryan & Abell, 1999; Hashweh, 1996; Lantz & Kass 1987; Richardson, 1996). The result of these researches indicates that teachers' beliefs influence teaching and learning process profoundly. However number of the studies concerning beliefs on education for sustainable development is limited. These limited number of studies cover mainly environmental sustainability (Tuncer, Tekkaya, & Sungur, 2006); pre-service teachers or university lecturers (e.g., Winter & Firth, 2007; Qablan, Al-Ruz, Khasawneh, & Al-Omar, 2009); closely-related constructs such as views and perceptions, etc. instead of beliefs (e.g., Keleş, 2011; Spiropoulou, Antonakaki, Kontaxaki, & Bouras, 2007). These results reveal that there is a need exploring teacher's beliefs on education for sustainable development which includes a holistic treatment. Furthermore, the result of the present study reveals how efficient the training of education for sustainable development is.

Education for sustainable development concerns with developing students' skills and values as well as their knowledge. Therefore student centered activities are more appropriate than traditional teaching strategies for education for sustainable development. Since one of the objectives of this study to explore teaching strategies

elementary teachers have used, findings are helpful to predict both elementary teachers pedagogical content knowledge in terms of education for sustainable development and implementation of sustainable development in their own lessons. Moreover, it is expected that findings are also indicated for sufficiency of teaching training programs in regards education for sustainable development.

Since sustainable development has a complex and interdisciplinary system, teachers face different type of barriers towards education for sustainable development. In this study, elementary teachers' perceived barriers were measured. Therefore, the findings of this measurement can be useful for ministry of national education and school managers to remove possible obstacles from education environment.

Lastly, since a comprehensive change occurs in education system in Turkey, it is expected that information about teachers' values and beliefs would be functional for curriculum planer and Secretary of National Education for designing a new education system and curriculum in terms of sustainable development.

CHAPTER 2

LITREATURE REVIEW

This chapter includes theoretical background about sustainable development (SD), education for sustainable development (ESD) and examinations of psychological constructs such as beliefs and values in terms of SD.

2.1 The Term "Sustainable Development"

Before starting, it is useful to differentiate between "sustainable development" and related term "sustainability". According to Reboratti (1999), "sustainability" is based from ecology and means maintainability of an ecosystem over time (as cited in Baker, 2006). Using "development" with "sustainability" changes focus point of the concept from ecology to society (Porter, 2000). Therefore, meaning of sustainable development implies balanced social and economic growth without externalizing environmental considerations (Porter, 2000). Similar to these ideas, O'Riordan (1993) emphasizes that sustainable development focusses on primarily on development while sustainability focusses on environmental (as cited in Dresner, 2002). Since these two terms are used interchangeably in the literature (Scott, & Gough, 2004) the phrase "sustainability" is also used in quotations, citations and paraphrases of current literature review. However; each term refers to sustainable development which includes social, economic and environmental dimensions.

There are many definitions cited about sustainable development. However, the most commonly used definition, which was declared by Brundtland Report, is "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs". The other definitions about sustainable development focus on specific dimensions, such as economy, environment or reflect different viewpoints. For instance; energy-

efficiency is the main concern for definition of Elkin et al. (1991; cited in Williams, Burton and Jenks, 2000). Jacobs (1991) focus on protecting the environment from damages and provide an equal consumption possibility (as cited in Human Settlements Development and Policy, 1996). Furthermore, Rezende (1993) clarifies sustainable development with public participation and the nonexistence of centralist democracy (as cited in Doğru, 2006). In respect of Pearce and his colleagues (1989) viewpoint, the term "non-declining capital" defines sustainable development (as cited in Dresner, 2002), which reflects an economic viewpoint.

2.2 A Brief History of Sustainable Development

Great number of sources related to sustainable development overlooked history of the sustainable development. In addition, many of them addressed this concept as if it was first emerged with Brundtland Commission's report in 1987. However, sustainable development is an older idea than it is predicted. Some of the forestry practices in seventeenth-century and land management in colonies can be accepted as a primitive stage of sustainable development (Mittler, 2001). Afterwards, Malthus (1766-1834) and William Stanley Jevons (1835-1882)'s concerns about famine, population growth are highlights of eighteenth and nineteenth century (Baker, 2006). However, sustainable development has become a more attractive issue since 1980s, especially after the report of Brundtland Commissions in 1987. Politicians, planners and academic studies have taken an interest on this concept (Mittler, 2001).

Before Brundtland Commission's report in 1987, which is the prominent event of its term, there were some other important international attempts towards sustainable development. In 1972, Club of Rome report (known as Limit to Growth) and The United Nations Conference on Human and Environmental (known as Stockholm Conference), and in 1980, World Conservation Strategy (IUCN) was featured movement of that period.

Club Rome which was established by a group of people from the fields of academia, civil society, and diplomacy published results of their research entitled

"Limits to Growth". This study contributed to be taken attention environmental issues by indicating quite strong association among environment and economic development. Industrialization, food production, world population, pollution and food depletion were five challenges overstressed in terms of future of the world. It was emphasized that in case of progression of current development tendency, possible environmental problems and food shortage would cause the end of human beings (Bozloğan, 2005).

One step beyond, United Nations arranged United Nations Human and Environment Conference (Stockholm Conference), which was accepted as the beginning point of international cooperation towards environment in 1972. Utilizing natural sources, association between environment and development, planning and management of the human settlements, relationship between industrializing countries, and identifying and controlling environmental pollutions were some prominent issues (United Nation Environment Programme, 1972). Consequently, two ideas came to light in this conference. The first, poverty was a reason for environmental problems and the second, scientific or technological knowledge could be solution to overcome challenges people face (Baker, 2006). In addition, thanks to this conference environmental problems have become more popular in the world agenda (Bozloğan, 2005).

In 1983, World Commission on Environment and Development (WCED) including participations from twenty different countries assembled via request of the Secretary of the United Nations. This assembly resulted with a declaration called as Our Common Future which was also known as the Brundtland Report in 1987 (Bozloğan, 2005). The Brundtland Report concerned with some issues such as, energy, food security, nongovernmental organization, environmental problems, urbanization, industrialization, citizen participation, and international collaboration in terms of sustainable development. It was not only focusing on issues associated environment and development issues; but also suggest solutions and frameworks to achieve changes people need.

Our Common Future is an important cornerstone in history of sustainable development. It is the first report that indicates social, economic and ecological dimension of sustainable development. This declaration assured concordance between 1960's developmental ideology and 1970's environmental ideology (Tekeli, 1996). To put it another way, sustainable development reflected the perspective of overcoming environmental degradation without ignoring needs for development.

Another important year for progression of the sustainable development concept was 1992. United Nations Conference on Environment and Development, also known as the Rio Earth Summit, arranged in Rio de Janeiro, Brazil. Great number of delegates from 178 different countries participated this conference. There were two main subjects discussed; the first, association between development and environment, which also caused conflicts between environmental concerns and social, economic needs; the second, issues originated from implementation of sustainable development. The conference resulted with the agreement on five documents which were published as, "The Rio Declaration on Environmental and Development", "Agenda 21", "The UN Framework Convention on Climate Change (UNFCCC)", "The UN Convention on Biological Diversity (CBD)" and "The Forest Principles".

The Rio Declaration on Environment and Development includes twenty-seven principles which were mainly dealing with the role of women, cooperation between states and individuals and integration of the environment to development process. Furthermore, it is stressed that developing and least developed countries should have equal opportunity to reach world standards. Although Agenda 21 involved similar conceptual points implied in the Rio Declaration on Environment and Development, it was also an action plan and explained how to integrate sustainable development to current social tendencies.

At the beginning of Agenda 21, basic factors that underlie unsustainable development were introduced. It was emphasized that factors such as excessive consumption tendency in developed countries and production patterns were considerably associated issues with unsustainable conditions. Following this

perspective, a comprehensive action plan considering not only preserving natural sources but also proceeding development was suggested to overcome these issues (Baker, 2006). Furthermore; importance of citizen participation and social groups' activities were emphasized in this action plan.

Agenda 21 was consisted of four section and forty chapters. Main keywords which describe these chapters were tabulated below.

Table 2.1

Issues in Agenda 21

Section 1 – Social and Economic Dimensions (chapters 2-8)
International cooperation, Combating poverty, Changing consumption patterns, Population and sustainability, Protecting and promoting human health, Sustainable human settlements, Making decisions for sustainable development.
Section 2 - Conservation & Management of Resources (chapters 9-22)
Protecting the atmosphere, Managing land sustainably, Combating deforestation, Combating desertification and drought, Sustainable mountain development, Sustainable agriculture and rural development, Conservation of biological diversity, Management of biotechnology, Protecting and managing the oceans, Protecting and managing fresh water, Safer use of toxic chemicals, Managing hazardous wastes, Managing solid waste and sewage, Managing radioactive wastes.
Section 3 - Strengthening the Role of Major Groups (chapters 23-32)
Women in sustainable development, Children and youth, Indigenous people, Partnerships with NGOs, Local authorities, Workers and trade unions, Business and industry, Scientists and technologists, Strengthening the role of farmers.
Section 4 - Means of Implementation (chapters 33-40)
Financing sustainable development; Technology transfer; Science for sustainable development; Education, awareness and training; Creating capacity for sustainable development; Organizing for sustainable development, International law; and Information for decision making.

In spite of the fact that Agenda 21 pointed out many of the vital global issues, one of the chapters was dedicated to locality. Thus, that chapter was called as local agenda and the common motto "think globally, act locally" originated from this perspective. More specifically, local authorities were regarded as a crucial agent for promoting sustainable development. Proceeding local economic, social and environmental structures, accommodating national policies and regulation with local implementation planning and controlling development of urban areas and educating and mobilizing citizen were some of the important responsibilities of local authorities, which were emphasized in Agenda 21 (UNCED, 1992).

Ten years later from Rio Conferences, Johannesburg, the biggest city in South African Republics, was prepared for a new conference. World Summit on Sustainable Development (WSSD) was held with the aim of evaluating that ten year period, discussing difficulties of implementation of sustainable development, sharing experiences and determining new strategies for the future. The WSSD was the biggest organization of UN until that moment. Besides twelve thousand six hundred twenty five government agents from over a hundred different countries, there were many individuals from agents of local governments, non-governmental organization and private sectors. Basically, two international documents; Johannesburg Declaration on Sustainable Development and Johannesburg Plan of Implementation were accepted at the end of this conference.

More recently, United Nations General Assembly organized a conference on sustainable development, which took a place in Brazil in June 2012. The conference focused on three objectives; political commitments, evaluation of progress between 1992 to 2012, and examining implementation on sustainable development. It is emphasized that seven areas such as decent jobs, energy, sustainable cities, food security and sustainable agriculture, water, oceans, and disaster readiness should have priority for sustainable development.

2.3 Values of Sustainable Development

The term values are defined as “dominating force in one’s life” (Schwartz & Bilsky, 1987). In respect to Rokeach (1973) viewpoint, values are specific type of beliefs, which shapes people or society’s perceptions towards life. Thus, values are directing our goals and provide norms to evaluate behaviours as normal or abnormal. They assure taking a position with regards to political, social, ideological or religious issues (Lakoff, 2002).

Schwartz and Blisky (1987) summarized researches towards values in three categories. In the first category, the values were received as an independent variable and impact of values on attitudes and behaviors were examined. In the second category, researchers tried to predict the effects of different socio-economic and socio-demographic on values. In the last category, values were compared among different cultures in terms of their existence, importance and association with other constructs.

In respect to Rokeach viewpoint (1973), who is the studies impact of values on other constructs, is of the opinion that when a new value was acquired, it is combined with value system which is resistance to change. Furthermore, attitudes and behaviours are associated with this system. Therefore, individuals’ behaviours and attitudes could be shaped by means of value changes. Considering sustainable development, researchers emphasize that change in human values is necessary to achieve the goal of sustainable development. Value change helps humanity to define and direct their goals and hold favorable attitudes towards sustainable development. In addition, it assures desirable actions of individuals, societies and organizations in terms of sustainable development (Leiserowitz, Kates, & Paris, 2006; Saifi & Drake, 2008).

According to Leiserowitz et al. (2006), there are five major efforts to clarify directly or indirectly defining values of sustainable development. Accordingly, two reports of U.S. National Academy of Science, Earth Charter, the United Nations Millennium Declaration and the Great Transition Scenario are presented as major

studies. Among them, according to Reports of U.S. National Academy of Science emphasized that change in human values depends on critical evidences of periods and condition of geographical region. For instance, World War II, nuclear armament, cold war or special condition of the Middle East and Africa is suitable for observing some cases and determining values. According to this report, although values on sustainable development have changed in the long term, four of them namely; peace, development, freedom and environment exist over time.

The second report of U.S. National Academy of Science analysis goals of sustainable development stems from conflicts between development and environment. Thus, goals and values of the sustainable development are divided two categories which include answers of "what is to be sustained" and "what is to be developed". As it is seen in the table 2.2 table in following page, six major groups reflect values of sustainable development.

Table 2.2

Values of Sustainable Development with respect to U.S. National Academy of Science

What is to be sustained:	What is to be developed:
	People
Nature	Child Survival
Earth	Life Expectancy
Biodiversity	Education
Ecosystems	Equity
	Equal Opportunity
Life Support	**Economy**
Ecosystem Services	Wealth
Resources	Ductive Sectors
Environment	Consumption
Community	**Society**
Cultures	Institutions
Groups	Social Capital
Places	States
	Regions

The third effort to determine values of sustainable development is the study of the Earth Charter Initiative. The declaration of "Fundamental Principles for Building a just, Sustainable, and Peaceful Global Society in the 21st Century" includes sets of values originated mainly from contemporary science, international law, the wisdom of the world's great religions and philosophical traditions (WCED, 1987). All these values are ordered four level entitled as community of life; ecological integrity; social and economic justice; and democracy, nonviolence, and peace.

United Nations put forward The Millennium Development Goals report in 2000. It includes eight international goals which include twenty-one targets. To

achieve these goals, six values and related objectives were determined as listed in table 2.3 in the following page.

Table 2.3

Values of Sustainable Development with respect to The Millennium Declaration

• **Freedom and Democracy.** Men and women have the right to live their lives and raise their children in dignity, free from hunger and from the fear of violence, oppression or injustice. Democratic and participatory governance based on the will of the people best assures these rights.
• **Equality.** No individual and no nation must be denied the opportunity to benefit from development. The equal rights and opportunities of women and men must be assured.
• **Solidarity.** Global challenges must be managed in a way that distributes the costs and burdens fairly in accordance with basic principles of equity and social justice. Those who suffer or who benefit least deserve help from those who benefit most.
• **Tolerance.** Human beings must respect one another, in all their diversity of belief, culture and language. Differences within and between societies should be neither feared nor repressed, but cherished as a precious asset of humanity. A culture of peace and dialogue among all civilizations should be actively promoted.
• **Respect for nature.** Prudence must be shown in the management of all living species and natural resources, in accordance with the precepts of sustainable development. Only in this way can the immeasurable riches provided to us by nature be preserved and passed on to our descendants. The current unsustainable patterns of production and consumption must be changed in the interest of our future welfare and that of our descendants.
• **Shared responsibility.** Responsibility for managing worldwide economic and social development, as well as threats to international peace and security, must be shared among the nations of the world and should be exercised multilaterally. As the most universal and most representative organization in the world, the United Nations must play the central role.

The last effort is The Global Scenario Group's The Great Transition scenario which highlights the importance of value change. "Material sufficiency for human needs", "a nonmaterial realization of the good life," and "shared responsibility for both human communities and nature" are determined values of sustainable development.

Although five different approaches are examined in this section, The United Nationals Millennium Declaration (2000) is unique. Only this declaration has explicit and well defined values titled as "fundamental values of sustainable development". Therefore, the perspective of this declaration is adopted to this research about teachers' values on sustainable development.

2.4 Education for Sustainable Development

Wheeler (2000) states that understanding characteristic of sustainable development is a widespread study among many researchers. Three characteristics which are "system thinking", "interconnections" and "multiples perspectives" are generally mentioned to explain sustainable development. Sustainable development includes mainly three systems which are environment, economy and society. Furthermore, there are many subsystems under these systems. Thus, system thinking assures better understandings. All these systems have varieties of interconnections each other. People have different perceptions, observation or interpretations in terms of these interconnections. That is the reason why sustainable development has multiple perspectives.

All these systems, interactions and perspectives indicates how sustainable development is a complex system for both understanding and applying. Thus, this system needs more comprehensive approaches for learning, teaching and research. As Funtowicz and Ravetz (2008) states;

"These new problems are characteristic of complex systems. These are not necessarily complicated; they involve interrelated subsystems at a variety of scale levels and of a variety of kinds. Thus we know that every technology is embedded in its societal and natural contexts, and that nature itself is shaped by its interactions

with humanity. In such complex systems, there can be no single privileged points of view for measurement, analysis and evaluation".

In this respect; education for sustainable development represent a continuous learning process in which learners' use systematic, creative thinking towards action for sustainable development (UNECE, 2005).

In general terms, education for sustainable development refers to prepare individuals for their basic needs in the direction of well-being. Put it differently, individuals, communities and countries make decisions in favour of sustainable development via education (UNECE, 2005). Achieving environmental and ethical awareness, enhancing values, positive attitudes, skills and intended behaviours rises as products of this education.

Formal education, public awareness and trainings are three branches of implementation of education for sustainable development (UNCED, 1992). Formal education is accepted as essential part of the education for sustainable development. Students acquire appropriate knowledge and change their attitudes and behaviors via this process (UNECE, 2005). Similarly, Wheeler (2005) is of the opinion that students should be equipped with the following competencies as a consequence of education for sustainable development.

- A deep understanding of complex environmental, economic, and social system;
- Recognition of the importance of the interconnectedness of these systems in a sustainable world;
- Respect for diversity of "points of view" and interpretations of complex issues of cultural, racial, religious, ethnic, regional, and intergenerational perspectives.

On the other hands, informal education is a complement of formal education. Informal education contributes to lifelong learning, participation of a great number of community and more learner centeredness actives. It also ensures learning environment in the workplace for employers and employees. Due to different

characteristic of these educations, it is suggested that all forms of ESD should be utilized (UNECE, 2005).

Characteristics, competencies and standards are widespread terms in order to describe education for sustainable development. For instance; according to the framework for the UNDESD international implementation scheme (2006) the existence of some high-level learning and teaching characteristics is an obligation for ESD. Thus, ESD provides satisfactory outcomes and improve quality of education. For this purpose, seven features are determined and clarified as;

"Interdisciplinary and holistic": All branches of education should include sustainable development. As well as their curriculums should be designed for this purpose.

"Value-driven": Values underlie sustainable development should integrate process of education and they should be obvious for further examination of them.

"Critical thinking and problem solving": It is requirement for dealing with conflicts and dilemmas of sustainable development.

"Multi-method": Since sustainable development has multi-disciplinary characteristics, different teaching, approaches, techniques and methods should be preferred for reflecting these features of sustainable development.

"Participatory decision-making": Learners actively participle learning process and design their own learning.

"Applicability": Interaction between learners' daily life and education should be provided.

"Locally relevant": Not only global issues but also local challenges should be represented considering learners common language.

According to de Haan (2006), education for sustainable development should include three fundamental characteristics. The first, interdisciplinary learning which refers suggest more than specialized fields for solving problems. The second, "new

forms of participative learning" refers consultation of expert of different fields. The last of them, "innovative structure" refers students proceedings in term of sustainable development projects, activities or business.

In addition to three fundamental characteristics, de Haan (2006) clarified nine different competences which were basis for education ESD. These nine competencies were explained following way;

- Competence in foresighted thinking.
- Competence in interdisciplinary work.
- This calls for interdisciplinary learning.
- Competence in cosmopolitan perception, transcultural, understanding and cooperation.
- Learning participatory skills.
- Competence in planning and implementation skills.
- The capacity for empathy, compassion and solidarity.
- Competence in self-motivation and motivating others.
- Competence in distanced reflection on individual and cultural models.

In terms of Paden's (2000) perspective, the structure of education for sustainable development can be symbolized with a star including five vertexes and presenting in figure 2.1. The first vertex of the star corresponded to content of education for sustainable development. The second vertex means formal and informal lifelong learning process. The third of them referred to methods which also includes interdisciplinary, learning centered, inquiry. Citizen actions towards ESD and the values of ESD were sequenced as fourth and fifth vertex of the star. In addition to these five components, Paden mentioned that literacy, numeracy and learning motivation towards ESD were at the centre of the star.

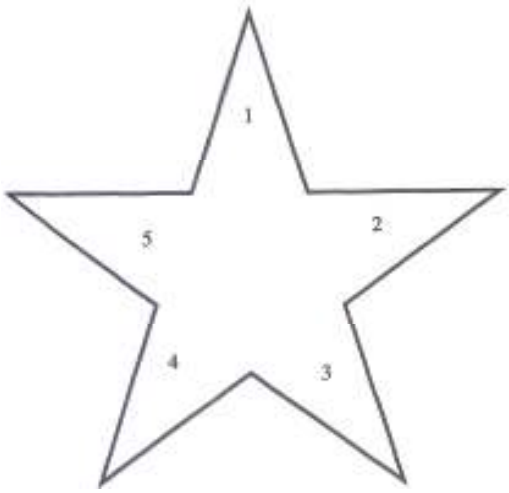

Figure 2.1 Five components of Education for Sustainable Development

Comparing these approaches in different researches or declarations, some of the common points can be underlined. First of all, integration and consultation of different fields were entitled interdisciplinary. From these perspectives, it was emphasized that only one discipline was not sufficient to solve current problems, since current problems were more sophisticated. The second common point was active participation and action skills of individuals. Different models emphasized importance of participation of individuals because the new sustainable design will be the result of individuals own attempts and skills. In addition to these two common points, with respect to learning methods and techniques, students centred activities and techniques were strongly suggested for education for sustainable development.

Similar to characteristics, standards and components of ESD, skills acquired during or a result of implication of ESD was mentioned in these studies. In one of these studies, Haan and Harenberg (1999) put in order skills individuals acquire as a consequence of education for sustainable development. According to them, there were five skills named as negotiation, projection, collaboration, motivation and critical thinking and they explained them in the following way.

Negotiation skills: it emphasizes that sustainable development is a common culture in world wide. It provides negation and agreement between people.

Projection skills: Association between nature and culture are understood and plans are made in this direction.

Collaboration skills: it refers cooperation with other people for favours of current and future generation.

Motivation skills: it refers willing for sustainable development and taking roles for this purpose. All behaviors are shaped considering favour of future generations.

Critical thinking skills: individuals create principles for ecological, social and economic sustainable world; they evaluate themselves and other people with current perspectives. (As cited in Kaya, & Tomal, 2011)

Although education for sustainable development pledges productive results, it causes some challenges for educators. Gayford (2001) points out five challenges teachers face considering the structure of education for sustainability. First of all, it is debatable. There is no agreement among experts towards the nature of sustainable development. Therefore, this situation causes absence of baseline for teachers. Secondly, it is not compatible with curriculum. Almost all steps of formal education separate different fields which are designed in term of reductionist approach. However, education for sustainability includes complex and sophisticate issues which need a holistic approach. Third, there is great need for perspectives towards subjects of ESD which generally includes political, cultural and ethical issues. Fourth, teachers cannot decide which information is appropriate to use, since expert cannot ensure consensus towards technological and scientific knowledge of ESD. Last, because of difficulties, teachers deal with some component of sustainable development. In such a case, it causes loosing holistic views of sustainable development.

However, there is a tendency splitting concept of the sustainable development into several pieces. It is claimed that learning these pieces ensures understanding whole sustainable development. Division of sustainable development as environmental sustainability, social sustainability and economic sustainability are

a common way for both research and learning activities. But, Wheeler (2000) opposed this idea since it divides the concept into three district fields and makes difficult integration of the whole concept. Alternatively, he suggests five themes which include economy, environment and society comprehensively. These five perspectives titled as “thinking about affecting the future”, “designing sustainable communities”, “stewardship of natural resources”, “sustainable economics” and “globalization”.

2.5 Education for Sustainable Development in Turkey

Education for sustainable development in elementary schools of Turkey can be examined considering two aspects; education curriculums and national projects. As to curriculums, Tanrıverdi (2009) analysed elementary education curriculums considering seven targets suggested by Council of the European Union. According to the results of this study, any of the objectives of the curriculum did not contain the terms “sustainable development” or “sustainability” and there was no separate subject area towards sustainable development. It is stated that science and technology and social science curriculums included some objectives associated sustainable development indirectly. However, social, economic and cultural aspects of sustainable development were ignored in these objectives. Furthermore, it was addressed that objective of curriculums aims to acquire knowledge and attitude instead of values and skills.

National projects towards sustainable development differentiate two categories as directed by the Ministry of National Education and directed by non-governmental organizations. Blue Sky Green Leaf, Capital Energy Action, Keep Your Energy for Future, Kentges and White Flag projects were designed by the Ministry of National Education. On the other hand, Green pack and Eco-schools are prominent projects directed by non-governmental organizations.

The Main aim of Blue Sky Green Leaf was determined as preventing pollution around the school district, designing school environment and increasing awareness towards environment. Furthermore, developing students' problem solving, cooperation and decision making skills address as aims in terms of students. In the

setting of this project, twenty-nine criteria which was associated with disposal and recycle, appearance of schools, preventing pollution and environmental education. Schools performed according to criteria rewarded with grean leaf blue sky flag and certificate.

As to Capital Energy Action and Keep Your Energy for Future, acquisition of effective energy usage habits was prior target. Schools were designed considering issues such as heat insulation, illumination, effective water usage. In Scope of Kentges, urban life, urban awareness and cultural heritage of cities were important topics. Competitions were arranged among schools for reaching targets of the project. Besides these projects, some project was dealing with social themes. For instance, one of them White Flag was designed to provide healthy and hygienical school environment, protect public health and growth educated generation with respect to health. Teachers, school manager and students endeavoured for designing their school condition in term of requirement of white flags. Schools were checked by inspectors from the Ministry of Health and those of which fulfil requirements were awarded with a white flag.

Green Pack Project was designed by the Regional Environmental Center (REC) which was independent and international organization. The Green Pack project included a set of educational materials which was called as green pack, training seminars towards teachers and a web site in terms of education for sustainable development. The terms sustainable development and education for sustainable development were introduced to teachers in educational seminars. In addition, teachers learn how to use green pack education materials and how to integrate education for sustainable development in their lessons. The project was supported by both Ministry of National Education and Ministry of Environment and Urban Planning.

Eco-Schools project carried out with the participation of 53 different countries at the international level. In Turkey, The Turkish Environment Education Foundation (Tür-Çev) was responsible for this project. Targets of this project were determined as increasing awareness towards environment, informing about

environmental management and sustainable development. Eco-schools project had a holistic action plan whose participants are schools' managers, teachers and students. A coordinator teacher and 20-25 students established eco-teams and they were primarily responsible for this action plan. As a result of a series of activities, schools were awarded for green flag which was symbol of sensitivity towards environment. Furthermore, twelve education seminars have been carried out for coordinator teachers up to present.

2.6 The Term Beliefs from Different Aspects

According to Pajares (1992), feasible and worthy studies towards beliefs construct needs a clear definition of the term beliefs, choosing proper research methods and thoughtful design. It is a prerequisite for researchers study in this field to explain the meaning of beliefs and belief systems they care about and to indicate differences between beliefs and other psychological constructs such as knowledge, attitudes. In this respect, this part is dedicated to clarifying what beliefs means for the current study in the light of the literature.

Belief is one of the common terms studied by researchers from different research fields. Although scientists have conducted a great number of research about beliefs up to now, there is no agreement about definitions of beliefs construct. While Pajares (1992) define beliefs as "individual's judgment of the truth or falsity of a proposition, a judgment that can only be inferred from a collective understanding of what human beings say, intend, and do" (p. 316), Borg (2001) defines as "a belief is a proposition which is consciously or unconsciously held and accepted as true by the individual" (p. 181). In addition to them, Rokeach (1968) defines beliefs as "any simple proposition, conscious or unconscious, inferred from what a person says or does, capable of being preceded by the phrase 'I believe that'" (p. 113).

Since there is ample amount of definitions about beliefs, Borg (2001) summarizes common points of these definitions. Borg (2001) stated that most of these definitions have four characteristics entitled the "truth element", "the relationship between beliefs and behaviour", "conscious and unconscious beliefs"

and “beliefs as value commitments”. “Truth element” refers to the accuracy of beliefs with respect to an individual holding them. The second common point of definition which titled as “the relationship between beliefs and behaviour” indicates that beliefs direct people’s behaviour and thinking. The third “conscious and unconscious beliefs” means that people are aware their some of beliefs, not all of them. The last, “beliefs as value commitments” refers to role of the values to evaluate and assess.

Beyond defining beliefs construct, there is a great number of attempts to clarify the structure. In one of the earliest ideas about beliefs, Dewey (1938) explains that beliefs systems contain one dimension including two poles. On the one polar reflects traditions and customs. The other polar reflects progressive and innovation. According to the model, these components are associated with negativity. For instance; if people have tradition trends, they are supposed to have poor principles in terms of progressive.

In the 1960s, Rokeach (1968) categorizes beliefs into five different groups to clarify beliefs structure and called them as type A, type B, type C, type D and type E. In Rokeach’s aspect, type A is the centre of human beliefs and resists to any change. Type B beliefs are related to the individual’s personnel subject, which is not linked to social norms. Type C is a kind of beliefs that emerges as a result of socialization, training and education process. In case beliefs originate from some visual, audio sources, it is titled as Type D beliefs. Lastly, Type E beliefs are rarely associated with other beliefs and more negligible belief groups. These types of beliefs stem from personality. In addition to beliefs types, Rokeach (1968) states that beliefs have three dimensions; behavioral, cognitive and affective. Cognitive domains are indicator of knowledge. Individuals differentiate between correct and false by means of cognitive domains. Affective component determines the position of individual toward specific content. They may take positive, negative or neutral positions. The last, behavioral component is associated with behaviors. When activated, they trigger actions.

Among a large spectrum of beliefs studies, Greens (1971) explains three characteristics of beliefs, which contribute to better understandings of beliefs. The first, he explains that some beliefs are primary and some of them are derivative. To support this idea, Greens (1971) suggests asking individuals for their reason for beliefs. According to him, people generally tend to use another belief statement to explain why they believe something. Questions for each belief statement cause a process and this process ends with their primary beliefs. Therefore, beliefs that cannot support any statement entitled primary beliefs and others entitled derivative. As to the second explanation, some beliefs are more central than the others. Locating centre means connecting with greater number of beliefs. These multiple connections among beliefs cause resistance to change of beliefs. The last explains how individuals can hold inconsistent beliefs at the same time. Green (1971) address that beliefs are stored in distinct clusters. It is assumed that these district clusters comprise consequence of different context (as cited in Beswick, 2007).

Because of the variety of beliefs understandings, Furinghetti and Pehkonen (2003) clarify some points that should be taken into consideration while studying on beliefs. It is advisable;

- To consider two types of knowledge (objective knowledge and subjective knowledge)
- To consider beliefs as belonging to subjective knowledge
- To include affective factors in the belief systems, and distinguish affective and cognitive beliefs, if needed
- To consider degrees of stability, and to acknowledge that beliefs are open to change
- To take care of the context (e.g. Population, subject, etc.) and the research goal within which beliefs are considered."

According to Pajares (1992), there are many term which have similar usage with beliefs. Beliefs refers to attitudes, perceptions, values, judgments, axioms,

opinions, ideology, conceptual systems, preconceptions, dispositions, implicit and explicit theories, internal mental processes, action strategies, rules of practice, practical principles, perspectives, and repertories of understanding in studies on educational psychology. On the other hand, debates concerning beliefs usually focus on the distinction between beliefs and knowledge (Pajares, 1992). According to Pajares while knowledge is derived from objective facts, beliefs are derived from judgments. One of the researchers studied on relationship beliefs and knowledge is Fenstermacher (1994) confirmed knowledge as "justified true beliefs". This perception indicates how close relationship exists between these two constructs. Furinghetti and Pehkonen (2003) divide into knowledge two categories called as objective knowledge and subjective knowledge. This categorization makes sense both relationship and distinction of knowledge and beliefs.

To distinguish beliefs or belief systems of knowledge or knowledge systems, Abelson (1979) suggests six features. These are titled as "existence beliefs", "alternative worlds" "evaluative component", "episodic material", "unboundedness", "nonconsensuality". Inside of these features, "nonconsensuality" and "unboundedness" arrange beliefs as a system.

"Existence beliefs" refers to the existence or nonexistence of specific conceptual entities. These entitles are partially associated with belief systems. God, witches, assassination conspiracies are an example for entities (Abelson, 1979). In the case of education, teachers have some beliefs concerning the existence of certain students' characteristic. In fact, these characteristics such as laziness, ability do not reflect their behaviour completely. These are entities about students' characters (Nespor, 1987).

According to "alternative worlds" conceptualization of ideal situation and realities are dramatically different from each other (Nespor, 1987) and it is symbolized with the differences between "the world as it is" and "the world as it should be" (Abelson, 1979). Most of the teachers have ideals, intention or utopian models that they are inexperienced in practice concerning classroom environment.

They try to shape their classrooms in this direction. However, actual situation does not occur as expected (Nespor, 1987).

Belief systems depend on much more "evaluative" and "effective" components than knowledge systems. Although there is an obvious interaction between beliefs and knowledge system, beliefs systems' conceptual categories such as bad and good, moods or personal assessments are quite different from knowledge systems in terms of operation (Abelson, 1979). Nespor (1987) clarifies this situation with an example of a chess game. Information about the rules of the game or correct chess movement is not dependent on liking or disliking chess. Furthermore, researcher signifies importance evaluation and affect in the education field. It is handled complains concerning abstraction of subjects. Teachers notice that students cannot understand subjects because of abstractness. As a consequence, they assume students learning will be more effective while using physical materials. It is indicated that teachers have a value called as "practical" and they organize their classroom activities by means of this assumption.

Abelson (1979) argues that there are great magnitudes of episodic material originated from personal experiences or tradition and customs or political doctrines in the belief system. However, knowledge system depends on facts and principles instead of episodic materials. It is also common situation that teachers report their current practices are result of their previous experiences in their teaching careers (Nespor, 1987).

Unlike other four features "unboundedness" and "nonconsensuality" are associated with the belief system. One of them is "nonconsensuality" is perceived as a summary of other features. It means that propositions, concepts, arguments and other concepts constitute belief systems. In conclusion, beliefs are more resistant to change than knowledge. On the other hand, the term "unboundedness" is explains that there is no reasonable and strong indicator for beliefs and real world situations. Moreover, existing relationship depend on experience of person. However, knowledge systems are relatively domains of application (Nespor, 1987).

Literature reviews demonstrate that there are deeply differences among some scientists' perception and definition concerning beliefs. Pajares (1992), Furinghetti (1996) are of the opinion that beliefs are components of knowledge. Oppositely, with respect to Thompson (1992), Ruffell, Mason, & Allen (1998) beliefs are components of conceptions. While according to Grigutsch (1998), Underhill (1998) and Olson & Zanna (1993) beliefs are components of attitudes, in Bassarear's (1989) aspect, beliefs are opposite poles of attitudes. However, it appears that the most cited definition by anthropologists, social psychologists, and philosophers; "beliefs are thought of as psychologically held understandings, promises, or propositions about the world that are felt to be true" (Richardson, 1996, p. 103). On the other hands, Haney et al. (2003)'s definition; "one's convictions, philosophy, tenets, or opinions about teaching and learning" (p. 367), is more appropriate for educational studies. Thus, the perspective of this definition guided for evaluation of beliefs towards education for sustainable development.

2.7 Teachers' Beliefs

According to Calderhead (1996) the term teaching beliefs refer to teachers' pedagogical beliefs and reflection of these beliefs to teaching activities. In this respect, teachers' beliefs are examined in terms of learners and learning, the role of teachers, subject matter, teaching and learning to teach (Calderhead 1996). However, some scientists have preferred different terminologies for describing teachers' beliefs. "Orientations", "personal epistemologies", "practical knowledge", "perspectives" and "principles of practice" are used in place of teachers' beliefs (Kagan 1992).

According to Richardson (2003) and Rokeach (1968) personal experience, socialization, education, acculturation, etc are sources of beliefs. In terms of teachers' beliefs, there are three major sources that influence teachers' beliefs are listed as "experience with schooling and instruction", "experience with formal knowledge (both school subjects and pedagogical knowledge)" and "personal experience". Personal experience refers to teachers' beliefs concerning himself and relation with others. Teachers' understandings between education and society are

also part of it. Hence, socioeconomic background, gender, regional differences, life decisions, their teaching activities could influence both beliefs and teaching activities. In addition, "experience with schooling and instruction" corresponds that teachers generate their beliefs about teaching and learning via observing teaching-learning environment. The last one, "experience with formal knowledge" means that teachers develop their beliefs consequence of their own learning attempts about pedagogical knowledge and subject matter.

In the light of literature review, it is revealed that studies on teachers' beliefs mostly focus on the content such as teaching chemistry (Boz & Uzuntiryaki, 2006), teaching mathematics (Perry, Howard, and Tracy 1999; Handal, 2003), language teaching (Erdem, 2009), context such as gender (Tuncer et al., 2006; Alpaslan, 2011) geographic context (Sang, Valcke, van Braak, & Tondeur, 2009; Handal, 2002) socio-economic context (Handal, 2002) and consistency between beliefs and practices (e.g., Raymond, 1997; King, Shumow, & Lietz, 1999; Savaşçı-Açıkalın, 2009).

Many researchers have studied about the relevance of beliefs and behaviours claim that teachers' beliefs considerably influence their classroom activities, learning and teaching process (Richardson 1996; Thompson, 1984; Pajares, 1992). In respect of Pajares (1992) viewpoint, "beliefs are the best indicators of the decisions individuals make throughout their lives". In his view, beliefs are associated with teachers' planning, instructional decisions, and classroom practices. He also claims that beliefs are more effective than knowledge to predict behaviour. Ernest (1989) argues that although teachers may have equal knowledge, they prefer different teaching strategies. In this regard, beliefs are effective in understanding or predict teachers' decision making process. Therefore, there are many research to explore the relationship between beliefs and teachers' practice, which were conducted in different fields of education such as teaching mathematics (Vacc & Bright, 1999), science (Czerniak & Lumpe, 1996), history (Wilson & Wineburg, 1988), literacy (Fang, 1996), use of technology (Ertmer, 2005).

Among these studies, King, Shumow, & Lietz (1999) examined consistency between elementary science teachers' beliefs and their observed behaviours via a case study. Four elementary science teachers were chosen for an American urban school in this manner. Data were collected from both interviews and observing these teachers. In the first part, a semi structured interview directed teachers almost 45 minutes. Teachers responded to questions concerning their classroom activities, science curriculum, teachers' role in science teaching, and enjoyable aspect of teaching practices. Second part of the data collection process, one lesson of each teacher's was recorded on videotape. Then, these videotapes were analysed by three experts who was educational psychologist, science education specialist and experienced elementary school teacher. After evaluation of all these data, researchers concluded that there is a mismatch between what the teachers say and what observation see. Although teachers prefer words such as "facilitator" and "hands-on" science associated with their teaching beliefs and classroom activities, observations of experts are quite different from teachers' reports related their lessons.

On the other hands, there are debates towards consistency of teachers' beliefs and practices, since some studies demonstrate inconsistency between teachers' beliefs and practices. In one of them, Richards (1998) conducted a research study to evaluate this relationship in Hong Kong. A belief survey was directed both experienced and inexperienced teachers related use of lesson plans. Then, their classroom activities were observed. The result of the study indicates that although both experienced and inexperienced teachers believe the advantage of lesson planning, experienced teachers generally do not prefer it in their classes.

Similarly, Raymond (1997) investigated the relationship between beginning elementary teachers' beliefs and mathematic teaching practices by means of a multiple case study. Theoretical background of the study was based on the Fazio's (1986) model which was coupled with associated studies in mathematics education. According to this model mathematics beliefs of teachers are centre of belief practice relationship. Although data were collected from six teachers, researchers reported the most representative one. Interviews, observations, document analysis and a belief

survey were preferred in the data collection process. The findings of this study indicate that teachers' beliefs and classroom activities' are not completely consistent with each other. Researchers claim that teachers' beliefs towards mathematics teaching and learning are less traditional than their actual classroom practices.

Some researchers argue that inconsistency between teachers' beliefs and practice stems from the complexities of classroom environment (Duffy, 1982). There some contextual factors can limit teachers' beliefs and practices. Ennis (1996) categorized these exogenous variables as students' personal characteristic, teachers' characteristics and school characteristics.

As it implied previously, there are some studies focused on beliefs in terms of context. Gender (Kalaian & Freeman, 1994; Lin, 1992; Kesici, 2008), their teaching experience (Perry et al., 1999; Thompson, 1992), subject domain they teach (Brown, 1985) and cultural or regional differences (Yang, 2000; Sang et al., 2009) constitute common instance of these contextual variables.

Kesici (2008) attempted to find whether or not there was significant difference teachers' democratic belief in terms of gender. Dimension of democracy as justice, equality and freedom are examined separately. In this qualitative study, 286 teachers, 36% of them are female and 64% of them are male, are selected randomly from Van city, Turkey. Consequently, it was found that gender causes differences between groups. More specifically, female teachers possess more democratic beliefs than male teachers. The magnitude of this difference is found low in terms of equality, very low in terms of freedom and average in terms of justice.

Considering teachers' experience, Perry et al. (1999) studied about mathematics teachers' beliefs towards the nature of mathematics and learning and teaching of mathematics. Researchers obtained data from 40 head mathematics teachers (HMT) and other mathematics classroom teachers (OMT) from Australian secondary schools. Both OMT and HMT are grouped in terms of their less than 1 year experienced, 1 to 5 years experienced, 6 to 10 years experienced, 11 to 20 years experienced and more than 20 years experienced teachers. Two factors are found

related to mathematics teacher beliefs as transmission and child-centeredness. In findings of this study, researchers emphasized that HMTs scores are remarkably higher than OMTs scores in terms of child-centeredness and remarkably lower in terms of transmission factor. Researchers argued that HMT teachers were more experienced than OMT teachers and pointed out differences between teachers are the result of the experience. Furthermore, their findings are supported by Thompson's (1992) finding which is argued teachers' beliefs related mathematics teaching are shaped by teachers' experience rather than their studies in teaching training programs.

Prospective teachers' beliefs are also examined in terms of cultural differences. Yang (2000) compared Taiwanese prospective teachers' beliefs about language learning and teaching with Americans. Investigation of the findings reveals that American and Taiwanese prospective teachers have different beliefs related the same issues.

Another quantitative research for evaluating teachers' beliefs was conducted in Chinese by Sang et al. (2009). 820 primary teachers were selected and directed questionnaire to evaluate whether there is a significant difference teachers traditional and constructivist beliefs in terms of contextual variables (gender, teaching experience and regional differences). These teachers were spread out 11 different provinces in Chine and categorized as developed versus developing and urban versus rural. Furthermore, responses were grouped into three categories; less than 5 years experience, 6 to 15 years experience and more than 15 years experience teachers. The result of the studies indicated that urban school teachers in developing areas have significantly higher belief scores than other areas. On the other hands, analysis related gender also demonstrated differences between groups. Male teachers hold traditional beliefs significantly higher than female teachers. However, there was no significant relationship with respect to experience.

The present study focused on teachers' beliefs on education for sustainable development. Therefore, teachers' beliefs were examined with respect to content. In

the following part, studies on beliefs in the content of education for sustainable development was presented.

2.8 Studies on the Values of Sustainable Development and Teacher Beliefs about Education for Sustainable Development

There is plenty of research concerning education for sustainable development in the literature. These studies focus on different aspects of ESD concept. For instance, analysing of curriculum in the context of sustainable development (Tanrıverdi, 2009; Kaya, & Tomal, 2011); university lecturers', in-service teachers' and pre-service teachers' attitudes (Qablan, et al., 2009; Spiropoulou et al., 2007; Kalu, Uwatt, & Asım, 2005; Şahin, Ertepınar, & Tuncer, 2009); university lecturers' classroom practices (Qablan et al., 2009); teachers' literacy (Spiropoulou et al.,2007; Tuncer, Ertepınar, & Şahin, 2008); pre-service teachers' views (Keleş, 2011); teachers' knowledge (Winter, & Firth, 2007), pre-service teachers' and in-service teachers' beliefs (Tuncer et al, 2006; Winter & Firth, 2007; Qablan et al., 2009; Cotton et al., 2007) are highlight of ESD studies.

However, it was revealed that studies related to the values of sustainable development and teachers' beliefs on education for sustainable development mainly concern about one of the components among economic, social and environmental dimension. According to Gayford (2001) even though focusing one of the components is more manageable, integrated structure and holistic concept of ESD is lost in that case. With respect to this idea, it could be seen that the numbers of the study include holistic concept about the beliefs of ESD and values of SD are limited.

Among these studies, Qablan et al. (2009) conducted a study in three environmental science faculties with sixty-five lecturer at Jordanian universities. This study includes both qualitative and quantitative data collection strategies. The result of the study indicates that lecturers believe the importance of ESD and support it in their courses. Furthermore, lecturers believe that ESD should be a common target of all university courses and different kind of strategies should be employed for ESD.

Another study performed in England, Winter and Firth (2007) researched how pre-service geography teachers reflect their beliefs, experience and knowledge concerning ESD to their instruction in secondary schools. Four pre-service teachers were chosen and interviewed in content of this case study. Educating students as a responsible citizen and changing students negative attitudes towards environment are noticeable beliefs of pre-service teachers in terms of ESD. Furthermore, they believe teachers should expose students to controversial and complex issues to develop their own attitudes and values.

There are scale development studies addressed holistic concepts of SD to understand the individuals' values. For instance, Shepherd et al (2009) and Yang et al. (2011) developed instruments for understand individuals' values towards SD. Yang et al. Interviewed with group of geography teachers in China. They developed an instrument to measure values of geography teachers towards SD by using the result of interviews and their own literature reviews. Another study about VSD conducted by Shepherd at al. (2009) based on the values specified in the United Nations Millennium Declaration. Items of this instrument designed to measure these values known as "freedom", "equality", "solidarity", "tolerance", "respect for nature", "shared responsibility".

Take into account previous studies, it was revealed that any studies related values of sustainable development conducted on elementary teachers so far. On the other hands current literature review indicates that previous studies elementary teachers' beliefs on education sustainable development was not sufficient since they generally focus on only one component of sustainable development. Therefore, the current study aims to determine elementary teachers' beliefs on education for sustainable development considering the holistic concept of sustainable development.

CHAPTER 3

DESIGN OF THE STUDY

This chapter of the study refers to design and procedure of the study with eight topics namely, research design of the study, the population and the sample, the variables, selection and development of the measuring tools, procedure, statistical techniques utilized in the study, internal validity and assumptions, limitations and ethical issues.

3.1 The Research Design of the Study

This study contains both causal comparative and cross-sectional survey research methodologies. Cross-sectional survey is defined as collecting data from a sample reflecting certain characteristics of the determined population at a specific time point, which may proceed during hours, days, weeks, or more (Fraenkel & Wallen, 2006). As to cross-sectional survey, elementary teachers' values on sustainable development (VSD), their beliefs about education for sustainable development (BESD), barriers they have perceived and teaching methods they have used were examined. On the other hand; correlational research aims to reveal an association between two or more variables without any manipulation (Fraenkel & Wallen, 2006). Analysis regarding the relationship between barriers teachers have perceived and beliefs about ESD constituted correlation research part of the present study.

3.2 The Population and Sample

The target population of the current study covers all elementary teachers from fourteen different teaching fields in Turkey. Accordingly, these teachers work as educators in the fields of psychical education, religious culture, science and technology, foreign language, music, elementary mathematics, pre-school,

counseling, social science, classroom teaching, Turkish language, information technology, technology design and visual arts.

Due to the fact that the study with this target population was not feasible, an accessible population was determined. While choosing an accessible population, existence or nonexistence of background information of elementary teachers and opportunity to determine these teachers were taken into account. Due to lack of standardized courses focusing on SD and ESD in teacher education programs; it was plausible to conclude that all teachers were not well equipped with sufficient competencies and knowledge about sustainable development and ESD. However, some projects on environmental and sustainability education in Turkey may have contributed to teachers' academic improvement. Therefore, teachers who participated in the Eco-Schools and the Green Pack Projects were preferred as the accessible population of the present research.

Number of the teachers participated the Green Pack Teacher Training Programs was 231. This figure refers to teachers who previously participated in educational seminars and have been applying to or using Green Pack education program. The total number of male teachers was 136 (58.4 %) and the number of female teachers was equal to 95 (40.8%) in this population. Regarding the distribution of these teachers according to their teaching fields; classroom teachers constituted 42.9 % of the Green Pack teachers with the number of the 100 teachers. The second largest teaching field was science teachers who constituted 17.6 % (n= 41) of this population. On the other hand; there were only one visual arts and one information technology teachers. The details of the Green Pack teachers' features regarding gender and teaching fields are presented in table 3.1.

Table 3.1

Teaching Field and Gender Distribution of Green Pack Teachers

Field	Gender		Total
	Male	Female	
Classroom	53	47	100
Counseling	4	1	5
Visual Arts	0	1	1
Information Technology	1	0	1
Science	25	16	41
Social Sci.	18	6	24
Technology Design	6	4	10
Turkish Language	8	6	14
Mathematics	3	4	7
Religious Culture	4	2	6
Physical Edu.	2	2	4
Foreign Language	2	2	4
Missing	10	4	14
Total	136	95	231

The number of the schools which participated in the Eco-Schools project was 429. These schools had one or two coordinator teachers managing cooperation between other schools, designing school activities and participating in Eco-School trainings. 685 (155 male, 535 female) coordinator teachers supported this project. However, there was no information concerning distribution of teaching fields.

The convenience sampling method was preferred as the sampling method in the present study. Measurement tool was converted to an online-survey and then the link of the online-survey was sent to teachers' email addresses via officials of each project. In addition, researcher of the study visited some schools which were in Ankara district and administered the survey directly. A total of 211 elementary teachers from thirteen different teaching fields responded to the survey as a result of

this implementation. The Number of the Green Pack teacher was 145 and the number of the Eco-School coordinator teachers were 96. It was revealed that 31 teachers were members of both projects. Furthermore; these teachers also attended different projects such as Blue Sky Green Leaf (n= 46, 21.8 %), Forest in Schools (n=30, 14.2%), Green Leaf (n=30, 14.2%), Keep Your Energy for Future (n=26, 12.3%), Child-Friendly School (n=20, 9.5 %), Capital Energy Action (n=11, 5.2%), Children's Orchards (n=10, 4.7%), Kentges (n=6, 2.8%), White Flag (n=6, 2.8%) and other local, national or international projects (n=26, 12.3%).

As far as thirteen teaching fields were considered, percentages of Classroom Teaching with 44.5% (n= 94) and then, Science Teaching with 17.5 (n=37) reflected the highest participation rate, while Special Education and Preschool were .5% (n=1). Looking at gender of the elementary teachers, the percentages of male teachers (43.1%) were lower than the percentages of female teachers (56.4%). Details concerning the gender and teaching field distribution of the participants are presented in table 3.2.

Table 3.2

Sampling Distribution with respect to Gender and Teaching Fields

	Gender		Total
	Male	Female	
Physical Education	2	2	4
Religious Culture	2	0	2
Science	14	23	37
Foreign Language	1	10	11
Mathematics	4	5	9
Preschool	0	1	1
Counseling	2	1	3
Visual Arts	0	2	2
Classroom	42	52	94
Social Sci.	11	8	19
Technology and Design	7	8	15
Turkish	5	4	9
Special Education	0	1	1
Missing			4
Total	90	117	211

3.3 The Variables

Teachers' values on sustainable development (VSD), their beliefs about education for sustainable development (BESD), perceived barriers towards education for sustainable development (PBESD), and techniques in education for sustainable development (TESD) were the variables of the current study. VSD, PBESD scores were continuous variables and were measured via 7-point Likert-type scale. BESD score was also a continuous variable measuring via 5-point Likert-type scale. On the other hand; TESD was a categorical variable including three categories as "have

used", "have not used but would like to use" and "have not used since it is not appropriate for ESD".

3.4 Selection and Development of Measuring Tools

The measurement tool used in the present study consisted of six different scales. Data were collected using these parts namely, "values on sustainable development scale", "beliefs about education for sustainable development scale", "techniques in education for sustainable development scale", "barriers towards education for sustainable development scale", "demographical information questionnaire" and "familiarity with sustainable development questionnaire". Further information concerning instruments was presented in the following parts.

3.4.1 Demographical Information Scale

The demographic information questionnaire was used to gather some information about teachers' socio-demographic and socio-economic characteristics. Items associated with gender, teaching fields and teaching experience were directed to participants.

3.4.2 Familiarities with and Understandings of Sustainable Development Scale

Aim of familiarities with and Understandings of Sustainable Development scale was to explore participants' familiarities with and understandings of, sustainable development in five items. The first item was designed to determine whether or not participants took part in any in-service education programs and took a course throughout their graduate or undergraduate programs. The second item was associated with projects towards sustainable development that teachers may have joined or supported.

Original version of item three and item five were developed by Kagawa (2007) and item four was developed by Şahin (2008). Turkish versions of these items were taken a part of "A Questionnaire on University Students' Views of Sustainable Development" (Şahin, 2008). To be more specific, item three aimed to reveal

whether or not participants were familiar with sustainable development in terms of usage in media and academia. Item four was a multiple choice question and involved in five different definitions of sustainable development which also reflected five different perspectives. Finally, item five aimed to measure understandings of participants via key words they wrote about sustainable development.

3.4.3 Beliefs about Education for Sustainable Development Scale

Beliefs about education for sustainable development (BESD) scale was a five-point Likert type ranging from scores '1' to '5'. '1' corresponded to strongly disagree, '2' corresponded to disagree, "3" corresponded to undecided, "4" corresponded to agree and "5" corresponded to strongly agree. The scale including 32 items was developed in order to examine elementary teachers' beliefs in terms of education for sustainable development in this research.

3.4.3.1 The Pilot Study for BESD Scale

Development Process of the questionnaire started with a profound literature review. A 42- Item scale was formed. Some of the items were adopted from similar studies on education for sustainable development and belief studies on different fields.

Because of limitation to reach in-service teachers, pilot study was conducted with university students (e.g., Shepherd et al., 2003; Cooper & Kagel, 2008) in an education faculty. To assure consistency between the composition of the main study's sample and the pilot study's sample, three factors were taken into account. First, mostly pre-service teachers were chosen from 3^{th}, 4^{th} and graduate levels since they learn how to teach in those grade levels. Secondly, students who had taken courses associated with sustainable development; thirdly those who were familiar with both the media and academic usage of sustainable development were also selected as the participants of the pilot study. Data gathered from the students who declared their unfamiliarity with the term of 'sustainable development' were removed. Statistic analysis thereupon conducted with 211 data.

3.4.3.2 The Reliability of BESD Scale

Statistical analysis started with calculating Cronbach Alpha coefficient of pilot data for reliability of the scale. The Cronbach Alpha value was found as .845, which was above acceptable level .70 (DeVellis, 2003). However, item analysis results showed that corrected item correlation values which indicates the correlation between per item and total score of the instrument were lower than expected and some of them loaded negative values. According to Pallant (2007), low values (less than .3) means that the item and scale are measuring different things. Depending on the reliability analysis and examination of these items, corrected item total correlation values which were lower than .3 were removed from the scale.

3.4.3.3 The validity of BESD Scale

To assure content-validity, three experts from the field of elementary education examined items in terms of format of the instrument, clarity, sentence structure and comprehensiveness. Items were analyzed and revised considering experts' reflections before conducting pilot study.

With the purpose of providing construct validity evidence for the current scale, exploratory factor analysis was conducted. Before carrying out factor analysis, assumptions checked considering Pallant's (2007) categorization under two headings as sample size and strength of intercorrelations among variables. According to Tabachnick and Fidell (2007), the number of the sample should be five times the numbers of items in a scale. In terms of strength, they recommend an inspection of the correlation matrix for evidence of coefficient greater than .30. In SPSS analysis two measurements were used to provide this assumption; Kaiser-Meyer-Olkin value which should be at least .6 and Barlett's test of Sphericity which should be significant. Considering factorability of the current data; the number of the sample was 211 which were higher than five times the numbers of the items in this scale. KMO value was found as .875 and Barlett's test of Sphericity was statically significant ($\chi 2$= 2142,710 and p=.000), which means assumptions were met.

Factor analysis conducted with principle component factor extraction technique and the most common orthogonal approach to rotation called varimax. In order to determine number of the factors of this scale, Kaiser's criterion, scree test and parallel analysis were utilized. Considering results of these tests, firstly numbers of the component were determined. Secondly, item loadings for these components, loading values and content of the items were examined. Finally, it was observed that some items were not consistent with factors, some factors could not provide meaningful integrity and some items load on multiple factors. Therefore, four items were revised considering content of the scale. Six items removed from the scale since they make difficult to interpret the results (Kline, 2000). Final version of belief about education for sustainable development scale was constituted with 32 items and it was directed to elementary teachers.

3.4.3.4 Finalized Version of BESD Scale

In the context of the main study, statistical analysis on the reliability and validity of the BESD scale were repeated with the data gathered from the elementary teachers. Cronbach Alpha value was found as .939 which is greater than the value gathered from analysis of the pilot study. Kaiser-Meyer-Olkin measure was .953 and Barlett's test of Sphericity was significant ($\chi 2$= 5532,336 and p= .000). Furthermore, the number of participants were larger than five times the numbers of the items in the scale, which referred to adequacy of sample for factor analysis. Kaiser's criterions, Scree test, parallel analysis, loading on the factors and explained variances were examined to decide number of the factors. Consequently, it is revealed that this scale contains three factors which explained 64.31 % variance of the scale. These three factors were named as "beliefs about limitations on ESD", "beliefs about implementation of education for sustainable development" and "beliefs about adequacy of education for sustainable development in Turkish education system". Explained variance, Cronbach Alpha values and references for items are represented table 3.3 and 3.4. In addition, rotated component matrix and scree plot are inserted to appendix B.

Table 3.3

Factors of Beliefs about Education for Sustainable Development Scale

Name of Subscale	N of item	Total variance explained (%)	Cronbach Alpha
Beliefs about implementation of education for sustainable development	21	49.35	,97
Beliefs about limitations on education for sustainable development	7	9.24	.87
Beliefs about adequacy of education for sustainable development in Turkish education system	4	5.72	,79

Table 3.4

Distribution of Adapted Items

Item number	Adapted from
1, 2,5,6,15,16,18,21,22,24,25,26,	Yang and Wong (2010)
4,7,19,20,27,32	Qablan, Khasawneh and Al-Omari (2009)
3,9,10,13	Alpaslan (2011)

3.4.4 Values on Sustainable Development Scale

The values on the sustainable development instrument (VSD) were developed by Shepherd et al. (2009) for measuring values that underline sustainable development. Theoretical background of this scale depended on the Millennium Declaration (United Nations General Assembly, 2000), in which values of sustainable development were categorized under six sub-dimensions as “Freedom

consideration", "Equality consideration", "Solidarity consideration", "Tolerance consideration", "Respect for nature", "Shared responsibility". The original source of the measuring tool has twenty items and 1-7 Likert type scale, which is also known as semantic differential. The first four factors include three items each, and the other two factors (shared responsibility, respect for nature) include four items each.

3.4.4.1 Adaptation of VSD Scale

In the current study, adapted version of the values on sustainable development scale was used to measure elementary teachers' values that underlie sustainable development. Before the adaptation process, necessary permission was taken from the developer of the scale. Then, items were translated into Turkish from English. Afterwards, they were adapted taking into account socioeconomic, ethical and moral differences between the countries. Translations were checked by one of the experts in the field of foreign language department. Three experts from elementary education, two of them studying on environmental education and sustainability and the other expert studying on affective domains, examined items in terms of clarity and appropriateness according to particular factors. Before the pilot implementation of the questionnaire, items were revised considering experts' comments.

3.4.4.2 The Pilot Study of VSD Scale

The scale was administered to 230 students in a university with convenience sampling methods. Large percentages of students (72.2 %) were from education faculty and the rest (27.8 %) were from different fields of other faculties. The reliability of the scale was checked by calculating Cronbach Alpha values. The coefficient was found as .881, which was above the acceptable level .70 (DeVellis, 2003).

Construct validity of the adapted scale was examined through exploratory factor analysis. Before conducting this analysis, factorability of the data was tested with Kaiser-Mayer-Olkin (KMO) value and Barlett's test of Sphericity. It was found that KMO value was .885 and Barlett's test of Sphericity was statically significant

($\chi 2$= 1927,294 and p= .000), which was an indicator for appropriateness of data for factor analysis. The results of principle component analysis with varimax rotation showed that items loaded on six factors with respect to eigenvalue rule. However, it is observed that some items loaded on different factors when compared to the original scale. Problematic items were revised considering factor loadings and item total correlation values.

3.4.4.3 Main study of VSD Scale

Considering the main study, validity and reliability issues of VSD scale were reexamined. As to the validity, both exploratory factor analysis with principle component extraction and multiple group confirmatory factor analysis were conducted to understand the structure of the scale. In the first step, exploratory factor analysis provided understanding of association among items, and between items and factors. In the second step, it was tested whether items clustered as it was indicated in the original study. Moreover, Cronbach Alpha values and corrected item correlation scores were checked for both overall scale and sub-dimension.

Before conducting factor analysis, assumptions of this analysis were checked. KMO value was found as .849, Barlett's test of Sphericity was statically significant ($\chi 2$= 2182,907 and p= .000) and the number of the case was more than five times the number of the variables. Therefore, the assumptions of the factor analysis were satisfied.

In the first step, principle component extraction method with varimax rotation was preferred for factor analysis. The number of the factors were examined with Kaiser's criteria, scree test and parallel analysis. Scree test and parallel analysis results revealed that values of sustainable development scale had four sub-dimensions. After this decision, factor analysis was repeated with four factor restriction and then items of each factor examined and compared with the original scale.

Comparing the original factor solution with the adapted scale's factor loadings, it was observed that items of 'equality' and 'tolerance' factors fitted to the

original loadings. However, all items of ‘freedom’, ‘equality’ and three items of ‘respect for nature’ clustered together. Since “human” and “social and environmental interactions among them” were common points of these constructs, it was concluded that teachers may not have differentiated freedom, solidarity and respect for nature constructs. In addition, some items of respect for nature construct focused on human behaviors towards changing consumption and production patterns Thus, loading these items with solidarity and freedom factors made sense in terms of ‘human interactions’ emphasis.

In the second step of analysis, multiple group method (MGM), a type of confirmatory factor analysis was conducted to test whether or not adapted instruments’ items fitted to theoretical factors of scale. To conduct these analyses, the total scores of the each factor were calculated and correlation between factors and items were checked. As a consequence of this analysis, it was revealed that all the items loaded on original factors except item 13 and item 16. Therefore, these two items were removed from the scale to assure construct validity of the scale. The correlation between theoretical factors and items are presented table 3.5, and the removed items are also given in table 3.6.

Table 3.5

Result of Multiple Group Confirmative Analysis

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Item 1	**,878**	,124	,524	,280	,399	,379
Item 2	**,877**	,150	,567	,256	,412	,417
Item 3	**,896**	,153	,597	,244	,508	,368
Item 4	,125	**,872**	,093	,353	-,018	,264
Item 5	,086	**,935**	,128	,307	-,095	,251
Item 6	,224	**,910**	,165	,364	,018	,343
Item 7	,728	,103	**,798**	,199	,459	,374
Item 8	,584	,104	**,793**	,173	,469	,326
Item 9	,280	,137	**,766**	,079	,180	,126
Item 10	,169	,374	,107	**,774**	,084	,384
Item 11	,315	,267	,201	**,883**	,121	,576
Item 12	,269	,300	,165	**,849**	,084	,404
Item 14	,439	-,094	,421	,088	**,897**	,173
Item 15	,447	-,006	,362	,099	**,920**	,210
Item 17	,346	,262	,275	,424	,173	**,802**
Item 18	,397	,306	,306	,433	,163	**,878**
Item 19	,331	,214	,250	,483	,167	**,792**
Item 20	,316	,230	,209	,520	,175	**,814**

Table 3.6

The Removed Items from VSD Scale

N	Point 1	Point 7
13	Sometimes some natural resources need to be sacrificed for important developments (such as economic development, technological improvement, etc.).	All precautions must be taken to protect natural resources in our development efforts.
16	To a certain extent, the natural environment will look after itself to the benefit of future generations.	It is the obligation of a society to vigorously protect the natural environment for the benefit of future generations.

Finally, the reliability of the scale was calculated with the Cronbach Alpha coefficient. It was found as .858, which was above the acceptable level .70 (Devellis, 2003). Moreover, the Cronbach Alpha values for sub-dimensions were calculated and presented in Table 3.7.

Table 3.7

Reliability of Components of VSD Scale

Factor	N of the item	Cronbach Alpha
Freedom	3	.859
Equality	3	.890
Solidarity	3	.664
Tolerance	3	.780
Respect for nature	2	.787
Shared Responsibility	4	.832

3.4.5 Perceived Barriers towards Education for Sustainable Development Scale

PBESD was developed to examine the barriers that the teachers have perceived during education for sustainable development in the formal education process. Ten items were adopted from instrument titled "*Teachers' Perception of Teaching Environmental Issues in Science Education instrument*" (Ko, & Lee, 2003) and then translated. Furthermore, other five were constituted considering the article titled "*Education for Sustainability: an Approach to the Professional Development of Teachers*" (Gayford, 2001). The items were scored with seven point Likert-scales. Score "1" reflected that barrier was very eligible for me and score "7" reflected that barrier was not at all eligible for me.

3.4.6 Techniques in Education for Sustainable Development Scale

Techniques in education for sustainable development scale was used to measure teachers' preference on teaching techniques utilized in education for sustainable development. Appropriate techniques for education for sustainable development were determined in the light of the book which titled "*Handbook on Methods Used in Environmental Education and Education for Sustainability*" (Scoullos, & Malotidi, 2004) and the article which titled "*Studies towards Teachers' Perceptions Environmental Issues*" (Ko, & Lee, 2003). Three options were presented for each technique as "have used", "have not used but would like to use" and "have not used because it is not appropriate for ESD".

3.5 Procedure

Present study launched with a literature review towards sustainable development, education for sustainable development and psychological constructs (beliefs and values). Articles, declaration, books and some other internet sources were examined and different instruments analyzed to achieve the purposes of the research. The consequence of this step; values of sustainable development scale developed by Shepherd et al. (2009) were adapted to conditions of Turkey. In addition to this scale, beliefs about education for sustainable development (BESD),

perceived barriers towards ESD and teaching techniques towards ESD were developed in the light of literature and similar scales.

Measuring tool was piloted during March-April 2012 to graduate and undergraduate students who fulfill desirable characteristics in a University. 211 volunteers attended the pilot test in which direct administration method was used to collect data. Analysis of reliability and validity were performed and necessary corrections were carried out.

Data collection process for the main study started after taking required permission from Middle East Technical University Human Research Ethics Committee (Appendix C) and National Education Ministry (Appendix D). The direct administration method was utilized to gather data from teachers in Ankara. Mail and web surveys were preferred for teachers living other cities. Consequently, 211 teachers filled measuring tools between June-August 2012.

3.6 Statistical Techniques Utilized in the Study

After implementation of the instrument, data prepared and designed for analysis. Both descriptive and inferential statistics techniques were utilized via Statistic Package for the Social Sciences (SPSS 18) program.

3.6.1 Descriptive Statistic

The mean and standard deviation of the items were presented to show teachers' values and beliefs. In addition to that, graphics and the frequencies were utilized to indicate understandings, familiarities of teachers in terms of sustainable development, barriers they have perceived and techniques they have used towards education for sustainable development.

3.6.2 Inferential Statistic

Inferential statistics were utilized to test the null hypothesis of the current study. In this vein, bivariate correlation was used to explore the association between

barriers elementary teachers have perceived in terms of education for sustainable development and their beliefs on ESD.

3.7 Internal Validity

Internal validity was defined as "any relationship between two or more variables should be unambiguous as to what it means rather than being due to some other unintended variable" (Fraenkel, & Wallen, 1996, p. 242). Therefore, considering the procedure followed in this study, possible threats to the internal validity were determined as subject characteristics, mortality, data collector characteristics and location.

Subject characteristics could be a treat for the internal validity, since random assignment could not be used as a sampling method. Participants of this study were members of the projects linked to education for sustainable development. However, some teachers may have high interest, while some may have low interest towards sustainable development. Secondly, some different perspectives could be held among coordinator teachers of Eco-Schools and Green Pack teachers. Training courses may affect teachers' beliefs and values. Third, current sample was constituted with elementary teachers from different geographic regions. Therefore, it may cause cultural and social differences among teachers. Those three treats were accepted as the limitations of this study.

As to mortality, it was revealed that only two participants failed to complete instruments. Considering the number of the participant who completed instrument, these two responses were removed from the data of this study. In addition to mortality, location could be another threat to the internal validity. This instrument was administered elementary teachers from different cities in Turkey by using web-survey. Therefore, there was no information towards the location where teachers filled out instrument.

Besides to web-survey data collection technique, direct implementation technique was also used in Ankara district. However, data collector characteristics

could not be a threat since only one collector carried out the collection with standardized procedures.

3.8 Assumptions, Limitations and Ethical Issues in the Study

Assumption, limitation and ethical issues of this study considered by the researcher were given below.

3.8.1 Assumptions

- It was assumed that both in-service and pre-service teachers responded to questionnaires honestly.
- The characteristics of the pilot sample and the main sample were similar and represented to population.

3.8.2 Limitations

- Self reported questionnaire was used in the current study. Thus; results depended on the elementary teachers' perceptions and understandings.
- The present study was limited to specific groups of elementary teachers. However, it is possible that there were many teachers familiar with the concept of sustainable development but not a member of the Green Pack or the Eco-Schools projects.

3.9 Ethical Issues in the Study

- Participants did not identify themselves and did not give any information about their private life to ensure confidentiality.
- Participants were informed concerning the aim of the present study and the process.
- This study did not cause any physical or psychological harm to individuals.

CHAPTER 4

RESULTS

This chapter was devoted to the results of the analysis of the elementary teachers' responses. Findings of the elementary teachers' beliefs about education for sustainable development (ESD), values on sustainable development (SD), barriers they have perceived in terms of ESD and teaching strategies they have used in ESD were presented with descriptive statistics. Moreover, null hypothesis regarding the relationships between barriers elementary teachers have perceived and their beliefs about ESD.

4.1 Elementary Teachers' Familiarities with and Understandings of Sustainable Development

Two questions were directed to elementary teachers to measure their familiarities with "sustainable development" in terms of usage in media and usage in their own academic fields. As to academic usage, figure 4.1 showed that 40.3% of the elementary teachers described themselves as 'quite familiar' with this term. Furthermore, the percentages of the teachers declaring themselves as very familiar and moderately familiar were 23.8 and 27.2 respectively. On the other hand, cumulative percentages of teachers referring as quite unfamiliar and not at all familiar were only 8.7.

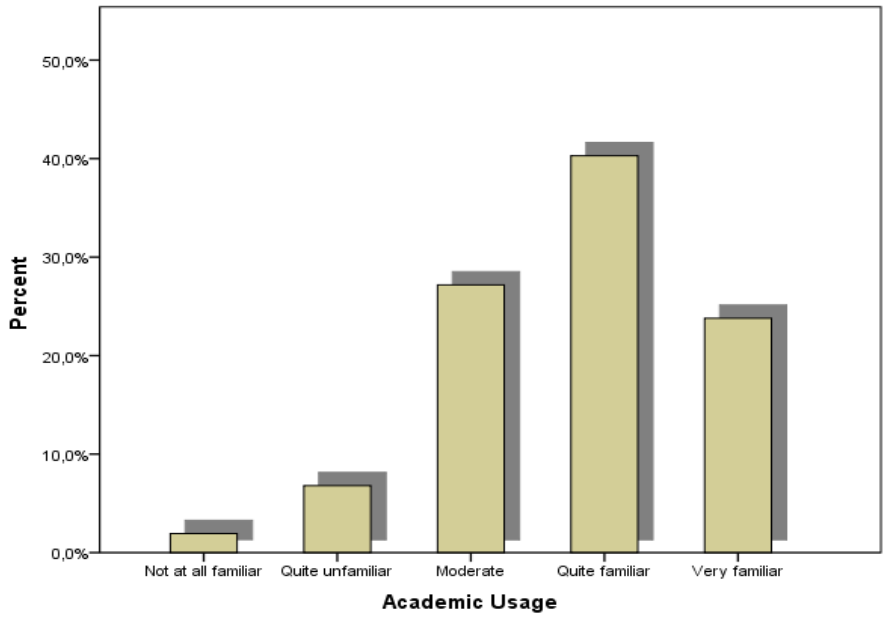

Figure 4.1 Elementary Teachers' Familiarities towards Academic Usage of Sustainable Development

With respect to media usage; more than one-third of the elementary teachers (39.3%) declared themselves as quite familiar with the terms "sustainable development". In addition to that, 20.4% of the elementary teachers described themselves as very familiar, 27.2% of them described as moderate. The percentages of the elementary teachers' responses to familiarities with media usage of sustainable development were presented in figure 4.2.

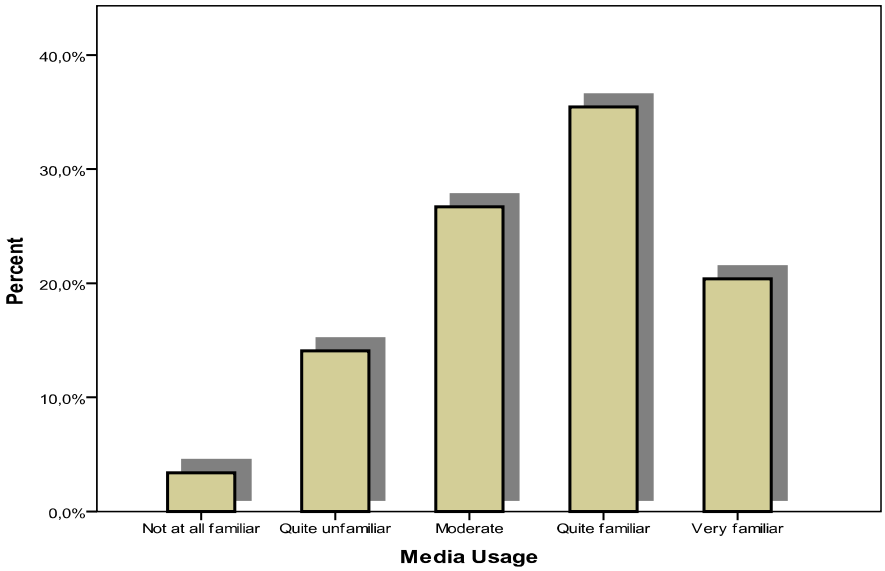

Figure 4.2 Elementary Teachers Familiarities towards Media Usage of Sustainable Development

Taking into account of the familiarities of the elementary teachers with academic and media usage of sustainable development together, there were no teachers defining themselves as "not all familiars" with both usages. Therefore, elementary teachers in this study were familiar with at least one of the usage of sustainable development.

To explore elementary teachers' own understandings of sustainable development, elementary teachers were asked to choose one of the definitions reflecting their own understanding of sustainable development. Most of the elementary teachers defined sustainable development (62.1%) as *"development which meets the needs of the present without comprising the ability of future generations to meet their own needs"*. Secondly, the definition of *"development against the industrialization that aims to preserve our natural resources in order to overcome the "ecological crisis" that we face it"* was selected by 31.8% of the elementary teachers. On the other hand, only 2.4% of the elementary teachers defined sustainable development as "*growth that sustain the provision of goods and services as well as the enhancement of their qualities for long term*". The rate of the respondents who identified sustainable development as "*development which allows*

individuals to live according to their own views of good life" and "*economic growth which meets the needs of society for both long and short term by showing no concern for environmental protection*" was 1.4%.

In addition to the question concerning definitions of sustainable development, elementary teachers were also asked to write up at least three vocabularies or key words related to this concept to reveal their understanding. Total written 552 words were analyzed and categorized in the light of the framework suggested by Kagawa's (2007). In that vein, these words were placed in sixteen categories, which can be seen in table 4.1.

Table 4.1

Frequently Written Words by Elementary Teachers

Categories	Words (frequency)
Aspects	
Environmental	Environment (14), nature (13), recycle (22), ecology (10), protection (10), life (6), renewability (8), renewable energy (6)
Social	Human (4), society (4)
Economic	Economy (9), possession (14) , efficiency (11)
Temporal	
The Future	Future (19), future generation (6), children (2)
Long-term	Persistence (9), continuity (8)
Improvement	Development (6), evolution (4)
Stability	Stable (1)
Approaches towards sustainable development	
Governance, policy, politics	Policy (2)
Learning and action	Education (8), awareness (3), conscious (2)
Management	Planning (2)
Technology, building and design	Advanced technology (1)
Homeostasis	Balance (2)
Human attitude	Responsibility (2), sharing (2), thrift (2)
Scale/Level	
Local	-
Global/International	Globalization (1)
Perception of sustainable development	
Feelings	Quality (4), love (2), trust (2)

As it was seen in figure 4.3, elementary teachers' keywords mostly referred to environmental aspect of sustainable development. 42.0% of these words were associated with the environment, nature, ecology and other environmental issues. Compared with the percentage of environmental aspects, the percentages of other

categories were relatively low. For instance, words associated with economic aspects and the future was only 12.1% and 11.2% respectively. Furthermore, long term, learning and action, and perception categories' percentages were between 5 and 10. All other categories fall under 5 percent of all suggested keywords by elementary teachers.

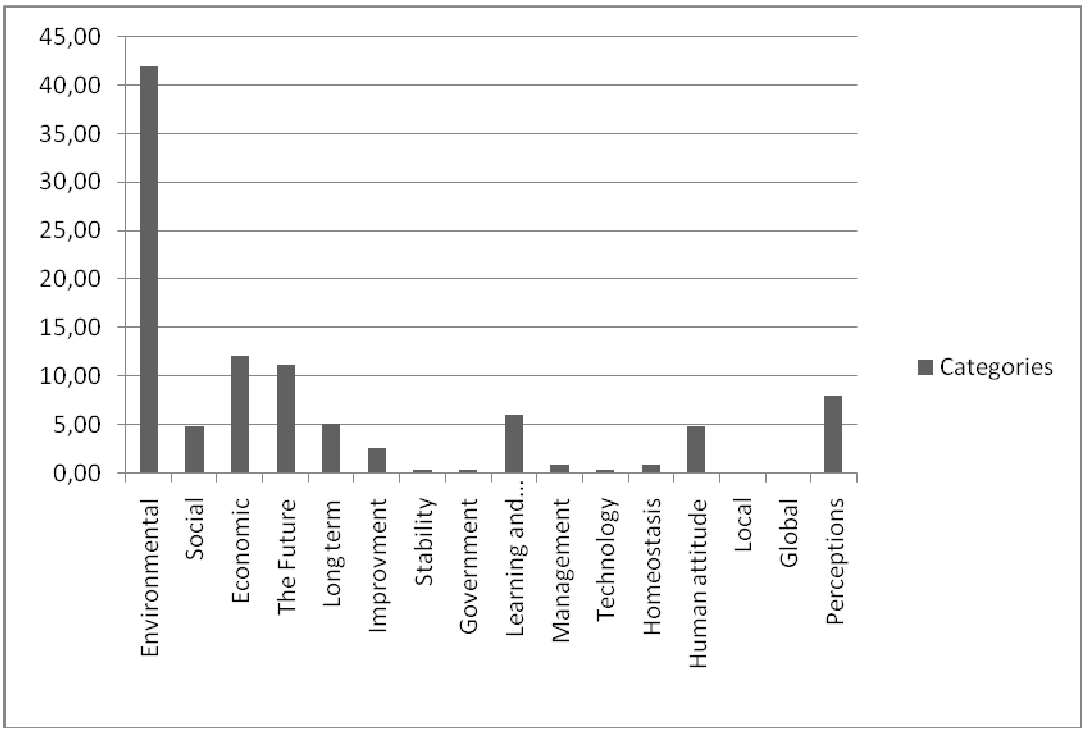

Figure 4.3 Frequencies of Categories with Respect to Elementary Teachers' *Identification*

4.2 Elementary Teachers' Beliefs about Education for Sustainable Development

Elementary teachers' beliefs about education for sustainable development were examined by means of an item based frequency assessment. The mean scores, the standard deviations, frequencies and percentages of both items and sub-dimensions were taken into account in these analyses.

4.2.1 Beliefs about Implementation of Education for Sustainable Development

Beliefs about implementation of education for sustainable development sub-dimension contain twenty-one items. The mean score of this sub-dimension was

found as 4.43 over 5 with the standard deviation of .070. This meant that elementary teachers had favorable beliefs about implementation of education for sustainable development. Figure 4.4 show the percentages of participants' responses.

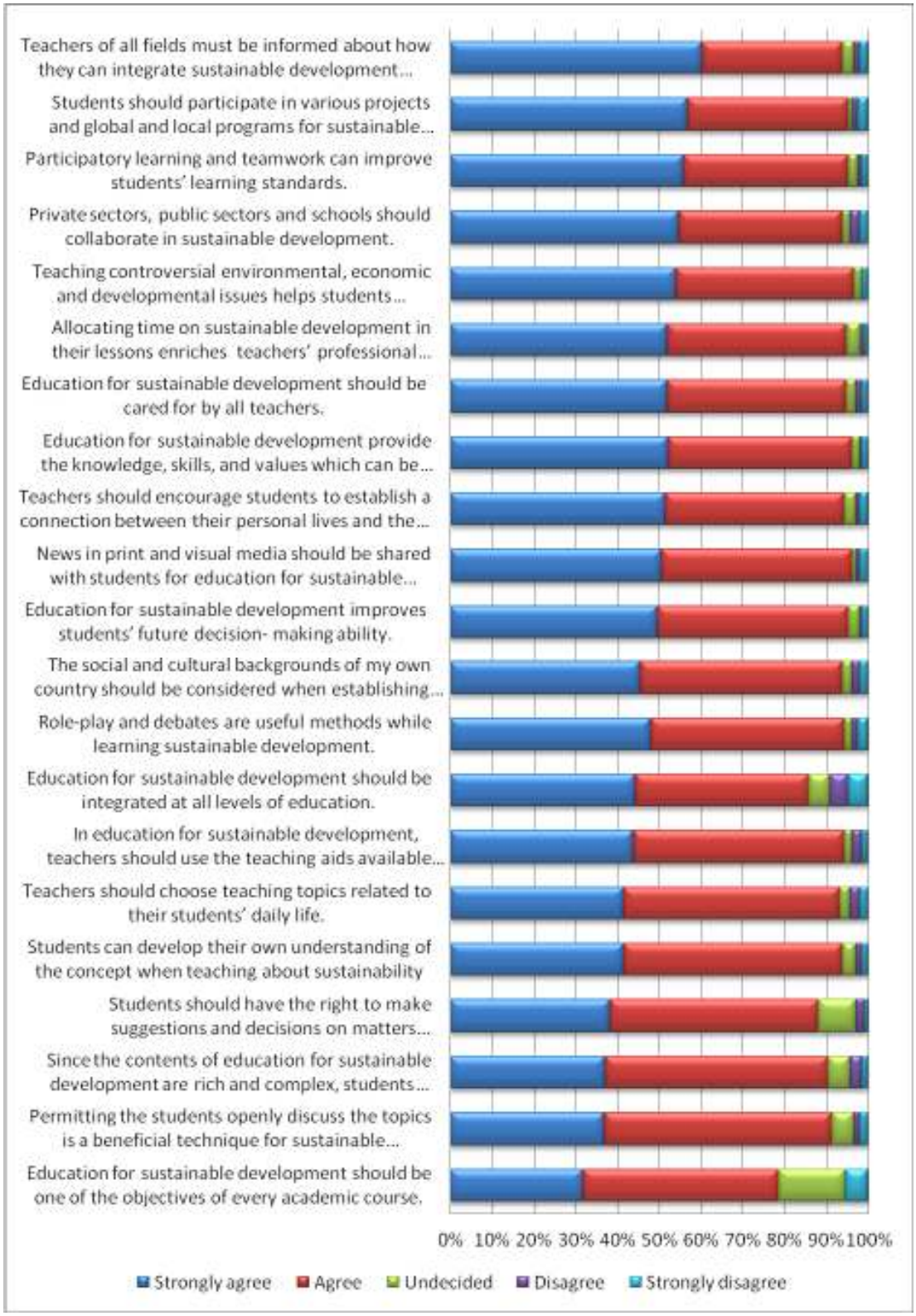

Figure 4.4 Beliefs about Implementation of education for sustainable development

Taking into account of the items of this sub-dimension, mainly three different aspects of implementation of education for sustainable development emerged. Accordingly, items on this scale are related to positive contribution of education for sustainable development, design of the courses in terms of education for sustainable development and responsibilities regarding implementation of education for sustainable development. As seen in figure 4.4, the majorities of the elementary teachers strongly agree or agree with these three aspects of implementation of education for sustainable development. For instance, regarding the beliefs about positive contribution of education for sustainable development, teachers stressed that exposing to students with issues related to sustainable development improves their critical thinking ability (96.7%); ESD improves students' future decision-making ability (95.2%); and students can develop their own understandings of the concept when teaching about sustainability (93.8%). With respect to design of the courses, teachers emphasized that news in print and visual media should be shared with students (96,2); teachers should encourage students to establish a connection between their personal lives and the issues of global environment and development (94.2); students should be allowed to choose the topics of study according to their interest since the content of education for sustainable development are complex and rich (90.5). Lastly, teacher were of the opinion that ESD should be one of the objectives of every academic course (97.6%); it should be integrated into all educational levels (95.1%); and private sectors, public sectors and schools should collaborate in sustainable development (93.7%) in terms of responsibilities regarding implementation of sustainable development.

4.2.2 Beliefs about Limitations of Education for Sustainable Development

Elementary teachers' beliefs about limitation of education for sustainable development were assessed with six items. The mean score of the sub-dimension was found as 1.709 out of 5 and the standard deviation of .529, which referred that the great majority of the elementary teachers disagree or strongly disagree with the items of this belief dimension as shown in figure 4.5.

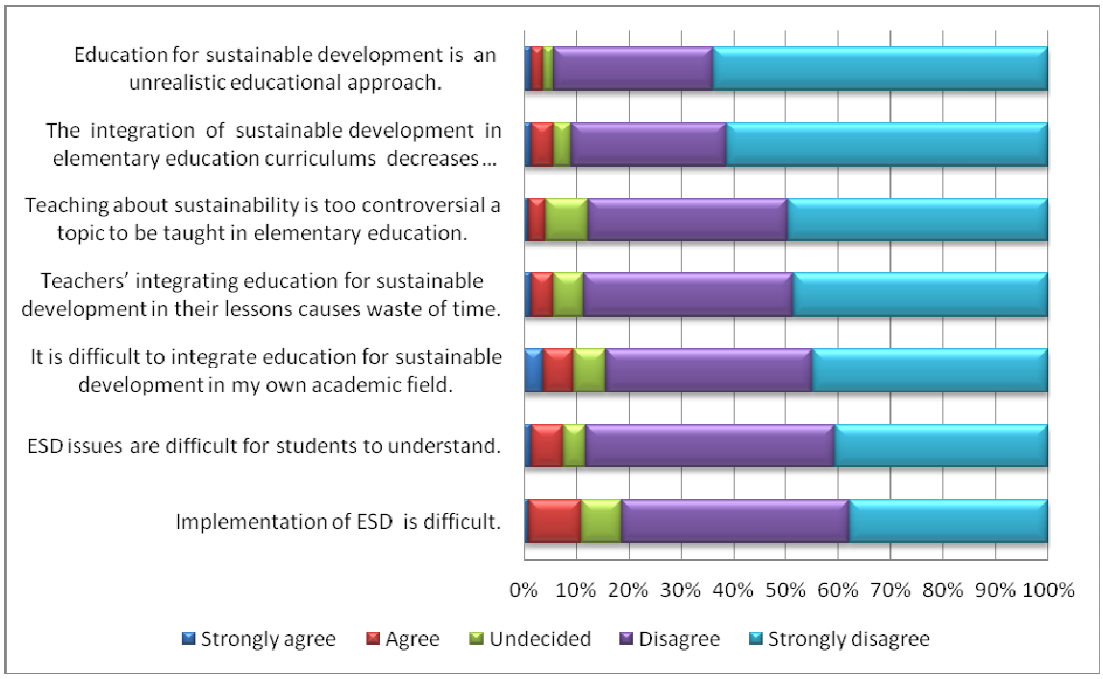

Figure 4.5 Beliefs about Limitations on Education for Sustainable Development

To be more specific, elementary teachers opposed to ideas that ESD is an unrealistic educational approach (93.3%), ESD issues are difficult for students to understand (87.2%) and teachers' integrating ESD in their lessons causes waste of time (87.2%), integration of ESD in elementary teachers' own academic field is difficult (83.8%).

4.2.3 Beliefs about Adequacy of Education for Sustainable Development in Turkish Education System

Beliefs about adequacy of education for sustainable development in Turkish education system section includes three items measuring beliefs of elementary teachers about the sufficiency of textbook activities, curriculums and teacher trainings in terms of education for sustainable development. In addition, one of the item measures sufficiency of current education in elementary schools in terms of education for sustainable development.

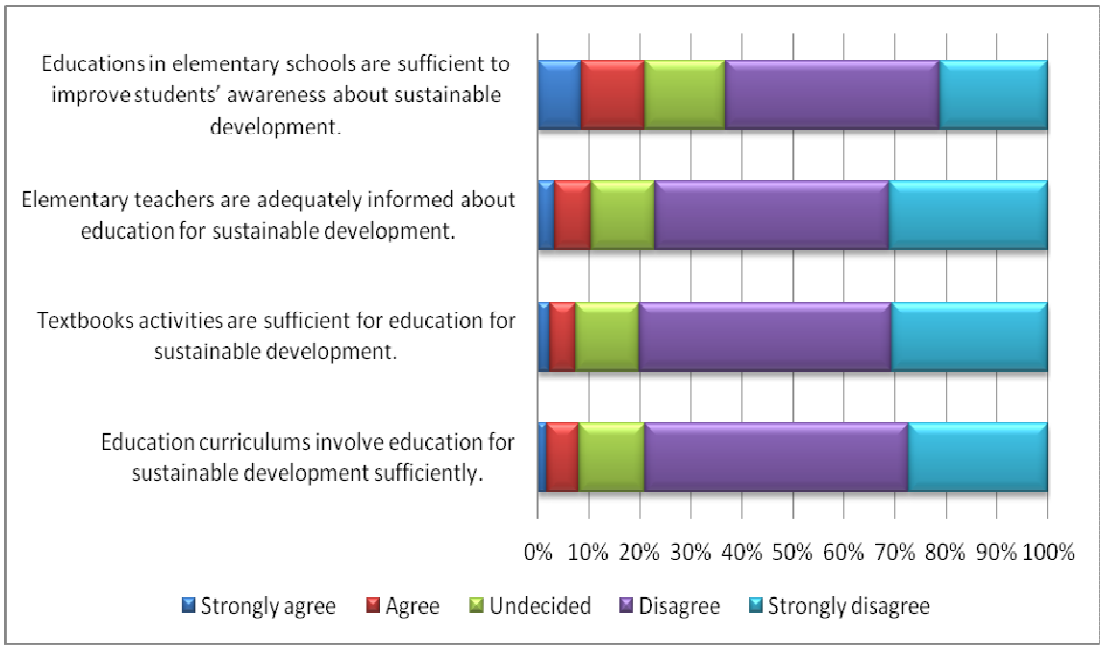

Figure 4.6 Beliefs about Adequacy of Education for Sustainable Development in Turkish Education System

The mean score of 2.13 over 5 with the standard deviation of .68 shows that elementary teachers did not believe adequacy of education for sustainable development in the Turkish education system. As seen figure 4.6, the majority of the elementary teachers agreed that textbooks activities are not sufficient (80.0%), education curriculums do not involve ESD sufficiently (78.9%) and elementary teachers are not adequately informed about ESD (76.8%). Furthermore, 63.2 percent of the elementary teachers pointed out that current education in elementary schools is not sufficient to improve students' awareness about sustainable development.

4.3 Elementary Teachers Values on Sustainable Development

Values on sustainable development were measured by seven point Likert type scale. While "7" corresponded to the most favorable value statement, "1" corresponded to the most unfavorable value statement in terms of sustainable development. The total mean score of the elementary teachers' responses was found as 5.809 over 7 with a standard deviation of .543. This high mean score indicates that elementary teachers possess favorable values on sustainable development.

Examination of dimension of the elementary teachers' values on sustainable development is presented following parts.

4.3.1 Freedom Consideration

With respect to freedom consideration, the mean score was calculated as 6.06 over 7 with a standard deviation of .22. As shown table 4.2, the great majority of the elementary teachers were of the opinion that families have right to live free from fear any violence (*M*=6.06), all people right to live without hunger and poverty (*M*=6.00), and all the people deserve the highest level of justice (*M*=6.13). That is, the teachers' responses refer to favorable values regarding freedom.

Table 4.2

Freedom Consideration

N	Point 1	M (SD)	Point 7
1	Sometimes the threat of violence is necessary to achieve social good.	6.06 (1.36)	All people have the absolute right to live their lives free from the fear of any violence.
2	All parents must struggle against hunger with their own efforts.	6.00 (1.38)	All parents have the right to live their lives free from hunger.
3	In some instances, people deserve lower levels of justice.	6.13 (1.35)	The highest level of justice should be available for all people at all times.

4.3.2 Equality Consideration

Looking at equality consideration, the mean score of the elementary teachers' responses is 4,951 with a standard deviation of .574. To put it in a different way, elementary teachers have moderate values in terms of equality consideration.

Table 4.3

Equality Consideration

N	Point 1	Mean(SD)	Point 7
4	People who contributed the most to economic development deserve greater access to its benefits.	5.14 (2.09)	People must have equal access to the benefits generated by development regardless of whether they contributed to that development or not.
5	The nations that foster economic development the most deserve greater access to its benefits.	4.92 (2.05)	All nations must have equal access to benefits from economic development.
6	Those citizens most responsible for economic prosperity should receive more of the resulting benefits.	4.86 (2.07)	The benefits of the global economy should be shared equally among all nations.

As detected in table 4.3, while some elementary teachers stressed that equal access to the benefits of economic development should be available for countries, nations and people, some of the elementary teachers supported counter arguments.

4.3.3 Solidarity Consideration

The mean score of 5,655 with a standard deviation of .583 was found for solidarity consideration. Considering elementary teachers' responses, they were of the opinion that rich people should share their income with the poor (*M*=6.06) and nations should help other nations affected by global crises (*M*=5.94). However, compared with the item seven and item eight, item nine had relatively low mean score and high standard deviation. That is to say, while most of the elementary teachers advocated the idea that people who suffer the most deserve help from people who suffer the least, there were many teachers who supported the idea that we must first address the suffering of our own before helping others with their suffering.

Table 4.4

Solidarity Consideration

N	Point 1	Mean(SD)	Point 7
7	If we earn our benefits then it is not necessary to give others some of our gains.	6.06 (1.21)	Those who benefit the most must help provide for those who benefit the least.
8	Just because one faces few burdens from global change does not mean that they must give assistance to those who are more burdened.	5.94 (1.26)	Those who bear a substantial burden from global changes should receive assistance from those who are less burdened.
9	We must first address the suffering of our own before helping others with their suffering.	4.98 (1.72)	Those who suffer the most deserve help from those who suffer the least.

4.3.4 Tolerance Consideration

Similar to solidarity consideration, responses of the elementary teachers to items of tolerance consideration reflect their favorable values towards sustainable development with the 5.99 mean score and a standard deviation of .80.

Table 4.5

Tolerance Consideration

N	Point 1	Mean(SD)	Point 7
10	Peace within societies invariably begins with promoting the society's traditional way of life.	6.15 (1.49)	Peace within societies invariably begins with openness toward others' ways of life.
11	There are some people's opinions that do not deserve respect.	6.10 (1.46)	All human beings must respect the diversity of opinions across all people.
12	In some cases, it becomes necessary to repress differences across societies.	5.71 (1.67)	People must not repress any differences across societies.

According to Table 4.5, the great majority of the elementary teachers emphasized that people should respect different lifestyles (*M*= 6.15), diversity of opinion across all people (*M*=6.10), and differences across society (*M*=5.71).

4.3.5 Respect for Nature Consideration

Respect for nature dimension has 5.75 of the mean score with a standard deviation of .071, which indicate that elementary teachers hold values of respect for nature. Accordingly, the ideas that current production pattern (M=5.77) and consumption pattern (*M*=5.72) must be changed to protect the welfare of the natural environment were supported by a large number of the elementary teachers. Detailed information is presented in table 4.6.

Table 4.6

Respect for Nature Consideration

N	Point 1	Mean(SD)	Point 7
14	Current patterns of production only require minor adjustments to protect the welfare of the natural environment.	5.77 (1.52)	Current patterns of production must be substantially changed to protect the welfare of the natural environment.
15	People need only make minor changes to their current consumption out of respect for nature.	5.72 (1.63)	People must make major changes to their current consumption out of respect for nature.

4.3.6 Shared Responsibility Consideration

In comparison with the mean scores of other dimensions, shared responsibility construct has the highest mean scores with 6.163 and standard deviation of .365. Details about items of this sub-dimension are presented in table 4.7.

Table 4.7

Shared Responsibility Consideration

N	Point 1	Mean(SD)	Point 7
17	We are responsible for assuring that people within our society have their rights for freedom maintained but we are not responsible for these rights for people in other societies.	6.58 (1.02)	We are all responsible for assuring that all people's rights to freedom are maintained.
18	A civilized nation must accept responsibility for improving the welfare of its less fortunate citizens but is not responsible for the welfare of another nation's citizens.	6.32 (1.19)	Civilized nations must accept responsibility for improving the welfare of less fortunate individuals around the world.
19	We are responsible when members of our immediate society do not tolerate cultural differences but are not responsible for the behavior of members of distant societies.	6.08 (1.42)	We all share responsibility when members of our global society do not tolerate cultural differences.
20	Each civilized nation should focus on ending injustices in their own borders and not influence other nations in their efforts.	6.46 (1.06)	It is the moral obligation of civilized nations to work together to end global injustices.

As shown in table 4.7, elementary teachers were of the opinion that people are responsible to assure freedom rights (M=6.58) and tolerate cultural differences (M=6.02). In addition, they advocate that civilized nations are responsible to improve the welfare of less fortunate individuals around the world (*M*=6.32), and work together for global justice (6.46).

4.4 Perceived Barriers towards Education for Sustainable Development

Perceived barriers towards education for sustainable development were consisted of fourteen different statements that teachers may perceive as barriers. Their perceptions towards these barriers were measured via 1-7 Likert type scale. Point one reflects that teachers hardly ever perceive these statements as barriers, while point seven reflects intensity of their perceptions as barriers. The frequencies

of elementary teachers' responses can be seen in figure 4.7. Furthermore, the mean scores and standard deviations are presented in table 4.8.

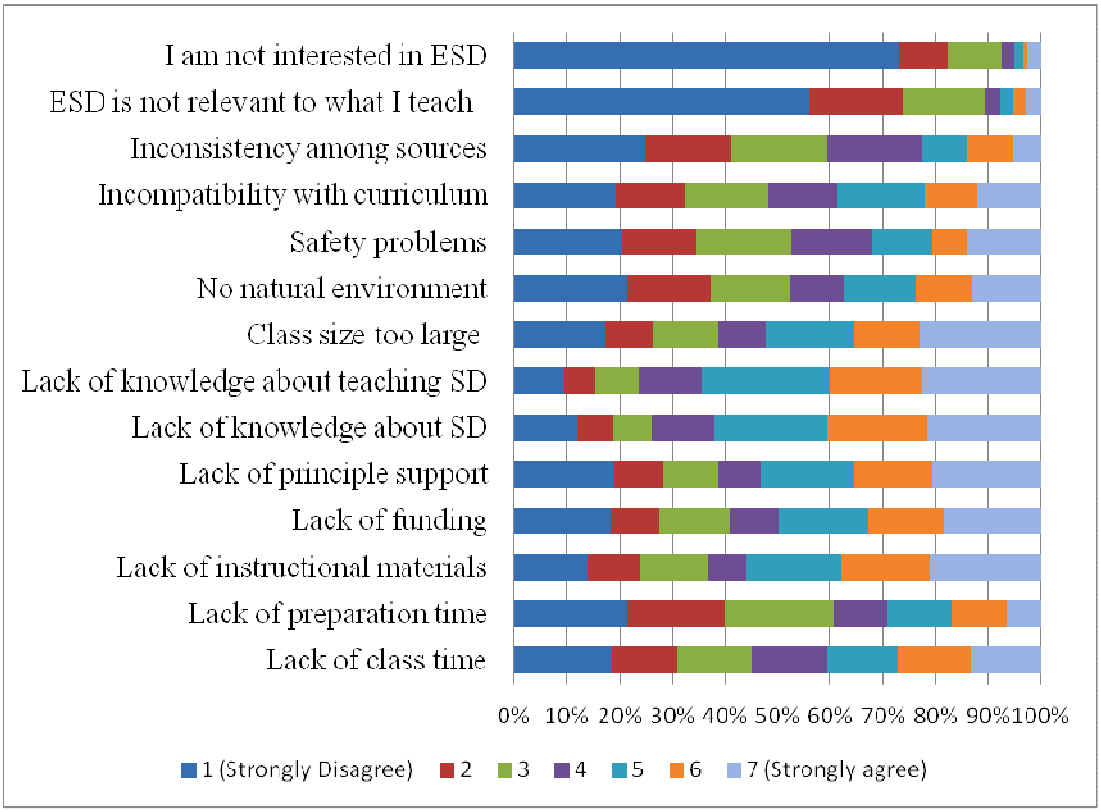

Figure 4.7 Perceived Barriers towards Sustainable Development

As it could be detected in table 4.8, elementary teachers participating in the current study reported that they are interested in education for sustainable development (M=1.63). With respect to perceived barriers, the association between their teaching fields and sustainable development (M=1.97) are not perceived as an obstacle towards sustainable development comparing with other items. Furthermore, the mean scores of other twelve items are very close to each other and their mean scores cluster between 3.17 and 4.78. Nevertheless, lack of the knowledge about SD (M=4.67), lack of knowledge about teaching SD (M=4.78) were relatively common obstacles for elementary teachers. On the other hand, it was revealed that the standard deviation of the items was relatively high, which meant teachers' responses were spread out over a large range of values. Accordingly, teachers generally had

different perceptions about barriers. For instance, there were no consensus among teachers' perceptions regarding lack of funding, lack of principle supports, lack of instructional materials, lack of class time, lack of natural environment, class sizes, and safety problems.

Table 4.8

Barriers towards Sustainable Development

Items	Mean	SD
Lack of knowledge about teaching SD	4.78	1.89
Lack of knowledge about SD	4.67	1.97
Lack of instructional materials	4.40	2.09
Class size too large	4.28	2.18
Lack of principle support	4.23	2.19
Lack of funding	4.14	2.13
Lack of class time	3.87	2.05
Incompatibility with curriculum	3.73	2.01
No natural environment	3.63	2.08
Safety problems	3.59	2.02
Lack of preparation time	3.31	1.88
Inconsistency among sources	3.17	1.82
ESD is not relevant to what I teach	1.97	1.47
I am not interested in ESD	1.63	1.31

4.5 Strategies towards Education for Sustainable Development

The scale consisted of teaching methods with three choices as "I have used", "I have not used" and "I have not used because it is not appropriate for ESD" were directed to explore elementary teachers' preference towards instructional strategies. As presented table 4.9, relatively large percentage of the respondents declared that they have used these teaching strategies.

Table 4.9

Teaching Strategies towards ESD

Strategies	**Percentages (%)**		
	I prefer	I do not prefer	I do not prefer because…
Brainstorming	91.2	8.8	-
Case study	86.8	13.2	-
Independent or group projects	85.9	14.1	-
Lectures	81.8	2.0	16.3
Educational games	78.5	20.0	1.5
Computer-assisted learning activities	77.6	21.0	1.5
Role-playing	76.5	23.0	1.0
Problem-solving activities	72.1	25.9	2.0
Guided discovery	70.6	28.9	.8
Indoctrination	70.1	13.9	15.9
Field trips	68.7	28.4	.9
Simulations/ animation/ modeling	59.9	39.6	.5
Experiments	58.6	38.4	3.0

Brainstorming (91.2%), case study (86.8%) and group projects (85.9%) were more frequently preferred strategies for elementary teachers. In addition these three, elementary teachers stressed that they have used lectures (81.8%), educational games (78.5), computer-assisted learning activities (77.6), and guided discovery (70.6%). On the other hand, experiment (58.6 %) and simulation/ animation and modeling (59.9%) were have used less frequently. Moreover, more than fifteen

percentages of the elementary teachers have not used lectures and indoctrination since these teaching methods were not appropriate for sustainable development.

4.6 The association between Perceived Barriers of the Elementary Teachers with Beliefs about ESD.

The Pearson correlation was calculated to reveal whether or not a significant relationship exists between perceived barriers of the elementary teachers and their beliefs about education for sustainable development. There were five assumptions listed by Pallant (2007) as level of measurement, independent of observation, normality of distribution, linearity and homoscedasticity. Preliminary analysis was performed to ensure no violation of these assumptions.

As to the relationship between perceived barriers towards education for sustainable development and elementary teachers' beliefs about education for sustainable development, it was found that there was a negative relationship between teachers' beliefs about education for sustainable development and the barriers they have perceived (r= -.17, n=175, p<.05). To put this findings another way, it can be stated while elementary teachers' beliefs about ESD increase, elementary teacher's perceived barriers decrease. Considering the categorization of Cohen (1998), the strength of the correlation could be categorized as small. In addition, the coefficient of determination was found as 3, which meant that perceived barriers scores of elementary teachers explain nearly 3 percent of the variance of their beliefs about education for sustainable development scores.

Further analysis was conducted to explore elementary teachers' beliefs about ESD and each perceived barriers. The results indicated that the elementary teachers' beliefs about education for sustainable development has significant negative correlations with the barriers of lack of funding, incompatibility with curriculum, inconsistency among sources, their teaching fields and their interest in education for sustainable development. On the other hand, relationship between elementary teachers' beliefs about ESD and other perceived barriers were non-significant. Detailed information is presented in table 4.10.

Table 4.10

Correlation Coefficient between Elementary Teachers' Beliefs about ESD and Perceived Barriers Towards ESD

	Beliefs about ESD
	r
Lack of knowledge about teaching SD	-,071
Lack of knowledge about SD	-,052
Lack of instructional materials	-,112
Class size too large	-,013
Lack of principle support	-,004
Lack of funding	-,152*
Lack of class time	-,073
Incompatibility with curriculum	-,204**
No natural environment	-,020
Safety problems	-,129
Lack of preparation time	-,108
Inconsistency among sources	-,211**
ESD is not relevant to what I teach	-186*
I am not interested in ESD	-159*

*Significant at the .05 level (two-tailed).

**Significant at the .01 level (two-tailed).

4.7 Chapter Summary

In this chapter, the results of the statistical analysis were represented. To sum up these results;

It was detected that most of the elementary teachers were familiar "sustainability" and "sustainable development" terms with respect to media and academic usages. The great majority of them defined sustainable development as *"development which meets the needs of the present without comprising the ability of*

future generations to meet their own needs". Furthermore, keywords written by elementary teachers were mostly associated with environmental aspects.

As to elementary teachers' beliefs about education for sustainable development, they hold favorable beliefs about implementation of education for sustainable development. On the other hand, means scores of their responses about the limitation of educations for sustainable development and adequacy of education for sustainable development in the Turkish education system were low. In addition to their beliefs, it was revealed that elementary teachers had high mean scores in terms of their values on sustainable development

With respect to elementary teachers' perceptions, lack of knowledge about SD, lack of knowledge about teaching SD and lack of instructional materials were relatively common barriers of education for sustainable development. Moreover, Elementary teachers have used mostly brainstorming, case study and group studies strategies in education for sustainable development.

Finally, it was revealed that there were statistically noticeable relationship between perceived barriers of ESD and teachers' beliefs about ESD.

CHAPTER 5

CONCLUSIONS, DISCUSSIONS AND IMPLICATIONS

This chapter presents the summary of the study, conclusions and discussions of the results implications, and finally recommendations for further studies.

5.1 Summary of the Study

This study aimed to reveal elementary teachers' values on sustainable development, their beliefs about education for sustainable development, their perceived barriers, and the techniques they have used in terms of education for sustainable development. Another purpose of the current study was to examine the possible relationship between the barriers that the elementary teachers perceived their beliefs on education for sustainable development. To achieve these aims, the instrument used in the study was administered to 211 elementary teachers from thirteen different teaching fields in Turkey. This data collection process was carried out from May to September 2012 via utilizing direct administration and web-survey data collection methods.

5.2 Conclusion and Discussion of the Results

5.2.1 Elementary Teachers' Familiarities with and Understandings of Sustainable Development

Descriptive analysis indicated that elementary teachers were familiar with the term of "sustainable development" with its usage in academia and media. More than 85 % of the elementary teachers identified themselves as very, quite and moderately familiar with both usages. Furthermore, elementary teachers defined the term sustainable development as *"development which meets the needs of the present without comprising the ability of future generations to meet their own needs"* which has become widely accepted definition (MacLeod, 1992) after its reports in Our

Common Future (WCED, 1987). Although teachers identified themselves as familiar with sustainable development and preferred widely accepted definition, the words they wrote up referred to the environmental aspect of sustainable development. It was revealed that the teachers frequently wrote words associated with the environment, nature, and ecology rather than words associated with long term, politics, improvement, technology, management and culture. In other words, elementary teachers reflected that sustainable development was more related to environmental aspects than social and economic aspects. Therefore, it revealed that the elementary teachers participating in this study lacked an adequate understanding of sustainable development. Sustainable development was regarded as preservation of nature and environmental quality. However, sustainable development has contested, multi-faceted. Accordingly, sustainable development needs future perspective in order to design a better future generation. People should have knowledge, values and skills in order to ensure equity, equal opportunity and quality for sustainable future. Globalization and global communities, which concentrate on local acting and think global effects of local acts should also be considered in the concept of sustainable development. In this aspect, elementary teachers' conceptualization of sustainable development is not adequate.

This result was compatible with the findings of previous studies, which indicate that teachers were lack of an adequate understanding of sustainable development since it is complex, and were lack of necessary holistic perspective, which combine environment, economic and social aspects of sustainable development. For instance; Pepper and Wildy (2008) found that the concept of sustainable development is not widely embraced by teachers. With respect to the findings of Borg, Gericke, Hoglund, & Bergman (2012), the environmental aspect of sustainable development was paid attention while social and economic aspects were ignored by in-service teachers. According to arguments of Borg et al. (2012) in-service teachers' understanding resulted from the deficiency of teacher education programs and the absence of further trainings towards in-service teachers. Since elementary teachers attending the in-service training programs were selected as the sample of the current study, it was expected that they would have adequate

understandings towards sustainable development. In this context, it appears that the duration of the in-service teacher trainings may not be sufficient to help teachers acquire the adequate understandings or content of these programs may not be well designed. On the other hand, Prosser and Trigwell (1997) pointed out the relationship between understanding and teaching of the same subject. According to these researchers, limited understanding of a concept causes limited teaching. Since the elementary teachers attending the current study were lack of an understanding of sustainable development concept, they may not integrate holistic perspective to their own lessons. To put it another way, teaching activities utilizing by elementary teacher may not be sufficient to help students understand the holistic approach of sustainable development.

Previous studies regarding teachers' understandings were generally focused on science teachers and social science teachers (e.g., Summers and Child 2007; Winter and Firth 2007) since curriculums of these fields were more associated with sustainable development. However, current study involved elementary teachers from different teaching fields since sustainable development should be one of the common objectives for all academic fields. In the context of the study, detailed examination of understandings of elementary teachers participating in the current study indicated that words associated the environmental aspect did not belong any specific teaching fields. To put it another way, teachers from different teaching fields also wrote words associated with environmental aspect.

5.2.2 Elementary Teachers' Beliefs on Education for Sustainable Development

Elementary teachers' high scores concerning implementation of education for sustainable development and low scores concerning limitations on education for sustainable development indicated that teachers held favorable beliefs. However, their low scores concerning adequacy of education for sustainable development in the Turkish education system showed unfavorable beliefs of elementary teachers.

As pointed out by Richardson (2003) beliefs of teachers stemmed from three main sources such as "personal experience", "experience school and instruction",

and “experience with formal knowledge”. Considering the fact that 82 % of the elementary teachers did not take any course related to sustainability or sustainable development in their undergraduate program , 82.5 % of them are familiar with sustainable development usage in the media, and they are currently members of at least one project related with sustainable development, it may be claimed that elementary teachers beliefs stem from their personal experience and experience with formal knowledge instead of experience school and instruction. To put it differently, elementary teachers favorable beliefs stemmed from their interaction with some sources such a media and in-service courses, projects and teaching environment.

Consistency between beliefs and classroom activities are debatable issue and the result of some studies (e.g., Richards 1998; Raymond & College 1997) also showed inconsistency between teachers’ beliefs and their classroom activities. In addition, some of the studies which support consistency between teachers’ beliefs and their classroom activities (e.g., Beck et al., 2000; Haney et al., 1996) were criticized since self reported-data collection techniques were used instead of direct observation. However, many researchers (e.g., Thompson, 1984; Pajares, 1992; Richardson, 1996) unveiled that teachers’ beliefs are indicator for their classroom activities. Furthermore, these researchers also emphasized that teachers’ beliefs are not isolated from contextual factors. Therefore, although elementary teachers’ favorable beliefs about education for sustainable development may be indicator for their sufficient teaching classroom activities concerning education for sustainable development, their inadequate understandings of sustainable development may limit these activities.

UNESCO (2005) clarified characteristics of education for sustainable development such as; interdisciplinearity and holistic, values driven, critical-thinking and problem solving, multi method, participatory decision-making, applicability, and locally relevant. As to interdisciplinerarity and holistic, education for sustainable development should be integrated whole curriculums instead of a separate subject. Similarly, elementary teachers attending the current study are of the opinion that education for sustainable development should be integrated at all levels of education,

it should be one of the objectives of every academic course, and it should be cared for by all teachers.

With respect to values driven characteristics of education for sustainable development, it is suggested that teaching activities should involve values underlining sustainable development. In the context of the current study, elementary teachers declared that education for sustainable development is an approach to improve students' value, knowledge and skill, which can be used in their daily life. On the other hand, Mogensen (1997) emphasized that learners should be exposed to issues of sustainable development in a social context in order to improve students' critical and reflective thinking abilities. Furthermore, UNESCO (2005) stressed that education for sustainable development should address debate and challenges of sustainable development to improve critical thinking and problem solving abilities. Respondents of this study also agreed that teachers should encourage their students to establish a connection between their personal lives and the issues of global environment and development, teaching controversial environmental, economic and developmental issues helps students develop their critical-thinking ability while they disagreed that teaching about sustainability is too controversial to be taught in elementary education and ESD issues are difficult for students to understand.

In addition to critical and problem solving characteristics of ESD, it was emphasized that education for sustainable development should be multiple methods and participatory decision making process. Accordingly, it was advocated that teachers should use different pedagogies in terms of education for sustainable development and learners should participate learning activities (UNESCO, 2005). Elementary teachers attending in this study also have favorable beliefs regarding multiple methods and participatory decision making process. As to multiple methods, for instance, elementary teachers declared that role-play and debates are useful methods, and permitting the students openly discuss the topics is a beneficial technique. With respect to participatory decision making process, elementary teachers confirmed that participatory learning and teamwork can improve students' learning standards, students should participate in various projects and programs for

sustainable development, students should have the right to make suggestions and decisions on matters concerning their school's syllabus regarding education for sustainable development, and since the contents of education for sustainable development are rich and complex, students should be allowed to choose the topics of study according to their interests.

Lastly, characteristics of applicability, which means learning outcomes should be integrated daily life, and characteristics of locally relevant, which refers education for sustainable development should address local as well as global issues are other aspects of high quality of education for sustainable development (UNESCO, 2005). In parallel with these viewpoints, the ideas that the social and cultural background of our country should be considered for ESD, teachers should choose teaching topics related to their students' daily life, the social and cultural backgrounds of my own country should be considered when establishing the contents of education for sustainable development were supported by elementary teachers participating in the present study. Considering both requirements of high quality of education for sustainable development and elementary teachers beliefs about limitations and implementations of education for sustainable development, consistency between them revealed.

Similar to the findings of the current study in terms of implementation of ESD, previous studies also stressed favorable beliefs of teachers who have background about sustainable development. According to Jaspar (2008), teachers were of the opinion that education for sustainable development contribute to students' learning, some websites are more useful for engaging student, and community members, organizations should support schools in terms of implementation of ESD. As far as Gayford (1998) is concerned teachers are of the opinion that education for sustainable development should be integrated whole-school approach. Moreover, Winter and Firth (2007) emphasized that teachers believe that importance of issue based approaches and role of the teacher to develop students' own understanding. Result of the current study indicated that participant (Green Pack Teachers and Eco- School coordinator teachers) who have background

information about sustainable development have favorable beliefs regarding implementation of sustainable development.

In previous studies, deficiencies of the Turkish education system regarding education for sustainable development were also emphasized. With respect to Yapıcı (2003), subjects and units in the curriculum were not sufficient to transfer the idea of sustainable development to students. In addition to this idea, Tanrıverdi (2009) stresses that elementary education curriculums lack learning outcomes and topics in terms of sustainable development. More recently, Kaya and Tomal (2011) pointed out the deficiencies of Social Science Education programs in terms of education for sustainable development. In the current study, elementary teachers also emphasized deficiency of the elementary education curriculums. Moreover, they point out the deficiencies of textbook activities and teacher trainings.

5.2.3 Elementary Teachers Values on Sustainable Development

Values on sustainable development scale concern with measuring six fundamental values of sustainable development. Analysis showed that elementary teachers have favorable values in terms of sustainable development. To be more specific, elementary teachers have freedom, equality, solidarity, tolerance, shared responsibility and respect for nature values.

Fundamental values of sustainable development were declared and clarified by the Millennium Declaration (United Nations General Assembly, 2000). Taking into account of the value descriptions in this report, elementary teachers' some traits could be predicted. Accordingly, they likely to be respectful all diversity of beliefs, cultures, languages, races and religions, sensitive lives of all other creatures, and the balance of the nature. Values of elementary teachers have also reflects equal rights for all people and equals opportunities for both genders. Furthermore, they likely to embrace democratic and participatory governance since it assures rights people deserve. Lastly, they have tendency to care about responsibilities such as assuring peace, security, and social and economic development.

With respect to Hart's (2003) viewpoint, teachers' classroom activities could be predicted taking into account of their values. For instance, teachers who are of the opinion that men should have priority for job applications are less likely to teach about gender equality. Since it is found that elementary teachers participating in the current study have freedom, equality, solidarity, tolerance, shared responsibility and respect for nature values, they may tend to reflect these values in their own lessons.

UNESCO (2005) stated that education for sustainable development is mainly associated with values and teaching activities should be designed considering values underlining sustainable development. In addition, it is emphasized that teachers reflect values of sustainable development with two ways in their own lessons. Firstly, they can teach these values directly. Secondly, they can be a role model for their students. Since elementary teachers participating in the current study have fundamental values of sustainable development, they may teach these values directly or they may be a role model for their students. As a consequence, students will be equipped with the values underlined in the Millennium Declaration, which will ensure a sustainable future.

5.2.4 Barriers towards Education for Sustainable Development

Previous studies (e.g., Summers and Corney 2005; Corney 2006; Scott and Gough, 2002) pointed out that the most common barrier for teachers was inadequate understanding of the association between their own fields and sustainable development. In addition to these findings, it is found that elementary teachers participating in the current study also lacked an adequate understanding about sustainable development. With respect to Prosser and Trigwell (1997) viewpoints, limited understanding of a concept causes limited teaching. Considering both the results of the previous studies and limited understandings of elementary teachers participating in the current study, they were expected to perceive lack of the knowledge about SD and the lack of teaching about SD as barriers. In parallel with this, majority of elementary teachers declared that they perceived these factors as barriers. Therefore, this situation indicates existence of the coherence between

elementary teachers understanding about sustainable development and barrier they have perceived. To put other words, although elementary teachers lack understanding, knowledge and teaching concerning sustainable development, they are aware of this deficiency. Elementary teachers' this awareness may contribute to both their own professional improvement and students' efficient learning.

According to earlier findings, one of the barriers elementary teachers face is the lack of support from the head of the school (Stradling 1984; Winter and Firth 2007). In the current study, some elementary teachers perceived lack of support from the head of the school as a barrier while some others did not. These different responses may stem from the differences between contextual factors of the projects elementary teachers attending. Accordingly, cooperation between teachers and manager of the school is a requirement for the Eco-school projects. Therefore, the supports of the head of the schools may not be barriers for the Eco-school coordinator teachers while it may be a barrier for the Green Pack teachers. On the other hand, the Green Pack project contains varieties of instructional materials for supporting teachers' activities. Therefore, the lack of instructional materials may not be barriers for the Green Pack teachers, while it may be a barrier for the Eco-schools teachers. To compare with public schools, lack of funding and class size are not supposed to be an obstacle for elementary teachers working in private schools. In addition, natural environment may be perceived as a barrier for elementary teachers in metropolitan comparing with elementary teachers in rural areas. To conclude, elementary teachers' perception on barriers towards education for sustainable development may be influenced by some contextual factors such as facilities of the projects or courses they participate in, and economic and social potentials of schools.

5.2.5 Teaching Strategies of Education for Sustainable Development

The findings of the current study showed that the majority of the elementary teachers preferred all thirteen strategies suggested in the measurement tool. More specifically, techniques such as brainstorming case study, independent or group projects, and lectures were more common for education for sustainable development. Furthermore, the majority of the elementary teachers also have used educational

games, role playing, computer assisted-learning activities, and guided discovery. Usage of different techniques may be associated with the elementary teachers teaching fields. As stated earlier, the sample of the present study consisted of elementary teachers from thirteen different teaching fields. These teaching fields may tend to use specific teaching methods for education for sustainable development. Detailed examination of elementary teachers' responses indicates that computer assisted learning activities, experiment, simulations, animation and modeling strategies are mostly preferred by science and technology teachers. Educational games, field trips and role playing mostly have been used by classroom teachers. In addition, case studies are mostly preferred by science and technology, social science and Turkish language teachers. Guided discovery and individual and group projects have been used mostly by foreign language and science and technology teachers.

Education for sustainable development deals with not only transferring specific knowledge to students, but also developing students' skills, values and perspective for a sustainable future (Hopkins & McKeown, 2002). Therefore, elementary teachers should prefer student centered teaching strategies instead of traditional teaching strategies (Björneloo 2004; Corney and Reid 2007; Corney 2006; Sterling 2001; Winter and Firth 2007). However, elementary teachers in the current study reported that they also preferred traditional teaching strategies such as indoctrination and lecturing. Thus, this situation may be associated with elementary teachers' insufficient understandings concerning sustainable development. Since elementary teachers focus on content and ignore values, skills and perspectives of sustainable development, they may think indoctrination and lecturing as a way to transfer content of sustainable development to students.

Considering the fact that elementary teachers lack sufficient understanding of sustainable development, student centered teaching strategies they have used may not effective for sustainable development. Prosser and Trigwell (1997) stress that inadequate understanding of a concept limits teaching activities. Therefore, elementary teachers may have used these techniques for teaching content instead of values or skills.

5.2.6 The relationship between perceived barriers and beliefs about education for sustainable development

Most of the research (Fang, 1996; Pajares, 1992) indicated that teachers' beliefs cannot be examined out of the context. Some external factors stemming from the classroom environment, school, the principle, community and curriculum may influence teachers' beliefs. Therefore, the association between perceived barriers of elementary teachers which includes some of the contextual factor and elementary teachers' beliefs about education for sustainable development were examined. The relevant results showed that there was a statistically significant negative relationship between these variables. In other words, high level of elementary teachers' beliefs was associated with low level of barriers they have perceived.

Considering items of the scale separately, elementary teachers' beliefs about education for sustainable development were associated with funding, curriculums, their teaching fields, sources about sustainable development and their interest in sustainable development. However, there was no relationship between elementary teachers' beliefs and class time, preparation time for lesson, instructional materials, knowledge about sustainable development, knowledge teaching about sustainable development, class size, and natural environment. Therefore, since teachers have perceived lack of funds, curriculums, their teaching fields, sources about sustainable development and their interest in sustainable development as barriers for education for sustainable development, their beliefs scores about education for sustainable development decrease. That is to say, the absence of these five barriers towards education for sustainable development contributed to the favorable beliefs for elementary teachers.

Considering elementary teachers' responses to barriers they have perceived, lack of perceived lack of funds, curriculums, their teaching fields, sources about sustainable development and their interest in sustainable development are relatively the least common perceived barriers. Therefore, elementary teachers' have favorable beliefs, since they have not perceived these five factors as common barriers they face.

5.3 Implications

The result of the study has some implication and suggestion for educator, researcher and administrator.

- It is revealed in this study that elementary teachers' perspectives regarding sustainable development reflected environmental aspects. Therefore, the term education for sustainable development perceived as the same with environmental, natural or ecological education. However, sustainable development deals with both social, economic aspects as well as environmental aspect. Furthermore, education for sustainable development reflects values of these aspects equally (Paden, 2000). Therefore, in service courses and projects regarding sustainable development and education for sustainable development should reflect these values equally.
- In order to keep elementary teachers' beliefs on education for sustainable development and values on sustainable development high, in-service training programs should proceed. Furthermore, teacher should support with necessary instructional materials.
- In-service teacher trainings should be designed to eliminate some of the barriers elementary teachers perceived.
- Elementary teachers believe that the current situation of the Turkish education system in terms of education for sustainable development is not sufficient. Therefore, textbooks and curriculums should be designed considering characteristics, competencies and standards of education for sustainable development.

5.4 Recommendations for Further Studies

- Elementary teachers' knowledge on sustainable development and education for sustainable development should be examined in order to determine their competence.

- Elementary teachers' values on sustainable development and beliefs on education for sustainable development should be investigated in a further study considering regional differences and teaching fields.
- A similar study should be conducted with a random sampling method and greater number of elementary teachers for the purpose of generalizing to Turkish population.
- The present study may be replicated with secondary teachers.
- Barriers elementary teachers face should be examined considering school type, teaching field.
- Further studies may examine whether or not barriers elementary teachers have perceived differentiate between different teaching fields.

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APPENDIX A

SÜRDÜRÜLEBİLİR KALKINMA (SK) DEĞERLERİ VE SÜRDÜRÜLEBİLİR KALKINMA EĞİTİMİ İNANÇLARI ANKETİ

KİŞİSEL BİLGİLER

1. Cinsiyetiniz: ☐Erkek ☐Kadın
2. Branşınız:.....
3. Hizmet Yılınız: ……..
4. Görev yaptığınız il:.....

SÜRDÜRÜLEBİLİR KALKINMA ANLAYIŞINIZ

1. İçerisinde sürdürülebilirliğin veya sürdürülebilir kalkınmanın da konu edinildiği;
   a. Herhangi bir hizmet içi eğitim programına katıldınız mı? ☐Evet ☐Hayır
   b. Lisans/lisanüstü öğreniminizde herhangi bir ders aldınız mı? ☐Evet ☐Hayır
   c. Öğrencileriniz, okulunuz aracılığı ile aşağıdaki projelerden hangilerine katıldınız veya destek oldunuz?
      ☐ Eko Okullar ☐ Mavi Gök Yeşil Yaprak ☐ Çocuk Dostu okul
      ☐ Yeşil Kutu ☐ Çocukların Meyve Bahçeleri ☐ Okullarda Orman
      ☐KENTGES ☐ Geleceğe Enerjin Kalsın ☐Başkent Enerji Hareketi
      ☐Yeşil Yaprak ☐Diğer (lütfen belirtiniz).....

2. "Sürdürülebilirlik" ya da "sürdürülebilir kalkınma sözcükleri" size ne kadar tanıdık geliyor?

	Hiç	Biraz	Orta	Oldukça	Çok
Medyada kullanılan şekliyle	1	2	3	4	5
Akademik alanınızda kullanılan şekliyle	1	2	3	4	5

3. Aşağıdaki ifadelerden hangisi ‘Sürdürülebilir Kalkınma’ ile ilgili **kendi** anlayışınıza en yakındır?

   a) Çevre korumasının ihmal edilmesi pahasına toplumun kısa ve uzun vadede gerekli olan ihtiyaçlarının karşılanmasına yönelik bir kalkınma şeklidir.
   b) Bireylerin kendi kaliteli yaşam anlayışlarına göre yaşayabilmelerini destekleyen bir kalkınma şeklidir.
   c) Gelecek nesillerin ihtiyaçlarının karşılanması ve olanaklarını tehlikeye sokmadan günümüzün ihtiyaçlarını karşılayan bir kalkınma şeklidir.
   d) Mal ve hizmet üretiminin ve bu ürünlerin kalitesindeki artışın uzun vadede sürdürüldüğü bir kalkınma şeklidir.
   e) Karşı karşıya olduğumuz ekolojik krizden kurtulabilmek için doğanın ve doğal kaynaklarımızın korunmasını hedefleyen bir kalkınma şeklidir.

4. ‘Sürdürülebilirlik’ ile ilgili kişisel anlayışınızı yansıtan anahtar kelimeler ya da söz öbeklerinden en az 3 tane yazınız. *(Lütfen yukarıda 3. soruda yer alan kelimeleri kullanmayınız.)*

   ……

SÜRDÜRÜLEBİLİR KALKINMAYA YÖNELİK DEĞERLER

Sürdürülebilir kalkınmaya yönelik değerlerin ölçüldüğü bu bölümde her madde farklı görüşleri yansıtan yargı çiftlerinden oluşmaktadır. Her iki yargı çiftini dikkatlice okuduktan sonra bunlardan hangisine ve ne ölçüde yakın olduğunuzu 1 den 7 ye kadar olan rakamlardan birini seçerek belirtiniz. 1, 2, 3 rakamlarından birini seçmeniz sol taraftaki düşünceyi, 5, 6, 7 rakamlarından birini seçmeniz sağ taraftaki düşünceyi desteklediğinizi gösterir.

Örnek:

	1	2	3	4	5	6	7	
Ailelerin geçiminden erkekler sorumlu olduğu için iş başvurularında erkek adaylara öncelik tanınmalıdır.		x						İş başvurularında tüm adaylara eşit davranılmalıdır.

Bu işaretleme, çoğu durumda erkek adaylara iş başvurularında öncelik tanınması gerektiğini düşüncesini göstermektedir.

1	Tüm insanlar herhangi bir şiddete maruz kalma korkusu olmadan yaşamayı hak ederler.	1	2	3	4	5	6	7	Kimi durumlarda şiddet tehdidi toplumun iyiliği için gereklidir.
2	Tüm ailelere açlık ve fakirliğin olmadığı bir ortamda yaşamayı hak ederler.	1	2	3	4	5	6	7	Açlık ve fakirlik gibi durumlara karşı aileler kendi çabalarıyla mücadele etmelidirler.
3	Bütün insanlar her zaman en üst düzeyde adaleti hak ederler.	1	2	3	4	5	6	7	Bazı durumlarda insanlar adaleti daha az hak ederler.
4	Ülkesinin ekonomik kalkınmasına daha çok katkı sağlayan insanlar, bu kalkınmanın faydalarından daha fazla yararlanmayı hak eder.	1	2	3	4	5	6	7	Ülke ekonomisine katkıları olsun ya da olmasın tüm insanlar ekonomik kalkınmanın faydalarından eşit bir şekilde yararlanmalıdır.
5	Ekonomik kalkınmaya daha çok katkı sağlayan devletler bunun faydalarından daha fazla yararlanmalıdır.	1	2	3	4	5	6	7	Tüm ülkeler ekonomik kalkınmanın faydalarından eşit bir şekilde yararlanmalıdır.
6	Ekonomik kalkınmaya katkıda bulunan ekonomi çevreleri, bunun getirdiği kazançlardan daha fazla yaralanmalıdır.	1	2	3	4	5	6	7	Küresel ekonominin kazancı tüm halklar tarafından eşit olarak paylaşılmalıdır.
7	Geliri fazla olan insanlar geliri az olan insanlara yardım etmelidir.	1	2	3	4	5	6	7	Gelirimiz fazla olsa bile bunu başkalarıyla paylaşmak gereksizdir.
8	Küresel krizlerden etkilenen toplumlara diğer toplumlar yardım etmelidir.	1	2	3	4	5	6	7	Küresel krizlerden etkilenen toplumlara diğer toplumların yardım etmesi gerekmez.

9	Kendi sorunlarımız olsa da öncelikle bizden çok daha fazla sorunu olanlara yardım etmeliyiz.	1	2	3	4	5	6	7	Başkalarının bizden çok daha büyük sorunları olsa bile, öncelikle kendi sorunlarımıza yönelmeliyiz.
10	Ülke içindeki barış için sayıca çok olan kesimin yaşam şekline hoşgörülü olunması yeterlidir.	1	2	3	4	5	6	7	Ülke içindeki barış, tüm insanların yaşam şekline hoşgörüyle yaklaşıldığında başlar.
11	Bazı insanların düşünceleri saygıyı hak etmez.	1	2	3	4	5	6	7	Tüm insanların farklı düşünce ve inançlarına karşı hoşgörülü olunmalıdır.
12	Toplum içindeki farklılıkları baskı altına almak bazı durumlarda gereklidir.	1	2	3	4	5	6	7	Toplum içindeki her türlü farklılığa hoşgörülü olunmalıdır.
14	Doğal çevreyi korumak için mevcut üretim şekillerinde büyük ölçüde değişiklikler yapılmalıdır.	1	2	3	4	5	6	7	Doğal çevreyi korumak için mevcut üretim şekillerinde sadece küçük çaplı değişiklikler yeterlidir.
15	İnsanlar doğa için hali hazırdaki tüketim alışkanlıklarında büyük değişiklikler yapmak zorundadır.	1	2	3	4	5	6	7	İnsanların doğa için tüketim alışkanlıklarında küçük değişiklikler yapmaları yeterlidir.
17	Kendi toplumumuzda yaşayan insanların haklarını korumada sorumluyken diğer toplumların hakları bizim sorumluluğumuzda değildir.	1	2	3	4	5	6	7	İnsan haklarının dünya çapında korunmasından herkes sorumludur.
18	Uygar ülkeler sadece kendi vatandaşlarının hayat kalitesinin yükseltilmesinden sorumludurlar.	1	2	3	4	5	6	7	Uygar ülkeler dünyadaki tüm insanların hayat kalitesinin yükseltilmesinden sorumludurlar.

19	Bizden uzaktaki toplumlar kültürel farlılıklara karşı hoşgörülü değilse bundan biz sorumlu olamayız.	1	2	3	4	5	6	7	Dünyadaki toplumlar kültürel farklılıklara hoşgörülü değilse bundan tüm insanlık sorumludur.
20	Her ülke sadece kendi sınırları içerisindeki haksızlıkların giderilmesinden sorumludur.	1	2	3	4	5	6	7	Dünyadaki haksızlıkların giderilmesi, tüm ülkelerin birlikte çalışması gereken ahlaki bir sorumluluktur.

SÜRDÜRÜLEBİLİR KALKINMA EĞİTİMİ (SKE) HAKKINDA İNANÇLAR

Aşağıdaki maddelerin ifade ettikleri görüşe ne ölçüde katıldığınızı ilgili rakamları yuvarlak içine alarak belirtiniz

		Tamamen Katılmıyorum (1)	**Katılmıyorum (2)**	**Kararsızım (3)**	**Katılıyorum (4)**	**Tamamen katılıyorum (5)**
1	SKE, öğrencilerin ileriye yönelik karar verme yeteneklerini geliştirir.	1	2	3	4	5
2	SKE sürecinde ekonomi, çevre ve sosyal kalkınma ile ilgili tartışmalı konuları ele almak öğrencilerin eleştirel düşünme becerilerini geliştirir.	1	2	3	4	5
3	SK konularına derslerinde yer vermek öğretmenlerin mesleki birikimini zenginleştirir.	1	2	3	4	5
4	Sürdürülebilir kalkınma eğitimi sürecinde öğrenciler kendi kavramsal anlayışlarını geliştirebilir.	1	2	3	4	5
5	SKE sürecinde katılımcı öğrenme ve takım çalışmaları öğrencilerde anlamlı öğrenmeyi pekiştirir.	1	2	3	4	5
6	SKE günlük yaşamda	1	2	3	4	5

	kullanılabileceğimiz bilgi, değer ve yetenekleri kazandırır.					
7	SKE tartışmaya açık konuları içerdiği için ilköğretim düzeyinde öğretilemez.	1	2	3	4	5
8	SKE gerçekçi olmayan bir eğitim düşüncesidir.	1	2	3	4	5
9	SK ile ilgili konulara ilköğretim programlarında yer verilmesi öğrencilerin dersten soğumasına neden olur.	1	2	3	4	5
10	SKE'nin eğitim vereceğim alanla bütünleşmesi zordur.	1	2	3	4	5
11	SKE konularının öğrenciler tarafından anlaşılması zordur.	1	2	3	4	5
12	SKE'yi uygulamak zordur.	1	2	3	4	5
13	Sürdürülebilir kalkınma ile ilgili konulara öğretmenlerin derslerinde yer vermesi zaman kaybına neden olur.	1	2	3	4	5
14	SKE tüm örgün eğitim kademelerine eklenmelidir.	1	2	3	4	5
15	Öğretmenler SKE sürecinde öğrencilerinin günlük yaşamları ile ilgili olan konuları seçmelidir.	1	2	3	4	5
16	SKE sürecinde öğretmenler günlük hayatta kolaylıkla ulaşabilecekleri öğretim materyallerini kullanmalıdır.	1	2	3	4	5
17	SK için özel sektör, kamu sektörü ve okullar birlikte çalışmalıdır.	1	2	3	4	5
18	Ülkemizin kültürel ve sosyal özellikleri SKE'nin içeriği oluşturulurken göz önünde bulundurulmalıdır.	1	2	3	4	5
19	SKE her dersin temel amaçlarından biri olmalıdır.	1	2	3	4	5
20	Sürdürülebilir kalkınma eğitimi öğretim alanı ne olursa olsun her öğretmen tarafından önemsenmelidir.	1	2	3	4	5
21	Öğrenciler, SKE sürecinde öğretim programları hakkında öneride bulunma ve karar verme hakkına sahip olmalıdır.	1	2	3	4	5

22	Öğretmenler, öğrencilerin günlük yaşamları ile küresel çevre ve kalkınma sorunları arasında bağ kurmalarını sağlamalıdır.	1	2	3	4	5
23	SKE'yi gerçekleştirirken yazılı ve görsel medyada çıkan haberler öğrencilerle paylaşılmalıdır.	1	2	3	4	5
24	Öğrencilerin, sürdürülebilirlikle ilgili küresel ve yerel konuları kapsayan çeşitli proje ve eğitim programlarına (eko-okullar, çocukların meyve bahçeleri, mavi gök yeşil yaprak vb.) katılmalıdır.	1	2	3	4	5
25	Rol oynama ve tartışma yöntemi, SKE sürecinde faydalı olan öğretim yöntemlerindendir.	1	2	3	4	5
26	SKE'nin kapsamı çok geniş olduğu için öğrenciler kendi ilgilerine göre bu alanda çalışma konuları belirleyebilmelidir.	1	2	3	4	5
27	Öğrencilerin konuları açık bir şekilde tartışmasını sağlamak SKE için iyi bir tekniktir.	1	2	3	4	5
28	Her branştan öğretmene sürdürülebilir kalkınma konularına derslerinde nasıl yer verebileceklerine dair bilgiler verilmelidir.	1	2	3	4	5
29	Okullarda verilen eğitim öğrencilerde SK'ye dair duyarlılık geliştirmek için yeterlidir.	1	2	3	4	5
30	Ders kitaplarındaki etkinlikler SKE için yeterlidir.	1	2	3	4	5
31	Eğitim programlarında SKE'ye yeterli düzeyde yer ayrılmıştır.	1	2	3	4	5
32	Öğretmenlere SKE ile ilgili yeterli bilgilendirme sağlanmaktadır.	1	2	3	4	5

SÜRDÜRÜLEBİLİR KALKINMA EĞİTİMİNE DAİR ENGELLER

SKE esnasında aşağıda verilen engellerden hangileri ile karşılaştığınızı belirtiniz.

Ders süresinin kısalığı.	1	2	3	4	5	6	7
Derse hazırlanmanın zaman alması.	1	2	3	4	5	6	7
Öğretim materyallerinin yetersizliği.	1	2	3	4	5	6	7
Maddi olanaksızlılar.	1	2	3	4	5	6	7
İdareci desteğinin yetersizliği.	1	2	3	4	5	6	7
Sürdürülebilir kalkınma konularında bilgi eksikliği.	1	2	3	4	5	6	7
SK konularının öğretimi hakkında bilgi eksikliği.	1	2	3	4	5	6	7
Kalabalık sınıflar.	1	2	3	4	5	6	7
Uygun doğal çevrenin (orman, göl, vb.) yokluğu.	1	2	3	4	5	6	7
Güvenlik sorunları.	1	2	3	4	5	6	7
Öğretim programı ile uyumsuzluğu.	1	2	3	4	5	6	7
SKE hakkındaki kaynakların tutarsızlığı.	1	2	3	4	5	6	7
SKE benim öğretim alanımla ilgili değil.	1	2	3	4	5	6	7
SKE ile ilgilenmiyorum.	1	2	3	4	5	6	7
Diğer nedenler (Lütfen belirtiniz:…….)	1	2	3	4	5	6	7

KULLANILAN TEKNİKLER

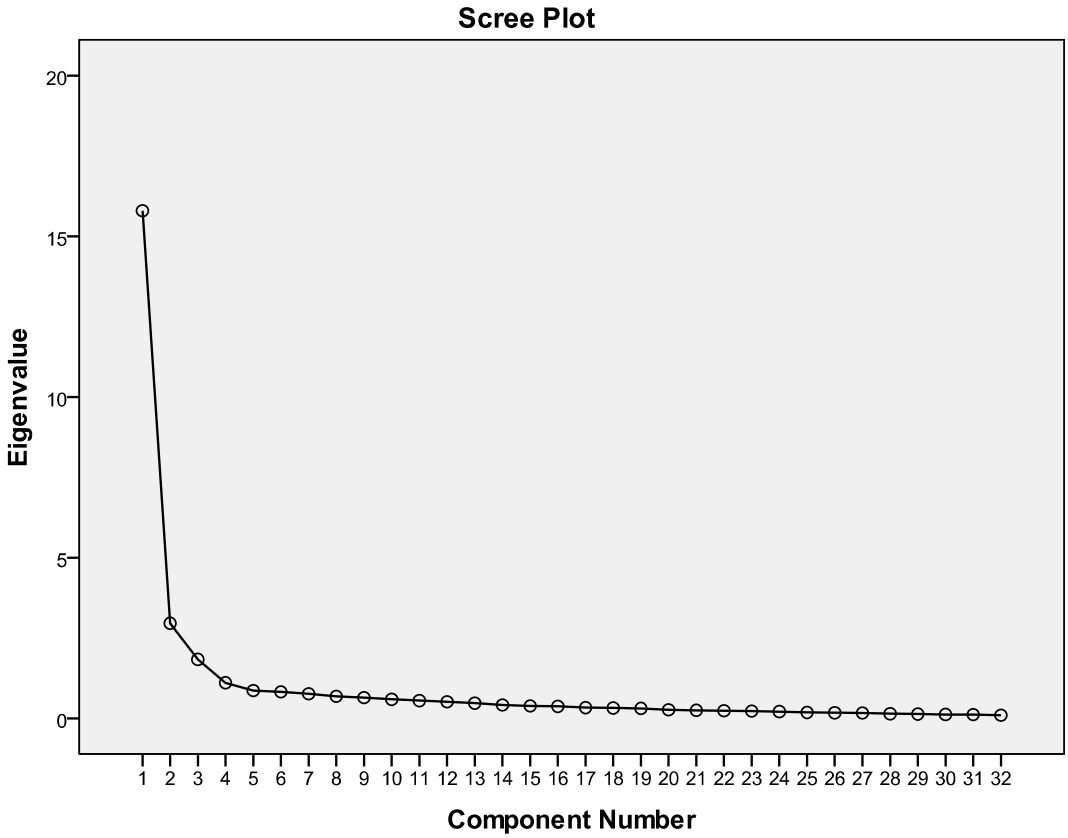
Sürdürülebilir kalkınmaya yönelik olarak aşağıdaki öğretim yöntem ve tekniklerinden hangilerini kullanıyorsunuz?

	Kullanıyorum	Kullanmıyorum ama kullanmayı isterim	Kullanmıyorum, çünkü SKE'ye uygun değil.
Gezi / Gözlem			
Düz anlatım			
Keşfetme			
Rol oynama / Drama			
Bireysel / Grup Projeleri			
Probleme Dayalı Öğretim			
Modelleme / Simülasyon / Animasyon			
Eğitsel Oyunlar			
Beyin Fırtınası			
Örnek Olay			
Bilgisayar destekli etkinlikler			
Fikir aşılama			
Deney			

Diğer (lütfen tanımlayınız)			

APPENDIX B

SCREE PLOT FOR ELEMENTARY TEACHERS' BELİEFS



APPENDIX C

THE ROTATED COMPONENT MATRIX FOR ELEMENTARY TEACHERS' BELİEFS

Rotated Component Matrix

		Component		
		1	2	3
23	SKE'yi gerçekleştirirken yazılı ve görsel medyada çıkan haberler öğrencilerle paylaşılmalıdır.	,869	,150	-,125
25	Rol oynama ve tartışma yöntemi, SKE sürecinde faydalı olan öğretim yöntemlerindendir.	,857	,222	-,104
22	Öğretmenler, öğrencilerin günlük yaşamları ile küresel çevre ve kalkınma sorunları arasında bağ kurmalarını sağlamalıdır.	,857	,224	-,160
24	Öğrencilerin, sürdürülebilirlikle ilgili küresel ve yerel konuları kapsayan çeşitli proje ve eğitim programlarına (eko-okullar, çocukların meyve	,841	,168	-,101
20	Sürdürülebilir kalkınma eğitimi öğretim alanı ne olursa olsun her öğretmen tarafından önemsenmelidir.	,840	,184	
16	SKE sürecinde öğretmenler günlük hayatta kolaylıkla ulaşabilecekleri öğretim materyallerini kullanmalıdır.	,837	,222	-,107
18	Ülkemizin kültürel ve sosyal özellikleri SKE'nin içeriği oluşturulurken göz önünde bulundurulmalıdır.	,828	,188	
28	Her branştan öğretmene sürdürülebilir kalkınma konularına derslerinde nasıl yer verebileceklerine dair bilgiler verilmelidir.	,806	,157	-,188
17	SK için özel sektör, kamu sektörü ve okullar birlikte çalışmalıdır.	,800	,236	-,134
27	Öğrencilerin konuları açık bir şekilde tartışmasını sağlamak SKE için iyi bir tekniktir.	,791	,259	
15	Öğretmenler SKE sürecinde öğrencilerinin günlük yaşamları ile ilgili olan konuları seçmelidir.	,769	,197	-,138
21	Öğrenciler, SKE sürecinde öğretim programları hakkında öneride bulunma ve karar verme hakkına sahip olmalıdır.	,753	,175	-,118
3	SK konularına derslerinde yer vermek öğretmenlerin mesleki birikimini zenginleştirir.	,720	,353	
26	SKE'nin kapsamı çok geniş olduğu için öğrenciler kendi ilgilerine göre bu alanda çalışma konuları belirleyebilmelidir.	,703	,251	

2	SKE sürecinde ekonomi, çevre ve sosyal kalkınma ile ilgili tartışmalı konuları ele almak öğrencilerin eleştirel düşünme becerilerini geliştirir.	,688	,466	
5	SKE sürecinde katılımcı öğrenme ve takım çalışmaları öğrencilerde anlamlı öğrenmeyi pekiştirir.	,681	,436	
19	SKE her dersin temel amaçlarından biri olmalıdır.	,659	,160	,101
4	Sürdürülebilir kalkınma eğitimi sürecinde öğrenciler kendi kavramsal anlayışlarını geliştirebilir.	,637	,407	
6	SKE günlük yaşamda kullanılabileceğimiz bilgi, değer ve yetenekleri kazandırır.	,635	,492	
14	SKE tüm örgün eğitim kademelerine eklenmelidir.	,608	,212	
1	SKE, öğrencilerin ileriye yönelik karar verme yeteneklerini geliştirir.	,590	,413	-,124
11	SKE konularının öğrenciler tarafından anlaşılması zordur.	,235	,799	
12	SKE'yi uygulamak zordur.	,102	,766	
9	SK ile ilgili konulara ilköğretim programlarında yer verilmesi öğrencilerin dersten soğumasına neden olur.	,285	,712	-,220
13	Sürdürülebilir kalkınma ile ilgili konulara öğretmenlerin derslerinde yer vermesi zaman kaybına neden olur.	,326	,674	-,175
8	SKE gerçekçi olmayan bir eğitim düşüncesidir.	,382	,635	-,325
10	SKE'nin eğitim vereceğim alanla bütünleşmesi zordur.	,213	,614	
7	SKE tartışmaya açık konuları içerdiği için ilköğretim düzeyinde öğretilemez.	,245	,523	-,277
30	Ders kitaplarındaki etkinlikler SKE için yeterlidir.	-,161	-,117	,874
31	Eğitim programlarında SKE'ye yeterli düzeyde yer ayrılmıştır.	-,125	-,286	,793
29	Okullarda verilen eğitim öğrencilerde SK'ye dair duyarlılık geliştirmek için yeterlidir.			,746
32	Öğretmenlere SKE ile ilgili yeterli bilgilendirme sağlanmaktadır.		-,214	,682

APPENDIX D

DOCUMENT OF HUMAN RESEARCH ETHICS COMMITTEE

1956

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Middle East Technical University
Fen Bilimleri Enstitüsü
Graduate School of
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Sayı: B.30.2.ODT.0.AH.00.00/126/68

28 Mayıs 2012

Gönderilen: Yrd. Doç. Dr. Elvan Şahin
İlköğretim Bölümü

Gönderen : Prof. Dr. Canan Özgen
IAK Başkan Yardımcısı

İlgi : Etik Onayı

" İlköğretim Öğretmenlerinin Sürdürülebilir Kalkınma Açısından İnanç ve Değerleri " isimli araştırmanız "İnsan Araştırmaları Komitesi" tarafından uygun görülerek gerekli onay verilmiştir.

Bilgilerinize saygılarımla sunarım.

Etik Komite Onayı

Uygundur

28/05/2012

Prof.Dr. Canan ÖZGEN
Uygulamalı Etik Araştırma Merkezi
(UEAM) Başkanı
ODTÜ 06531 ANKARA

APPENDIX E

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Yenilik ve Eğitim Teknolojileri Genel Müdürlüğü

Sayı : B.08.0.YET.00.20.00.0 / 16056 12.../09/2012
Konu : Araştırma İzni.

ORTA DOĞU TEKNİK ÜNİVERSİTESİ REKTÖRLÜĞÜNE

İlgi : a) 15.06.2012 tarih ve B.30.2.0DT. 72.00.00/400-3142 sayılı yazı,
b) 07.03.2012 tarih B.08.0.YET.00.20.00.0/3616 sayılı yazı (Genelge No: 2012/13)

Üniversiteniz İlköğretim Fen ve Matematik Eğitimi Ana Bilim Dalı Yüksek Lisans Programı Öğrencisi Ali SAĞDIÇ'ın " İlköğretim Öğretmenlerinin Sürdürülebilir Kalkınma Açısından İnanç ve Değerleri" isimli araştırması için uygulama izni talebi incelenmiştir.

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APPENDIX F

TEZ FOTOKOPİ İZİN FORMU

ENSTİTÜ

Fen Bilimleri Enstitüsü ☐

Sosyal Bilimler Enstitüsü **X**

Uygulamalı Matematik Enstitüsü ☐

Enformatik Enstitüsü ☐

Deniz Bilimleri Enstitüsü ☐

YAZARIN

Soyadı : SAĞDIÇ
Adı : ALİ
Bölümü : İlköğretim Fen ve Matematik Alanları Eğitimi

TEZİN ADI (İngilizce) : A closer look into Turkish elementary teachers regarding education for sustainable development

TEZİN TÜRÜ : Yüksek Lisans **X** Doktora ☐

1. Tezimin tamamı dünya çapında erişime açılsın ve kaynak gösterilmek şartıyla tezimin bir kısmı veya tamamının fotokopisi alınsın. ☐

2. Tezimin tamamı yalnızca Orta Doğu Teknik Üniversitesi kullancılarının erişimine açılsın. (Bu seçenekle tezinizin fotokopisi ya da elektronik kopyası Kütüphane aracılığı ile ODTÜ dışına dağıtılmayacaktır.) ☐

3. Tezim bir (1) yıl süreyle erişime kapalı olsun. (Bu seçenekle tezinizin fotokopisi ya da elektronik kopyası Kütüphane aracılığı ile ODTÜ dışına dağıtılmayacaktır.) **X**

Yazarın imzası ..... Tarih .....