

PRE-SERVICE CLASSROOM TEACHERS' PERCEIVED COMPETENCIES ON
EDUCATION FOR SUSTAINABLE DEVELOPMENT

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ABSTRACT

PRE-SERVICE CLASSROOM TEACHERS' PERCEIVED COMPETENCIES ON EDUCATION FOR SUSTAINABLE DEVELOPMENT

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The purpose of this study was to analyze pre-service classroom teachers' perceived competencies on Education for Sustainable Development (ESD). For this purpose, first, attitudes of pre-service classroom teachers towards Sustainable Development (SD) were examined; then, their perceived competencies regarding ESD were investigated. Finally, the curriculum of classroom teachers was analyzed to see if it reflected learning opportunities for development of the competencies. In this study, a mixed methods sequential explanatory design was used. Firstly, survey design was used. The participants consisted of 1008 pre-service classroom teachers in 12 universities across Turkey. The data was collected through a data collection tool designed by the researcher. To analyze the data, descriptive statistics and inferential statistics (MANOVA) were used. Secondly, document analysis was used. To collect data, selected courses in classroom teaching curriculum were analyzed. The results of descriptive statistical analyses revealed that pre-service classroom teachers had positive attitudes towards SD. The results of MANOVA analysis demonstrated that level of development of the city they live in affected pre-service classroom teachers' attitudes towards SD and competencies regarding ESD; whereas

parents' education level did not affect either their attitudes or competencies. The results also indicated that as pre-service classroom teachers reflect more positive attitudes towards SD; they perceive themselves more competent regarding ESD. The findings of the document analysis indicated that although there were some learning opportunities for developing pre-service classroom teacher competencies for ESD in classroom teaching curriculum, they were not clearly mentioned in goals, objectives and the content of the courses examined.

Keywords: Education for Sustainable Development, Teacher Attitudes, Teacher Competencies, Pre-Service Teachers, Classroom Teaching Curriculum.

ÖZ

SINIF ÖĞRETMENİ ADAYLARININ SÜRDÜRÜLEBİLİR KALKINMA İÇİN EĞİTİME YÖNELİK YETERLİK ALGILARI

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Bu çalışmanın amacı sınıf öğretmeni adaylarının Sürdürülebilir Kalkınma için Eğitim (SKE) konusuna yönelik yeterlik algılarını belirlemektir. Bu amaçla, öncelikle, sınıf öğretmeni adaylarının Sürdürülebilir Kalkınma (SK) konusuna yönelik tutumları incelenmiştir. İkinci olarak, Sürdürülebilir Kalkınma için Eğitim konusuna yönelik yeterlik algıları araştırılmıştır. Son olarak, sınıf öğretmenliği öğretim programı, bu yeterliklerin geliştirilmesi için gerekli öğrenme fırsatlarını yansıtmayı yansıtmadığı açısından incelenmiştir. Bu çalışmada, karma yöntemlerden sıralı açıklayıcı desen kullanılmıştır. Bu sebeple, öncelikle tarama deseni kullanılmıştır. Çalışmanın katılımcılarını, Türkiye'nin 12 üniversitesinden 1008 sınıf öğretmeni adayı oluşturmuştur. Veriler, araştırmacı tarafından geliştirilen veri toplama aracı kullanılarak toplanmıştır. Nicel verilerin analizinde betimsel istatistik ve çok yönlü varyans analizi (MANOVA) kullanılmıştır. İkinci olarak, betimsel döküman analizi yapılmıştır. Nitel veriler, sınıf öğretmenliği öğretim programının seçilen derslerinin incelenmesiyle toplanmıştır. Betimsel istatistik analizi sonuçları, sınıf öğretmeni adaylarının sürdürülebilir kalkınmaya yönelik tutumlarının olumlu olduğunu ortaya koymaktadır. Çok yönlü varyans analizi (MANOVA) sonuçları, sınıf öğretmeni adaylarının yaşadıkları şehirlerin kalkınmışlık düzeylerinin, onların

tutum ve yeterlik algıları üzerinde etkili olurken; ebeveynlerinin eğitim düzeylerinin herhangi bir etkisi olmadığını göstermektedir. Ayrıca, sınıf öğretmeni adaylarının sürdürülebilir kalkınmaya yönelik olumlu tutumları arttıkça, sürdürülebilir kalkınma için eğitime yönelik yeterlik algılarının da arttığı sonucuna varılmıştır. Döküman analizi sonuçları ise sınıf öğretmenliği öğretim programının bazı öğrenme fırsatlarını içermesine rağmen, bunların derslerin amaçları, hedefleri ve içeriğinde açıkça belirtilmediğini göstermektedir.

Anahtar Kelimeler: Sürdürülebilir Kalkınma için Eğitim, Öğretmen Tutumları, Öğretmen Yeterlikleri, Öğretmen Adayları, Sınıf Öğretmenliği Öğretim Programı

To My Son
DENİZ SOYSAL

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LIST OF ABBREVIATIONS

- **ASPnet:** UNESCO Associated Schools Project Network
- **CSCT:** Curriculum, Sustainable development, Competences, Teacher training
- **CSD:** United Nations Commission on Sustainable Development
- **DESD:** Decade of Education for Sustainable Development
- **ESD:** Education for Sustainable Development
- **MoNE:** Turkish Ministry of National Education
- **SD:** Sustainable Development
- **SEGE:** The Research of the Socio-economic Order of the Provinces and The Districts
- **SES:** Socio-Economic Status
- **UNCED:** The United Nations Conference on Environment and Development
- **UNDESD:** United Nations Decade of Education for Sustainable Development
- **UNECE:** United Nations Economic Commissions for Europe
- **UNEP:** The United Nations Environment Programme

CHAPTER I

INTRODUCTION

This chapter consists of four parts: (a) background of the study, (b) purpose and (c) significance of the study; and (d) definitions of terms.

1.1 Background of the Study

With the beginning of globalization, the world has become “a new world” for the living beings on it. It has produced new challenges both for the nature and the humanity in ecologic, economic and social aspects. In addition to its advantages, in terms of ecologic aspects, one of the most known problems has also occurred namely the global warming. In order to save the world from global warming, people have worked on environmental precautions. However, they have recognized that saving the world from environmental problems is not enough for the prosperity of humanity. As a result of unequal distribution of resources, globalization has also made some economic and social problems, such as poverty, famine and gender, and racial discrimination, visible. For this reason, there appeared the need for taking some economic and social precautions. Finally, in order to prevent humanity from these problems, the concept of sustainable development has been coined.

The concept of sustainable development appeared in 1980's with the help of world commissions as a result of the expansion of globalization. In 1982, the General Assembly of the United Nations organized a commission called “The World Commission on Environment and Development” or “Bruntland Commission”, and in 1987, they published a report entitled “Our Common Future”. In the report, the concept of sustainable development was described as “a development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development [WCED], 1987). The key concepts of the term were also stated as “the concept of ‘needs’” referring to the “essential needs of the

world's poor", and "the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs" in the report. In other words, sustainable development was considered as the readjustment and the moderate use of resources in meeting our present needs in order to meet our future needs. By focusing on environmental protection and economic and social development, the report also stated that "sustainable development requires meeting the basic needs of all and extending to all the opportunity to satisfy their aspirations for a better life" (WCED, 1987).

After that, other international meetings followed this to create opportunities for sustainability. In 1992, in Rio de Janeiro, The United Nations Conference on Environment and Development (UNCED) published a global plan for action for sustainable development, known as the Agenda 21-Earth Summit- about the "international agreements on climate change and biodiversity" (Kates, Parris & Leiserowitz, 2005, p.10). This report focused on the development of societies and economies bringing together the environmental, economic and social concerns in a policy. Furthermore, ten years later, in 2002, at the World Summit on Sustainable Development in Johannesburg, South Africa, leaders from government and non-governmental organizations, farmers, youth and children, representatives of business and industry came together to develop sustainable development policies for conserving the resources and improving the lives of the people. As it was stated in the report, they tried to "bring the world together" to take action on sustainable development (Johannesburg Summit 2002, 2002, p.1). Then, the UN General Assembly announced the period of 2005 – 2014 as the Decade of Education for Sustainable Development for this aim (United Nations Decade of Education for Sustainable Development [UNDESD], 2006).

Later, in 2009, a conference was held in Denmark to give a climatic ultimatum especially about the reduction of green-house effects, and financing a green industry. Later on, in 2010, in Cancun, Mexico, a United Nations Climate Change Conference was held to indicate the key steps to reduce green-house gas emissions and to help developing nations protect themselves from climate effects

and build their own sustainable futures (United Nations Climate Change Conference, 2012). In addition to this, in 2011, the United Nations Climate Change Conference was held in Durban, South Africa as the international community's response to climate change. As a result, the negotiations were held for the implementation of the Kyoto Protocol and Cancun agreements. Also, it was decided to adopt a universal legal agreement on climate change as soon as possible (United Nations Environment Program [UNEP], 2011).

Also, the United Nations Conference on Sustainable development was held in Rio de Janeiro, Brazil, in 2012, to renew their commitment to sustainable development and to establish an economically, socially and environmentally sustainable future for the planet and for present and future generations (United Nations Sustainable Development Knowledge Platform, 2012). They stated their common vision as eradicating poverty; maintaining sustainable development by integrating economic, social and environmental aspects; creating greater opportunities for all; reducing inequalities; raising basic standards of living, promoting human rights and basic freedoms for all people without discrimination of their race, color, sex, language, religion, political or other opinion, national or social origin, property, birth, disability or other status (United Nations Sustainable Development Knowledge Platform, 2012). All these concepts were also considered as the basics of sustainable development.

On the other hand, in order to fulfill the requirements of sustainable development, the concept of Education for Sustainable Development has also been introduced. Education for Sustainable Development is defined as “learning to respect, value and preserve the achievements of the past; ... live in a world where all people have sufficient food for a healthy and productive life; ... [and] be caring citizens who exercise their rights and responsibilities locally, nationally and globally” (UNDESD, 2006, p.1). Also, the main goal of Decade of Education for Sustainable Development (DESD) is described by the UN General Assembly as integrating the values of sustainable development to all aspects of learning by changing the behaviors to provide a sustainable and just society for all.

By recognizing the importance of education for Sustainable Development, the prominence of re-orienting teacher education also has increased. In terms of teacher education, first, United Nations Commission on Sustainable Development (CSD) asked UNESCO to develop guidelines for re-orienting teacher education for sustainable development in 1998. Then, UNESCO established “UNESCO Chair on Reorienting Teacher Education to Address Sustainability” as an international network of 30 teacher education institutions from 28 countries. These countries met in Canada (2000), South Africa (2002), Sweden (2004) and Finland (2006) to establish engagement of the teacher education institutions. In 2005, they published a report called “Guidelines and Recommendations for Re-orienting Teacher Education to Address Sustainability” as a source for the United Nations Decade of Education for Sustainable Development (2005-2014) (Gough & Scott, 2007). In 2009, in the UNESCO world conference for Education for Sustainable Development, it was stated that investment in education is a life-saving measure for our future (UNESCO, 2009). Also, as an initiative UNESCO prepared the UNESCO Teaching and Learning for Sustainable Future multimedia teacher education program and Education for Sustainable Development (ESD) Innovations Course Toolkit to disseminate information about Education for Sustainable Development.

There is also an organization called COPERNICUS-CAMPUS that is responsible for the University Charter for Sustainable Development to involve European Universities in a network to share their knowledge and make contributions to sustainable development. In 2007, COPERNICUS Guidelines were developed to support higher education institutions’ implementations in relation to Bologna Process. Also, European Commission supported the guidelines under the Socrates Program. There are “more than 320 universities and higher education institutions from 38 countries across Europe have signed the Charter” stating that they will contribute to sustainable development in their institutions (UNECE, n.d., p.6). From Turkey, there are signatories universities for the charter namely Hacettepe University, Middle East Technical University, Uludağ University,

Trakya University, Anadolu University, Boğaziçi University, Marmara University, Yıldız Technical University, Ege University, Ondokuz Mayıs University. COPERNICUS Guidelines aim to support the higher education institutions in integration of sustainable development into the modules, qualifications framework and learning outcomes.

In 2010, the Council of the European Union reported the council conclusions emphasizing the importance of Education for Sustainable Development for achieving a sustainable society. They recommended ESD for all levels of formal education and training in addition to non-formal and informal learning. They considered focusing on awareness raising and the development of key competences of ESD at primary and lower-secondary levels. The members were invited to equip their teachers and school staff with the knowledge and competencies to promote ESD. They recommended adequately equipping the teachers and the trainers to teach issues of ESD through initial and in-service training. In addition, ESD issues are considered among the priorities of the Lifelong Learning program and in the strategic framework of Education and Training 2020 (Council of the European Union, 2010).

For the inclusion of education for sustainable development in curricula from pre-school to adult education, the CSCT (Curriculum, Sustainable Development, Competences, Teacher training) Project was developed at the request of the UNECE (United Nations Economic Commissions for Europe) Ministers of the Environment in 2003. The aim of the project was to provide curriculum models integrated with ESD to teacher training institutes. With the coordinating institution of the department of teacher education of Katholieke Hogeschool Leuven (Flemish Community of Belgium), the project included 15 partners from 8 countries including Norway, Denmark, UK, Spain, Austria, Hungary, Germany and Switzerland. The model was developed by this group in three years during workshops and discussions at the meetings (UNECE, 2008 p.30) (Figure 1).

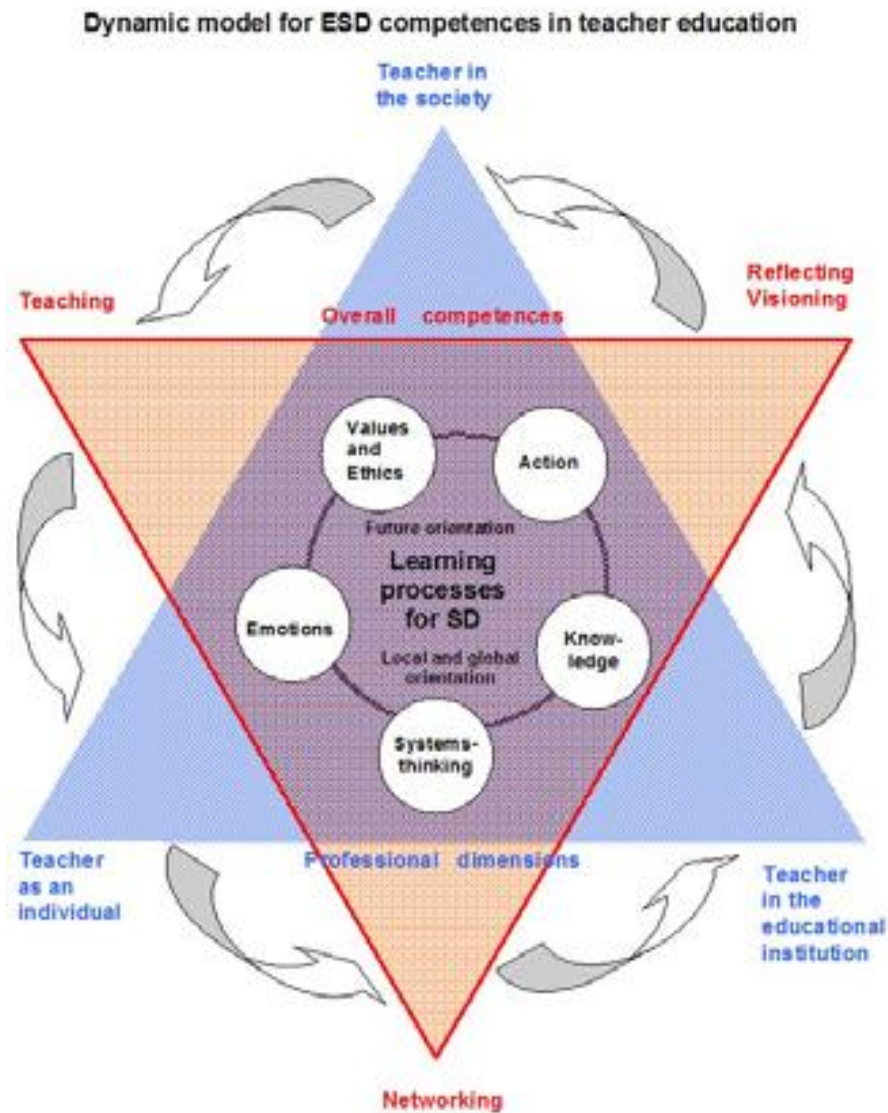


Figure 1 Curriculum, Sustainable Development, Competences, Teacher Training (CSCT) Competency Model

According to the CSCT project, “Dynamic model for ESD competences in teacher education” was developed (UNECE, 2008, p.26). In the model, teachers are beyond instructors. They are the “individuals who are in dynamic relationship with their students, their colleagues and the wider society” (p.27). Also, they have three overall competencies namely teaching, reflecting/visioning, and networking. Teaching has a “constructive” focus. Reflecting/visioning is about reflecting on

what has happened and creating new solutions to the problems. Networking is related to creating learning opportunities in society. Furthermore, the model presents five domains of competencies as knowledge, systems thinking, emotions, ethics and values, and action. The requirements of each competency are also stated in the model. In this study, this model was accepted as a guide in the determination of the competencies of the pre-service classroom teachers.

With the help of global studies, Turkey has also started to do some research on sustainable development. UNESCO has a holistic vision of education all around the world, and as such it has its commission in Turkey, too. For that reason, UNESCO- National Turkish Commission has the Department of Peace and Education for Sustainable Development in Turkey and it has been continuing its studies on education for sustainable development. According to the commission (Turkish National Commission for UNESCO, 2016, “Education for sustainable development”) education for sustainable development;

- provides opportunities for knowledge and skills of all individuals to shape a sustainable future and allows them to acquire human values,
- requires participatory learning and teaching methods for the learning individuals by motivating and encouraging them to change their behavior,
- develops critical thinking, ability to imagine scenarios for the future and decision making and cooperation skills.

As it is stated by UNESCO- National Turkish Commission, in order to help the transformation of societies, sustainable development should be provided. For this transformation, the following activities are recommended (Turkish National Commission for UNESCO, 2016, “Education for sustainable development”):

- to strengthen the communication among people concerned with education for sustainable development,
- to increase the quality of education on ESD,
- to help the countries in their achievement of Millennium Development Goals,

- to help the countries to develop policies about ESD in their education reform studies.

It was stated by the commission that education for sustainable development requires the inclusion of key subjects of sustainable development into education such as biodiversity, education for climate change, disaster risk reduction, cultural diversity, poverty alleviation, gender differences, sustainable lifestyle, health, peace and human security, water and sustainable urbanization.

Turkey with its 45 schools is one of the members of the UNESCO Associated Schools Project Network (ASP net), as a global network of 10,000 educational institutions in 181 countries. Member institutions of this network range from pre-schools, primary, secondary and vocational schools to teacher training institutions and they work for enhancing international understanding, peace, intercultural dialogue, sustainable development and quality education in practice.

In Turkey, a number of studies have been conducted by Directorate General of Elementary Education of Ministry of Education and Ministry of Environment and Forestry for sustainable development. The Project of Eco-Schools is one of the studies introduced by Foundation of Turkish Environmental Education in 1995 and has been continued since then.

In 2012, a report was published by the Republic of Turkey Ministry of Development, named “The Report of Sustainable Development: Embracing the Future”. The report included the evaluation of the progress of Turkey about sustainable development and its policies that would be conducted in the future and the contributions of it for the solutions to the global problems.

It is clear that education for sustainable development has been an important concept both for our country and our world in this century. For that reason, our teachers should be knowledgeable about the themes of Education for Sustainable Development and also they should be equipped with the necessary competencies to prepare our children as the activists of sustainable development. The fourth grade / senior students of the department of classroom teaching are the prospective teachers and their prospective students will be the members of our sustainable world. In

order to enhance this sustainable world, basic concepts of sustainable development should be passed through educational institutions. For this reason, there appears the need for the analysis of prospective teachers' competencies and the curriculum of teacher training institutions. Especially, as primary education will constitute the basic education for the students, their teachers should have specific competencies to provide sustainable development. However, in today's world, people's knowledge about sustainable development both in our country and in the world is limited. For this reason, there appears a need for the analysis of teachers' attitudes towards sustainable development and their competencies regarding education for sustainable development to increase the knowledge of sustainable development of the members of the societies.

On the other hand, Erkal, Şafak and Yertutan (2011)'s study about the importance of the role of family in shaping the behaviors of the individuals, and the study of Iizuka (2000) about the effects of the level of the development of the countries on individuals' point of views towards environmental issues indicated the importance of these factors. For that reason, the effect of the level of parents' education and the level of development of the cities are considered to be examined in terms of education for sustainable development.

Based on these, this study focuses on education for sustainable development in terms of pre-service classroom teachers' attitudes and their perceived competencies for teacher education regarding the effects of the level of parents' education the level of development of the cities they live. Also, it questions the relationship between the attitudes of pre-service classroom teachers towards sustainable development and their perceived level of competencies towards education for sustainable development. In addition, it focuses on the curriculum of classroom teachers in terms of learning opportunities for the competencies of education for sustainable development.

1.2. Purpose of the Study

This study aims to analyze pre-service classroom teachers' attitudes towards sustainable development and their perceived competencies on education for sustainable development with regard to the education level of their parents and the level of development of the city in which they live. For this reason, first, the attitudes of pre-service classroom teachers about sustainable development are examined. Secondly, based on the competencies stated in the CSCT project's (UNECE, 2008), "Dynamic model for ESD competences in teacher education", pre-service classroom teachers' perceived competencies on education for sustainable development are investigated. Also, the relationship between the pre-service classroom teachers' attitudes towards sustainable development and their perceptions of the level of competence for education for sustainable development is analyzed. Lastly, the curriculum of classroom teachers is also analyzed to see whether it reflects the learning opportunities for the development of these competencies. For this aim, the following research questions have drawn the framework of the study:

1. What are the pre-service classroom teachers' attitudes towards sustainable development?
 - 1.1. Are there significant differences in their attitudes towards sustainable development with respect to the level of development of the city they live in?
 - 1.2. Are there significant differences in their attitudes towards sustainable development with respect to their fathers' and mothers' education level?
2. How competent do pre-service classroom teachers perceive themselves regarding Education for Sustainable Development (ESD) with regards to the competence areas of (a) knowledge, (b) systems-thinking, (c) emotions and (d) values-ethics?
 - 2.1. Are there significant differences in their perspectives with respect to the level of development of the city they live in?
 - 2.2. Are there significant differences in their perspectives with respect to their fathers' and mothers' education level?

3. Is there any relationship between pre-service classroom teachers' attitudes towards sustainable development and their perceptions of the level of competence regarding education for sustainable development?
4. Does the curriculum of classroom teaching provide learning opportunities to develop pre-service classroom teachers' competencies regarding Education for Sustainable development?

1.3. Significance of the study

With the increasing emphasis on the concept of sustainable development, the need for the education has gained prior importance to provide it for the wealth of humanity all over the world. For this reason, the concept of Education for Sustainable Development (ESD) has been formulated.

ESD is described as “the total sum of diverse ways to arrive at a ‘learning society’ in which people learn from and with one another” (UNESCO, 2011a, para.2). This learning has three components as environmental, economic and social and they are all interrelated. Without environmental sustainability, it is difficult to provide social and economic sustainability. For that reason, to provide sustainability in these aspects, the goals of education need to be reconsidered. After reconstructing the goals of education, education for sustainable development has taken its place in the curricula. This study will be helpful in presenting the attitudes of the pre-service classroom teachers towards different aspects of sustainable development. In that way, their attitudes might be taken into consideration for the construction of the goals of education for sustainable development.

With the changes in curricula, the need for training teachers has also arisen. For this reason, COPERNICUS CAMPUS emphasizes the importance of teacher training for sustainable development. It is stated that teacher training is important as teachers shape the way students perceive sustainable development. For that reason, they provide guidelines for the integration of sustainable development to the curricula and quality assurance in higher education institutions (UNECE, n.d.). Therefore, with the analysis of perceived teacher competencies, this study will be

helpful for the determination of teacher competencies for education for sustainable development, and as a result, the competencies can be integrated to teacher education curricula.

Research also shows that basic education has a key role in promoting sustainable development in a nation as it is another key in a nations' development. With the help of basic education, the rate of literacy and the rate of standard of living increases. Basic education is compulsory in many countries although the duration of it changes from country to country. Also, basic education and primary school teachers provide the basis for sustainable development in children's minds in early years. For this reason, education for sustainable development must be enhanced through basic education institutions especially by including critical thinking skills, organization and analysis skills irrespective of the academic subject matter. Recognizing this importance of basic education, in this study, primary school curriculum is analyzed for education for sustainable development. In that way, how sustainability is integrated into the curriculum is analyzed. Therefore, this study is expected to present the place of education for sustainable development in pre-service teacher education curriculum and in that way, it might be helpful for the determination of learning opportunities in classroom teaching curricula regarding education for sustainable development.

As a developing country, Turkey also needs to enhance sustainable development. In sustainable development, the people who take parts in decision making such as in government, media and industry have a key role to sustain the development for a long time. For this reason, an education sector has the primary role to promote sustainable development. Our teachers undertake the substantial role to foster human development and create a learning society in this respect. They should help students feel confident and take the responsibility of their present and future actions. For this reason, education faculties as teacher education institutions are the fundamental institutions where education for sustainable development is promoted. However, a teacher who wants to deal with sustainable development should have specific competencies. This study will also be helpful in portraying

situations in terms of pre-service teachers' possessing the proposed competencies in addition to reflecting on their attitudes towards sustainable development.

On the other hand, there are some factors that might affect the attitudes towards sustainable development and competencies regarding education for sustainable development. Parents' education and the level of development of the regions are some of these main factors. As Erkal et al. (2011) emphasized, family is the beginning of the socialization process and also it is the first place where each individual is prepared for society. Therefore, family plays an important role in shaping the behaviors of the individuals. Also, it has an important effect on the behaviors of the individuals regarding their decisions about consumption. Therefore, the education level of the family members might also affect the behaviors of the individuals. For that reason, this study will indicate the effect of the education level of their fathers and mothers on pre-service classroom teachers' attitudes towards sustainable development and their perceived level of competencies.

There are some studies that highlight the importance of socio-economic factors that shape the attitudes of individuals. For instance, Kılıç and Yücel (2013) stated that without eradicating socio-economic problems such as poverty, it is difficult for the individuals to focus on environmental problems. Also, Iuzuka (2000) stated that the citizens of highly developed countries and developing countries had different point of views toward environmental issues. In addition, in Turkey, the Ministry of Development has also conducted a study named as "The Research of the Socio-economic Order of the Provinces and The Districts" (SEGE-2011) and sorted the provinces according to some indicators (The Ministry of Development, 2013). These indicators might also be important for the analyses of attitudes and the perceived competencies of pre-service classroom teachers. This study will contribute to explaining the effects of socio-economic status (SES) on the attitudes towards sustainable development and on the competencies regarding education for sustainable development for the enrichment of teacher education curriculum.

In this study, in order to recognize how ready our teachers are for ESD, the attitudes of pre-service classroom teachers regarding sustainable development and

their perceived competencies regarding Education for Sustainable Development are determined. Also, the relationship between pre-service classroom teachers' attitudes towards sustainable development and their perceived level of competence for education for sustainable development are examined. Moreover, the effects of their fathers' and mothers' level of education and the level of the development of the cities in which they live on their attitudes and perceived competencies are examined. In addition, with the higher importance of basic education, the roles of the primary school teachers increase. For that reason, whether the curriculum of classroom teaching provides learning opportunities to develop pre-service teachers' competencies for Education for Sustainable development is also analyzed. Therefore, the present study will contribute to the further development and enrichment of classroom teaching curricula for training teachers with stronger competencies for education for sustainable development.

The results of the study will shed light on the development of teacher attitudes towards sustainability and development of teacher competencies for education for sustainable development by indicating the factors that affect their attitudes and perceived competencies. Also, the current study will be helpful in determining teacher competencies for education for sustainable development by indicating the competency areas and presenting a scale for this.

To sum up, the findings of the study are expected to provide meaningful feedback to the policy makers and education faculties by presenting the attitudes of pre-service classroom teachers towards education for sustainable development and their perceived levels of feeling competent in the development of pre-service and in-service education for education for sustainable development. Also, the observed effects of education level of their parents and the development level of the provinces they live will provide valuable information in policy making. It also aims to indicate the level of education for sustainable development represented in the teacher education curriculum for the integration of the curricula with it to train the teachers of the future equipped with education for sustainable development. In addition, by closing the gap of the research area on this topic in Turkey, this study will provide a

local analysis for the global world of education for sustainable development as it is becoming a key for a learning society.

1.4. Definition of Terms

Sustainable development: “development that meets the need of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987, p.43).

Regarding the social dimension, the Our Common Future report argues that “sustainable development requires meeting the basic needs of all and extending to all the opportunity to fulfill their aspirations for a better life” (WCED, 1987, p.15).

As for the environmental dimension, the report says “sustainable development does imply limits...imposed by the present state of technology and social organization on environmental resources and by the ability of the biosphere to absorb the effects of human activities” (WCED, 1987, p.15).

Regarding the economic dimension, the report argues that economic growth increases living standards and quality of life for the population (WCED, 1987, p. 28), but that it has to be within the planet’s ecological means and must also guarantee that the poor get their fair share of resources to sustain that growth (WCED, 1987, p. 15).

Cultural sustainability: Enhancing protection and preservation of cultural identities and sense of place through heritage, shared spaces, social capital, educational opportunities and public policies in ways to promote social, economic and environmental sustainability.

Education for sustainable development: “A learning process based on the ideals and principles that underlie sustainability and is concerned with all levels and types of learning to provide quality education and foster sustainable human development – learning to know, learning to be, learning to live together, learning to do and learning to transform oneself and society” (UNESCO, 2011b, para.1).

Competence: Consistent ability to realize particular sorts of purposes to achieve desired outcomes.

Five domains of competencies for ESD: The competencies such as knowledge, systems thinking, emotions, ethics and values, and action that teachers have according to “Dynamic model for ESD competences in teacher education” stated in the CSCT project (UNECE, 2008):

1. **Knowledge:** Having specific features of knowledge for education for sustainable development.
2. **Systematic thinking:** Awareness of being part of the living system Earth and thinking in different kinds of systems such as geographical, ecological, political, economical and social.
3. **Emotions:** Feeling interconnectedness with the world and having empathy and compassion.
4. **Ethics and values:** Norms, attitudes, beliefs and assumptions that are guiding our perception of education for sustainable development.
5. **Action:** The process of experiencing and participation of all the other domains to enhance education for sustainable development (In this study, this competence is not analyzed as all the four competencies stated above includes its own action domain).

Level of Development of the Provinces: The Ministry of Development in Turkey has conducted a study named as “The Research of the Socio-economic Order of the Provinces and The Districts (SEGE-2011) and sorted the provinces according to some indicators (The Ministry of Development, 2013). These indicators might also be important for the analyses of attitudes and the perceived competencies of pre-service classroom teachers. These eight indicators are:

1. **Demographic Indicators:** Population density, age specific fertility rate, young dependent population rate, actual migration rate and urbanization rate.
2. **Employment Indicators:** Unemployment rate, labor force participation rate, the population in working age (15 - 64 ages) rate in the total population, the manufacturing industry rate in insured employment rate ,

employees covered by social security in active total population rate, average daily gain, average daily gain – women, employment rate.

- 3. Education Indicators:** Illiterate population rate, the rate of illiterate female population in total female population, general secondary education actual enrolment rate, vocational and technical high school's enrolment rate, average YGS success rate of the provinces, the rate of faculty or college graduate in 22+ age population .
- 4. Health-care Indicators:** Number of hospital bed per hundred thousand people, the number of doctor per ten thousands of people, the number of dentist per ten thousands of people, the number of pharmacy per ten thousands of people, the rate of free health care card holder in the provincial population.
- 5. Competitive and Innovative Capacity Indicators:** The share of the provincial export in total export, the amount of export per capita, the shares of manufacturing businesses in Turkey, the rate of the registered offices of manufacturing, the electricity consumption of manufacturing per capita, the shares of the parcels made in organized industrial zone in Turkey, the shares of the number of the small industrial estates in Turkey, the share of the total capital of newly established companies in total capital of Turkey, the number of companies with foreign capital per ten thousand people, the number of brand application a hundred thousand per capita, the number of patent application a hundred thousand per capita, the rate of master's and doctoral degree owner population in 30+ age population, the value of agricultural production per rural population, the shares of the number of tourism investment - management and municipal certified Beds in Turkey and the share of the amount of the Incentive Certificates Investment in Turkey.
- 6. Financial Indicators:** The share of bank loans of the provinces in Turkey's bank loans, the share of saving deposits of the provinces in Turkey's saving deposits, the amount of people's bank deposit per capita, the number of

active individual customers of internet banking per thousand, the number of active enterprise customers of internet banking per thousand, the budgetary income per capita, the share of the provincial tax revenues in Turkey.

- 7. Accessibility Indicators:** The rate of rural asphalt-concrete road, the proximity of the province to the nearest airport, the number of broadband subscribers per household, the number of GSM subscribers per person, the load-km value of the provincial highway and state road, the rate of the provincial railway line in total surface area
- 8. Quality of Life Indicators:** The rate of gross leasable area of a shopping centre per thousand, the rate of municipal population served by the sewerage network in total municipal population, the electricity consumption of residential per capita, the number of private cars per ten thousand, the average value of Sulphur dioxide (SO₂), the average value of particulate matter (smoke), the rate of the remaining population of social security coverage in total population, the number of the sentenced person in prisons per hundred thousand people, the number of suicides per a hundred thousand people.

According to these indicators, the provinces are given a value of index and they are sorted accordingly:

- Level 1:** Highly developed provinces. Their value of index is 1+. There are eight provinces.
- Level 2:** Moderately developed provinces (The provinces close to the higher level of development). Their value of index is between .5 and 1. There are 13 provinces.
- Level 3:** Moderately developed provinces (The provinces close to the moderate level of development). Their value of index is between .5 and .16. There are 12 provinces.
- Level 4:** The moderately developed provinces. Their value of index is between .16 and .24. There are 17 provinces.

Level 5: The moderately developed provinces (The provinces close to the lower level of development). Their value of index is between .24 and -1.00. There are 16 provinces.

Level 6: Lower level developed provinces. Their value of index is below -1.00. There are 15 provinces.

The provinces according to their degree of development are listed in Table 1.1 (Appendix B).

CHAPTER II

REVIEW OF LITERATURE

This part presents the theoretical background of sustainable development, education for sustainable development and teacher education for sustainable development. It also presents the related studies conducted both abroad and in Turkey.

2.1. Sustainable Development

In this part, sustainable development is explained with its relevant goals and dimensions.

2.1.1. What is Sustainable Development?

In order to understand the concept of Education for Sustainable Development, first, the concept of sustainable development should be defined. According to OECD, in its common definition, “sustainable development means integrating the economic, social and environmental objectives of society, in order to maximize human well-being in the present, without compromising the ability of future generations to meet their needs”. With its broad definition, it means promoting equitable distribution of income and increasing the economic and political empowerment of citizenry. That is, providing equality, improved health and education for the women, the poor, and the minority (Pyle and Farrant, 2002, p. 3).

As it is stated in Our Common Future (WCED, 1987), satisfaction of human needs is the basic objective of sustainable development. As the essential needs of the people in developing countries such as food, shelter and clothing are not met, they live in poverty and inequity. If their quality of life is not improved, they will be subjected to the ecological and other crises. For that reason, for the ecological improvement, countries need economic, social and cultural improvement.

Moreover, there is a Model of the Three Pillars of Sustainability that will make the meaning of sustainability clearer. According to this model, sustainable

development is not only related to environmental factors, but it is also based on economic and socio-cultural factors (Mastrandrea & Santini, 2012). All these pillars comprise sustainable development, without one of them; it would be difficult to provide sustainable development as a whole.

On the other hand Alba, Gonzalez-Gaudiano, Lankshear & Peters (2000) state that it is not so easy to provide the equilibrium among the economic, social and environmental components of sustainable development. This equilibrium is both dynamic and varies with differing spatial and temporal circumstances. Also, it requires adoption of global and local policies (pp.52-53). For that reason, societies are in need of change. There are some suggestions for the ideas that should be integrated into this change (Alba et al., 2000). For instance, it should be noted that none of the present development pathways can spontaneously lead to sustainability. Also, they should perform an intense social effort for the changes to take place.

Furthermore, as it is stated in Our Common Future (WCED, 1987, para.81), sustainable development requires:

- a political system that secures effective participation of citizens in decision making processes,
- an economic system for generating technical knowledge on a self-reliant and sustained basis,
- a social system that provides for solutions for the tensions arising from disharmonious development,
- a production system that for the protection of the ecological base for development,
- a technological system that can search continuously for new solutions,
- an international system that supports sustainable trade and finance, and
- an administrative system that is flexible and encouraging for self-correction.

As a result, every country is in need of change for sustainable development with their ecologic, social and economic policies. They are required to decide on the national and international goals, and then take action for the sustainable

development. The studies conducted in the countries that achieved sustainable development will help the ones that are on the way to make changes for it. In addition, each country needs its own political, economic, social, production, technological, international and administrative systems to provide sustainable development as a whole.

2.1.2. Goals of Sustainable Development

In 2000, the Millennium General Assembly of the United Nations came to a joint agreement and presented the Millennium Declaration including the Millennium Development Goals (MDGs) to fight with all dimensions of poverty. These eight goals are shared by all peoples of the world and they are decided to be implemented by 2015 (United Nations, 2015a):

1. eradicating extreme poverty and hunger in the world.
2. achieving universal primary education.
3. promoting gender equality and empowering women.
4. reducing child mortality.
5. improving maternal health.
6. combating HIV/AIDS, tuberculosis, malaria and other diseases.
7. ensuring environmental sustainability.
8. developing a global partnership for development.

Then, a report was published about the results of MDGs (United Nations, 2015a). In this report it was stated that with the help of the local, regional, national and global efforts, the conditions of the people have improved. It was also emphasized that with targeted interventions, suitable strategies, adequate resources and political will, even the poorest countries can make dramatic progress. However, it was required to continue these efforts.

In addition to these goals, during the United Nations Conference on Sustainable Development held in Rio de Janeiro, Brazil, from 20 to 22 June 2012, member states agreed to start a process to develop a new set of sustainable development goals (United Nations, 2015b). Then, an open working group was

established to develop a set of sustainable development goals to be achieved by 2030:

1. ending poverty in all its forms everywhere,
2. ending hunger, achieving food security and improved nutrition and promoting sustainable agriculture,
3. ensuring healthy lives and promoting well-being for all at all ages,
4. ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all,
5. achieving gender equality and empowering all women and girls,
6. ensuring availability and sustainable management of water and sanitation for all,
7. ensuring access to affordable, reliable, sustainable and modern energy for all,
8. promoting sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all,
9. building resilient infrastructure, promoting inclusive and sustainable industrialization and fostering innovation,
10. reducing inequality within and among countries,
11. making cities and human settlements inclusive, safe, resilient and sustainable,
12. ensuring sustainable consumption and production patterns,
13. taking urgent action to combat climate change and its impacts,
14. conserving and sustainably using the oceans, seas and marine resources for sustainable development,
15. protecting, restoring and promoting sustainable use of terrestrial ecosystems, sustainably managing forests, combating desertification, and halting and reverse land degradation and halting biodiversity loss,
16. promoting peaceful and inclusive societies for sustainable development, providing access to justice for all and building effective, accountable and inclusive institutions at all levels,

17. strengthening the means of implementation and revitalizing the global partnership for sustainable development.

The goals mainly focused on eradicating poverty and hunger for all, providing equity in all areas, empowering women, and promoting clean environment. These goals were also aimed to integrate three dimensions of sustainable development as economic, social and environmental. In fact, these three dimensions are interrelated. For instance, economic growth is required for developing the goals regarding education and health, and also for the goals of a clean environment. In that way, they cause synergies for our sustainable world.

Moreover, in the report, six elements for delivering the sustainable development goals were also described:

1. Dignity: to end poverty and fight inequalities

In all regions of the world, there is poverty and inequalities in all areas. To make a society reach its full potential, whole segments of that society should contribute to this. For that reason, people should especially fight with the inequalities of women, youth and minorities. Also, people should remove obstacles for the people with disabilities and older persons, and empower the poor.

2. People: to ensure healthy lives, knowledge and the inclusion of women and children

Societies should ensure that women, youth and children access to health services. Also, violence against women, girls and children should be stopped. All children should have a right to be educated. Moreover, universal health care opportunities must be provided. In addition, young people should be able to receive quality education and lifelong learning beginning from early childhood. Also, they should have vocational education and training besides science, sports and culture.

3. Prosperity: to grow a strong, inclusive and transformative economy

“Economic growth should lead to shared prosperity”. The strength of an economy should depend on how it meets the needs of its people. All people, including women, disabled people and migrants should have access to social

protection and financial services. In addition, the world's richness of natural resources should be translated into shared prosperity.

4. Planet: to protect our ecosystem for all societies and our children

We must protect our atmosphere, forests, oceans, and wildlife as they are our global heritage. Also, sustainable consumption, agriculture and food systems should be ensured.

5. Justice: to promote safe and peaceful societies and strong institutions

Laws must protect human rights without discrimination. Fair justice systems, press freedom, access to information, freedom of expression are enablers of sustainable development. Justice for all should be secured in both national and international levels.

6. Partnership: to catalyze global solidarity for sustainable development

As a result, uniting around the problems and having a partnership are vital for sustainable development. The people and the planet should be placed at the centre and relevant stakeholders should do the things together at local, regional, national and global, levels.

2.1.3. Dimensions of Sustainable Development

There are four dimensions of sustainable development proposed in one of the approaches (Mastrandrea & Santini, 2012). According to this approach, a fourth dimension is added to three pillars of sustainability. Three pillars of sustainability comprise environmental, economic and social aspects including culture in its social aspects. However, in the Four Dimensions approach, culture is accepted as the fourth dimension and the conflicts and synergies among the dimensions are emphasized. The four dimensions of sustainability can be summarized as follows (p.73):

1. Environmental aspects: They are related to careful management of resources, protection of biodiversity, harmonization with ecological cycles, reducing the impact of individuals and communities, use of renewable energy, etc.

2. Economic aspects: They are related to green economy, environmental management systems, ecological innovative technologies and eco-design, regional networks and local marketing, fair trade, etc.

3. Social aspects: They are related to justice and social equity, health and well-being promotion, respect for the needs of future generations, democratization, participation of individuals and communities in the governance, rights to live on the fruit of their own labor, etc.

4. Cultural aspects: They are related to sustainable lifestyle, holistic experience of nature, aesthetic aspects of development, cultural diversity as bio diversity, traditional and historical knowledge, consumer awareness, global responsibility, cosmopolitan culture, etc.

In addition, there is another study conducted by Mignaqui (2014) on the dimensions of sustainable development and added another dimension namely the political dimension. He stated that a country can be called as a developed country if it is sustainably developed in terms of economic, social, environmental and also political dimensions. He also emphasized the integration of the dimensions by stating that developed countries should have a broad fulfillment of basic needs and accessibility to economic means among its population and they should do so within ecological limits.

2.2. Education for Sustainable Development

In this part education for sustainable development is explained with regard to its definition and essentials.

2.2.1. What is Education for Sustainable Development?

Education for Sustainable Development is defined as a process for social change fostering the values, behavior and life styles for a sustainable future through education, training and public awareness. It includes learning how to make decisions to balance the economy, environment and well being of all communities (UNESCO, 2005a). According to UNESCO (2013), education for sustainable development empowers people to make decisions for environmental integrity, economic viability and a just society for present and future generations, in addition to respecting cultural diversity. Also, it provides everyone with the opportunity of quality education; the values, behavior and lifestyles for a sustainable future and for

positive societal transformation. Moreover, ESD tries to promote justice, equity, gender equality, poverty reduction, democracy and peaceful societies.

The fundamental value of education for sustainable development is stated as respect (UNESCO, n.d.). This respect can be for others, in the present and for the future generations. Also, it can be for the planet and what it provides for people such as resources and plants.

According to UNESCO (n.d.) education for sustainable development is also about learning to respect, value and preserve the achievements of the past; to be grateful for the wonders and the peoples of the Earth; and to live in a world where all people have sufficient food for a healthy and productive life. Also, it is about learning to save our planet; to create and enjoy a better, safer, more just world; and be caring citizens who are aware of their rights and responsibilities locally, nationally and globally.

On the other hand, education for sustainable development makes people have skills for life such as being aware of the environment and living adequately in the knowledge society, learning continuously; have economic development based on human and social capital, get education for all people such as with the ones with social disadvantages and learning difficulties. These are stated in OECD (UNESCO, n.d.), as the four dimensions to ESD:

1. Environmental awareness: Environment and School Initiatives (ENSI) was initiated in 1986. This programme focuses on the development of environmental awareness, active approaches to teaching and learning, and citizenship education by exchanging international experiences.

2. Competencies for the knowledge economy in a life span perspective: The skills of knowledge workers and the conditions for lifelong learning for all.

3. Human and social capital and economic growth: The role of human and social capital in economic growth,

4. Inclusive education: The special education needs of students with organic disabilities, learning difficulties and social disadvantages.

Education for sustainable development also requires the transformation of education to contribute effectively to the reorientation of sustainable societies (UNESCO, 2014). In that case, ESD applies to all levels of education such as formal and non-formal education, informal education and trainings. Also, ESD learning requires participatory teaching, critical thinking, clarifying one's own values, envisioning more positive and sustainable futures, systematic-thinking, and exploring the dialectic between tradition and innovation (UNESCO, 2011b).

2.2.2. Essentials of Education for Sustainable Development

According to the essential characteristics of ESD presented by UNESCO (2007), Education for Sustainable Development is based on the principles of sustainable development and deals with the three pillars of economy, environment and society. It promotes lifelong learning and engages in formal, non-formal and informal education. Also, it is locally relevant focusing on local needs, and culturally appropriate having international effects. It is interdisciplinary, as no one discipline can provide ESD, but all disciplines can contribute to it with the help of content and pedagogical techniques such as higher order thinking skills (UNESCO, 2007). Also, as “sustainable development is not a fixed thing but a quest for developing our daily life and communities in directions that benefit most people now and in the future” (Breiting, Mayer & Mogensen, 2005, p.15), it requires “active, creative and critical citizens”. For that reason, the learners are at the centre in education for sustainable development, and their values, ideas and perspectives are developed as the “active agents in the construction of their knowledge”.

There are four major thrusts of ESD (UNESCO, 2005b) determined by UNESCO to promote ESD within an International Implementation Scheme. According to these thrusts, access and retention in quality basic education should be improved. Existing educational programmes should be reoriented to address sustainability. Also, public understanding and awareness of sustainability should be increased, and training should be provided to advance sustainability across all sectors.

On the other hand, education is vital for the process of sustainable development. By the help of education, generations can be equipped with the knowledge about sustainable development. For this reason, first, the teacher education curricula must include sustainability and after educating teachers, schools must include sustainable development in the curricula of every level of education.

In order to address sustainability in a curriculum, the following five dimensions should be considered (McKeown, 2002):

1. Knowledge: It is related to the knowledge of environment, economics and society. Students need to know what is happening in their environment, how human affects environment, whether there are negative impacts of human activities to environment and what can be done to stop them. Also, they should know the relationship between environment, economics and society. They need to be aware of fundamental concepts such as poverty, peace and justice.

2. Issues: These are related to environmental, economic and social issues which are foundations of ESD such as protecting and managing fresh water, poverty, and decision making. These issues should be integrated into the curricula and also they should be locally relevant.

3. Skills: These are related to the skills that will help students interact with the environment and address the needs of a society. Also, the skills should help them to learn after they leave their schools and have sustainable lives. They can be listed as “(a) the ability to communicate effectively (both orally and in writing), (b) to think about systems (both natural and social sciences), (c) to think in time - to forecast, to think ahead, and to plan, (d) to think critically about value issues, (e) to separate number, quantity, quality, and value, (f) to move from awareness to knowledge to action, (g) to work cooperatively with other people, (h)to use these processes: knowing, inquiring, acting, judging, imagining, connecting, valuing, and choosing, and (i) to develop an aesthetic response to the environment” (McClaren,1989, as cited in McKeown, 2002, p.20).

4. Perspectives: These are related to the perspectives that students have to understand both the global issues and the local issues in a global context. They need

to see the issues from a global context. Also, they should consider the issues from the views of different stakeholders. Some of the perspectives that the students should understand are that;

- social and environmental problems change through time, they have a past and a future.
- contemporary global environmental issues are interrelated to each other.
- to understand local issues in a global context, their community and the confines of their local and national boundaries should be analyzed.
- before reaching a decision or judgment, different point of views should be taken into consideration.
- all our problems cannot be solved just by technology and science.

5. Values: These are related to valuing the self, respect to the environment and the others in the world. The students need to understand the value of themselves, the values of the society they live and the values of the others living around the world. Social justice is also another important part of values. It covers meeting the basic needs of humans and respecting the traditions and the values of other societies.

Sustainability is directly affected by education in three areas (McKeown, 2002, pp. 12-13). The first area is “implementation”. Educated citizens can implement sustainable development. If a nation has a high illiteracy rate, it has less development options and this also affects both the economy and society of this nation. “An educated workforce” is accepted as a key for being a developed country. In addition, the second area is described as “decision making”. Educated citizens also can give good community - based decisions related to social, economic and environmental issues. They can analyze the related documents and do research on issues to protect their nations. The last area is related to quality of life. Education is vital for improving the quality of life. When individuals are educated, the socio-economic status of the families’ increases and this provides improvement of the life conditions of the nations by providing chances to the next generations.

Also, the role of education in fostering more sustainable societies is explained in Agenda 21 (as cited in UNESCO, 2005b) such as the following:

Education increases human welfare, and is a decisive factor in enabling people to become productive and responsible members of society. A fundamental prerequisite for sustainable development is an adequately financed and effective educational system at all levels, particularly the primary and secondary levels, that is accessible to all and that augments both human capacity and well being. The core themes of education for sustainability include lifelong learning, interdisciplinary education, partnerships, multicultural education and empowerment... Special attention should also be paid to the training of teachers, youth leaders and other educators. Education should also be seen as a means of empowering youth and vulnerable and marginalized groups, including those in rural areas, through intergenerational partnerships and peer education. Even in countries with strong education systems, there is a need to reorient education, awareness and training so as to promote widespread public understanding, critical analysis and support for sustainable development. (p.15)

As education is so enormously important for societies, it can be used as a key to human welfare and productivity. For that reason, special attention should be given to education of teachers as they have the roles of educating the members of a society. Therefore, teacher education should be reoriented according to the themes of education for sustainable development.

On the other hand, in 2007, COPERNICUS – CAMPUS as the university network for sustainable development was established for the incorporation of sustainable development into the European Higher Education Area. It aims to make universities rethink their positions for a sustainable society. This network emphasizes that universities play an important role in equipping active citizens with the knowledge, skills and values about sustainable development in local and global arenas. As it is stated in the Copernicus guidelines, sustainable development can be incorporated into curricula by the help of critical thinking skills. Also, the methodology and the textbooks should be future oriented. In addition, higher education institutions can organize case studies and meetings between university teachers from different countries for the internationalization of sustainable development issues (UNECE, n.d.).

It was stated by UNESCO (2005a, p.70) that every discipline and every teacher can contribute to sustainable development by understanding the concept of

sustainability and its principles. When they understand this, they can design their own curriculum according to the knowledge, issues, perspectives, skills and values of sustainability.

The Council of the European Union arrived at conclusions on Education for Sustainable Development in November 2010. The role of Education for Sustainable Development is emphasized as equipping individuals and groups with the necessary knowledge, skills and attitudes to preserve the world for the future generations. It is also stated that Education for Sustainable Development should be integrated into the education and training systems at all levels in lifelong learning perspective as educational institutions are among the key players in developing competencies for sustainable development (UNESCO, 2005a, p.70).

2.3. Teacher Education for Education for Sustainable Development

Teacher education has great importance for providing sustainable development. Teachers are the ones who guide the students in sustainable development by disseminating the knowledge, skills and values of sustainability. For this reason, higher education institutions need to reorient their education faculties' programs to especially address sustainability.

For reorienting teacher education for sustainable development, education faculties should firstly decide on the themes that they want to emphasize in their policies about sustainability in terms of environmental, economic and social conditions. There are some guidelines for the design of ESD in education. The following criterion is specified by UNITWIN/UNESCO Chair on Reorienting Teacher Education to create and evaluate ESD projects (UNESCO, 2005a, p.16):

- ESD is locally relevant and culturally appropriate.
- ESD is based on local needs, perceptions, and conditions, but recognizes fulfilling local needs often have global effects and consequences.
- ESD engages formal, non-formal, and informal education.
- ESD is a life-long endeavour.
- ESD accommodates the evolving nature of the concept of sustainability.

- ESD addresses content, context, pedagogy, global issues, and local priorities.
- ESD deals with the well being of all three realms of sustainability – environment, society, and economy.

There is also negative design criterion for the pitfalls to avoid when creating ESD projects. According to it, ESD is not imported from another cultural, economic, or geographic region and it is not “one size fits all,” but must be created to account for regional differences.

For that reason, when developing policies for sustainable development, education faculties should be familiar with both local and global environmental, cultural and economic conditions. They should know that as each country has their own values, they also have their own unique practices for sustainable development. However, with the help of the best practices of the other societies, they can develop their own locally relevant and culturally appropriate programs.

There are some recommendations for the teacher educators (UNESCO, 2005a, pp. 43-44). They can prepare interdisciplinary courses on sustainability for student teachers and provide them with the required materials on local and global sustainability issues. Also, teacher educators may inform student teachers about pedagogical techniques to improve their higher-order thinking skills, and support decision-making and participatory learning, and help them for the formulation of questions. Moreover, they can emphasize the importance of active participation and decision-making in citizenry in a sustainable, and in that way, they can challenge their students to create ways to incorporate participation and decision making into their classroom procedure and curriculum.

Teacher educators are also recommended to discuss social equity (e.g., gender, racial, ethnic, and generational) with student teachers by identifying the situations in which the local people indicate social tolerance, societal intolerance, equity, and discrimination. Also, they might analyze the curriculum they will be teaching together with the student teachers to identify topics and themes related to sustainability and local sustainability issues. They can encourage student teachers

to explore their own values and attitudes towards local sustainability problems. Moreover, they may promote understanding of global sustainability to encourage critical thinking and decision making for their personal lifestyle and economic choices.

In addition, it is recommended that teacher educators might develop specialized ESD programs for student teachers such as mini-courses and student teachers might get a certificate after completion of those courses. In that way, student teachers can use them for seeking employment. They can promote graduates who are specialized in ESD and its contribution to society. Also, they might place graduates who are specialized in ESD in key schools and ministerial positions to help bring about change to the institutions they are in.

2.3.1. Teacher Competencies for Education for Sustainable Development

Teacher education is one of the essential parts of education for sustainable development. Adomßent and Hoffman (2013, p.4) states that for sustainable development “social modernization” is required, and this can be supplied by the “active participation of competent citizens”. For this reason, there is a necessity to explain the concept of competence especially in terms of teacher education.

There are some studies trying to explain the concept of competence. According to Mochizuki and Fadeeva (2010, p.392), competence means “what the students will be more capable of doing after completing the learning activity” by focusing on capability of doing an activity. According to the UNESCO Report, *Learning : the Treasure Within* (Delors et al., 1996), there are also “four pillars of education for the 21st century such as –learning to know, learning to do, learning to be and learning to live together”. As Delors et al. (1996) states these pillars of education can also be used to define ESD competencies for educators.

De Haan (2010) tries to explain the key competencies for realizing sustainable development by the concept of “Gestaltunskompetenz” (shaping competence) (as cited in Adomßent & Hoffmann, 2013, p. 318). According to him, Gestaltunskompetenz means “having the skills, competencies and knowledge to change economic, ecological and social behavior without these changes merely being

a reaction to existing problems (De Haan, 2010 as cited in Adomßent & Hoffmann, 2013, p. 318).

Based on this description of competence, there are two ESD related competence approaches for teacher education. One of them is UNECE approach. The UNECE Steering Committee on Education for Sustainable Development established an Expert Group on Competencies in Education for Sustainable Development in 2009. The group has developed competencies for educators based on the UNESCO's pillars of ESD (Table 2.1, UNECE, 2011). These competences aim to guide what educators should know, what they should be able to do, how they should live and work with others, and how they should be if they are to contribute to ESD. The competencies are also grouped according to three essential characteristics of ESD as a holistic approach focusing on integrative thinking and practice; envisioning change emphasizing past, present and future; and achieving transformation focusing on people, pedagogy and education systems.

Table 2.1

Competencies for Educators in Education for Sustainable Development

	HOLISTIC APPROACH Integrative thinking and practice	ENVISIONING CHANGE Past, present and future	ACHIEVING TRANSFORMATION People, pedagogy and education systems
<p>Learning to know <i>The educator understands....</i></p>	<ul style="list-style-type: none"> -the basics of systemic thinking; - ways in which natural, social and economic systems function and how they may be inter-related; - the interdependent nature of relationships within the present generation and between generations, as well as those between rich and poor and between humans and nature; - his or her personal world view and cultural assumptions and seeks to understand those of others; - the connection between sustainable futures and the way we think, live and work; - his or her own thinking and action in relation to sustainable development. 	<ul style="list-style-type: none"> - the root causes of unsustainable development; - that sustainable development is a living concept; - the urgent need for change from unsustainable practices towards advancing quality of life, equity, solidarity, and environmental sustainability; - the importance of problem setting, critical reflection, visioning and creative thinking in planning the future and effecting change; - the importance of being prepared for the unforeseen and a precautionary approach; - the importance of scientific evidence in supporting sustainable development. 	<ul style="list-style-type: none"> -why there is a need to transform the education systems that support learning; - why there is a need to transform the way we educate/learn; - why it is important to prepare learners to meet new challenges; - the importance of building on the experience of learners as a basis for transformation; - how engagement in real-world issues enhances learning outcomes and helps learners to make a difference in practice.
<p>Learning to do <i>The educator is able to....</i></p>	<ul style="list-style-type: none"> - create opportunities for sharing ideas and experiences from different disciplines/places/cultures/generations without prejudice and preconceptions; - work with different perspectives on dilemmas, issues, tensions and conflicts; - connect the learners to their local and global spheres of influence. 	<ul style="list-style-type: none"> - critically assess processes of change in society and envision sustainable futures; - communicate a sense of urgency for change and inspire hope; - facilitate the evaluation of potential consequences of different decisions and actions; - use the natural, social and built environment, including their own institution, as a context and source of learning. 	<ul style="list-style-type: none"> -facilitate participatory and learner-centered education that develops critical thinking and active citizenship; - assess learning outcomes in terms of changes and achievements in relation to sustainable development

Tablo 2.1(continued)

	<i>HOLISTIC APPROACH</i> <i>Integrative thinking and practice</i>	<i>ENVISIONING CHANGE</i> <i>Past, present and future</i>	<i>ACHIEVING TRANSFORMATION</i> <i>People, pedagogy and education systems</i>
<p>Learning to live together <i>The educator works with others in ways that....</i></p>	<p>- actively engage different groups across generations, cultures, places and disciplines.</p>	<p>-facilitate the emergence of new worldviews that address sustainable development; - encourage negotiation of alternative futures.</p>	<p>-challenge unsustainable practices across educational systems, including at the institutional level; - help learners clarify their own and others world views through dialogue, and recognize that alternative frameworks exist;</p>
<p>Learning to be <i>The educator is someone who....</i></p>	<p>- is inclusive of different disciplines, cultures and perspectives, including indigenous knowledge and worldviews.</p>	<p>-is motivated to make a positive contribution to other people and their social and natural environment, locally and globally; -is willing to take considered action even in situations of uncertainty.</p>	<p>- is willing to challenge assumptions underlying unsustainable practice; - is a facilitator and participant in the learning process; - is a critically reflective practitioner; - inspires creativity and innovation; - engages with learners in ways that build positive relationships.</p>

The other ESD related competence approach is stated in CSCT (Curriculum, Sustainable development, Competences, Teacher training) Project which was developed at the request of the UNECE (United Nations Economic Commissions for Europe) Ministers of the Environment in 2003. The CSCT project's framework "Competencies for ESD teachers" aims "to integrate ESD in the curriculum of teacher training institutes" and it stresses the importance of the concept of competence in teacher education. Firstly, the definitions of competence from different sources are presented. In one of the sources it is defined as "key qualifications, social competences, 'soft skills,... or dynamic skills (Lassnig, Mayer & Svecnic, 2001, as cited in Sleurs, 2008). Also, they presented the definition of OECD (2005) in three categories as "the interactive use of tools", "acting autonomously" and "interacting within socially heterogeneous groups" (p.35).

Then, five domains of competencies according to the project as knowledge, systems thinking, emotions, ethics and values, and action are listed. These competencies are also related to the four pillars of education of 21st century as "domain competences" for "learning to know", "methodological competences" for "learning to do", "personal competences", for "learning to be" and "social competences" for learning to live together (Erpenback & Rosenstil, 2003, as cited in Sleurs, 2008). In addition, the definition of De Haan (2001) for the concept of "Gestaltungskompetenzen" (shaping competence) is given as "the skill of applying knowledge about sustainable development and recognizing problems about non-sustainable development" (p.36). This skill is related to the analysis of present and future environmental, economical and social developments and to be able to make decisions for action.

In the report, it is also stated that the definition of Weinert (2001, p.51, as cited in Sleurs, 2008) has been accepted. "The theoretical construct of action competence comprehensively combines those intellectual abilities, content-specific knowledge, cognitive skills, domain-specific strategies, routines and subroutines, motivational tendencies, volitional control systems, personal value orientations, and social behaviors into a complex system" (Sleurs, 2008, p.40).

After the definition of the concept of competence, the report summarizes the domains of competence (Sleurs, 2008, p.42) as follows:

1. Knowledge: It has three dimensions as “conceptual, factual and action related knowledge”. Knowledge also is related to time as” past, present and future”; “space as local and global”, “and it is inter-, trans-, pluri- or cross-disciplinary constructed”. Our knowledge can be constructed by both individually and socially. Also, critical thinking is really important for the construction of knowledge. Some of the teacher competencies related to knowledge can be listed as;

- Being able to master SD key concepts and knowledge such as interdependence of society, economy and the natural environment from local to global, citizenship and stewardship, needs and rights of future generations, quality of life, and equity and justice.
- Being able to acquire relevant knowledge about SD issues in order to contribute to the construction of a curriculum,
- Being able to select educational goals for SD, considering the developmental stage and prior knowledge of students, and the diversity within the group of learners,
- Being able to create a powerful learning environment for teaching SD issues.

2. Systems thinking: For a sustainable future and to solve the problems of today’s world, thinking in systems is a requirement. These systems can be named as geographical, ecological, political, economical and social systems. Related competencies can be listed as;

- Being able to encourage students to look at issues from different perspectives,
- Being able to perceive the school as a living system and trying to act with the school team and in class according to the insights of systems thinking in the context of ESD,
- Being able to be aware that schools are a part of local, national and global systems.

3. Emotions: Thinking, reflecting, valuing, taking decisions and acting are related to emotions. Empathy and compassion is also vital for emotional competence as “feeling inter-connectedness with the world” is basic for intrinsic motivation in ESD. Related competences are;

- Being aware that emotions are crucial to our lives and can often be related to former experiences and also depend on the surrounding culture,
- Being able to develop the competences of compassion and empathy and develop the awareness of interconnectedness with the world in space and time,
- Being a good mediator in resolving conflicts between humans with different interests in the classroom and the school, and in external relations.

4. Ethics and Values: Our thinking, feelings and actions are shaped by norms, values, attitudes and beliefs. Ethical principles “for building a just, sustainable and peaceful global society for the 21st century” are given importance (Sleurs, 2008, p. 43). Competencies related to ethics and values are;

- Being able to clarify his/her own beliefs, assumptions and values related to SD, education and learning,
- Being able to encourage students to question their beliefs and assumptions in order to clarify their thinking,
- Being able to modeling values of respect and dignity which underpin sustainable development,
- Being able to help learners gain plural perspectives on issues.

5. Action: Action involves all four domains for sustainable development. It includes experiencing change, learning from mistakes and increasing motivation.

The competencies related to action can be listed as;

- Being able to imagine alternative futures and new, creative solutions,
- Being able to act as an “agent for changing”,
- Being able to explain his own position and have civic courage,

- Being able to define relevant topics for action towards SD and break it down into steps for action; describe conditions in society that can be the reason for action.

As a result, for education for sustainable development, teachers need to have these competences. In this study, teacher competencies were studied in that particular framework.

2.4. Research on Education for Sustainable Development Abroad

After the development of the concept of education for sustainable development, many countries started to do research on it. In these research studies, the concept of education for sustainable development has been analyzed from both teacher and student perspectives. Also, there are some studies conducted on teacher competencies. In addition, different curriculum analyses regarding education for sustainable development have become the main concern of the researches.

2.4.1. Research on Teachers' Perspectives for Education for Sustainable Development

For the perceptions of teachers about education for sustainable development, Burmeister and Eilks (2013) studied the understanding of sustainability and education for sustainable development among German student teachers and trainee teachers of chemistry. The study was conducted through a survey which was analyzed both quantitatively and qualitatively. As a result, it was found that both groups had positive attitudes towards ESD and knew the importance of ESD for chemistry education. However, when comparing two groups, no major differences were found. Theory of sustainability was not offered either by the subject matter courses in teacher education in chemistry or in the courses in education and general science education. Only few participants possessed theoretical knowledge about either sustainability or ESD.

Borg, Gericke, Höglund and Bergman (2014) studied Swedish upper secondary school teachers' conceptual understanding of sustainable development with regard to their subject area and teaching experience. The data was collected

through a questionnaire. As a result, it was found that teachers differ in their understanding of the concept of sustainable development mostly according to their subject areas. For instance, while social studies teachers were emphasizing social dimensions, science teachers were emphasizing ecological dimensions. However, the effect of experience could not be found significant. The study also reflected the importance of training as %70 of the teachers stated that they needed training in sustainable development.

Birdsall (2014) conducted a study to explore New Zealand student teachers' understandings of sustainability and self-awareness of their understandings. These teachers were in the final year of a Bachelor of Primary Education. He designed and used a tool to measure their understandings and another one to measure their self-awareness of their understandings. The findings of the study revealed that student teachers had a simplistic understanding of sustainability as they only focused on the environmental aspect of it. Also, over half of the student teachers could not rate their own level of understanding accurately. That is, they lacked awareness of their understanding of sustainability. In discussion, he suggested the need for the development of teachers' understandings of sustainability so that they can plan and teach effective sustainability education programmes.

Nikel (2007) also conducted a study to examine the student teachers' understandings of education for sustainable development. The data were collected through case studies of 30 student teachers from Initial Teacher Education Programmes in England, Denmark and Germany. As an interpretative research, the study mapped similarities and differences in student teachers' understandings of key ESD concepts and tasks. The findings of the study reflected the importance of 'taking responsibility' and 'having responsibility' as key notions in interpreting their professional role and student learning in relation to ESD. In making sense of ESD, student teachers focused on the nature of the decision-making process.

For the perceptions and attitudes of students of teacher training towards environment and sustainability, Ull, Agut, Piñero and Minguet (2014) also conducted a study. This was a survey conducted at three Universities of the Comunidad

Valenciana, Spain aiming to introduce sustainability across university's curricula of both Early Childhood Education Teacher Degree and Primary Education Teacher Degree. A total of 922 students answered the survey. It was found as a result of the survey that majority of respondents were not aware of the impact of their daily activities on the environment. As for the introduction of sustainability in teaching, 75.9% of students said that it was appropriate to do that. Also, almost half of the participants said that they did not receive enough training to deal with environmental problems in the future. They also stated that the universities should disseminate their initiatives and students should become more involved in university life.

Jones, Trier, and Richards (2008) studied about the perceptions of academics and students towards embedding education for sustainable development in higher education. They conducted a case study to examine common challenges and opportunities for undergraduate programs in the School for Earth, Ocean and Environmental Science (SEOES) at the University of Plymouth. The results revealed that academics generally supported the embedding of ESD in the curriculum. However, there are three different attitudes. Some academics were comfortable with the term and could use their own descriptions. Other ones demonstrated an underlying hostility toward the term ESD; however, they thought that it was unclear. Thirdly, some respondents stated that they had lack of knowledge about ESD and for that reason this created a barrier to use this term. Also, there were some evidences that ESD related teaching and learning occurred in that university. However, it was used as content rather than pedagogy as there is a general uncertainty about the meaning, scope, boundaries, application and limitations of the term ESD.

Corney and Reid (2007), studied student teachers' learning about subject matter and pedagogy in education for sustainable development. It was a phenomenographic study. It focused on what the student teachers perceived as their learning about ESD and the sources that contribute to it. The data were collected through open proformas and interviews of student geography teachers taking the University of Oxford Post-Graduate Certificate in Education (PGCE) in 2003–2004. The data indicated their conceptions of subject matter and pedagogy. Student

teachers' perceptions of their learning was reflected in six dimensions as understanding of the nature of sustainable development for teaching, knowledge of approaches/strategies for teaching about sustainable development, awareness of preferred teaching stance related to personal views about sustainable, awareness of Geography Department practice in ESD and awareness of a potential for cross-curricular work in ESD. In addition, the range of sources were analyzed in two dimensions as school based sources-mentor, and initial teacher education courses of learning and university based sources of learning-university sessions about the theory and pedagogy of ESD and student teachers' school experiences. As a result, it was emphasized that "student teachers' learning of any particular aspect of ESD may draw on a variety of sources, and this is likely to be influenced by their preconceptions about ESD and education, as well as their experiences on their teacher education course" (p.49).

Jaspar (2008) conducted a qualitative study for teachers' perspectives regarding education for sustainable development. In the study, she conducted semi-structured interviews with four teachers from middle school and high schools who teach about sustainable development in their classes. As a result, six themes were identified as motivations, teaching style, and teachers' perceptions of the impact on students' learning, modeling, spirituality, and challenges to teaching about sustainable development. Then, she found the teachers highly motivated to teach about sustainable development and she added some implications for the teachers at the end of the study. She recommended teachers to make use of existing programs, go beyond the traditional classrooms, look for sources on the Internet and serve as a model for sustainable development for their students.

Yang, Lam and Wong (2010) developed an instrument for identifying secondary school teachers' beliefs about ESD in China after the new educational reform. In their instruments, there are two subscales as sustainability values and teaching beliefs of ESD. Sustainability values includes respect and care for the community of life, ecological integrity, social and economic justice; and democracy, nonviolence and peace. Teaching beliefs of ESD consist of three dimensions as

relevance to daily life, students' needs in the future, and integrated teaching. This instrument is expected to be helpful for the future research.

Furthermore, Summers, Corney and Childs (2003) conducted a study on teaching sustainable development on primary schools in terms of its planning and teaching. It was a qualitative study and nine teachers were interviewed before and after teaching about sustainable development. Then, seven key issues were analyzed as sustainable development and the National Curriculum, choosing a topic, making it sustainable development, learned helplessness and empowerment, personal understanding of sustainable development, teaching of controversial topics and teacher time. As a result, it was found that the concept of sustainable development is new to the teachers and they showed little awareness of the topic in the National Curriculum. Also, for the selection of topics, they selected mostly the global topics instead of the local ones. For this reason, it is recommended that teachers need more information and help for teaching of sustainable development.

In addition, Summers, et al (2005) also studied education for sustainable development in initial teacher training with an interdisciplinary collaboration. Data were collected through questionnaires sent to ITT partnership schools, geography and science graduate students teachers and to their mentors. As a result, it was found that the school context did not present interdisciplinary practice, student teachers had more comprehensive knowledge related to sustainable development compared to their mentors, and geographers had a more developed understanding of sustainable development than their science counterparts. As a result, they recommended a new model for developing ESD in the partnership as providing joint geography and science sessions in the universities to make student teachers and tutors work together and develop personal understanding of sustainable development.

Beltran, Zachariou, Liarakou, and Flogaitis (2014) studied about mentoring as a strategy for empowering Education for Sustainable Development in schools. With the aim of integrating ESD in the teaching–learning process, they used a mentoring system to introduce experienced and newly appointed teachers, who are all novice in the field of ESD, to planning and implementing ESD. Then, they evaluated the

potential of this mentoring system. As a result, it was found that mentoring encompasses all of the attributes that ESD teacher education requires and also it promotes teacher interaction and the formation of professional learning communities for ESD. Moreover, it was found that the mentoring system increased teachers' pedagogical content knowledge of any subject.

Lamp, Greculescu, and Todorescu (2013) analyzed the implementation and the use of the concept of education for sustainable development, based on learning strategies to develop the pupils' creative skills and competences for real participation and cooperation. An on-line questionnaire was sent to 126 teachers working in some schools participating in ECO – SCHOOLS. The results indicated that the most frequently used learning strategies are: learning by cooperation, and learning by simulation. On the other hand, the least frequently used methods are found as learning by investigation and learning by case study. In addition, active listening, assertiveness, assuming of responsibilities and solidarity are considered as a necessity for successful relationships based on social cooperation and interaction among pupils and people in general. Therefore, teachers need to develop these competences. The results have also indicated that the teachers mostly try to develop the competence of active listening (91.67%) as it facilitates empathy and exchange of opinions. As a result, it was found that teaching and learning approaches should focus on students, and encourage them to form and develop their own ideas and values.

In addition, McNaughton (2012) examined what the teachers learnt about effective pedagogy resulting from a systematic study of their own practice in ESD/Global Citizenship Education (GCE) and highlighted the development of their own understanding and values about the place of ESD/GCE in their curriculum. It was a small-scale qualitative study based on the analysis of the reflective journals kept by 10 teachers during the planning and implementation of ESD/GCE projects within their own classrooms. As a result of the analysis of the summative analytical commentaries these themes were found as" the teachers' evaluations of pupil learning and responses in terms of the development of their knowledge, skills in and

attitudes towards, the ESD/GCE themes and the development of the teachers' own understanding of and enthusiasm for ESD/GCE”(p.770). Also, it was stated that, as a result of critical reflection on their work, the teachers felt the confidence to adopt the more learner-centered pedagogy of ESD/GCE and benefitted more from the participation in ESD/GCE activities.

Adeogun and Olisaemeka Blessing (2011) examined the influence of school climate on students' achievement and teachers' productivity for sustainable development. A questionnaire was used to collect data. 150 respondents were involved in the study including the principals, teachers and students. The findings show that there was a significant relationship between school climate, academic performance and teacher productivity. Also, it was recommended to ensure provision of effective learning environment such as neat, and peaceful; and conducive working conditions providing democracy, dialogue, motivation, in-service training and cordial relationship.

Bentham, Sinnes and Gjøtterud (2015), used soft systems methodology “to gain a picture of the current organizational structure of a Science and Technology Education Department and to further develop a hypothetical picture of what the same organizational structures would look like if they incorporated ESD” (p.158). It was stated that soft systems methodology is used in organizational research to understand both organizational structures and dynamics. In that methodology, a group of teacher educators were given these two pictures in a focus group interview to reflect on three foci. This study tried to “explore the teacher educators' responses to the hypothetical system picture which elaborates on a system for teacher education for sustainable development”(p.158). As a result, it was revealed that (1) teacher educators' perceptions of professional autonomy and management's perceptions are different; (2) there are seven relevant sub-systems which influence teacher educators' priority and practice; (3) For supporting the suggested ESD curriculum innovation, research and leadership were considered as the most powerful tools by teacher educators; (4) ESD is not a priority for teacher educators owing to various reasons, although it was considered important. Therefore, there is a need for a Continuing Professional

Development (CPD) support sub-system to enable teacher educators to gain a better conception of how to embed ESD in the Science and Technology teacher education department.

On the other hand, Zachariou, Beltran and Manoli (2013), studied sustainable schools in Cyprus from school principles' perspectives. They explored school principles' self-reported competence for organizing and implementing ESD in schools and their needs of education and training on education for sustainable development to lead sustainable schools. Data were collected through a survey from 150 primary schools in Cyprus during 2005-2007. It was found that school principals in Cyprus are poorly equipped for their new role as leaders of sustainable schools and agents of change, and they focused on exploring suitable approaches for their professional development on ESD. Finally, they discussed the need for developing principles' professional development programmes in the study.

Wright (2010) also examined how presidents and vice-presidents in Canadian universities conceptualize sustainable development and sustainable universities. Also, he studied the role of the universities for a sustainable future, key issues facing the universities, and the barriers to implementing sustainability initiatives on campus. The study was conducted through in-depth interviews with university presidents and vice-presidents. As a result, it was found that the majority of participants were familiar with the concept of sustainable development, but less familiar with the concept of a sustainable university. Also, the participants were more focused on the environmental aspects of sustainability rather than the social and economic aspects. The majority of the participants were found dedicated to having their university become more sustainable. However, some constraints were found toward sustainability such as financial predicaments, lack of understanding and awareness of sustainability issues amongst the university population, and a resistance to change.

2.4.2. Research on Students' Perspectives for Education for Sustainable Development

For the students' perspectives on education for sustainable development, Khalil, Ramzy and Mostafa (2013), conducted a study to measure students'

perception towards sustainable development to highlight their perception before and after joining Heliopolis University (HU). Also, the study emphasized on the extent to which students are anticipating implementing SD concept in their lives. The study was an exploratory qualitative research. As a result, it was stated that although the university students' limited engagement with sustainable development concepts, they had an adequate understanding of the concept and its applications. They had the ability to list examples, and identify solutions, in realizing the concept of SD and they felt a high sense of responsibility towards their local community. Also, it was stated that the students expressed their interest to continue disseminating information and practice about SD through their close contact circles.

Also, Sharma and Kelly (2014) conducted a study exploring students' perceptions and understandings, and attitudes towards education for sustainable development (ESD) at Delta Business School (DBS) in New Zealand. In the study, a survey was administered to 60 accounting and business students at DBS. Also, the data were supplemented with interviews. The results revealed that most students have a positive perception of ESD. Although the majority of the students had no prior knowledge of sustainable development before attending university, students who had taken sustainable development-focused courses were generally supportive of the teachings and find them useful. In addition, a majority of students stated that sustainable development-focused papers should become compulsory. The results also suggested that students' knowledge of sustainable development improved when they took relevant courses at DBS.

In their study, Cruickshank and Fenner (2012) examined how a number of key themes such as dealing with complexity, uncertainty, change, other disciplines, people, environmental limits, whole life costs, and trade-offs are introduced in the Master's programme in Engineering for Sustainable Development, at Cambridge University, through student-centered activities. Role plays, games, systems thinking, and multi criteria decision making activities and surveys were used to collect data to test the students' perceptions about whether or not the course is providing learning environments to develop awareness and skills in the mentioned areas. As a result,

delivering a new way of thinking through a combination of lectures, class activities, assignments, interactions between class members, and access to material elsewhere in the University developed these students' skills in each of the key themes.

Kagawa (2007) conducted a study to explore the students' perceptions and understandings of, and attitudes towards, sustainable development in the University of Plymouth, UK. Data was collected through a survey in 2005. The findings of the study indicated that the majority of the students had positive attitudes towards sustainability. However, it was found that they were not familiar with the concepts of sustainable development in that degree. Moreover, the students strongly associated the concepts of sustainable development with the environmental aspects not with the economical and social aspects.

Olsson and Gericke (2016), focused on sustainability consciousness of the adolescent students in their study. The study was conducted through a survey, with 2,413 Swedish students in the sixth, ninth and twelfth grades using an age-adapted questionnaire. The results revealed that sustainability consciousness of Swedish students' dips in adolescence and ESD certified schools do not have any positive effects on tackling the dip in adolescents' sustainability consciousness. For that reason, there is a need to modify the sustainability education for adolescents. As a result, education for sustainable development is recommended to meet that need.

Leeuw, Valois, and Seixas (2014), studied about understanding high school students' attitude, social norm, perceived control and beliefs to develop educational interventions on sustainable development. It was a survey design. Multiple regression and correlational analyses were used in the study. Two hundred and twelve students of 6 different high-schools from all over Luxembourg participated to the study. The results revealed that "the students' intention to adopt environmentally sustainable behaviors is a positive function of their perceived control over the behavior ($\beta = .46, p < .01$), their perceived descriptive norms ($\beta = .27, p < .05$) and their attitude towards these behaviors ($\beta = .18, p < .05$)" (p.1205). Also, it was found that, "the more the students had a feeling of control over the adoption of sustainable

behaviors, the more likely they would show the intention to perform them” (p.1207). Therefore, educational interventions should focus on especially this control factor.

Finally, Olsson, Gericke and Rundgren (2016) studied the effect of implementation of education for sustainable development in Swedish compulsory schools by assessing pupils’ sustainability consciousness in ESD schools compared with ordinary schools. Quantitative research design was used in the study. A Likert-scale questionnaire with 50 items was developed to evaluate pupils’ sustainability consciousness through a nationwide study in Sweden with the participation of 1773 pupils. They examined the environmental, economic, and social dimensions of sustainable development in terms of sustainability knowingness, attitudes, and behavior. The results revealed that there was a significant, but small difference with respect to sustainable consciousness between the two groups of pupils. There were also differences between the ESD group and the ordinary schools regarding age. The students in ESD-schools in the sixth grade had experienced something in their teaching that influenced their sustainable consciousness in a different way than the pupils in ordinary schools. In addition, the results indicated that the environmental dimension contributed most to the three-dimensional differences. Further, girls were more affected by the kind of environmental focus in teaching experienced by the ESD-group.

2.4.3. Research on Teacher Competencies for Education for Sustainable Development

In their study, Varga, Kòzsò, Mayer and Sleurs (2007) studied developing teacher competencies for education for sustainable development from the Environment and School Initiatives (ENSI) approach. They present two examples from ENSI activities. The first one is one year action research based training course for pre-service teacher education. The second one is an analysis of a sequence of project supporting workshop for in service teacher education. Also, they went so far as presenting future step for teacher competences as self-reflection at an individual and school level. Obike (2007) also studied the needs for continues teacher

development for ESD and suggested focusing on skills and knowledge to achieve sustainable development.

Ferreira, Ryan and Tilbury (2007) studied on professional development models of sustainable development in initial teacher education in Australia. They stated that initial teacher training is a strategic opportunity for teachers' readiness for the teaching of sustainable development. For that reason, they identified three models of professional development as Collaborative Resource Development and Adaptation Model, the Action Research Model and the Whole of System Model. The first model is about the development and dissemination of curriculum and pedagogical resources. The second one uses action research process as a way of engaging the teachers with the content and practice of sustainable development. The Whole of System Model is related to all areas that are related to sustainable development. At the end, a new model was recommended as Mainstreaming Sustainability Model to be more systematic for professional development of the teachers. It is a hybrid model of the Action Research Model and the Whole of System Model focusing on developing a practitioner's sense of autonomy and ownership. It relates the reflective action research in a dimensional change with different stakeholders.

Mischo (2015) also studied early childhood teachers' perceived competence during transition from teacher education to work as a longitudinal study. Teachers' perceived competencies were assessed through a questionnaire. As a result of factor analysis, two factors were found as child-related competences and environment-related competences. Significant increase in both competence factors towards the end of teacher education and a decrease in child-related competences were found when teachers started to work in a kindergarten after graduation. The level of teacher education did not have effect on the competences.

Also, Corney (2006) studied the challenges of geography student teachers about their learning to teach about ESD in a qualitative study. In the study, it is found out that there are three areas of challenges related to the complexity of subject matter, teaching and learning approaches and strategies, and the differences

between student teachers beliefs about ESD and the context for their teaching. In the end, it was recommended to develop some competences for these areas of challenges.

Barth, Godemann, Rieckmann and Stoltenberg (2007) conducted a study on developing key competencies for sustainable development in higher education. It was a qualitative study based on focus groups from informal and formal learning settings. One year interdisciplinary study programme for sustainability was developed and tested through focus groups. As a result, it was found that within the study programme, developing competencies for sustainability was encouraged. Also, to acquire the competencies, the importance of various contexts was highlighted. In addition, the results of the study revealed that both formal and informal learning settings were of great importance. For that reason, a culture of teaching for sustainability should combine both formal and informal settings including competencies developed in extra-curricular settings.

Moreover, Besong and Holland (2015) studied sustainability competencies with final year undergraduate students in Higher Education. They used DAB (The Dispositions, Abilities and Behaviors) method to determine their competencies. As a result, it was found that many of the higher education learners are not willing to develop climate action plans for their communities. Also, they stated that despite the general awareness on environmental matters there was a need to integrate climate change education in higher education.

Lasen, Tomas and Hill (2015) conducted a document analysis in their studies and they suggested service-learning as a pedagogical approach to develop their competencies of pre-service teachers in an Australian teacher education. The pre-service classroom teachers progressively develop the necessary competencies to participate in the “sustainability action process and feel the need to built sustainability competencies developmentally in cohesive ways across their learning programs, guided by social justice and equity principles through service learning which is feeling the need to service to community by self discounts, acquisition of knowledge, higher order thinking skills and values.

Lastly, Sims and Falkenberg (2013) studied on developing competencies for education for sustainable development in undergraduate and graduate teacher education programs at Canadian universities. The results revealed how identified initiatives relate to the development of core ESD competences for educators as established by UNECE (2012). The results of their study suggested experiential, inter-disciplinary and inter-institutional learning, and building partnerships with colleagues, students, and community organizations.

2.4.4. Research on Curriculum Studies for Education for Sustainable Development

There are some studies focusing on sustainable development related to the specific course curricula. Firth and Winter (2007) studied how Post Graduate Certificate of Education (PGCE) student teachers taught sustainable development in geography courses in UK. They conducted interviews with the teachers and as a result, it was found out that student teachers and newly qualified teachers could initiate sustainable development through geography courses when they got the development programs based on ESD. Also, at the end of the study, they recommended a more structured curriculum for the reorientation of teacher education.

Moreover, Lindeman and Sanchez (2009) studied the role of language education in sustainable development. In the article, they argued about several points. Firstly, they claimed that learning a second language establishes interconnections between different people, societies and environments. Therefore, multilingualism is helpful for sustainable development. For that reason, they stated that educators must be aware of the importance of English as a global language and use it as sources of information for the people for sustainable development. They ended the article by stating that “the English speaking world is, in part, made up of some of the most polluting, economically active, resource-wise, avaricious and militarily powerful regimes on the planet”, and so they give importance to the dialog and participations of these nations in sustainable development.

Jóhannessona, Norðdahlb, Óskarsdóttirb, Pálsdóttirb and Pétursdóttirc (2011), made a project about curriculum analysis and education for sustainable development in Iceland. Action research was conducted to indicate how the Iceland public school for early childhood, compulsory and upper secondary school deals with education for sustainable development. They also constructed a curriculum analysis key based on the content of UNESCO guidelines and three principles of action for developing education for sustainability, identified by the research groups. The curriculum key has some characteristics as (1) indications of values, opinions and feelings about nature and environment, (2) identification of knowledge contributing to a sensible use of nature, (3) statements about welfare and public health, (4) indications of democracy, participation and action competence, (5) recognition of equality and multicultural issues, (6) indications of awareness and understanding of global issues, and (7) references to economic development and future prospects. As a result, their analysis indicated that the Icelandic curriculum for early childhood, compulsory and upper secondary schools did not include a clear view towards education for sustainability. However, in relation to the goals, in detail, it was found that they provide teachers and schools with some guidance on education for sustainable development. Also, the curriculum key was found instrumental in identifying the opportunities of education for sustainability on a curriculum.

Holmberg, Svanström, Peet, Mulder, Balas and Segalàs (2008) studied embedding sustainability in higher education through interaction with lecturers. It was a case study of three European technical universities. In the study, the work of three universities was compared regarding the integration of sustainable development into their educational programmes and individual interaction with teachers and other actors were described. The results revealed that each university had its own strategy for embedding ESD into their curricula. In general, there was a tendency to have compulsory courses in all programs providing basic knowledge and skills of sustainable development and also, including integrated parts through the programme

to deepen the understanding. There were also other opportunities offered for students such as specialized bachelor, master and minor programmes and optional courses.

Murray, Dunbar and Murray, (2014) conducted a study on evaluating values-centered pedagogies for clarifying learners' personal values in terms of sustainable behavior. They conducted a pre-test post-test survey to 113 undergraduates from the same discipline after they had an intensive training workshop on values-based sustainability. The results indicated small but statistically significant shifts in perceptions of the participants' personal values especially in relation to values correlating with sustainability.

Finally, there are some studies conducted in different countries. For instance, Kitamura and Hoshii (2010) analyzed the place of education for sustainable development at universities in Japan, Down (2006) in Jamaica, and Chhokar, (2010) in India. In those research studies, the situation of education for sustainable development in their countries was summarized.

2.5. Education for Sustainable Development Studies in Turkey

There are some studies conducted on education for sustainable development in Turkey. The Project of Eco-Schools is carried out by International Environmental Education Foundation and has 30 member countries and over than 10.000 member schools. The project is carried out by Environmental Education Foundation of Turkey and is implemented in 134 primary schools in Ankara, İstanbul, İzmir, Bursa, Eskişehir, Aydın, and Antalya. In the primary schools of Eco-Schools project, the students are provided with the education of sustainable development and environmental awareness. Students try to raise the awareness of their parents as well. These schools also fulfill the criteria of International Environmental Education Foundation and are provided with the prize of green flag (Türkiye Çevre Eğitim Vakfı, 2016).

Also, for the teacher competencies, MoNE has determined some teacher competencies as “generic teacher competencies” and “field specific competencies” for subject specific training (MoNE, 2008, Öğretmenlik Mesleği Genel Yeterlikleri). The generic teacher competencies include six main competencies as “Personal and

Professional Values-Professional Development”, “Knowing the Student”, “Learning and Teaching Process”, “Monitoring and Evaluation of Learning and Development”, “School-Family and Society Relationships”, and “Knowledge of Curriculum and Content”. The competency of “School-Family and Society Relationships” has some competencies related to education for sustainable development such as being aware of natural, socio-cultural and economic characteristics of the school environment, being sensitive to important problems of the environment and reflecting these facts on the teaching process.

Field specific competencies for the teachers of classroom teaching include eight competency areas (MoNE, 2008, Sınıf Öğretmeni Özel Alan Yeterlikleri). Out of eight areas, the seventh one has some competencies related to education for sustainable development. This area is about individual responsibilities and socialization.

The competencies included in this area are related to having the ability;

- to make students know themselves and their surroundings such as family, friends and school,
- to make them behave democratically and gain responsibility,
- to make them establish effective communication,
- to make them know the natural environment they live in and develop their observation skills,
- to inform them about natural disasters and to develop the love of nature and awareness of protecting the nature,
- to develop the awareness of time (past, present and future) and transformation,
- to integrate the ideas of Atatürk about children rights, human rights, and the rights and responsibilities for democracy and citizenship to the learning environment.

In 2012, a report was published by the Republic of Turkey Ministry of Development, named “The Report of Sustainable Development: Embracing the Future”. The aim of the report was to evaluate the progress of Turkey about

sustainable development and express sustainable development policies that would be conducted in the future and the contributions of it for the solutions to the global problems. The report stated that economic, environmental and social dimensions of sustainable development were recognized as a whole and with the help of the developments in economy; there would be a progress in struggle with poverty. Also, it was stated in the report that sustainable development was integrated to the 6th (1990-1994), 7th (1996-2000), 8th (2001-2005) and 9th (2007-2013) Development Plans (The Turkey Ministry of Development, 2012)

On the other hand, the studies conducted on education for sustainable development in Turkey are also about the perspectives of teachers and students; and also analysis of curricula in terms of sustainable development.

2.5.1. Research on Teachers' Perspectives for Education for Sustainable Development

Tuncer, Tekkaya and Sungur (2006) studied on preservice teachers' beliefs about sustainable development and the effects of gender and enrolment to an environmental course. The study has been conducted to the students of Faculty of Education of the Middle East Technical University with an environmental attitude questionnaire. As a result, it was found out that university students are conscious of sustainable development, and gender and enrolment to an environmental course effect their beliefs. Females and the students who enrolled to an environmental course are more conscious about sustainable development.

Moreover, Keleş (2007) studied the effects of ecological footprint applications used in environmental education on changing the awareness, attitudes and behaviors of prospective science and technology teachers toward environment and sustainable life. In the study, a single group pre-test post-test design was used. The research was applied to the students of Science Education in Gazi University. As a result, ecological footprint as a tool for environmental education was found to be effective in changing the awareness, attitudes and behaviors of prospective science and technology teachers toward environment and sustainable life. It also

increased the points of the teacher candidates' awareness, attitudes and behaviors in the post test phase.

Kılınç and Aydın (2013) studied Turkish student science teachers' conceptions of sustainable development. A sample of 113 Turkish student science teachers was given a questionnaire including two separate sections. In the first section, questions related to personal information such as gender, age, and year group were asked, and in the second part, the meaning of SD was asked through a phenomenographic approach. As a result, it was found that student teachers had a variety of ideas about SD. Their ideas could be collected under seven headings as environment, technology, society, economy, politics, energy, and education. In addition, it was thought that this variety stems from gender, context-based issues, and informal experiences. For instance, while females mostly have 'environmental', 'social', 'political', and 'educational' orientations, males have 'environmental', 'economical', and 'energy-related' orientations. As a result, three implications were suggested. First, student teachers should be provided with opportunities to become more aware of their individual preconceptions about SD and the reasons for them. Then, they should be encouraged to discuss their conceptual framework with their peers and be encouraged to think more critically about their existing ideas. Another implication is about the competences targeted in the programmes of ESD in teacher training. Competences can be developed about controversial issues and being aware of differing teaching roles such as neutrality and balance. The final implication is concerned with developing curricula for ESD in teacher education displaying the interrelationships among these different aspects of SD.

Sağdıç and Şahin (2015) conducted a study to develop a scale to assess elementary teachers' beliefs on education for sustainable development. First, 211 preservice elementary teachers participated to the study, and the data were analyzed through exploratory factor analysis. Then, the scale was administered to 210 elementary school teachers who participated in an eco-school and green package teacher training program and the data were analyzed via confirmatory factor analysis, discriminant and convergent validity analyses and item analysis. The results revealed

that the scale of the beliefs on education for sustainable development, which includes thirty two items and three factors, was a valid and reliable scale.

Teksöz, Şahin and Ertepinar (2010), conducted a study on environmental literacy, pre-service teachers and a sustainable future. Their study aimed to determine environmental literacy of pre-service teachers in 4 public universities in Ankara and examine the relationships among the sub-dimensions of environmental literacy. Also, they investigated the effect of gender on these sub-dimensions. It was a quantitative study and the data were collected through “Environmental Literacy Questionnaire”. The results were expressed according to 4 dimensions, as environmental knowledge, environmental attitudes, environmental uses, and environmental concerns. The results revealed that environmental knowledge of the pre-service teachers were highly low. However, they showed positive environmental attitudes and their level of environmental awareness was acceptable. Moreover, there was a statistically significant positive correlation among environmental knowledge, environmental attitudes, environmental uses, and environmental concerns of pre-service teachers with a small effect size. In addition, in terms of the effect of gender on the sub-dimensions, the results revealed that there was a small statistical significance of gender on the sub-dimensions. In terms of environmental attitudes, environmental uses, and environmental concerns females had higher means, but in terms of environmental knowledge, males had higher means.

Demirbaş (2015) conducted a study to indicate the sustainable development level of awareness of pre-service teachers in terms of their departments and gender. The study had a quantitative design. A scale of sustainable development awareness was administered to 504 pre-service teachers studying in different departments at Education Faculty of Ahi Evran University. The scale had three dimensions as environmental ethics, social factors and environmental economic. As for the departments, sustainable development awareness levels of preservice teachers were high in terms of environmental ethics and social factors; and were medium in terms of environmental economic dimension. When they were compared to the departments, sustainable development awareness levels of pre-service teachers were

significantly different in terms of environmental ethics and environmental economic. However, there was no significant difference in terms of social factor. Also, the sustainable development awareness levels of pre-service teachers of the department of Computer Education and Instructional Technology, Turkish Language Teaching and Counseling were higher than the departments of Pre-school Teaching, Social Studies Teaching and Science Knowledge Teaching. In addition, the results indicated that there was no significant difference between both total and all factors related to sustainable development awareness levels of pre-service teachers in terms of gender.

Öztürk and Öztürk (2015) conducted a study to determine the awareness and sensitivity of the pre-service teachers about the national and global environmental problems, the activities they could use for the development of environmental consciousness and their opinions for the solution of these problems. They also tried to examine the effects of gender and academic departments on their social and academic sensitivities. It was a survey design and the data were collected from 134 pre-service teachers studying in the first year in Faculty of Education in Ordu University in 2013–2014 academic year spring term by questionnaires. The results of the study indicated that the excessive use of natural resources was the most important environmental problem in Turkey and the world, and they said they see environmental organizations as the most effective environmental groups in solving these problems. Also, those most valuable contributions provided through the TV and radios in order to raise awareness in the community thought. It was also found that there is no significant difference between the opinions of the participants in terms of “gender” and “education field” dimension but there is a significant difference in terms of “gender” dimension related to social and academic sensitivity.

2.5.2. Research on Students’ Perspectives for Education for Sustainable Development

In his study, Kaya (2013) developed a measuring tool to determine the attitudes of students in secondary schools towards sustainable development. The data was collected through a 23 item scale named as “The Attitude Scale for the Sustainable Development”. The scale was developed through a literature survey

and the content analysis of compositions of eight students in secondary schools about the appropriate behaviors for ‘Sustainable Environment’, ‘Sustainable Economy’ and ‘Social Sustainability’. As a result of developing the survey, three factors were found as social, environmental and economical sustainability. In addition, the scale was recommended to be used in measuring the attitudes of students in secondary schools towards sustainable development, determining the effects of some variables on the attitudes of students towards sustainable development, explaining the effects of different courses on the attitudes of students towards sustainable development and revealing the relationship between different attitudes and the attitudes towards sustainable development.

Also, Şahin (2008), in her doctorate thesis entitled “An Examination of Indications for a Green Curriculum Application towards Sustainability” studied the familiarity, attitudes, values and behaviors of METU students regarding ESD and the predictors of their attitudes and behaviors towards sustainable life styles. For the study, a survey was designed and given to METU students 688 of whom were from Education Faculty. As a result, she found out that students had favorable attitudes and intrinsic values toward sustainable development. However, their behaviors were not found coherent with sustainability. On the other hand, their attitudes and values were found significant in determination of students’ behaviors toward sustainable living. However, faculty of Education students’ attitudes were not found significantly related to their behaviors toward sustainable development.

Moreover, Öztürk, Olgan and Güler (2012), studied preschool children’s ideas on sustainable development and gender differences on these ideas. Their perspectives of three pillars of sustainability related to 7R’s (reduce, reuse, respect, reflect, rethink, and redistribute) were analyzed through qualitative research by semi-structured interviews. 36 preschool children from four different preschools in Ankara participated in the study. Participants explained their ideas about reduce, reuse, respect, and recycle parts of 7R’s; but no ideas were reported related to reflect, rethink, and redistribute. Also, it was found that gender did not have an influence on preschool children’s ideas about sustainability. The results reveal that,

as for the environmental pillar of sustainability, most of the preschool children can express their ideas about reduce and reuse issues. For the economical pillar of sustainability, a few preschool children mentioned recycling but no children expressed their ideas about redistributing. About the social-cultural pillar of sustainable development, findings of the study revealed that preschool children have higher levels of respect towards plants and animals, nature and people. It was found that preschool children's ideas about 7R's of sustainable development were limited in some terms. Their answers showed that they did not have any idea about reflect, rethink and redistribute aspects. The underlying reason for their unfamiliarity with reflects, redistribute and rethink can be related to their cognitive level. In conclusion, they stated that there was a need to develop existing early childhood education approaches to provide experiences for young children about education for sustainable development issues and involve active participation of teachers, parents and society.

In addition, Özgürler and Cansaran (2014) conducted a study to explore the level of environmental literacy of the graduate students in Amasya University and their approach to environment and environmental issues. They also investigated their beliefs about the sustainable development. The study was a qualitative design and the data was analyzed through content analysis. The data were collected by interviews from 5 graduate students studying at Amasya University in 2012-2013 academic year. The results of their study revealed that, environmental knowledge of graduate students was not at a high level, but their approach to environment and environmental issues, and their interest for environmental education was found at a high level. Moreover, they found that the graduate students in Amasya University had positive awareness about sustainable development.

Lastly, in their study, Şahin, Ertepinar and Teksöz (2009) conducted a study on the implications for a green curriculum application toward sustainable development. They first aimed to determine university students' familiarity of sustainable development and they also examined university students' attitudes towards sustainable development, environmental values, and their behaviors toward

sustainable life styles. The study was a survey and the data was collected through questionnaires of 958 Middle East Technical University students during February-June of 2008. The results of the study revealed that the participants were familiar with sustainable development. Also, the participants had favorable attitudes towards sustainable development.

2.5.3. Research on Curriculum Studies for Education for Sustainable Development

Tanrıverdi (2009) analyzed primary school curriculum in Turkey regarding sustainable environmental education. The study was conducted by document analysis. As a result of the curriculum documents, it was found out that, the learning outcomes are based on knowledge and comprehension of sustainable environmental education rather than developing skills, values and perspectives of sustainability. However, they aim to improve students' awareness and to develop positive attitudes towards environment they live in. In addition, the content of the curriculum was found related to the protection of our local nature, rather than sustainable environmental education.

Also, Demirbaş (2011) analyzed the curriculum of geography course in terms of sustainable development. He investigated the objectives, learning areas, activities, skills, values and measurement and evaluation techniques of the course. The study was conducted by document analysis. As a result, it was found that the curriculum of Geography course aims to create awareness towards sustainable development.

In addition, Kaya and Tomal (2011) examined the social sciences education program in terms of sustainable development training. It was a qualitative study focused on content analysis of the social sciences education program. As a result of the analysis, it was found that although there were some learning areas related to sustainable development, some parts of the learning areas were not enough to learn about sustainable development. Also, the results revealed that sustainable development, cultural sustainability, sustainable economics, sustainable use of

natural sources, sustainable peace, sustainability of residence areas and sustainable land use were found important for sustainable development training.

2.6. Summary

This chapter reviewed the relevant literature on education for sustainable development. The results of the literature review indicated that the research conducted regarding education for sustainable development mainly focused on teacher and student perspectives, teacher competencies and curriculum analysis regarding education for sustainable development in different fields.

The results of the literature review showed that the number of studies conducted on education for sustainable development is limited. Although the number of studies conducted on teachers' perspectives regarding education for sustainable development in the world is comparatively high, the number of these studies conducted in Turkey is quite limited. Especially, there is a gap in the research area regarding teacher competencies related to education for sustainable development.

From the literature survey, one can come to the conclusion that there are both qualitative and quantitative studies conducted on education for sustainable development in Turkey and elsewhere in the world. When the studies conducted in the world were analyzed, it could be seen that they generally focused on teachers' and students' attitudes and beliefs towards education for sustainable development. These studies were generally conducted through questionnaires, semi-structured interviews, interviews and case studies. The effects of different demographic variables such as age differences, gender differences, school climate and subject matter differences were examined through the studies as well. They were generally conducted on chemistry, geography and science courses and mainly in early childhood education, upper-secondary education, as well as undergraduate and graduate teacher education institutions. The results primarily focused on the fact that teachers and students had positive attitudes towards sustainable development. Also, it was highlighted in the studies that the concept of sustainable development was new to students and teachers, and there was a necessity for training toward

sustainable development. Moreover, the focus of the perspectives was in general on environmental aspects of sustainable development. The competency studies generally offered models for the development of teacher competencies. In addition, the focus of the curriculum analyses was on geography and language education in early childhood education, higher education and technical university institutions.

When the studies conducted in Turkey were analyzed it could further be seen that they generally focused on environmental awareness, teachers' and students' attitudes and beliefs towards education for sustainable development. These studies were generally conducted through questionnaires and interviews. The effects of different demographic variables such as age differences, gender differences, training and departmental differences were examined through the studies. They were generally conducted in education faculties and department of social sciences. The results mainly focused on that the teachers and the students had positive attitudes towards sustainable development. In addition, the focus of the curriculum analyses was on geography, primary school education and social science education.

Also, as sustainable development is a quite new subject and there were a limited number of data collection tools, the tools of the studies were constructed by the researchers of their own in general. Mostly, questionnaires, online-questionnaires, and scales were used for data collection for the quantitative studies. Then, the data were analyzed through descriptive and inferential statistics. They used frequencies, correlational analysis, multiple regression, and ANOVA and MANOVA analyses. Also, the ones who developed a new scale used exploratory factor analysis. As for the qualitative studies, mostly, interviews, structured interviews and semi-structured interviews, document analysis, focused group interviews and case studies were conducted. In some of the studies reflective journals and action research were also conducted.

To sum up, this literature review effectively demonstrates that education for sustainable development is a recent concept for the world. For this reason, the number of the studies and their point of research are limited both in Turkey and the world. The studies generally focus on the analysis of the perspectives of the

teachers, students and some courses. Also, there are certain studies conducted on curriculum analysis for sustainable development. However, there is a need for the studies on teacher competencies and teacher education curricula for education for sustainable development both in Turkey and the world to analyze local and global differences.

CHAPTER III

METHOD

This part presents (1) overall design of the study, (2) research questions, (3) population and sample, (4) data collection instruments, (5) validity and reliability, (6) data collection procedure, (7) data analysis and (8) the limitations of the study.

3.1. Overall Design of the Study

This study is a mixed methods sequential explanatory design which consists of two distinct phases as quantitative followed by qualitative (Creswell, & Plano Clark, 2011). In this design, the researcher first collects and analyzes the quantitative data on “pre-service classroom teachers’ attitudes towards sustainable development, their perceptions about their competencies regarding education for sustainable development and the relationship between their attitudes and perceptions regarding education for sustainable development”. Then, the qualitative data are collected to analyze “whether the curriculum of classroom teaching provides learning opportunities to develop pre-service classroom teachers’ competencies for Education for Sustainable Development”. Finally, the data was analyzed to help elaborate on the quantitative results obtained in the first phase. The rationale for this approach is to provide a general understanding of the research problem because “the qualitative data and their analysis refine and explain statistical results by exploring participants’ views in more depth (Creswell, 2003; Rossman & Wilson, 1985; Tashakkori & Teddlie, 1998, as cited in Creswell & Plano Clak, 2011).

For the first part, as a quantitative study, a survey is used because surveys gather data with the intention of describing the nature of existing conditions especially on attitudes and preferences, beliefs and predictions or behavior and experiences (Cohen, Manion & Morrison, 2007). In this study, survey is used to examine pre-service classroom teachers’ attitudes towards sustainable development; their perceptions regarding their competencies on education for sustainable

development and the relationship between their attitudes and perceptions regarding education for sustainable development.

Population of the study included all the fourth grade / senior students enrolled in the department of classroom teaching in the state universities in Turkey. To determine the sample, six regions of Turkey according to the inter-provincial differences in terms of socio-economic development were examined. Then, the provinces that had universities with the department of classroom teaching were determined. The universities with this department from each region were selected on a basis of their experiences, accessibility and the number of students they have; and all the 4th year regular shift students constituted the sample. It was decided to reach three universities from each region as 18 universities in total, but it could be reached 12 universities with 1008 participants.

The data were collected by a data collection instrument named “A Scale on the Attitudes and Perceived Competencies of Pre-Service Classroom Teachers Regarding Education for Sustainable Development” designed by the researcher. The data collection instrument included three parts. In the first part, there were some questions related to demographic information about the participants. In the second part, it included a scale related to the attitudes of pre-service classroom teachers towards sustainable development. This scale was called as “The Scale for the Attitudes of Pre-Service Classroom Teachers towards Sustainable Development”. Finally, the third part was related to the perceived competencies of the pre-service classroom teachers named as “The Scale for the Perceived Competencies regarding Education for Sustainable Development”. The instrument was piloted and the findings of the piloting became helpful in determining validity and reliability of the instrument.

The data of the first part of the study were analyzed through descriptive and inferential statistics. Firstly, descriptive statistics was run to analyze the attitudes of pre-service classroom teachers towards sustainable development and their competencies regarding education for sustainable development. Then, the effect of the level of development of the cities they live in and their parents’ education was

analyzed through multivariate analysis of variance, MANOVA. Also, correlational analysis was conducted to see the relationship between the attitudes of pre-service classroom teachers and their perceived competencies on education for sustainable development. As a result, conclusions were drawn and the findings were discussed.

For the second part of the study, in order to find whether the curriculum of classroom teaching provide learning opportunities for Education for Sustainable Development, document analysis was conducted. Document analysis includes the analysis of the facts to be searched for or the analysis of the written documents about those facts (Yıldırım&Şimşek, 2008, p.187). The importance of the written documents is closely related to the research problems (p.188). For that reason, the researcher decided to choose the related documents about the research problem in this study.

For this study, the documents to be analyzed are the ECTS Information Package of Hacettepe University, the selected courses of the classroom teaching curriculum as “Life Studies Teaching, Social Studies Teaching , and Science and Technology Teaching I-II”, the selected course books of those courses “Hayat Bilgisi Öğretimi ve Öğretmen Klavuzu (Sönmez, 2005), Sosyal Bilgiler Öğretimi (Öztürk, 2015), Kuramdan Uygulamaya Sosyal Bilgiler Öğretimi (Kabapınar, 2014)”, Kuramdan Uygulamaya Fen ve Teknoloji Öğretimi (Çepni, 2015) and the curriculum of Life Studies, Social Studies, and Science and Technology courses developed by the Ministry of National Education (MoNE).

The documents were selected through purposeful sampling methods because these methods provide the study of the situations of wealth of information thoroughly (Yıldırım&Şimşek, 2008, p.107). Also, among these methods, intensity sampling was used as it was considered that these courses and the course books could provide intensified information about the study.

As for the analysis of the second part, first, the themes of sustainable development were identified according to the related literature in order to analyze the documents in that framework. Then, they were read closely to identify the meaningful units according to the research questions and analyzed.

3.2. Research Questions

The study included four main research questions and they have drawn the framework of the study about the attitudes of pre-service classroom teachers towards sustainable development and perceived competencies of them regarding education for sustainable development:

1. What are the pre-service classroom teachers' attitudes towards sustainable development?
 - 1.1. Are there significant differences in their attitudes towards sustainable development with respect to the level of development of the city they live in?
 - 1.2. Are there significant differences in their attitudes towards sustainable development with respect to their fathers' and mothers' education level?
2. How competent do pre-service classroom teachers perceive themselves regarding Education for Sustainable Development (ESD) with regards to the competence areas of (a) knowledge, (b) systems-thinking, (c) emotions and (d) values-ethics?
 - 2.1. Are there significant differences in their perspectives with respect to the level of development of the city they live in?
 - 2.2. Are there significant differences in their perspectives with respect to their fathers' and mothers' education level?
3. Is there any relationship between pre-service classroom teachers' attitudes towards sustainable development and their perceptions of the level of competence regarding education for sustainable development?
4. Does the curriculum of classroom teaching provide learning opportunities to develop pre-service classroom teachers' competencies regarding Education for Sustainable development?

3.3. Population and Sample

Population of the study included all the fourth grade / senior students enrolled in the department of classroom teaching in the state universities in Turkey. The reason for the selection of the fourth grade / senior university students was that they

were prospective teachers and they were expected to cover a large proportion of the curriculum in their departments. In that way, it was expected to observe the effects of curriculum on those students.

To determine the sample, first, six regions of Turkey according to the inter-provincial differences in terms of socio-economic development were examined. These six regions were determined according to “The Research of the Socio-economic Order of the Provinces and The Districts” (SEGE-2011) conducted by the Ministry of Development (The Ministry of Development, 2013). The reason for the analysis of the six regions was that sustainable development is considered as related to economic and social factors in addition to environmental factors. In that way, it was expected to analyze the effects of these factors. Then, the provinces that had universities with the department of classroom teaching were determined. The universities with this department from each region were selected on a basis of their experiences, accessibility and the number of students they have. All the 4th year regular shift students except for the “Secondary Teaching Shift” constituted the sample. Table 3.1 presents the population of the study according to the universities and their level of development. The number of the students shows the number of students accepted to the program.

Table 3.1

Population of the Study in terms of Universities and their Level of Development

1 st Level of Development	2 nd Level of Development	3 rd Level of Development	4 th Level of Development	5 th Level of Development	6 th Level of Development
İstanbul N=57	Pamukkale N=149	Balıkesir N=62	Recep Tayyip Erdoğan U N=129	Sinop N=82	Diyarbakır Dicle N=88
Marmara N=129	Abant İzzet Baysal N=113	Celal Bayar N=123	Düzce N=72	Giresun N=159	Kars Kafkas N=108
Yıldız Teknik N=47	Trakya N=108	Mersin N=62	Hacı Bektaş Veli N=41	Aksaray N=57	Harran N=47
Gazi N=118	Çanakkale 18 Mart N=123	Uşak N=62	Amasya N=103	Niğde N=108	Van Yüzüncü Yıl N=82
Hacettepe N=129	Çukurova N=113	Mehmet Akif Ersoy N=129	Dumlupınar N=62	Gaziosmanpaşa N=108	Siirt N=93
Ankara N=82	Erciyes N=72	Bülent Ecevit N=98	Fırat N=62	Atatürk N=108	İbrahim Çeçen N=129
Dokuz Eylül N=108	Sakarya N=62	Gaziantep N=62	Ahi Evran N=103	Sütçü İmam N=57	Hakkari N=31
Ege N=62	Adnan Menderes N=93	Karadeniz Teknik N=129	Kırıkkale N=98	Ordu N=41	Muş Alparslan N=93
Kocaeli N=52	Necmettin Erbakan N=129	19 Mayıs N=105	İnönü N=98	7 Aralık N=62	
Uludağ N=118			Afyon Kocatepe N=88	Bayburt N=93	
Akdeniz N=82			Çoruh N=72	Bozok N=41	
Anadolu N=103			Erzincan N=159	Adıyaman N=113	
Osmangazi N=62			Mustafa Kemal N=129		
Muğla N=98			Kastamonu N=134		
			Bartın N=47		
			Cumhuriyet N=108		

Table 3.2 presents the sample of the study. The number of the students shows the students who participated in the study.

Table 3.2

Data Collected Universities

1 st Level of Development	2 nd Level of Development	3 rd Level of Development	4 th Level of Development	5 th Level of Development	6 th Level of Development
Uludağ University N=112	Çanakkale 18 Mart University N=80	Karadeniz Teknik University N=105	Afyon Kocatepe University N=74	Gaziosmanpaşa University N=101	Kars Kafkas University N=95
Gazi University N=20	Trakya University N=96		Sivas Cumhuriyet University N=45	Atatürk University N=71	
	Pamukkale University N=72		Hatay Mustafa Kemal University N=111		

In the sample of the study, there were 12 universities and 1008 participants. As it can be seen from Table 3.3, out of 1008 participants, 699 of them were female and 309 of them were male. Regarding their age, they were divided into four groups: (a) 18 to 20 year-olds (N=9, 9%); (b) 21 to 23 year-olds (N=851, 85%); (c) 24 to 26 year-olds (N=141, 14%); and (d) 27 to 29 year-olds (N=7, 7%).

Table 3.3

Basic Characteristics of the Participants

Variables	Groups	<i>n</i>	%
Gender	Female	699	69
	Male	309	31
Age	18-20	9	9
	21-23	851	85
	24-26	141	14
	27-29	7	7
Name of university	Uludağ	112	11
	Gazi	20	2
	Çanakkale	79	8
	Karadeniz Technical	105	10
	Afyon Kocatepe	75	7
	Sivas Cumhuriyet	46	4
	Hatay Mustafa Kemal	120	12
	Trakya	108	11
	Gaziosmanpaşa	102	10
	Atatürk	72	7
	Kars Kafkas	96	10
	Pamukkale	73	7

Also, regarding their universities, 1008 participants were from 12 different universities as Uludağ University ($n=112, 11\%$), Gazi University ($n=20, 2\%$), Çanakkale University ($n=79, 8\%$), Karadeniz Technical University ($n=105, 10\%$), Afyon Kocatepe University ($n=75, 7\%$), Sivas Cumhuriyet University ($n=46, 5\%$), Hatay Mustafa Kemal University ($n=120, 12\%$), Trakya University ($n=108, 11\%$), Gaziosmanpaşa University ($n=102, 10\%$), Atatürk University ($n=72, 7\%$), Kars Kafkas University ($n=96, 10\%$), Pamukkale University ($n=73, 7\%$).

As for fathers' education (Table 3.4), there were eight groups as the illiterate ones ($n=16, 2\%$), literate ones but having no diploma ($n=31, 3\%$), the graduates of primary school ($n=405, 40\%$), the graduates of secondary school ($n=130, 13\%$), the

graduates of high school ($n=24$, 24%), the graduates of college ($n=51$, 5%), the graduates of university ($n=121$, 12%), and the ones having a master's degree ($n=13$, 1%).

Table 3.4

Education Level of Participants' Parents

Variables	Groups	<i>n</i>	%
Fathers' education	illiterate	16	2
	literate with no diploma	31	3
	primary school	405	40
	secondary school	130	13
	high school	241	24
	college	51	5
	university	121	12
	master's degree	13	1
	Mothers' education	illiterate	101
literate with no diploma		60	6
primary school		538	53
secondary school		111	11
high school		153	15
college		10	1
university		34	3
master's degree		1	0.1

In terms of their mother's education, most of the participants' mothers were the graduate of primary school ($N=538$, 53%), too. 15% of them were the graduate of high school ($N=153$), 11% of them graduated from secondary school ($N=111$). In the third group, contrary to their fathers', 6% of them were literate but having no diploma. Only 3% of them graduated from university ($N=34$). There were also 1% of college graduates ($N=10$). Only 1 of them had a master's degree.

Table 3.5

Training of the Participants

Variables	Groups	<i>n</i>	%
Training	Yes	94	9
	No	914	91

Finally, as it can be seen from the Table 3.5 that only 9% of them stated that they participated to a training about sustainable development (N=94). However, 91% of them did not take a specific or special training about the sustainable development (N=914).

3.4. Data Collection Instruments

For this study, two main data sources were used: Data collected from student teachers and data from documents. For the first data set a written self-reporting instrument consisting of three parts was used. Each part of the instrument is presented in the following paragraphs:

Part I. Demographic Information: This part included questions related to gender, age, university and department participants are studying in, the level of participants' fathers' and mothers' education, and whether they have attended a specific course/training related to sustainable development or not. Also, in the last two open ended questions, they were asked to write three key words expressing their personal opinion related to sustainability/ sustainable development and education for sustainable development.

Part II. Attitudes towards Sustainable Development: This part aimed to measure the participants' attitudes towards sustainable development in terms of environmental, socio-economic and cultural aspects. Five-point Likert Scale ranging from (1) Strongly Disagree to (5) Strongly Agree was used to reach this aim. It included 14 items.

Part III. Perceived Competencies regarding Education for Sustainable Development: This part aimed to measure the participants' perceived level of competence regarding education for sustainable development from their own point of views in the areas of knowledge, systems thinking, emotions, and values and ethics

in a five-point Likert scale ranging from (1) Strongly Disagree to (5) Strongly Agree. It included 16 items.

The data was also collected from documents. For the qualitative part of the study, as Hacettepe University is one of the prominent universities in Turkey and it has ECTS Information Package, it was considered to provide intensive information about the curriculum of classroom teaching. For that reason, the Department of Classroom Teaching in Hacettepe University was selected by this way for the documents to be analyzed to see whether the curriculum of classroom teaching provide learning opportunities to develop pre-service classroom teachers' competencies regarding Education for Sustainable Development.

Later, the course descriptions of "Science and Technology Teaching I-II", "Life Studies Teaching" and "Social Studies Teaching" courses were selected by purposeful sampling and analyzed as they were thought to cover content, objectives and activities leading to the achievement of sustainable development. The curriculum of Life Studies, Social Studies, and Science and Technology courses provided by the Ministry of National Education (MoNE) were also selected by purposeful sampling to be analyzed in parallel with them. As the curriculum of classroom teaching included the analysis of these courses, it was considered that these courses might also provide some learning opportunities for the teachers to develop their competencies regarding education for sustainable development. Lastly, the course books of those courses "Hayat Bilgisi Öğretimi ve Öğretmen Klavuzu (Sönmez, 2005), Sosyal Bilgiler Öğretimi (Öztürk, 2015), Kuramdan Uygulamaya Sosyal Bilgiler Öğretimi (Kabapınar, 2014)", Kuramdan Uygulamaya Fen ve Teknoloji Öğretimi (Çepni, 2015) were selected by the same sampling method and analyzed for the content of the courses.

3.4.1. Development of the Instrument

The data were collected by a data collection tool named "A Scale for the Attitudes and Perceived Competencies of Pre-Service Classroom Teachers Regarding Education for Sustainable Development" which was developed by the researcher. It included three parts. In the first part, there were some questions related

to demographic information. In the second part, it included a scale related to the attitudes of teachers towards sustainable development. This scale was called as “The Attitudes towards Sustainable Development”. Finally, the third part was composed of a scale about the perceived competencies of teachers regarding education for sustainable development, named as “Perceived Competencies on Education for Sustainable Development”.

For the construction of the instrument, the following steps were taken: First, the literature on sustainability and education for sustainable development was reviewed. For the demographic questions, “The Research of the Socio-economic Order of the Provinces and The Districts” (SEGE- 2011) was reviewed (The Ministry of Development, 2013). The reason for the analysis of this particular research was that sustainable development was considered as related to economic and social factors in addition to environmental factors. As a result, 8 questions were asked including their gender, age, university and department, the level of their fathers’ and mothers’ education and whether they have attended a course/training related to sustainable development or not. In addition, two open ended questions were asked about three key words expressing their personal opinion related to sustainability/sustainable development and education for sustainable development.

For the second part of the instrument, a scale named “Attitudes towards Sustainable Development” was constructed. To this end, first, the literature on sustainability and education for sustainable development was reviewed (UNESCO, 2013; Mastrandrea & Santini, 2012). Also, main themes from the goals of sustainable development were studied to determine the attitude statements to be included in the scale (United Nations, 2015). In addition, some questionnaires about the attitudes towards sustainable development were analyzed and some items were adapted from the items in Kagawa’s (2007) study on dissonance on students’ perceptions of sustainable development and sustainability. As a result, a pool of 29 items was prepared for the attitudes of the teachers.

Later, the instrument was sent to seven experts from different fields of study such as curriculum and instruction, secondary science and mathematics education,

computer education, classroom teaching, preschool teaching, and measurement & evaluation, and statistics. They were asked to express their opinion in terms of the instrument's being suitable for the purpose of the study, its clarity and content, easiness to answer, length, and its scaling.

As a result, some of the items were rewritten, some of them were combined and some of them were eliminated. Some experts said that some of the items were not clear in terms of their being an attitude or behavior. For that reason, the items that look like behaviors were deleted. Also, some of the items were closely related to each other and there were slight differences between them. For that reason, it would mean the same thing for the participants. Therefore, one of these items was eliminated and the other one was rewritten. Also, the item that was related to global warming was eliminated because it was found directly related to environmental problems and it would be difficult for some participants to relate it to sustainable development if they do not have any information beforehand. According to the opinions of the experts, the scale included 21 items. Lastly, as a result of the opinions of an expert in statistics who is one of the instructors of Department of Educational Sciences at Middle East Technical University, the items of the scale were dropped from 21 to 14. It was decided that as it was difficult to draw lines among the dimensions of sustainability according to literature, it would be better to include a small number of items in this scale. The dimensions of sustainable development are integrated to each other. For that reason, if there is small number of items and they are clearly stated, it will be easier for the participants to focus on the topic.

In addition, in the third part of the instrument, for the construction of the second scale named "Perceived Competencies on Education for Sustainable Development" the literature on education for sustainable development and teacher competencies were reviewed. In the literature, especially, the "Dynamic model for ESD competences in teacher education" by the CSCT project (UNECE, 2008) was analyzed for the determination of the competencies. The model was prepared for teacher training (Figure 1). It presented two triangles as "the Blue Triangle" and "the Red Triangle". The Blue Triangle represented professional dimensions of the

teachers and the Red Triangle represented the overall skills for education for sustainable development. In these skills, five domains of competencies were also presented as knowledge, systems thinking, emotions, ethics and values and action. Then, below each domain, the competencies that teachers should have for education for sustainable development were listed. For the scale, four domains of competencies were selected. The domain of action was decided not to be included in the scale, because all the other four competencies include its own action domain. Then, some of the competencies of each domain were selected and translated into Turkish. As a result; a pool of 29 items was constructed.

This scale was also sent to seven experts from different fields of study; curriculum and instruction, secondary science and mathematics education, computer education, classroom teaching, preschool teaching and statistics. They were asked to express their opinion in terms of the questionnaire's being suitable for the purpose of the study, its clarity and content, easiness to answer, length, and its scale.

According to the opinions of the experts, the items that look like an attitude but not like a competence were deleted. Some items were combined as they meant almost the same thing. Some of the items were found vague in terms of the domains. For instance, the item "I can use ways and methods to express my emotions and feelings alone for improving situations in the school and community" looked like including both the emotions and the systems thinking competencies. One of the items that were "I am aware of societal tensions including conflicting interests and also the positive trends in the society related to SD, education, so that they can anticipate changes and the consequences of action" was omitted as it was thought to be difficult to understand. As a result, 16 of the items were chosen for the scale of teacher competencies.

Finally, it was decided to conduct the pilot study to make the dimensions clearer. The study was conducted to 90 students of fourth grade in the classroom teaching department at Marmara University. First, exploratory factor analysis was conducted to determine the dimensions of the surveys and later internal consistency was estimated for ensuring reliability.

In the end, the instrument was submitted to Middle East Technical University (METU) Human Subject Ethics Committee for the approval. After the examination of the committee, it was concluded that the instrument did not include any ethical violation and it was approved to be used for data collection purposes. Afterwards the instrument was submitted to the universities and their permission was taken to administer the instrument to the fourth grade / senior classroom teaching students in 18 universities in Turkey.

3.4.2. The Results of the Pilot Study

To determine the underlying dimensions of the instrument, factor analysis was run with data collected from 90 fourth grade / senior students of classroom teaching department at Marmara University. The factor analysis was run separately for each scales, shortly; attitudes and competencies. The first exploratory factor analysis was run for the “Attitudes towards Sustainable Development Scale” with 14 items and the second one was run for the “Perceived Competencies on Education for Sustainable Development Scale” with 16 items.

As for the “Attitudes towards Sustainable Development Scale”, first, assumptions for normality and linearity were checked. In order to satisfy the normality assumption test, Skewness and Kurtosis test, Kolmogorov-Smirnov test, Q-Q plots, histograms, scattered plots and box plots were run. The results of Kolmogorov-Smirnov test indicated that normality cannot be assumed ($p < .05$). However, normality was assumed for Kurtosis and Skewness since all of the items were within the limits of ± 3 around the ideal value “0” (Tabachnick & Fidell, 2001) (Appendix C). Also, linearity was checked to determine whether the variables were linearly related. They frequently displayed normal distributions. As for the outliers, scattered plots and box plots were checked. As a result, five of the outliers were omitted. As for the sampling adequacy, Kaiser Meyer Olkin (KMO) analyses were conducted. The values of .60 and above are required for good sampling adequacy (Tabachnick & Fidell, 2001). For this scale, sampling size was appropriate as $KMO = .758$. In addition, to check whether there are correlations among the items or not, Bartlett test of Sphericity was used. It was found significant .000 ($p < .05$)

meaning that there were no correlations (Field, 2005). For making preliminary judgments about the factorial structure, correlation matrix tables were also examined. There were no problematic items according to Tabachnick and Fidell (2001), but some of the correlation values were lower than .30. These items were carefully analyzed in terms of factor loadings.

Then, factor analysis was run. In this study, Common Factor Analysis was used because “the aim of factor analysis is to reveal any latent variables that cause the manifest variables to covary” (Costello and Osbourne, 2005). Principle axis factor extraction method and oblimin rotation was used.

Table 3.6

Eigenvalue, Percentages of Variance and Cumulative Percentages for Factors of Teachers’ Attitudes for the Pilot Study

Factor	Eigenvalues	% of Variance	Cumulative %
1	4.68	30.04	30.04
2	2.04	10.89	40.94
3	1.10	4.10	45.04

To determine the factor structure of the attitude scale, the eigenvalue results, scree plot and pattern matrix table were examined. It was obvious that there were three factors which had eigenvalues greater than 1.00. The eigenvalues of the factors were presented in Table 3.6. After the rotation, these three factors accounted for 30.04%, 10.89% and 4.10% of the total variance respectively; a total of 45.04 % of the total variance. Scree plot also indicated three factors (Appendix C).

As it can be recognized in Table 3.7, the items were loaded in three factors. There are eight items (1,3,4,5,6,11,13,14) loaded on factor 1, three items (7,8,12) loaded on factor 2 and two items (9, 10) loaded on factor 3. Item 2 was not loaded on any factors, but it was kept in the scale to repeat the analysis with the actual study data.

Table 3.7

Factor Loadings for Teachers' Attitudes for the Pilot Study

Item number	Factor Loadings		
	Factor 1	Factor 2	Factor 3
Item 4	.836		
Item 11	.787		
Item 5	.730		
Item 1	.728		
Item 6	.694		
Item 3	.640		
Item13	.496		
Item14	.403		
Item 8		.854	
Item 7		.589	
Item 12		.472	
Item 10			.781
Item 9			.481

Examination of the items that loaded with these three factors indicated that factor 1 consisted of the items that reflected the pre-service classroom teachers' attitudes toward environmental aspects of sustainable development; factor 2 consisted of the items that reflected their attitudes towards socio-economic aspects; and factor 3 comprised of the ones that reflected cultural aspects of sustainable development. Therefore, factor 1 was labeled as "environmental", factor 2 was labeled as "socio-economic", and factor 3 was labeled as "cultural".

Table 3.8

Reliability Analysis of the Teachers' Attitudes for the Pilot Study

	Cronbach's Alpha	Number of Items
Environmental	.715	8
Socio-economic	.648	3
Cultural	.645	2

In terms of reliability; internal consistency was examined through Cronbach's Alpha for each of the three factors (Table 3.8). The reliability test for the first factor "environmental" is .72, for the second factor "socio-economic" is .65 and for the third factor "cultural" is .65. Therefore, all the items for these factors are found related and it was decided to keep them in the scale.

Then, for the scale "Perceived Competencies regarding Education for Sustainable Development", the assumptions of normality and linearity were checked. In order to satisfy the normality and linearity assumption tests; Skewness and Kurtosis test, Kolmogorov-Smirnov test, Q-Q plots, histograms, scattered plots and box plots were run. The results of Kolmogorov-Smirnov test indicated that normality cannot be assumed ($p < .05$). However, normality was assumed for Kurtosis and Skewness since all of the items are within the limits of ± 3 around the ideal value "0" (Tabachnick & Fidell, 2001) (Appendix C). Also, linearity was checked to determine whether the variables are linearly related. They frequently displayed normal distributions. As for the outliers, scattered plots and box plots were checked. There were not any serious outliers. As for the sampling adequacy, Kaiser Meyer Olkin (KMO) analyses were conducted. The values of .60 and above are required for good sampling adequacy (Tabachnick & Fidell, 2001). In this scale, sampling size was appropriate as $KMO = .808$. In addition, Bartlett test of Sphericity was also significant .000 ($p < .05$) (Field, 2005). For making preliminary judgments about the factorial structure, correlation matrix tables were also examined. There were no problematic items according to Tabachnick and Fidell (2001), but a few of the correlation values were lower than .30. These items were carefully analyzed in terms of factor loadings. For this scale Common Factor Analysis and principle axis factor extraction method was used. Also, oblimin rotation was used while determining the factors.

Table 3.9

Eigenvalue, Percentages of Variance and Cumulative Percentages for Factors of Teachers' Perceived Competencies for the Pilot Study

Factor	Eigenvalues	% of Variance	Cumulative %
1	5.98	35.15	35.15
2	2.79	15.37	50.52
3	1.34	6.07	56.59
4	1.06	4.29	60.88

To explore the factor structure of “Perceived Competencies on Education for Sustainable Development Scale”, eigenvalue results, scree plot and pattern matrix table were examined. There were four factors which had eigenvalues greater than 1.00 (Table 3.9). After the rotation, these four factors accounted for 35.15%, 15.37%, 6.07 % and 4.29% of the total variance respectively; a total of 60.88% variance. Scree plot also indicated four factors (Appendix C).

Table 3.10

Factor Loadings for the Pilot Study

Item number	Factor Loadings			
	Factor 1	Factor 2	Factor 3	Factor 4
Item8	.777			
Item9	.723			
Item10	.526			
Item7	.451			
Item 6	.434			
Item 5	.391			
Item 3		.838		
Item 1		.825		
Item 4		.825		
Item 2		.818		
Item 16			.895	
Item 14			.758	
Item 15			.653	
Item 13			.616	
Item 12				.744
Item 11				.728

From these four factors, factor 1 (8, 9, 10, 7, 6, 5) consisted of the items that reflected teachers perspectives in the competence area of values; factor 2 (1, 2, 3, 4) consisted of the items that reflected their perspectives in the competence area of knowledge; factor 3 (16, 14, 15, 13) comprised of the ones that indicated teachers' perspectives in the competence area of emotions; and factor 4 (11, 12) consisted of the items that indicated teachers' perspectives in the competence area of systems thinking (Table 3.10). Therefore; factor 1 was labeled as “values”, factor 2 was labeled as “knowledge”, factor 3 was labeled as “emotions”, and factor 4 was labeled as “systems thinking”. The item 9 and item 10 which were related to systems thinking according to the literature were loaded on the values.

Table 3.11

Reliability Analysis of Teachers' Perceived Competencies for the Pilot Study

	Cronbach's Alpha	Number of Items
Values	.773	6
Knowledge	.908	4
Emotions	.849	4
Systems thinking	.852	2

In terms of reliability, internal consistency was examined through Cronbach's Alpha for each three factors (Table 3.11). Cronbach's Alpha value for the first factor “emotions” is .85, for the second factor “knowledge” is .91, for the third factor “values” is .77, and for the fourth factor “systems thinking” is .85.

3.5. Validity, Reliability and Trustworthiness

As validity is described broadly as “the appropriateness, correctness, meaningfulness, and usefulness of the specific inferences researchers make based on the data they collect”, in this study, in order to ensure validity of the quantitative part, different measures have been used (Fraenkel & Wallen, 2008, p. 148) . For the content validity that is related to the validity of the questions to the research subject,

opinions of the experts were taken about the content, clarity and appropriateness of the questions of the data collection instrument with the research subject. In addition, for the construct validity that is related to the nature of the psychological construct or characteristics being measured by the instrument (Fraenkel & Wallen, 2008), factor analysis were conducted and assumptions were checked to strengthen the validity of the instrument. Reliability of the instrument was ensured by reliability analyses of Cronbach's alpha level for each dimension in the instrument (Table 3.8 and Table 3.11).

On the other hand, Lincoln and Guba (1985) replace the terms reliability and validity with trustworthiness for qualitative research. It includes the constructs of credibility, transferability, dependability and conformability. For that reason, to ensure the credibility of the qualitative part of the study, triangulation is used. Triangulation is defined as "the act of bringing more than one source of data to bear on a single point" by Marshall and Rossman (2006, p.202). In this study, data is collected from different sources namely selected courses from classroom teaching curriculum, selected course books used in classroom teaching curriculum and the curricula of selected courses determined by MoNE. Also, credibility is achieved by thick descriptions of data. Throughout the study, thick descriptions of data are provided for each data source. For transferability of the study, the steps of the research process are given in detail and purposeful sampling is chosen. For dependability, the details of the research design are provided and it is examined by a peer researcher who is an expert in classroom teaching curriculum. Lastly, to ensure conformability, triangulation of data sources is used to reduce the effect of researcher bias. Also, by the help of the feedback given by the supervisor of the researcher and a peer researcher, conformability is promoted.

3.6. Data Collection Procedure

After the approval of the data collection tool by METU Human Subjects Ethics Committee, a permission letter to administer the questionnaire was sent to each university. Then, although it took two or three weeks to get the official permission from some of the universities, it almost took two months to get the official

permission from all of them. After getting the permission, the departments of classroom teaching of the universities were called and they were informed about the study and the administering of the questionnaire. Then, as it was through the end of the second semester, the data were required to be collected in two months time during April and May, 2015. For that reason, the data were collected by the instructors of those universities. To this end, first, the instructors were called and informed about the study, the instrument and how it could be implemented. Then, the instrument was copied and sent to the instructors. An administration guide was also sent to those instructors for the purpose of collecting more appropriate data. In total, 1394 instruments sent to the universities according to the number of students accepted to the departments and 1029 instrument were sent back. The return rate was %74. Among the completed instruments, 1008 of them were used for the analysis as the others were not completed appropriately.

For the qualitative part of the study, firstly, Hacettepe University ECTS Information Package for the 2014-2015 academic year was analyzed for the curriculum of classroom teaching. The goals and aims of the curriculum and the content of the courses were analyzed for education for sustainable development. Later, the data for the course descriptions of “Science and Technology Teaching I-II”, “Life Studies Teaching” and “Social Studies Teaching” courses were collected from the ECTS Information Package. The course books of the courses were chosen from these course descriptions. Then, the data for the curriculum of Life Studies, Social Studies, and Science and Technology courses of the Turkish Ministry of National Education (MoNE) were collected from online sources. As the curriculum of classroom teaching included the analysis of these courses, it was considered that these courses might also provide some learning opportunities for the teachers to develop their competencies regarding education for sustainable development.

3.7. Data Analysis

The data of the study were analyzed by means of Statistical Package for Social Sciences (SPSS) version 18.0 software. The data in Demographic Information

Part was analyzed with descriptive statistics including means, standard deviations, frequencies and percentages.

The next part of the study on the pre-service classroom teachers' attitudes towards sustainable development was analyzed by the help of descriptive statistics to indicate the frequency tables, means and standard deviations. Also, to decide on the differences in pre-service classroom teachers' attitudes towards sustainable development regarding the independent variables such as the level of the development of the cities they live in and their parents' level of education, multivariate analysis of variance (MANOVA) was conducted. MANOVA emphasizes the statistical significance of differences among groups when there are several dependent variables (Tabachnick & Fidell, 2001). In this study, dependent variables were pre-service classroom teachers' attitudes towards sustainable development and the independent variables were education level of their parents and the level of development of the cities they live.

Furthermore, pre-service classroom teachers' perceptions regarding their competencies for sustainable development were analyzed through descriptive statistics. To decide on the differences in pre-service classroom teachers' perspectives among competence areas of knowledge, systems-thinking, emotions, values and ethics according to the levels of independent variables, multivariate analysis of variance (MANOVA) was applied. In this part, dependent variables were pre-service classroom teachers' perspectives in competence areas of knowledge, systems-thinking, emotions, values and ethics; and the independent variables were education level of their parents and the level of development of the cities they live in.

Moreover, in order to examine the relationship between the pre-service classroom teachers' attitudes towards sustainable development and their perceptions of the level of competence on education for sustainable development, correlational analysis was conducted. Pearson correlation coefficients were conducted and in order to control Type I error among the correlations, the alpha value was set as .01.

In order to find whether the curriculum of Classroom Teaching provides learning opportunities for Education for Sustainable Development, document

analysis was conducted. For the analysis, first, pre-determined categories regarding education for sustainable development and teacher competencies for ESD according to the literature were examined. Next, the themes of education for sustainable development were identified according to the related literature. Later, the content, words and sentences in documents were analyzed accordingly. Then, they were read closely to identify the meaningful units according to the research questions and interpreted.

The last two open ended questions were not analyzed as there were not enough responses from the pre-service teachers.

3.8. Limitations

The study was limited to the attitudes and perceived competencies of pre-service classroom teachers in 12 state universities in Turkey. The data was collected in 2014-2015 academic year spring term. As the data collection process started in the beginning of the second term, it took almost two months time to get the permissions from all the universities one by one. Therefore, it became really difficult to reach all the universities in different regions of Turkey in one or two months time before the term finished.

The study was also limited to the perspectives of pre-service classroom teachers to evaluate their own competencies about education for sustainable development. In this evaluation, social desirability might be a limitation. Pre-service teachers' competencies in terms of their actions were not observed. It was limited to their reported competencies of knowledge, emotions, systems thinking, and values and ethics.

CHAPTER IV

RESULTS

The present chapter includes the results of the study. The results are given under the following headings: (1) psychometric characteristics of the instrument, (2) summary of characteristics of the participants, (3) pre-service classroom teachers' attitudes towards sustainable development, (4) pre-service classroom teachers' attitudes towards sustainable development in relation to level of development and parent education, (5) pre-service classroom teachers' perceived level of competency on education for sustainable development, (6) pre-service classroom teachers' perceived level of competency in relation to level of development and parent education (7) the relationship of pre-service classroom teachers' attitudes towards sustainable development and their perceptions of competence on education for sustainable development, (8) learning opportunities to develop pre-service classroom teachers' competencies for education for sustainable development, and (9) summary of the results.

4.1. Psychometric Characteristics of the Instrument

For the data collection instrument, pilot study was conducted with 90 participants. In order to resolve the concerns about the number of the participants and concerns related to items' loading to factors for attitude and competency scales, the factor analysis was repeated with the actual study data, collected from 1008 pre-service classroom teachers. Although KMO results were a bit above .60 (Tabachnick & Fidell, 2001), it was expected to get higher results with the second factor analysis. Also, some correlations of the items in two scales were lower than .30 (Tabachnick & Fidell, 2001). In the second factor analysis, they were expected to be higher.

In order to recognize the underlying dimensions of two scales; attitudes and competencies, factor analyses were run again. Before running the factor analysis, the related assumptions of it were checked. In order to satisfy the normality and linearity

of assumption tests Skewness and Kurtosis test, Kolmogorov-Smirnov test, Q-Q plots, histograms, scattered plots and box plots were run. Normality was assumed for Kurtosis and Skewness since all of the items are within the limits of +/- 3 around the ideal value "0" for the two scales (Tabachnick & Fidell, 2001). The results of Kolmogorov-Smirnov test indicated that normality cannot be assumed ($p < .05$); however, according to Field (2005), as large samples will give rise to small standard errors, by larger sample sizes, significant values result from small deviations from normality. For this reason, as the sample size is quite large ($N=1008$), Q-Q plots, and histograms were analyzed. Also, linearity was checked to determine whether the variables are linearly related. They frequently displayed normal distributions. As for the outliers, Competencies on Education for Sustainable Development Scale" were excluded.

Then, factor analysis was conducted. Two factor analyses were conducted for this study. The first factor analysis was run for the "Attitudes towards Sustainable Development" and the second one was conducted for the "Perceived Competencies on Education for Sustainable Development".

First, for the "Attitudes towards Sustainable Development" in order to measure the sampling adequacy, Kaiser Meyer Olkin (KMO) analyses were conducted. The values of .60 and above are required for good sampling adequacy (Tabachnick & Fidell, 2001). In this study, sampling size is appropriate as $KMO=.86$. As it was expected, it was higher than in the first factor analysis ($KMO=.76$) of the pilot study. In addition, Bartlett test of Sphericity was also significant .000 ($p < .05$) (Field, 2005).

For making preliminary judgments about the factorial structure, correlation matrix table was examined. There were no problematic items according to Tabachnick and Fidell (2001), but there were fewer number of correlation values were lower than .30 when it was compared with the pilot study. For the scales, Common Factor Analysis, principle axis factor extraction method and oblimin rotation was used.

Table 4.1

Eigenvalue, Percentages of Variance and Cumulative Percentages for Factors of Teachers' Attitudes

Factor	Eigenvalues	% of Variance	Cumulative %
1	4.497	30.82	30.82
2	1.963	10.84	41.66
3	1.021	3.53	45.19

There were three factors which had eigenvalues greater than 1.00. The eigenvalues of the factors were presented in Table 4.1. As it can be seen in the table, these three factors accounted for 30.82, 10.84 and 3.53% of the total variance respectively, a total of 45.19%. When it was compared with the pilot study, there was a slight increase in explanation of total variance (45.04 %) in this analysis.

Table 4.2

Factor Loadings for Teachers' Attitudes

Item number	Factor Loadings		
	Factor 1	Factor 2	Factor 3
Item3	.74		
Item1	.67		
Item4	.58		
Item2	.51		
Item 6	.36		.34
Item 8		.70	
Item 7		.68	
Item 12		.35	
Item 14		.34	
Item 10			.76
Item 9			.67
Item 11			.57
Item 5			.42

As it can be recognized in Table 4.2, the items were loaded in three factors as it was in the pilot study. There were four items (1, 2, 3, 4) loaded on factor 1; four items (7, 8, 12, 14) loaded on factor 2; and five items (5, 6, 9, 10, 11) loaded on factor 3. Although item 6 was loaded on both factor 1 and 3, it was categorized in factor 3 according to the literature on sustainability. Item 13 was not loaded on any factors. When the results were compared with the first factor analysis, it was seen that some items related to factor 1 (5, 6, 11) were loaded on factor 3, and one item (14) was loaded on factor 2.

Examination of the items that loaded with these three factors indicated that factor 1 consisted of the items that reflected the pre-service classroom teachers' attitudes toward environmental aspects of sustainable development, factor 2 consisted of the items that reflected their attitudes towards socio-economic aspects and factor 3 comprised of the ones that reflected cultural aspects of sustainable development. Therefore, factor 1 was labeled as "environmental", factor 2 was labeled as "socio-economic", and factor 3 was labeled as "cultural" as they were the same in the pilot study.

Table 4.3

Reliability Analysis of Teacher Attitudes

	Cronbach's Alpha	Number of Items
Environmental	.759	5
Socio-economic	.614	4
Cultural	.763	4

In terms of reliability, internal consistency was examined through Cronbach's Alpha level for each three factors (Table 4.3). Cronbach's Alpha level for the first factor "environmental" is .76, for the second factor "socio-economic" is .61, and for the third factor "cultural" is .76. When the results were compared with the results of the pilot study, it was seen that Cronbach's Alpha level for the first factor (.72) and

the third factor (.65) were lower in the pilot study, but as for the second factor (.65), it was higher.

The second factor analysis was conducted for the Perceived Competencies on Education for Sustainable Development scale. As a result of the analysis, sampling size was found appropriate as KMO=. 92 and Bartlett test of Sphericity was found significant .000 ($p<.05$). As it was expected, KMO value were lower (.81) in the pilot study.

For making preliminary judgments about the factorial structure, correlation matrix table was examined. There were no problematic items according to Tabachnick and Fidell (2001), but there were fewer number of correlation values lower than .30 compared with the pilot study.

To determine the factorial structure; factor analysis was run again by fixing the number of the factors as four according to the results of the pilot study and the literature (Table 4.4). As “Jolliffe (1972, 1986) reports that Kaiser’s criterion is too strict and suggests the third option of retaining all factors with eigenvalues more than 0.7”, it was decided to retain these four factors although the eigenvalue of the fourth factor was below 1.00 (as cited in Field, 2009, p. 641).

Table 4.4

Eigenvalue, Percentages of Variance and Cumulative Percentages for Factors of Teachers’ Perceived Competencies

Factor	Eigenvalues	% of Variance	Cumulative %
1	6.66	39.04	39.04
2	2.35	12.49	51.53
3	1.04	3.26	54.79
4	.865	2.79	57.58

After the rotation, these four factors accounted for 39.04%, 12.49%, 3.26% and 2.79% of the total variance respectively, for a total of 57.58% of the total

variance. When the results were compared with the pilot study, it was seen that four factors accounted for slightly higher level of total variance (60.87%) in the pilot study.

Table 4.5

Factor Loadings for Teachers' Perceived Competencies

Item number	Factor Loadings			
	Factor 1	Factor 2	Factor 3	Factor 4
Item15	.837			
Item14	.796			
Item16	.743			
Item13	.551			
Item 2		.871		
Item 1		.821		
Item 3		.802		
Item 4		.770		
Item 6			.745	
Item 7			.501	
Item 5			.457	
Item 8			.375	
Item 11				.765
Item 12				.611
Item 10				.581
Item 9				.456

As a result, from these four factors, factor 1 (13, 14, 15, 16) consisted of the items that reflected their perspectives in the competence area of emotions, factor 2 (1, 2, 3, 4) consisted of the items that reflected their perspectives in the competence area of knowledge, factor 3 (5, 6, 7, 8) comprised of the ones that indicated teachers'

perspectives in the competence area of values, and factor 4 (9, 10, 11, 12)consisted of the items that indicated teachers’ perspectives in the competence area of systems thinking (Table 4.5). Therefore; factor 1 was labeled as “emotions”, factor 2 was labeled as “knowledge”, factor 3, as “values”, and factor 4 was labeled as “systems thinking” as they were in the pilot study. Two of the items related to systems thinking (9, 10) which were loaded on the values in the pilot study were loaded on the factor that the literature indicated.

Table 4.6

Reliability Analysis of Competencies Scale

	Cronbach’s Alpha	Number of Items
Emotions	.850	4
Knowledge	.895	4
Values	.730	4
Systems thinking	.803	4

In terms of reliability, internal consistency was examined through Cronbach’s Alpha level for each three factors (Table 4.6). The reliability test for the first factor “emotions” is .85, for the second factor “knowledge” is .89, for the third factor “values” is .73, and for the third factor “systems thinking” is .80. When the results were compared with the results of the pilot study, it was seen that the first factor of emotions had the same value (.85); but there were slight decrease in Cronbach’s Alpha levels of the factors of knowledge (.91), values (.77), and systems thinking (.85).

4.2. Summary of Characteristics of the Participants

In order to investigate the characteristics of the participants in terms of gender, age, university, father education, mother education and training descriptive statistics was used. The characteristics of the participants were already presented in Method Part (Chapter 3) and summarized in this section shortly to remind.

As for the gender (Table 4.7), out of 1008 participants, 699 were female and 309 were male. In terms of their age, they were divided into four groups: (a) 18 to 20 year-olds ($n=9$, 9%); (b) 21 to 23 year-olds ($n=851$, 84.4%); (c) 24 to 26 year-olds ($n=141$, 14%); and (d) 27 to 29 year-olds ($n=7$, 7%).

Table 4.7

Characteristics of the Participants

Variables	Groups	<i>n</i>	%
fathers' education	illiterate	16	1.6
	literate with no diploma	31	3.1
	primary school	405	40.2
	secondary school	130	12.9
	high school	241	23.9
	college	51	5.1
	university	121	12
	master's degree	13	1.3
mothers' education	illiterate	101	10
	literate with no diploma	60	6
	primary school	538	53.4
	secondary school	111	11
	high school	153	15.2
	college	10	1
	university	34	3.4
	master's degree	1	0.1
training	Yes	94	9.3
	No	914	90.7

Also, regarding their universities, 1008 participants were from 12 different universities as Uludağ University ($n=112$, 11%), Gazi University ($n=20$, 2%), Çanakkale University ($n=79$, 7.8%), Karadeniz Technical University ($n=105$, 10.4%), Afyon Kocatepe University ($n=75$, 7.4%), Sivas Cumhuriyet University ($n=46$, 4.6%), Hatay Mustafa Kemal University ($n=120$, 11.9%), Trakya University

($n=108$, 10.7%), Gaziosmanpaşa University ($n=102$, 10.1%), Atatürk University ($n=72$, 7.1%), Kars Kafkas University ($n=96$, 9.5%), Pamukkale University ($n=73$, 7.2%).

As for the fathers' education (Table 4.7), there were eight groups as the illiterate ones ($n=16$, 1.6%), literate ones but having no diploma ($n=31$, 3.1%), the graduates of primary school ($n=405$, 40.2%), the graduates of secondary school ($n=130$, 12.9%), the graduates of high school ($n=24$, 23.9%), the graduates of college ($n=51$, 5.1%), the graduates of university ($n=121$, 12%), and the ones having a master's degree ($n=13$, 1.3%).

In terms of their mothers' education, (Table 4.7), there were also eight groups as the illiterate ones ($n=101$, 10%), literate ones but having no diploma ($n=60$, 6%), the graduates of primary school ($n=538$, 53.4%), the graduates of secondary school ($n=111$, 11%), the graduates of high school ($n=153$, 15.2%), the graduates of college ($n=10$, 1%), the graduates of university ($n=34$, 3.4%), and the ones having a master's degree ($n=1$, 0.1%).

Finally, about the training they got about education for sustainable development, only 9.3% of the participants stated that they participated to a training about sustainable development ($n=94$). However, 90.7% of them did not have any training about the sustainable development ($n=914$).

4.3. Pre-Service Classroom Teachers' Attitudes towards Sustainable Development

This section provides the result of the first research question which examined the pre-service classroom teachers' attitudes towards sustainable development. The second part of the data collection instrument was designed for that purpose. After the factor analysis, dimensions of their attitudes were defined as "environmental", "socio-economic" and "cultural". Therefore, results related to their attitudes were presented based on these three factors. The results were presented as means and standard deviations (Table 4.8).

Table 4.8

Mean and Standard Deviations of the Attitudes of Teachers

Attitudes	<i>M</i>	<i>Sd</i>
Environmental	4.13	.71
Socio-economic	3.44	.74
Cultural	4.12	.69

The overall results indicated that pre-service classroom teachers' attitudes towards sustainable development were positive ($M = 3.91$, $SD = .52$, $n = 987$) as they were asked to rate their attitudes on a five point scale ranging from Strongly Agree (5) to Strongly Disagree (1). Furthermore, when the three dimensions were examined, the findings indicated that teachers' attitudes towards "environmental" ($M = 4.13$, $SD = .70.9$, $n = 98$) and towards "cultural" ($M = 4.12$, $SD = .68$, $n = 987$) factors were rated as agree. However, their attitudes towards "socio-economic" factor of sustainable development ($M = 3.44$, $SD = .73$, $n = 987$) indicated that pre-service classroom teachers rated socio-economic factor less positive than the environmental and cultural ones.

4.3.1. Pre-Service Classroom Teachers' Attitudes towards Sustainable Development regarding Environmental Factors

When pre-service classroom teachers' attitudes towards sustainable development were analyzed in terms of environmental factor (Table 4.9), it was seen that overall, their attitudes were positive ($M=4.13$). Most of the participants agree that the products suitable for recycling should be used in all the places possible (item 4) ($M=4.38$). %42.4 of the participants strongly agrees, % 38.3 of them agrees and % 14.4 of them neither agrees nor disagrees with recycling. Only %3.9 of them disagrees and %1.1 of them strongly disagrees with the use of the products suitable for recycling used in all the places possible.

Table 4.9

Environmental Factors of Sustainable Development

Items	%					<i>M</i>	<i>Sd</i>	<i>n</i>
	<i>SD</i>	<i>D</i>	<i>NA/ND</i>	<i>A</i>	<i>SA</i>			
4. The products suitable for recycling should be used in all the places possible.	1.1	3.9	14.4	38.3	42.4	4.38	.86	987
3. Alternative energy should be used to protect the environment.	1.3	3.4	13.5	33.5	48.2	4.24	.90	987
1. There is a need for sustainability for the protection of the environment.	2.2	1.7	14.5	38.7	42.9	4.18	.90	987
2. Less energy as possible should be consumed for the sustainable development.	3.3	10.2	21.8	39.8	24.8	3.73	1.1	987

SD=Strongly Disagree; D=Disagree; NA/ND= Neither agree nor disagree; A=Agree; SA=Strongly Agree

Moreover, many participants agree that alternative energy should be used to protect the environment (item 3) ($M=4.24$). Indeed, almost half of the participants strongly agrees (%48.2) and %33.5 of them agrees with the use of alternative energy. Only %3.4 of them disagrees and %1.3 of them strongly disagrees about the use of alternative energy. On the other hand, %13.5 of the participants stated their views as neither agree nor disagree with the use of alternative energy.

In addition, most of the participants agree that there is a need for sustainability for the protection of the environment (item 1) ($M=4.18$). %42.9 of them strongly agrees and %38.7 of them agrees with the need of sustainability. Only %1.7 of them disagrees and % 2.2 of them strongly disagrees with the need of sustainability for the protection of the environment. However, %14.5 of them is neither agrees nor disagrees about the need of sustainability.

When it is compared with the other items related to environmental factors of sustainable development, as for the use of energy, less participants think that less energy as possible should be consumed for the sustainable development (item 2) ($M=3.74$). While %24.8 of them strongly agrees and % 39.8 of them agrees less use

of energy for sustainability; %10.2 of them disagrees and % 3.3 of them strongly disagrees with the use of less energy for the sustainable development. However, %21.8 of them neither agrees nor disagrees with the use of less energy for the sustainable development.

4.3.2. Pre-Service Classroom Teachers' Attitudes towards Sustainable Development regarding Cultural Factors

When the attitudes towards sustainable development were analyzed in terms of cultural factors in detail (Table 4.10), it was seen that most of the participants agree about the economic support of sustainable development (item 11) ($M= 4.19$). % 42.6 of the participants strongly agrees, % 38.3 of them agrees and %14.8 of them neither agrees nor disagrees with this economic support. Only % 4 of them disagrees and % 0.4 of them strongly disagrees with sustainable development's supports on economic development.

Table 4.10

Cultural Factors of Sustainable Development

Items	%					M	Sd	n
	SD	D	NA/ND	A	SA			
11. Sustainable development supports economic development.	.4	4	14.8	38.3	42.6	4.19	.86	987
6. Sustainable development supports social development.	1.1	3.9	14.4	38.3	42.4	4.17	.89	987
10. People from different cultures should be able to live together.	1.2	3.3	14.4	39.4	41.6	4.17	.88	987
9. Cultural diversity in a society should be supported.	1.6	3.1	16.3	42.6	36.4	4.09	.89	987
5. As there are enough resources for the next generations, there is no need for sustainable development.	51.5	21	11.9	11	4.7	1.96	1.2	987

Moreover, the participants' attitudes related to sustainable development's support on social development look similar to their attitudes on economic support

(item 6) ($M=4.17$). % 42.4 of the participants strongly agrees and % 38.3 of them agrees with the idea that sustainable development supports social development support. % 3.9 of them disagrees and % 1.1 of them strongly disagrees about sustainable development's support on social development. Also, % 14.4 of the participants neither agrees nor disagrees about sustainable development's support on social development.

Also, a high percentage of the participants agree that people from different cultures should be able to live together (item 10) ($M=4.17$). % 41.6 of the participants strongly agrees and % 39.4 of the participants agrees that people of different cultures should live together. However, % 3.3 of them disagrees and % 1.2 of them strongly disagrees that people from different cultures should be able to live together. % 14.4 of them also neither agrees nor disagrees.

Furthermore, the participants agree that cultural diversity in a society should be supported (item 9) ($M= 4.09$). % 36.4 of the participants strongly agrees and % 42.6 of them agrees about cultural diversity. However, %3.1 of them disagrees and % 1.6 of the participants strongly disagrees % with this diversity. Also, % 16.3 of the participants neither agrees nor disagrees about the cultural diversity in a society.

In addition, a few participants agree that there a need for sustainable development as there are enough natural resources for future generations (item 5) ($M=1.96$). Indeed, slightly more than half of the participants (% 51.5) strongly disagree and % 21 of them disagrees that there is no need for sustainable development as there are enough natural resources for future generations. However % 4.7 of the participants strongly agrees and % 11 of them agrees with this item. Also, %11.9 of the participants is not sure about the need of sustainable development.

4.3.3. Pre-Service Classroom Teachers' Attitudes towards Sustainable Development regarding Socio-Economic Factors

When the attitudes towards sustainable development were analyzed in terms of socio-economic factors (Table 4.11), it was seen that they were about to agree that sustainable development can reduce poverty (item 12) ($M= 3.77$). Indeed, % 25.2 of

the participants strongly agrees and % 36.2 of them agrees that sustainable development can decrease poverty. However, % 30.6 of them neither agrees nor disagrees, % 6.3 of them disagrees and % 1.7 of them strongly disagrees with this decrease in poverty.

Table 4.11

Socio-economic Factors of Sustainable Development

Items	%					<i>M</i>	<i>Sd</i>	<i>n</i>
	<i>SD</i>	<i>D</i>	<i>NA/ND</i>	<i>A</i>	<i>SA</i>			
12. Sustainable development can reduce poverty.	1.7	6.3	30.6	36.2	25.2	3.77	.96	987
7. Sustainable development can provide equality between men and women.	6.0	14.5	38.4	26.6	14.5	3.38	1.08	987
14. Economic development should be given priority rather than sustainable development.	7.9	17.3	27.7	27.7	19.5	3.33	1.20	987
8. Sustainable development can provide equality for everyone.	5.7	12.9	36.3	28.3	16.9	3.29	1.07	987

In terms of gender equality (item 7), the participants partially agrees that sustainable development can provide gender equality ($M= 3.38$). Only % 14.5 of them strongly agrees and % 26.6 of them agrees. However, % 14.5 of them disagrees and %6 of them strongly disagrees that sustainable development can provide equality between men and women. %38.4 of them, on the other hand, neither agrees nor disagrees with this item. Moreover, the participants partially agrees that economic development should be given priority rather than sustainable development (item 14) ($M=3.33$). Only %19.5 of the participants strongly agrees and % 27.7 of the participants agrees that economic development should be given priority rather than sustainable development. However, % 27.7 of them partially agrees and % 17.3 of them disagrees and % 7.9 of them strongly disagrees about the priority of economic development over sustainable development.

In addition, the participants partially agree that sustainable development can provide equality for everyone (item 12) ($M=3.29$). % 16.9 of them strongly agrees and % 28.3 of them agrees with this quality for everyone. However, % 36.3 of the participants neither agrees nor disagrees and % 12.9 of them disagrees and % 5.7 of them strongly disagrees that sustainable development can provide equality for everyone.

4.4. Pre-Service Classroom Teachers' Attitudes towards Sustainable Development in relation to Level of Development and Parent Education

This section indicates the results of the inferential analyses about pre-service classroom teachers' attitudes towards sustainable development by the level of development of the city they live and the education level of their parents in relation to the first research question.

4.4.1. The Effect of the Level of Development on Attitudes towards Sustainable Development

A multivariate analysis of variance (MANOVA) was conducted to test whether there were any differences between pre-service classroom teachers' attitudes towards sustainable development with respect to the level of development of the cities they live. The levels of development were divided into six categories: as Level 1, Level 2, Level 3, Level 4, Level 5, and Level 6. Level 1 represents the highest and Level 6 represents the lowest. On the other hand, attitudes for sustainable development were divided into three factors as environmental, socio-economic and cultural. First, the assumptions were checked. Multivariate normality was checked by Mardia's test of multi-normality which should be non-significant so that the assumption will not be violated. However, in this analysis, the result is significant indicating non-normal multivariate distribution $p < .05$ ($p = .000$). However, as the F statistics are accepted as robust with respect to Type I error against non-normality (Stevens, 2002); in large sample sizes, MANOVA analysis can be carried out.

Also, as a preliminary check, the Levene's test should not be significant for any of the dependent variables. The Levene's test results for the dependent variable

“socio-economic”, yielded no significant value ($p > .025$). However, the dependent variables “cultural” and “environmental” were significant ($p < .25$) (Table 4.12). Therefore, for these variables, the alpha level was set as .02 for the explanation of the test of between subjects effects in order to reduce Type 1 error.

Table 4.12

Homogeneity of Variance Matrices Check by Levene’s Test

	<i>F</i>	<i>df1</i>	<i>df2</i>	<i>Sig.</i>
environmental	4.70	5	981	.000
socio-economic	1.69	5	981	.134
cultural	6.46	5	981	.000

Also, the variance-covariance matrices should be compared between groups by using Box’s test (Field, 2005). Box’s test is desired not to be significant in order to conclude there is insufficient evidence that the covariance matrices differ. Here *M* is significant ($p < .025$), so the homogeneity of covariance matrices assumption was violated. For that reason, Pillai’s Trace was reported for the multivariate analysis as the design is unbalanced and two of the DV’s are significant in Levene’s test and as it is more robust in large sample sizes (Field, Miles & Field, 2012).

Table 4.13

Bivariate Correlations

	Cultural	Socio-economic	Environmental
Cultural	1		
Socio-economic	.170*	1	
Environmental	.632*	.184*	1

* $p < .05$

Moreover, before conducting the MANOVA analysis, dependent variables should also be checked to see if they are highly correlated or not. As can be seen in Table 4.13, the correlations between socio-economic and cultural factors, and the environmental factor were low; but the correlation between environmental and cultural factors were a bit higher than .60 (Field, 2005). Therefore, the correlation between environmental and cultural factors was reported with caution.

Table 4.14

Means and Standard Deviations for Cultural, Socio-economic and Environmental Factors for Sustainable Development and the Level of Development

	Level of development	<i>M</i>	<i>SD</i>	<i>n</i>
cultural	level 1	4.47	.50	129
	level 2	4.09	.67	256
	level 3	4.24	.73	103
	level 4	4.03	.70	237
	level 5	4.17	.62	169
	level 6	3.83	.77	93
	Total	4.13	.69	987
socioeconomic	level 1	3.15	.69	129
	level 2	3.59	.74	256
	level 3	3.41	.67	103
	level 4	3.39	.69	237
	level 5	3.48	.73	169
	level 6	3.56	.83	93
	Total	3.44	.74	987
environmental	level 1	4.38	.54	129
	level 2	4.08	.73	256
	level 3	4.34	.63	103
	level 4	4.03	.72	237
	level 5	4.15	.69	169
	level 6	3.92	.83	93
	Total	4.13	.71	987

After checking the assumptions, in order to examine the effect of the level of development of the city they live on pre-service classroom teachers' attitudes toward sustainable development with respect to "environmental", "socio-economic", and "cultural" factors, MANOVA analysis was conducted. Firstly, descriptive statistics were reported. When the descriptive statistics were examined (Table 4.14) it can be seen that both the cultural ($M=4.47$; $SD=.50$) and environmental attitudes ($M=4.38$; $SD=.54$) of pre-service classroom teachers living in the cities of the 1st level of development seems to be more positive than the others. On the other hand, pre-

service classroom teachers living in the 6th level of development had the lowest mean for the cultural ($M=3.83$; $SD=.77$) and environmental attitudes ($M=3.92$; $SD=.83$) for sustainable development compared with pre-service classroom teachers living in the other levels. As for the socio-economic factor, while the attitudes of pre-service classroom teachers living in the 2nd level of development seem to be more positive compared with the others ($M=3.59$; $SD=.74$), the attitudes of pre-service classroom teachers living in the 1st level of development were less positive than the others ($M=3.15$; $SD=.69$)

The results of the analysis also revealed that the level of development of the city pre-service classroom teachers live had statistically significant effect on their attitudes towards sustainable development with respect to “environmental”, “socio-economic”, and “cultural” factors (Table 4.15). Pillai’s Trace=.121, $F(15, 3) = 8.27$, $p=.000$, multivariate $\eta^2=.040$.

Table 4.15

MANOVA Multivariate Tests for Attitudes regarding Level of Development

	Effect	<i>F</i>	Hypothesis <i>df</i>	Error <i>df</i>	<i>Sig.</i>	Partial η^2
Level of development	Pillai's Trace	8.27	15	3	.000	.040
	Wilks' Lambda	8.50	15	3	.000	.042
	Hotelling's Trace	8.71	15	3	.000	.043
	Roy's Largest	22.8	5	981	.000	.104
	Root					

Thus, since the multivariate main effects of the level of development were significant, the univariate tests of main effects were also examined. Univariate analysis indicated that the effect of the level of development on “cultural”, “socio-economic” and “environmental” factors was significant (Table 4.16).

Table 4.16

The Effect of the Level of Development on Teachers' Attitudes on ESD

	Dependent Variable	SS	df	MS	F	Partial η^2
Level of development	cultural	27.67	5	5.53	12.42*	.060
	socioeconomic	19.79	5	3.96	7.57*	.037
	environmental	19.39	5	3.88	7.97*	.039
Error	cultural	437.08	981	.45		
	socioeconomic	512.88	981	.52		
	environmental	47723	981	.49		
Total	cultural	17299	987			
	socioeconomic	12236	987			
	environmental	17348	987			

*p<.025

For the Univariate analysis, each pair wise comparison was tested at $\alpha=.025$ divided by three at the .008 level as there were three dependent variables, to control Type I error. The results showed that the level of development had statistically significant effect on pre-service classroom teachers' attitudes towards sustainable development with respect to cultural factor $F(5,981) = 12.42$, $p=.000$, explaining 24 % of the variance in that variable, socio-economic factor $F(5,981) = 7.57$, $p=.000$, explaining 19% of the variance in that variable, and environmental factor $F(5,981) = 7.97$ explaining 20% of the variance in "environmental" variable.

In addition, in order to examine the source of differences between teachers' attitudes towards sustainable development's cultural, socio-economic and environmental factors, in terms of the level of the development of the city they live, post hoc analysis was performed. As homogeneity of variances assumption was not met, Dunnett's C test was used to compare the groups.

With regard to the cultural factor, Dunnett's C test demonstrated that there were statistically significant differences between the means of pre-service classroom teachers' attitudes living in the 1st level of development ($M=4.47$) and the 2nd level of development ($M=4.09$), 4th level ($M=4.03$), 5th level ($M=4.17$) and the 6th level of development ($M=3.83$). This result indicates that the pre-service classroom teachers

living in the 1st level of development had more positive attitudes towards sustainable development in terms of cultural factors compared with the ones living in the 2nd, 4th, 5th and the 6th level of development.

Moreover, Dunnett's C test demonstrated that in terms of socio-economic factor, there were statistically significant differences between the means of pre-service classroom teachers' attitudes living in the 1st level of development ($M=3.15$) and the 2nd level of development ($M=3.59$), 5th level ($M=3.48$) and the 6th level of development ($M=3.57$). This result indicates that pre-service classroom teachers living in the 1st level of development had less positive attitudes towards sustainable development in terms of socio-economic factor compared with the ones living in the 2nd, 5th and the 6th level of development.

In addition, with regard to the environmental factor, Dunnett's C test demonstrated that there were statistically significant differences between the means of pre-service classroom teachers' attitudes living in the 1st level of development ($M=4.38$) and the 2nd level of development ($M=4.08$), 4th level ($M=4.03$) and the 6th level of development ($M=3.92$). This result indicates that pre-service classroom teachers living in the 1st level of development had more positive attitudes towards sustainable development in terms of environmental factor compared with pre-service classroom teachers living in the 2nd, 4th and 6th level of development.

4.4.2. The Effect of Parents Education on Attitudes towards Sustainable Development

In order to examine the effect of the education level of pre-service classroom teachers' fathers and mothers on the pre-service classroom teachers' attitudes towards sustainable development with respect to "environmental", socio-economic" and "cultural" factor, MANOVA analysis was conducted. The levels of their fathers' and mothers' education were divided into four categories as "unschooled", "primary education", "secondary education", and "higher education".

First, the assumptions were checked. Multivariate normality was checked by Mardia's test of multi-normality which should be non-significant so that the

assumption will not be violated. However, in this analysis $p < .05$ ($p = .000$). Therefore, multivariate normality assumption was violated.

Second, homogeneity of covariance matrices assumption was checked by Levene's test. The Levene's test results for the dependent variables yielded no significant value ($p > .025$) (Table 4.17).

Table 4.17

Homogeneity of Variance Matrices Check by Levene's Test

	<i>F</i>	<i>df1</i>	<i>df2</i>	<i>Sig.</i>
environmental	.97	14	972	.48
socio-economic	1.21	14	972	.26
cultural	.93	14	972	.52

Box's test is desired not to be significant in order to conclude there is insufficient evidence that the covariance matrices differ. Here M is not significant ($p < .025$), so the homogeneity of covariance matrices assumption was not violated. For that reason, Wilks' Lambda was reported for the multivariate analysis.

Table 4.18

MANOVA Multivariate Tests for Attitudes regarding Parents Education

Effect		<i>F</i>	Hypothesis <i>df</i>	Error <i>df</i>	<i>Sig.</i>	Partial η^2
father education	Pillai's Trace	.508	9	3	.870	.002
	Wilks' Lambda	.508	9	2	.870	.002
	Hotelling's Trace	.507	9	3	.871	.002
	Roy's Largest Root	.993	3	972	.395	.003
mother education	Pillai's Trace	.793	9	3	.622	.002
	Wilks' Lambda	.793	9	2	.623	.002
	Hotelling's Trace	.793	9	3	.623	.002
	Roy's Largest Root	1.91	3	972	.126	.006
meducation * feducation	Pillai's Trace	.876	24	3	.638	.007
	Wilks' Lambda	.876	24	3	.637	.007
	Hotelling's Trace	.877	24	3	.636	.007
	Roy's Largest Root	1.92	8	972	.055	.016

After checking the assumptions, MANOVA results were analyzed. The results presented in Table 4.18 indicated that the education level of their fathers did not have statistically significant effect on pre-service classroom teachers' attitudes towards sustainable development with respect to "environmental", socio-economic" and "cultural " factors, "Wilks' Lambda=.995, $F(9,2)=.508$, $p>.025$, multivariate $\eta^2=.002$. Since the multivariate main effects of the education level of their fathers were not significant, the univariate tests of main effects and post hoc results were not run.

Similarly, the education level of their mothers did not have statistically significant effect on their attitudes towards sustainable development with respect to "environmental", socio-economic" and "cultural" factors, Wilks' Lambda=.993, $F(9, 2) = .793$, $p>.025$, multivariate $\eta^2=.002$. Since the multivariate main effects of the education level of their mothers were not significant, the univariate tests of main

effects and post hoc results were not run. In addition, the interaction between father education and mother education was not statistically significant Wilks' Lambda = .979, $F(24, 3) = .876, p > .025$, multivariate $\eta^2 = .007$.

4.5. Teachers' Perceived Level of Competency on Education for Sustainable Development

The second research question of the study was stated as "How competent do pre-service classroom teachers perceive themselves regarding Education for Sustainable Development (ESD) with respect to the competence areas of (1) emotions, (2) knowledge, (3) values-ethics and (4) systems-thinking?" The third part of the data collection instrument was designed for that purpose examining teachers' perceptions on Education for Sustainable Development on the above mentioned constructs through 16 items. After the factor analysis, factors of their competencies were defined as "emotions", "knowledge", "values and ethics" and "systems-thinking". Therefore, results on competencies were also presented under these four factors.

When the teachers' competencies were analyzed, the overall results indicated that the pre-service classroom teachers almost agree that they can fulfill the requirements of education for sustainable development ($M = 3.86, n = 992$).

Table 4.19

Mean and Standard Deviations of the Competencies of Teachers

Competency	<i>M</i>	<i>Sd</i>
Emotions	4.05	.69
Values	4.04	.68
Systems-thinking	3.92	.67
Knowledge	3.43	.88

In this research question, the teachers' perspectives were analyzed in the competence areas of (1) emotions, (2) knowledge, (3) values-ethics and (4) systems-thinking. The pre-service classroom teachers perceived themselves more competent

in the area of emotions compared with the others ($M=4.05$). Then, they felt competent in terms of values ($M=4.04$), systems-thinking ($M=3.92$) and knowledge ($M=3.43$) respectively (Table 4.19).

4.5.1. Teachers' Perceived Level of Competency in Emotions

The first factor of the competences is “emotions”. As Table 4.20 demonstrates, most of the participants believe that they can relate the subjects regarding emotions with their own lives ($M=4.11$). Also, they can explain students that emotions can depend on the surrounding culture ($M=4.04$). Moreover, they can create learning situations so that students are able to develop feelings of empathy and identification with other human beings ($M=4.03$) and they can show the impact of emotions on perception, judgment, and decisions in their own lives ($M=4.02$).

Table 4.20

Competency in Emotions

Items	%					<i>M</i>	<i>Sd</i>	<i>n</i>
	<i>SD</i>	<i>D</i>	<i>NA/ND</i>	<i>A</i>	<i>SA</i>			
16. I can relate the subjects related to emotions with their own lives.	1.0	3.3	14.4	45.8	35.5	4.11	.84	992
14. I can explain my students that emotions can depend on the surrounding culture.	.7	3.8	17.5	46.7	31.3	4.04	.84	992
13. I can create learning situations so that my students are able to develop feelings of empathy and identification with other human beings.	.4	3.2	19.7	46.7	30.0	4.03	.81	992
15. I can show the impact of emotions on perception, judgment, and decisions in our own lives.	.6	3.1	18.2	49.6	28.4	4.02	.80	992

SD=Strongly Disagree; *D*=Disagree; *NA/ND*= Neither agree nor disagree; *A*=Agree; *SA*=Strongly Agree

4.5.2. Teachers' Perceived Level of Competency in Knowledge

The second factor of the competences is “knowledge”. As Table 4.21 demonstrates, some of the participants believe that they can create an effective learning environment for teaching sustainable development issues ($M=3.48$) and they feel competent that they can inform students about the key concepts of sustainable development ($M=3.47$). Also, some of them think that they can explain the economic, social and environmental aspects of sustainable development to students ($M=3.42$) and they can select educational goals for ESD, taking into account the developmental stage and the prior knowledge of the students, and the diversity within the group of learners ($M=3.36$).

Table 4.21

Competency in Knowledge

Items	%					M	Sd	n
	SD	D	NA/ND	A	SA			
4. I can create an effective learning environment for teaching SD issues.	2.8	12.6	33.1	36.8	14.7	3.48	.98	992
2. I can inform students about the key concepts of sustainable development.	2.9	13.2	32.4	37.1	14.4	3.47	.99	992
1. I can explain the economic, social and environmental aspects of sustainable development to students.	5.1	12.1	33.4	34.8	14.6	3.42	1.04	992
3. I can select educational goals for ESD, taking into account the developmental stage and the prior knowledge of the students, and the diversity within the group of learners.	3.5	14.3	37.5	31.6	13.1	3.36	1.0	992

4.5.3. Teachers' Perceived Level of Competency in Values and Ethics

As Table 4.22 demonstrates, most of the participants believe that they can model values of respect, equality, justice, dignity and respect for all which underpin sustainable development ($M=4.17$). Also, they agree that they can encourage students to determine a stance in the face of events ($M=4.13$). Moreover, they can

encourage their students discuss their own values ($M=4.03$) and they also do not impose their own values and opinions to students ($M=3.83$).

Table 4.22

Competency in Values and Ethics

Items	%					<i>M</i>	<i>Sd</i>	<i>n</i>
	<i>SD</i>	<i>D</i>	<i>NA/ND</i>	<i>A</i>	<i>SA</i>			
7. I can model values of respect, equality, justice, dignity and respect for all which underpin sustainable development.	.3	4.1	13.3	43.0	39.2	4.17	.83	992
6. I can encourage my students to determine a stance in the face of events.	1.2	3.7	14.0	42.8	38.2	4.13	.87	992
8. I can encourage my students discuss their own values.	1.5	3.8	16.6	46.0	32.1	4.03	.88	992
5. I do not impose my own values and opinions to students.	2.6	7.6	24.9	33.7	31.3	3.83	1.04	992

4.5.4. Teachers' Perceived Level of Competency in Systems-thinking

As Table 4.23 demonstrates, most of the participants believe that they can easily make students aware that schools are part of local, national and global systems ($M=4.02$). They can also make their students feel that they are all living in a system and the systems in a society have great importance ($M=4.01$). In addition, some of the participants agree that they can promote critical thinking environments for SD ($M=3.84$) and organize settings which allow learners to experience different perspectives of SD ($M=3.82$).

Table 4.23

Competency in Systems-thinking

Items	%					<i>M</i>	<i>Sd</i>	<i>n</i>
	<i>SD</i>	<i>D</i>	<i>NA/ND</i>	<i>A</i>	<i>SA</i>			
9. I can make students aware that schools are part of local, national and global systems.	.6	3.0	18.3	50.3	27.7	4.02	.80	992
10. I can make my students feel that they are all living in a system and the systems in a society have great importance.	.8	2.9	19.4	48.2	28.7	4.01	.82	992
12.I can promote critical thinking environments for SD.	.4	6.7	24.8	44.4	23.8	3.84	.88	992
11.I can organize settings which allow learners to experience different perspectives of SD.	.8	5.7	26.8	44.4	22.3	3.82	.87	992

4.6. Teachers' Perceived Level of Competency regarding Education for Sustainable Development in relation to Level of Development and Parent Education

This section indicates the results of the inferential analyses about the teachers' perceived level of competency for education for sustainable development by the level of development of the city they live and the education level of their parents.

4.6.1. Teachers' Perceived Level of Competency regarding Education for Sustainable Development in relation to Level of Development

A multivariate analysis of variance (MANOVA) was conducted to test whether there were any differences between the pre-service classroom teachers' perspectives of competencies on education for sustainable development with respect to the level of development of the cities they live. The levels of development of the cities they live were divided into six categories as Level 1, Level 2, Level 3, Level 4, Level 5, Level 6 (from the higher level to the lower level of development). On the other hand,

competencies on education for sustainable development were divided into four as emotions, knowledge, systems-thinking, and values and ethics.

First, the assumptions were checked. Multivariate normality was checked by Mardia's test of multi-normality which should be non-significant so that the assumption will not be violated.

However, in this analysis, the result is significant indicating non-normal multivariate distribution $p < .05$ ($p = .000$). However, as the F statistics are accepted as robust with respect to Type I error against non-normality (Stevens, 2002); in large sample sizes, MANOVA analysis can be carried out.

Second, homogeneity of covariance matrices assumption was checked. For this assumption to be true the univariate tests of equality of variances between groups should be met. This assumption was checked by using Levene's test. As a preliminary check, the Levene's test should be non-significant for any of the dependent variables. The Levene's test results for the dependent variables "systems-thinking", "emotions and "values and ethics" yielded no significant value ($p > .025$). However, the dependent variable "knowledge" was significant ($p < .25$) (Table 4. 24). Therefore, for this variable, the alpha level was set as .02 for the explanation of the test of between subjects effects.

Table 4.24

Homogeneity of Variance Matrices Check by Levene's Test

	<i>F</i>	<i>df1</i>	<i>df2</i>	<i>Sig.</i>
emotions	1.51	5	986	.184
knowledge	2.88	5	986	.014
values	2.26	5	986	.046
systems thinking	2.22	5	986	.051

Since Levene's test does not take account of the covariance, the variance-covariance matrices should be compared between groups by using Box's test (Field, 2005). Box's test is desired not to be significant in order to conclude, there is insufficient evidence that the covariance matrices differ. Here *M* is significant

($p < .025$), so the homogeneity of covariance matrices assumption was violated. For that reason, Pillai's Trace was reported for the multivariate analysis.

Table 4.25

Bivariate Correlations

	Emotions	Knowledge	Values	Systems-thinking
Emotions	1			
Knowledge	.354*	1		
Values	.613*	.251*	1	
Systems-thinking	.676*	.459*	.586*	1

* $p < .05$

Moreover, before conducting the MANOVA analysis, dependent variables should also be checked to see if they are highly correlated or not. As can be seen in Table 4.25, the correlations among most of the dependent variables were moderate as the values were lower than .60, but between emotions and values and systems-thinking were strong as the values were higher than .60 (Field, 2005). Therefore, they were reported with caution.

After checking the assumptions, MANOVA results were analyzed. Firstly, descriptive statistics were reported. When the descriptive statistics were examined, it can be seen that the pre-service classroom teachers living in the cities of the 3rd level of development perceive themselves more competent than the others in terms of "emotions" ($M=4.18$; $SD=.65$) and "knowledge" ($M=3.52$; $SD=.85$). Also, pre-service classroom teachers living in the cities of the 1st level of development perceive themselves more competent than the others in terms of "values" ($M=4.21$; $SD=.60$) while pre-service classroom teachers living in the cities of the 5th level of development perceive themselves more competent in terms of "systems-thinking" ($M=4.00$; $SD=.62$) (from the higher level to the lower level of development).

Table 4.26

MANOVA Multivariate Tests for Competencies regarding Level of Development

Effect		<i>F</i>	Hypothesis <i>df</i>	Error <i>df</i>	<i>Sig.</i>	Partial η^2
Level of development	Pillai's Trace	2.12	20	3.94	.002	.011
	Wilks' Lambda	2.13	20	3.26	.002	.011
	Hotelling's Trace	2.14	20	3.93	.002	.011
	Roy's Largest Root	5.37	5	986	.000	.027

Secondly, MANOVA table was analyzed. The MANOVA Table 4.26 below provides four multivariate tests. In this analysis Pillai's Trace was used as the design is unbalanced and one of the DV's is significant in Levene test. In order to examine the effect of the level of development of the city they live on the pre-service classroom teachers' perspectives of competence on education for sustainable development with respect to "values and ethics", "systems-thinking", "emotions" and "knowledge", MANOVA analysis was conducted. The results revealed that the level of development of the city the teachers live had statistically significant effect on their perceptions of competence on education for sustainable development with respect to "values and ethics", "systems-thinking", "emotions" and "knowledge", Pillai's Trace=.043, $F(20,4)=2.12$, $p=.002$, multivariate $\eta^2=.011$. Thus, since the multivariate main effects of the level of development were significant, the univariate tests of main effects were also examined. Univariate analysis indicated that the effect on "emotions" and "values" was significant.

Table 4.27

The Effect of the Level of Development on Teachers' Perspectives on ESD

Source	Dependent Variable	SS	df	MS	F	Partial η^2
Level of development	emotions	7.63	5	1.53	3.29*	.016
	knowledge	6.57	5	1.31	1.72	.009
	values	11.76	5	2.35	5.27*	.026
	systems-thinking	6.17	5	1.23	2.80	.014
Error	emotions	457.60	986	.46		
	knowledge	751.81	986	.76		
	values	440.50	986	.45		
	systems-thinking	434.67	986	.44		
Total	emotions	16739.75	992			
	knowledge	12444.19	992			
	values	16651.94	992			
	systems-thinking	15696.94	992			

*p<.025

For the Univariate analysis, each pair wise comparison was tested at $\alpha=.025$ divided by four at the .006 level as there were four dependent variables. As it can be seen in Table 4.27, the results showed that the level of development had statistically significant effect on teachers' perceptions of competence on ESD with respect to emotions, $F(5,986) = 3.29$, $p=.006$, explaining 13% of the variance in emotions variable, and on values, $F(5, 986) = 5.27$, $p=.000$, explaining 16% of the variance in values variable. However, the level of development did not have any statistically significant effect on knowledge and systematic-thinking.

In addition, in order to examine the differences between teachers' perceptions on values and emotions in terms of the level of the development of the city they live, post hoc analysis was performed. As homogeneity of variances assumption was not met, Dunnett's C test was used to compare the groups. With regard to the values, Dunnett's C test demonstrated that there were statistically significant differences between the competence perceptions of the teachers who lived in the cities of 1st level of development ($M=4.21$) and the teachers who lived in the 4th level of

development ($M=3.94$); and the teachers who lived in the 6th level of development ($M=3.83$) with regard to the values of ESD. This result showed that the teachers' who lived in the cities of 6th level of development perceived themselves less competent with regard to the values of ESD than the teachers who lived in cities of different levels of development.

With regard to the emotions, Dunnett's C test demonstrated that there were not any statistically significant differences between the competency perceptions of the teachers who lived in the cities of different levels of development.

4.6.2. Teachers' Perceived Level of Competency regarding Education for Sustainable Development in relation to Parent Education

In order to examine the effect of the education level of their fathers and mothers on the pre-service classroom teachers' perspectives of competence on education for sustainable development with respect to "emotions", "knowledge", "values & ethics", and "systems-thinking" MANOVA analysis was conducted. The levels of their fathers' and mothers' education were divided into four categories as "unschooling", "primary education", "secondary education", and "higher education".

First, the assumptions were checked. Multivariate normality was checked by Mardia's test of multi-normality which should be non-significant so that the assumption will not be violated. However, in this analysis, the result is significant indicating non-normal multivariate distribution $p < .05$ ($p = .000$). However, as the F statistics are accepted as robust with respect to Type I error against non-normality (Stevens, 2002); in large sample sizes, MANOVA analysis can be carried out.

Table 4.28

Homogeneity of Variance Matrices Check by Levene's Test

	<i>F</i>	<i>df1</i>	<i>df2</i>	<i>Sig.</i>
emotions	.97	14	977	.480
knowledge	1.27	14	977	.219
values	1.86	14	977	.027
systems thinking	.95	14	977	.503

Second, homogeneity of covariance matrices assumption was checked by Levene's test. The Levene's test results for the dependent variables yielded no significant value ($p > .025$) (Table 4.28).

Also, the variance-covariance matrices should be compared between groups by using Box's test (Field, 2005). Box's test is desired not to be significant in order to conclude there is insufficient evidence that the covariance matrices differ. Here M is significant ($p < .025$), so the homogeneity of covariance matrices assumption was violated. For that reason, Pillai's Trace was reported for the multivariate analysis as the design is unbalanced and two of the DV's are significant in Levene's test and as it is more robust in large sample sizes (Field, Miles & Field, 2012).

Table 4.29

MANOVA Multivariate Tests for Competencies regarding Parents Education

	Effect	<i>F</i>	Hypothesis <i>df</i>	Error <i>df</i>	<i>Sig.</i>	Partial η^2
father education	Pillai's Trace	1.28	12	3	.226	.005
	Wilks' Lambda	1.28	12	3	.225	.005
	Hotelling's Trace	1.28	12	3	.224	.005
	Roy's	3.09	4	976	.015	.013
	LargestRoot					
mother education	Pillai's Trace	.77	12	3	.684	.003
	Wilks' Lambda	.77	12	3	.684	.003
	Hotelling's Trace	.77	12	3	.684	.003
	Roy's Largest Root	1.74	4	976	.138	.007
	Root					
meducation * feducation	Pillai's Trace	1.14	32	4	.270	.009
	Wilks' Lambda	1.14	32	4	.269	.009
	Hotelling's Trace	1.14	32	4	.267	.009
	Roy's Largest Root	2.83	8	977	.004	.023
	Root					

After checking the assumptions, MANOVA results were analyzed. The findings presented in Table 4.29 indicated that the education level of their fathers did not have statistically significant effect on their perceptions of competence on education for sustainable development with respect to “emotions”, “knowledge”, “values & ethics”, and “systems-thinking” Pillai’s Trace =.016, $F(12, 3)=1.28$, $p>.025$, multivariate $\eta^2=.005$. Since the multivariate main effects of the education level of their fathers were not significant, the univariate tests of main effects and post hoc results were not examined.

Similarly, the education level of their mothers did not have statistically significant effect on their perceptions of competence on education for sustainable development with respect to “values and ethics”, “systems-thinking”, “emotions” and “knowledge”, Pillai’s Trace=.009, $F(12, 2.93)=.77$, $p>.025$, multivariate $\eta^2=.003$. Since the multivariate main effects of the education level of their mothers were not significant, the univariate tests of main effects and post hoc results were not examined, too. In addition, the interaction between father education and mother education was not statistically significant Pillai’s Trace=.037, $F(8,977) =1.14$, $p>.025$, multivariate $\eta^2=.009$.

4.7. The Relationship of Pre-Service Classroom Teachers’ Attitudes towards Sustainable Development and their Perceptions of Competence on Education for Sustainable Development

In order to examine the relationship of the pre-service classroom teachers’ attitudes towards sustainable development and their perceptions of competence for education for sustainable development correlational analysis was conducted. Pearson correlation coefficients were conducted and in order to control Type I error among the correlations, the alpha value was set as .01.

Table 4.30

Correlations between Attitudes and Competencies of ESD

		Attitudes
Competence	<i>Pearson Corr.</i>	.627
	<i>Sig. (2-tailed)</i>	.000
	<i>N</i>	1008

The results of the correlational analysis presented in Table 4.30 indicated statistically significant positive correlations with a large effect size between the attitudes of the pre-service classroom teachers towards sustainable development and their competence for education for sustainable development, $r(1006) = .627$, $p = .000$ (Cohen, 1988). That is, as the pre-service classroom teachers reflect more positive attitudes towards sustainable development, they perceive themselves more competent in terms of education for sustainable development.

Table 4.31

Correlation between the Attitudes toward SD and Perceived Levels of Competencies of ESD

		environmental	cultural	socio-economic
knowledge	<i>Pearson Corr.</i>	.341	.369	.273
	<i>Sig. (2-tailed)</i>	.000	.000	.000
	<i>N</i>	1008	1008	1008
systems thinking	<i>Pearson Corr.</i>	.543	.531	.305
	<i>Sig. (2-tailed)</i>	.000	.000	.000
	<i>N</i>	1008	1008	1008
values and ethics	<i>Pearson Corr.</i>	.512	.518	.202
	<i>Sig. (2-tailed)</i>	.000	.000	.000
	<i>N</i>	1008	1008	1008
emotions	<i>Pearson Corr.</i>	.527	.514	.243
	<i>Sig. (2-tailed)</i>	.000	.000	.000
	<i>N</i>	1008	1008	1008

Moreover, there are statistically significant positive correlations between the systems thinking competence and environmental factor, $r(1006) = .543$ and cultural

factor, $r(1006) = .531$ with a large effect size; and socio-economic factor, $r(1006) = .305$ with a medium effect size (Table 4.31). According to these results, as the pre-service classroom teachers show more positive attitudes towards sustainable development in terms of environmental, cultural and socio-economic factors, they perceive themselves more competent in terms of systems thinking competence of education for sustainable development.

Furthermore, there are statistically significant positive correlations between the values and ethics competence and environmental factor, $r(1006) = .512$ and cultural factor, $r(1006) = .518$ with a large effect size; and socio-economic factor, $r(1006) = .202$ with a small effect size. According to these results, as the pre-service classroom teachers indicate more positive attitudes towards sustainable development in terms of environmental, cultural and socio-economic factors, they perceive themselves more competent in terms of values and ethics competence of education for sustainable development.

Lastly, there are statistically significant positive correlations between the competence of emotions and environmental factor, $r(1006) = .527$ and cultural factor, $r(1006) = .514$ with a large effect size; and socio-economic factor, $r(1006) = .243$ with a small effect size. According to these results, as the pre-service classroom teachers' show more positive attitudes towards sustainable development in terms of environmental, cultural and socio-economic factors, they perceive themselves more competent in terms of education for sustainable development.

As a result, it can also be said that environmental and cultural attitudes of pre-service classroom teachers towards sustainable development has a large effect on their competence of systems thinking, values and ethics and emotions. However, they have a medium effect size on the competence of knowledge. On the other hand, their socio-economic attitudes towards sustainable development has a medium effect size on the competence of systems thinking, but small effect on the competences of knowledge, values and ethics and emotions.

4.8. Learning Opportunities to Develop Pre-Service Classroom Teachers' Competencies for Education for Sustainable Development

In order to find whether the curriculum of Classroom Teaching provide learning opportunities for Education for Sustainable Development, document analysis was conducted. However, before the document analysis, first, the themes of sustainable development were identified according to the related literature in order to analyze the documents in that framework (Appendix B).

Then, the European Credit Transfer and Accumulation System (ECTS) Information Package of Hacettepe University was analyzed for the curriculum of Classroom Teaching Department. Hacettepe University is one of the members of this system and departments of the university provide course descriptions and related detailed information about the courses they offer in this system. For that reason, in order to get detailed information about the courses of Department of Elementary Education, Division of Primary Education, related documents of the ECTS Information Package was analyzed.

Firstly, goals and objectives of the program were analyzed to recognize the place of education for sustainable development in the whole curriculum. The goals and objectives were stated as;

to educate primary classroom teachers, in the light of contemporary educational theories and in educational environments where technology and art is used effectively, who adopt the theoretical basis of education, who can use this theoretical basis in various primary schools (urban, suburban, state, private, ...); who can provide guidance to the development of these schools, of the students in these schools, and *of the societies in which these schools exist*; who can *sustain national and international collaboration* and professional development; who are highly *sensitive to the society and environment*; who are competent to become a teacher and accept *the universal values of being a teacher*; who are conscious to the protection and development of these competencies through *national and international cooperation* and to create scientific knowledge that will sustain this process and make it effective. (Hacettepe University ECTS Information Package, 2015)

As it could be recognized, the general goals and the objectives of Primary Education curriculum seemed to include goals and objectives about education for sustainable development in general. As it was stated, the goals and objectives focused on “*the society*”, “*sustaining national and international collaboration and cooperation*”, “*being sensitive to the society and environment*”, and “*universal values of being a teacher*” all of which were among basic premises of education for sustainable development.

Later, the selected courses of the Classroom Teaching curriculum as “Life Studies Teaching, Social Studies Teaching, and Science and Technology Teaching I-II” were analyzed in terms of their providing the pre-service classroom teachers with the learning opportunities to develop their competencies of Education for Sustainable Development.

In addition, some course books such as “Hayat Bilgisi Öğretimi ve Öğretmen Klavuzu (Sönmez, 2005), Sosyal Bilgiler Öğretimi (Öztürk, 2015), Kuramdan Uygulamaya Sosyal Bilgiler Öğretimi (Kabapınar, 2014)”, Kuramdan Uygulamaya Fen ve Teknoloji Öğretimi (Çepni, 2015) and the curriculum of Life Studies, Social Studies and Science and Technology courses provided by the Ministry of Education were analyzed.

4.8.1. Analysis of Life Studies Teaching

The first course analyzed was Life Studies Teaching. First, its course description according to ECTS was analyzed. Then, the course books of the course and thirdly, Life Studies Curriculum provided by the Ministry of education (MoNE) were analyzed.

Analysis of the Course Description: First, the aim of the course was analyzed. It was stated in the information package as: to provide the students to know *features, aims and contents of the Life Knowledge course* and to plan and to apply instructional process effectively in elementary education to the students (2015). The aims of the course did not include any concept related to Education for sustainable development. However, as providing the students to know the features, aims and contents of the Life Studies course was emphasized, the features, aims and contents

of this course was also analyzed to check the learning opportunities for Education for Sustainable Development. Later, the learning outcomes of Life Studies Teaching course were analyzed (Hacettepe University ECTS Information Package, 2015). Some of them are described as:

1. Knowing the aims, concepts and context of Life Studies course,
2. Searching for the historical development of Life Studies course in Turkey and Life Studies course approaches in other countries,
3. Examining Life Studies curriculum in terms of aims, skills, concept etc.,
4. Having knowledge about themes in curriculum and distribution of aims in themes by levels.

As a result of the analysis, it can be said that, the learning outcomes of Life Studies Teaching course did not reflect any outcome related to education for sustainable development.

Analysis of the Course Content: The content of the course was provided below (Hacettepe University ECTS Information Package, 2015):

- Aims, concepts and context of Life Studies course,
- Historical development of Life Studies course in Turkey and Life Studies course approaches in other countries.
- Examination of Life Studies curriculum in point of aims, skills, concept etc.
- Themes in curriculum and distribution of aims in themes by levels.
- Studies and examples of usage of basic teaching skills of Life Studies teaching, teaching strategies, teaching methods and techniques in Life Studies course,
- Usage of reference and material in Life Studies teaching,
- Application examples about Life Studies curriculum and evaluation of the classroom activities.

As it can be seen, the content of the Life Studies Teaching Course according to ECTS information package did not directly indicate any learning opportunities for

education for sustainable development, for that reason; the course book and the curriculum of Life Studies were needed to be analyzed to see whether there are any learning opportunities to develop pre-service classroom teachers' competencies of education for sustainable development.

Analysis of the Course Book: As it was stated in the course content, the course book named as “Hayat Bilgisi Öğretimi ve Öğretmen Klavuzu (Sönmez, 2005) was analyzed. The book begins with the explanation of the scope of the curriculum of Life Studies. It was stated that in this course, natural and social phenomena and events are covered (Sönmez, 2005, p.2). For instance, the facts related to “school and family” are some concepts of the social phenomena; and “autumn and winter”, and “life in our environment” are some concepts of the natural phenomena. It was stated in the book that while designing the activities for the students, teachers should pay attention to the social and environmental factors that the students live in.

In addition, it was stated in the scope part that, this course also covers cognitive and artistic phenomena. Throughout the scope of the book, the relationships among these phenomena and how they should be presented to the students were described. For instance, it was stated that selected activities should be designed to develop their problem solving skills and they should be suitable to the cultural values of the students (Sönmez, 2005, p.3).

As a result, it can be said that when covering the scope of the Life Studies course, the pre-service classroom teachers are dealing with the basic terms of education for sustainable development in terms of especially social and environmental aspects. Therefore, it seems to help pre-service classroom teachers to develop their competencies of education for sustainable development based on the competence of knowledge. Moreover, by emphasizing being respectful to the cultural values and emotions of students in designing activities, this course is expected to develop pre-service classroom teachers' competencies regarding “*values and ethics*” and also their “*emotional competencies*”. In addition, the emphasis of the book on the

critical thinking and problem solving skills may be helpful to develop their competence of “*systems thinking*” for education for sustainable development.

Analysis of Life Studies Curriculum: According to the content of Life Studies Teaching Courses, the pre-service classroom teachers were required to study aims, concepts and the skills of the Life Studies Course provided by the Ministry of National Education (2009). For that reason, the curriculum of Life Studies was also analyzed for the learning opportunities to develop pre-service classroom teachers’ competencies for education for sustainable development.

First, the vision statement of Life Studies curriculum was analyzed. It was stated by the Ministry of National Education (2009) as: raising individuals who are equipped with basic life skills, know his strengths and weaknesses, have healthy and safe life, *are sensitive to the nature and environment*, are willing to search, have high self-confidence, are at peace with himself and others, have *internalized national and spiritual values*.

As a result of the analysis of the vision statement, it can be said that Life Studies curriculum aims to provide learning opportunities for education for sustainable development. The reason is that it aims to raise individuals who are “sensitive to the nature and environment” which are the basic aims of education for sustainable development. Also, “internalizing national and spiritual values” are considered related to the “*values and ethics*” of education for sustainable development. In that way, the pre-service classroom teachers are expected to develop their competencies of education for sustainable development regarding “*knowledge*” and “*values and ethics*”.

However, as the vision statement is so broad, the goals of Life Studies curriculum were analyzed to see the learning opportunities for education for sustainable development in detail. The goals are stated as (MoNE, 2009):

6. developing the ability to use resources efficiently,
11. internalizing national, moral and human values,
12. developing the skills of thinking, questioning and producing different ideas and solutions,

13.developing the skills of maintaining and protecting a clean environment and nature,

14.developing a scientific understanding by questioning the nature, observing, grouping the results of the observation, classification and comparison.

When the goals of the program were analyzed, it was seen that the 6th, 11th, 12th, 13th, and 14th goal was related to sustainable development. The 6th goal was related to “the skills for the efficient use of resources” and the 13th one is related to “developing skills for keeping the nature and the environment clean and protecting them”. Those two goals can be useful in developing the “*competence of knowledge*” by focusing on the basic themes of education for sustainable development. Also, the 11th goal is related to “internalizing the national, spritual and humanitarian values”, which is expected to be related to the “*competence of emotions*” and “*values and ethics*”. Moreover, the 12th goal is related to “thinking, questioning and developing to find different ideas and solutions”, and the 14th one is related to “giving a scientific understanding by questioning the nature, observing, grouping the results of the observation, classification and comparison”. Therefore, these two goals are also considered helpful in developing the competence of “*systematic thinking*” of pre-service classroom teachers of classroom teachers. As a result, it can be said that analyzing the goals of Life Studies curriculum and designing activities based on these goals, pre-service classroom teachers may develop their four areas of competencies of education for sustainable development.

In addition, the skills and values of the program were analyzed. The skills such as decision making, problem solving, communication and cooperation; and the values of the program such as justice, tolerance, and respect completely overlap with the skills and values of education for sustainable development. All these skills and values are expected to develop pre-service classroom teachers’ competencies of education for sustainable development in terms of “*knowledge*”, “*emotions*”, “*values and ethics*” and “*systems thinking*”.

To sum up, although Life Studies Teaching course seems not to have direct aims, goals and content for education for sustainable development, the course books

used and the curriculum of Life Studies seems to reflect the aims of education for sustainable development. By analyzing this course, pre-service classroom teachers are expected to come across the learning environments for education for sustainable development and they are expected to have their related competencies.

4.8.2. Analysis of Social Studies Teaching

The other course analyzed in terms of its providing the pre-service classroom teachers with the learning opportunities to develop their competencies of Education for Sustainable Development was Social Studies Teaching. First, its course description according to ECTS was analyzed. Then, the course books of the course were analyzed. Lastly, Social Studies Curriculum provided by the Ministry of education (MoNE) was analyzed.

Analysis of Course Description: As for the Social Studies Teaching course, to analyze the course description, first, the aim of the course was analyzed. It was stated as (Hacettepe ECTS, 2015):

- to know features, aims and contents of the Social Studies course and to plan and apply instructional process effectively in elementary education to the students.

The aims of the course are not found related to Education for sustainable development. However, as providing the students to know the features, aims and contents of the Social Studies course was emphasized, the features, aims and contents of this course was also analyzed to check the learning opportunities for Education for Sustainable Development.

After the analysis of the aims, the learning outcomes were also analyzed (Hacettepe ECTS, 2015). Some of which are:

- Knowing aim, concept and context of Social Studies course,
- Conducting research on historical development of Social Studies course in Turkey and Social Studies course approaches in other countries,
- Examining Social Studies curriculum in point of aims, skills, concept etc.,
- Examining *values and democracy education* in Social Studies course and realize these importance's,

- Prepare and apply application examples about Social Studies curriculum and evaluate classroom activities.

The learning outcomes show that the Social Studies Teaching course aims to provide “values education” and “democracy education” which are directly related to the content, skills and values of education for sustainable development.

Analysis of the Course Content: The content of the course was provided below (Hacettepe ECTS, 2015):

- *Aims, concepts and context of Social Studies course,*
- Historical development of Social Studies course in Turkey and Social Studies course approaches in other countries.
- *Examination of Social Studies curriculum in point of aims, skills, concept etc.,*
- Themes in curriculum and distribution of aims in themes by levels.
- Studies and examples of usage of basic teaching skills of Social Studies teaching, teaching strategies, teaching methods and techniques in Social Studies course,
- Usage of reference and material in Social Studies teaching,
- *Values and democracy education in Social Studies course,*
- Application examples about Social Studies curriculum and evaluation of the classroom activities.

The content of the Social Studies Teaching course seems to have learning opportunities for education for sustainable development in terms of values education and democracy education. To recognize this in detail, course books of the course were also analyzed.

Analysis of the Course Book: The course books such as *Sosyal Bilgiler Öğretimi* (Öztürk, 2015), *Kuramdan Uygulamaya Sosyal Bilgiler Öğretimi* (Kabapınar, 2014)” were analyzed for the learning opportunities for education for sustainable development. When the course books were analyzed, it was considered that they began with the description of “Social Studies”. For instance, in Kabapınar’s book, it was stated that Social Studies course examines human and society and as a result of their interaction, it examines the environment (2014, p. 3). In that way, this

course basically includes the themes of education for sustainable development such as “human, society and environment” and therefore, it is expected to help comprising the “knowledge competence” of pre-service classroom teachers as they examine these books in their teaching of Social Studies or similar courses in their four years curriculum.

Also, “effective citizenship” was considered as one of the basic aims of Social Studies course. It was described as the citizens, who can criticize social values, can produce new values, and who are critical and creative instead of obeying social order without questioning it. This description is consistent with the aims of education for sustainable development and by studying how to become an “effective citizen”; pre-service classroom teachers are expected to develop their competence of “*values and ethics*” and “*systems thinking*” because of the aforementioned reason.

In addition, in Öztürk’s course book (2015, p. 3), Social Studies course was described as “the integration of Social Studies and humanities for citizenship education” (Barr et al, 1978, p.18 as cited in Öztürk, 2015, p.3). Also, the approaches to teaching Social Studies were grouped into three as “Social Studies teaching as citizenship transference”, “Social Studies teaching as a social science” and “Social Studies teaching as reflective research” (pp.5-6).

The first approach focuses on training new generations to ensure sustainability of the culture. The main aim is the teaching of societies’ basic institutions, values and ethics. One of the most vital aims of education for sustainable development also is providing cultural sustainability through respecting values and ethics of a society. By studying these subjects, pre-service classroom teachers are expected to develop their competencies of knowledge, and values and ethics.

According to the second approach, Social Studies teaching base upon the idea that having the knowledge, skills and values of Social Studies is the best preparation for the effective citizenship. For that reason, students should learn the structure of social sciences, their basic concepts, generalizations and theories; and information gathering and interpretation. In that way, this approach is expected to help pre-service classroom teachers develop their competence of systematic thinking.

Also, according to the last approach, Social Studies should provide the students with the knowledge of problem solving and decision making skills as education for sustainable development has the same aim, too. From these perspectives, it can be said that the course of “Social Studies Teaching” includes the basic concepts, skills and values of sustainable development such as “decision making and problem solving”. By studying these approaches, pre-service classroom teachers also study the themes of education for sustainable development which will be helpful in developing their competence of knowledge, values and ethics, and systematic thinking.

The pre-service classroom teachers are also expected to study “value education” and make lesson plans and apply them in their classes according to the program of Social Studies. In values education, they question which values to be covered. In the book, the values that a democratic person should have are listed (Öztürk, 2015, pp.231-232). “They are grouped under six categories as respect for humanitarian values, respect for freedom of conscious, integration of individual interests and social responsibilities, developing self-confidence by communication with others, reflect on ethical choices, and search for peaceful solutions.” Then, the values are given in detail. These values completely overlap with the values of education for sustainable development.

Furthermore, the selected course books also include information about “Teaching Thinking Skills for Effective Citizenship” (Öztürk, 2015). This chapter includes thinking skills such as critical thinking, creative thinking, problem solving and research skills, decision making and individual awareness which are closely related to the skills of education for sustainable development (Öztürk, 2015, p.145) to develop pre-service classroom teachers’ competence of systematic thinking.

As a result, it can be said that, pre-service classroom teachers are expected to have learning experiences for education of sustainable development in Social Studies Teaching course. In that way, they will develop their competence of knowledge, values and ethics, and systems thinking for education for sustainable development.

Analysis of the Curriculum of Social Studies: According to the content of “Social Studies Teaching” course, the pre-service classroom teachers were required to study aims, concepts and the skills of the “Social Studies” course. For that reason, the curriculum of “Social Studies” developed by MoNE was also analyzed for the learning opportunities for education for sustainable development (MoNE, 2012).

First, the vision statement of Social Studies curriculum was analyzed. It was stated as (Hacettepe Univ. ECTS, 2015):

The vision of the Social Studies course is to train Turkish Republic citizens who are contemporary in 21st century, adopting the principles and reforms of Atatürk , understanding the history and culture of Turkey, are equipped with basic *democratic values* and *respectful for the human rights*, are *environmentally sensitive*, interpreting the knowledge according to his experiences and *constructing it in social and cultural contexts*, and using and *organizing (critical thinking, creative, giving the right decision)*, *who has social participation skills*, *who have won the methods social scientists use to have advanced scientific knowledge*, *are active in social life*, *who are productive*, and *know their rights and responsibilities*.

As a result of the analysis of the vision statement, it can be said that Social Studies Curriculum aims to provide learning opportunities for education for sustainable development (Hacettepe Univ. ECTS, 2015). That is, by analyzing the aims of this curriculum, the pre-service classroom teachers are expected to be familiar with “democratic values” and “human rights” such as “being respectful to everybody’s rights and values”, “being ethical” and “being tolerant to difference”. Therefore, they will help pre-service classroom teachers develop their competence of “*knowledge*” and “*values and ethics*”. They are also expected to have knowledge about how to become “environmentally sensitive” and “how to develop organizing skills such as critical thinking and creative thinking”. In that way, their competence of “*knowledge*” and “*systematic thinking*” will be developed. In addition, they are expected to learn how to make the primary school students active in social life, and know their rights and responsibilities as the main objectives of education for

sustainable development. As a result, their competence of “*knowledge*” is expected to be developed.

After the analysis of the vision statement, the goals of the program were also analyzed (Hacettepe Univ. ECTS, 2015):

6. Based on national identity, it gives importance to the adoption of *universal values*.
9. Ensure that students are *sensitive to social problems*.

Based on this analysis, it was seen that the 6th, 9th and the 10th goals were related to education for sustainable development. The 6th goal focuses on both local and global values as education for sustainable development does so. The 9th goal also emphasizes the basic aim of education for sustainable development from social aspects which is being sensitive to social problems. In that way, pre-service classroom teachers are expected to develop their competencies of “*knowledge*”, “*values and ethics*”, and “*emotions*”.

In addition, the skills and the values of the program were analyzed. The skills such as critical thinking, creative thinking, communication and empathy; and the values of the course such as tolerance, and respect completely overlap with the skills and values of education for sustainable development. They are expected to develop pre-service classroom teachers’ competencies of “*systems thinking*”, “*emotions*” and “*values and ethics*”.

To sum up, “Social Studies Teaching Course” seems to have direct aims, goals and content for education for sustainable development. The course books used and the curriculum of Social Studies also reflect the aims of education for sustainable development. By analyzing this course, pre-service classroom teachers are expected to come across the learning environments for education for sustainable development and they are expected to develop their competencies of “*knowledge*”, “*emotions*”, “*systems thinking*”, and “*values and ethics*”.

4.8.3. Analysis of Science and Technology Teaching I-II

The other courses that were analyzed were Science and Technology Teaching I-II. First, their course descriptions according to Hacettepe University ECTS were analyzed. Then, the course books of the courses were analyzed. Lastly, Science and Technology Teaching curriculum provided by the Minister of education (MoNE) was analyzed.

Analysis of Course Description: First, the aim of the courses was analyzed. The aim of the two courses was stated as “helping student teachers to improve their knowledge and skills on teaching science”.

The aim of the courses was so broad that it was not possible to analyze it in terms of education for sustainable development. For that reason, the learning outcomes were analyzed (Hacettepe Univ. ECTS, 2015):

1. Define and differentiate the concepts of science and technology,
2. Explain the concept of scientific literacy and characteristics of a scientifically literate person,
3. *List the goals of science curriculum,*
4. List important events and periods in history of science,
5. List and explain the tenets of nature of science,
6. Define inquiry and list steps of inquiry,
7. Conduct inquiry activities,
8. *Use inquiry skills,*
9. Design inquiry activities.
10. List and apply approaches in teaching concepts
11. List and explain basic assessment approaches in science education
12. Design inquiry based activities.

Analysis of Course Content: When learning outcomes were analyzed, it was considered that inquiry skills are related to the systems thinking competence of education for sustainable development. To make it clear, the course content was analyzed.

Course content was stated as (Hacettepe Univ. ECTS, 2015):

- *basic concepts related to science and science education,*
- *features of science, technology, scientific knowledge, scientific literacy,*
- history and nature of science,
- *inquiry based learning,*
- *example inquiry activities.*
- techniques in developing concepts, misconceptions and conceptual change,
- problem based learning,
- project based learning,
- cooperative learning,
- assessment and measurement in science education: traditional and alternative assessment approaches,
- development of sample activities based on science curriculum.

After the analysis of the content, it can be seen that some of the basic concepts and features of science and the learning theories mentioned in the content of the course in general basically include critical thinking, creative thinking and inquiry skills. In that way, it is expected for pre-service classroom teachers to come across some learning opportunities for systems thinking competence of education for sustainable development. It was also thought that and inquiry based learning activities could be related to education for sustainable development.

To make it clear, the course books were analyzed for these subjects.

Analysis of the Course Book: The course book “Kuramdan Uygulamaya Fen ve Teknoloji Öğretimi (Çepni, 2015) was analyzed for the learning opportunities for education for sustainable development.

The book starts with the description of the basic concepts of science education. As it was stated under the characteristics of science, “science is a social activity that appears as a result of social needs” (Çepni, 2015, p.4). Also, it is so dynamic that it shows a continuous change, development and improvement. Moreover, it has a cumulative characteristic that, it has been accumulated throughout the history of humanity. In addition, it is related to society and culture (Çepni, 2015, p.5).

As a result, it can be seen that both this course and education for sustainable development focus on social needs of cultures, societies and humanity as a whole; and they both emphasize the changes, development and improvement in their needs. Therefore, this content may comprise the knowledge part of the competencies of education for sustainable development.

On the other hand, the book includes the aims of science education under the subheading of emotion and appreciation, which is directly related to emotional competence of education for sustainable development. There is one aim that is directly related to this. It was stated as “making decisions related to individual values, social problems and environmental problems” (Çepni, 2015, p.10). In that way, the importance of individual values, and social and environmental problems, and making decisions related to them is emphasized. Therefore, these aims are expected to develop the competence of emotions, and values and ethics of pre-service classroom teachers.

Furthermore, the last version of science and technology curriculum updated in 2013 were given in the book and it was compared with the one developed in 2003. One of the differences between these two programs is related to sustainable development. The subject of “sustainable development” was integrated to the program in 2013. According to this program, there are four learning areas as “Information”, “Skills”, “Perception”, and “Science-Technology-Society-Environment”.

When the learning areas were analyzed (Table 4.32, adapted from Çepni, 2015, p. 37), it can be seen that the learning area of “Science-Technology-Society-Environment” includes six sub-learning areas as “Socio-scientific Subjects”, “The Nature of Science”, “Science and Technology Relations”, “Social Contribution of Science”, “*Sustainable Development*” and “The Consciousness of Science and Career” . Also, it can be recognized that sustainable development is integrated to the other sub-learning areas. For instance, in “Socio-scientific Subjects” part, scientific and moral reasoning skills which are related to the solution of socio- scientific problems about science and technology are given. Also, the understanding of the

contribution of scientific knowledge to the social development and the solution of social problems was emphasized in “Social Contribution of Science” part which is directly related to education for sustainable development.

Table 4.32

Learning Areas and the Units in the Program of Science and Technology Course

Learning Area of Information	Learning Area of Skills	Learning Area of Perception	Learning Area of Science-Technology-Society and Environment
Living things and Life	The Skills of Scientific Process	Attitude	Socio-scientific subjects
Matter and Transformation	Life Skills	Motivation	The Nature of Science
Physical Events		Value	Science and Technology Relations
The Earth and the Universe		Responsibility	Social Contribution of Science Sustainable Development The consciousness of Science and career

Moreover, in “the learning area of skills”, “sustainable development awareness” is included under “life skills”. Also, in learning theories part of the course book, critical thinking skills were also highlighted.

As a result, it can be said that through science and technology teaching course books the themes of sustainable development is emphasized which can help pre-service classroom teachers develop their competence of knowledge. Also, by covering the critical thinking skills, their competence of systems thinking is expected to be developed.

In addition, the learning theories mentioned in the course content and the course book in general includes critical thinking, creative thinking, problem solving skills, cooperation, and collaboration and inquiry skills. For that reason, they include learning environments for education for sustainable development directly focusing on systems thinking competence.

Moreover, specific to this course, as for the 21st century skills, STEM Approach (Science, Technology, Engineering, and Maths) in Turkish called as FeTeMM (Fen, Teknoloji, Mühendislik, Matematik) was explained in the book (Çepni, 2015, pp.174-185). According to this approach, there are three groups of skills that students of 21st century should have:

1. *Learning and innovation skills:*
 - a. Creativity and innovation
 - b. Critical thinking and problem skills
 - c. Communication and cooperation
2. *Information, media and technology skills:*
 - a. Information literacy
 - b. Media Literacy
 - c. Technology literacy
3. *Life and career skills:*
 - a. Flexibility and adaptability
 - b. Entrepreneurship and self-regulation
 - c. Social and intercultural skills
 - d. Productivity and individual responsibility
 - e. Leadership and social responsibility

All these skills are directly related to education for sustainable development. For that reason, especially for the STEM approach, it can be said that its skills and the skills of education for sustainable development overlaps and it provides learning opportunities for education for sustainable development. Learning and innovation skills may be helpful in the development of systems thinking competence. In addition, life and career skills are expected to help pre-service classroom teachers

develop their competence of emotions by self-regulation. Also, flexibility and adaptability, social and intercultural skills and social responsibility will help them to develop their competence of values; because by analyzing these skills, they will come across the basics of education for sustainable development as valuing different views, living with the other cultures in harmony and being respectful to the variety, and showing ethical behaviors in society.

Analysis of Science and Technology Curriculum: Based on the aim of the course Science and Technology Teaching, the curriculum of the Science and Technology was also analyzed. First, the vision statement of the course was analyzed. The vision of the Science and technology was stated as (MoNE, 2010):

training all the individuals as science literate.

The individuals who are science literate are the ones who are “ inquirers, capable of *effective decision making, having problem solving skills, self-confident, open to cooperation; who can communicate effectively*, who are *lifelong learners with the awareness of sustainable development*, and science literate will *have information on the science, its skills, positive attitudes, perceptions and values; the understanding of technology-society-environment relationship* and have psychomotor skills.

The description of science literate individuals indicates us that awareness of sustainable development is one of the characteristics of being a science literate individual. That is by studying this curriculum, pre-service classroom teachers are expected to become aware of sustainable development. It may become possible for them to develop their competence of knowledge for education for sustainable development. Also, effective decision making and problem solving skills may be helpful in developing systems thinking competence.

Then, to analyze the details of sustainable development mentioned, the goals of the program were analyzed (MoNE, 2010);

1. providing basic information about Biology, Physics, Chemistry, Earth, Sky and Environmental Sciences, and the Health and Disasters,

2. In the process of understanding the relationship between nature and the discovery of human-environment, adopting a scientific process skills and scientific approach and finding solutions to problems,
4. recognizing the interaction between individuals, the environment and society and to improve the awareness of sustainable development in relation to the society, the economy, and natural resources,
8. contributing to the understanding that Science is produced as a result of the joint efforts of scientists from all cultures and developing a sense of appreciation of scientific studies.
9. providing the appreciation of the contribution of Science to the development of technology, settlement of social issues and the understanding of the relations in natural environment.
10. developing sensation, attitude and interest regarding the events that occur in nature,
12. developing the habit of scientific thinking using socio-scientific issues.

When the goals of the program were analyzed it can be seen that the goals 1, 2, 4, 8, 9, 10 and 12 are directly related to education for sustainable development. The 1st, 2nd, and the 10th goals are related to environmental aspects of education for sustainable development; 4th and the 9th ones are including social, environmental, and economic aspects of it; and the 8th and 12th goals are related to cultural aspects and systematic thinking in education for sustainable development. Moreover, based on the 4th goal, this program is expected to develop all the competencies of pre-service classroom teachers as it focuses on all the aspects of sustainable development as environmental, economic and social.

Skills and Values of the Program: This course focuses on life skills such as career awareness, awareness of sustainable development, analytic thinking, creativity, communication, group work and entrepreneurship. For the values, valuing science and research are emphasized, but the values regarding education for sustainable development are not mentioned. All of these are closely related to education for sustainable development as it was stated through the goals of the program.

4.9. Summary of the Results

As a result, descriptive statistics indicated that pre-service classroom teachers had positive attitudes towards environmental, cultural and socio-economic factor of sustainable development. Also, inferential statistics showed that pre-service classroom teachers' attitudes towards sustainable development had effect on the level of the development of the city they live. The level of development had statistically significant effect on teachers' attitudes of sustainable development with respect to cultural factor more than the socio-economic and environmental factors respectively. However, the education level of pre-service classroom teachers' fathers and mothers did not have statistically significant effect on their attitudes towards sustainable development with respect to "environmental", socio-economic" and "cultural " factors.

On the other hand, when the pre-service classroom teachers' perceptions on their competencies regarding education for sustainable development were analyzed, the overall results indicated that the pre-service classroom teachers perceive themselves competent to fulfill the requirements of education regarding sustainable development. The pre-service classroom teachers perceived themselves as more competent in the area of emotions compared with the other ones. Then, they felt competent in terms of values, systems-thinking, and knowledge respectively. The results also indicated that the level of development of the city the teachers live had statistically significant effect on their perceptions of competence on education for sustainable development. The level of development had statistically significant effect on teachers' perceptions of competence on ESD with respect to emotions, and values. However, the level of development did not have any statistically significant effect on their knowledge and systematic-thinking competencies. In addition, the education level of pre-service classroom teachers' fathers and their mothers did not have statistically significant effect on their perceptions of competences.

When the relationship between the attitudes of pre-service classroom teachers towards sustainable development and their perceived competences of education for sustainable development was investigated, it was found that as pre-service classroom

teachers reflect more positive attitudes towards sustainable development; they perceive themselves more competent in terms of education for sustainable development.

For the analysis of the learning opportunities of the curriculum of Classroom Teaching regarding education for sustainable development, the findings of the study revealed that although there are some learning opportunities for education for sustainable development, they are not clearly mentioned in goals, objectives and the content of the courses. Also, the learning opportunities are not well organized and detailed enough to develop the competencies of the pre-service classroom teachers especially in terms of knowledge and systems thinking. However, there are more learning opportunities for the development of the competencies of values and ethics and emotions regarding education for sustainable development.

CHAPTER V

DISCUSSION AND IMPLICATIONS

This chapter presents the discussion of the results and recommendations for practice and further research.

5.1. Discussion of Results

This chapter discusses the results of the study related to pre-service classroom teachers' attitudes towards sustainable development, the factors influencing their attitudes towards it; pre-service classroom teachers' perceived level of competency for education for sustainable development and the factors influencing their perceptions. Furthermore, this part discusses the relationship between pre-service classroom teachers' attitudes towards sustainable development and their perceptions of competence for education for sustainable development; and the analysis of the curriculum of classroom teaching in terms of the learning opportunities it provides to develop pre-service classroom teachers' competencies for education for sustainable development.

5.1.1. Pre-Service Classroom Teachers' Attitudes towards Sustainable Development

In relation to the first research question examining the attitudes of pre-service classroom teachers towards sustainable development, it was found that pre-service classroom teachers had positive attitudes towards sustainable development.

In this study, a new instrument to examine the attitudes of pre-service classroom teachers towards sustainable development was developed. Also, for the instrument, a factor analysis was conducted. According to the results the factor analysis, it was found that there were three factors of sustainable development that shape the attitudes of the pre-service classroom teachers as "environmental, cultural and socio-economic". Also, the studies of Corney (2006); McKeown, (2002); and Summers, Childs, and Corney (2005) support that there are three dimensions of

sustainable development as environmental, economic and social. For that reason, the attitudes of pre-service classroom teachers were also analyzed in terms of three dimensions of sustainable development. The findings indicated that teachers had positive attitudes towards the environmental and cultural aspects of sustainable development. However, their attitudes towards socio-economic aspects of sustainable development were less positive than the environmental and cultural aspects. The reason may be related to their understanding of sustainable development. As Kagawa (2007) emphasized in his study, the concept of sustainable development is predominantly associated with environmental aspects, and social and economic dimensions of sustainability were less represented. This can be because of its being more emphasized environmentally both in the international reports and coursebooks. Another reason may be related to the difficulty of understanding the socio-economic dimension of sustainability. As it is difficult to define each dimension and draw a line between them, it can be difficult for the pre-service classroom teachers as well to understand the concept of socio-economic sustainability. For that reason, there appears a need to emphasize the other dimensions of sustainable development especially in curricula.

Similarly, Birdsall (2014) also conducted a study to explore student teachers' understandings of sustainability. The findings of his study revealed that student teachers had a simplistic understanding of sustainability focusing only on the environmental aspect of sustainability. Moreover, consistent with the other studies about the attitudes towards sustainable development (e.g. Alkış & Öztürk, 2007; Summers, Corney, & Childs, 2004); Tuncer, Tekkaya, & Sungur (2006) also found that Turkish student teachers were conscious of the concept of sustainability, and they also mainly focused on the environmental aspects of sustainability.

On the other hand, in terms of the dimensions of sustainability, Borg, et al. (2014) also studied teachers' understanding of sustainable development with regard to their subject area. The study indicated that their understanding of sustainability differ according to their subject areas. While teachers of social studies emphasized social dimensions, science teachers focused on ecological dimensions. Although they

were aware of three dimensions, they did not have a holistic understanding of sustainability. Also, the study pointed out that there was a great uncertainty in teachers' understanding of economic dimension of sustainability.

Although their studies focused on the students' attitudes not the teachers' attitudes towards sustainable development, Kagawa (2007) and Leeuw, et al. (2014) also found that the majority of the students of university had positive attitudes towards sustainability. Their studies also indicated that the students strongly associated the concepts of sustainable development with the environmental aspects not with the economical and social aspects because of the emphasis given on environmental aspects throughout the world.

As it can be understood from these studies, for the pre-service classroom teachers, it is easier to understand the environmental aspects of sustainable development compared with the cultural and socio-economic aspects. The reason might be related to the global attitudes towards sustainable development. At the beginning, the protection of the environment was the main concern of the people as a result of global warming. For that reason, sustainability was considered as mainly focusing on the environmental protection of the world for the next generations. Also, the ease of providing environmental sustainability and the difficulty of providing socio-economic sustainable development might be another reason for them to be less positive about this aspect of sustainable development.

Apart from the descriptive findings on attitudes, the differences in pre-service classroom teachers' attitudes with respect to the level of development of the city they live, and their parents' education level were examined.

The results indicated that pre-service classroom teachers' attitudes towards sustainable development change according to the level of the development of the city they live. The development levels of the cities are determined by "The Research of the Socio-economic Order of the Provinces and The Districts" (SEGE-2011) and ordered from the highly developed cities to the low developed ones from the 1st to the 6th (The Ministry of Development, 2013). It was concluded that the level of development had statistically significant effect on teachers' attitudes of sustainable

development with respect to cultural aspects more than the socio-economic and environmental aspects respectively.

With regard to the cultural aspects, the results indicated that the pre-service classroom teachers living in the cities in the higher level of development had more positive attitudes towards cultural sustainability, compared to the pre-service classroom teachers living in the cities with lower level of development who demonstrated less positive attitudes. The reason of the influence of the level of development of the cities on teachers' attitudes towards sustainable development might be explained by the indicators of the level of development of the cities determined by SEGE (The Ministry of Development, 2013). Firstly, demographic indicators such as population density, actual migration rate and urbanization rate may create this difference. As the cities are ordered according to the rate of demographic indicators such as population density, actual rate of migration and urbanization, the cities in the first level of development are more crowded, urbanized and they accept more emigrants. That is, there is more cultural diversity in these cities compared with the other ones that are in the lower level of development. For that reason, pre-service classroom teachers might be more aware of this diversity and they could be more positive about cultural sustainability that supports this diversity. They might think that people from different cultures should be able to live together as a result of sustainable development, as they might be able to live together easily in their cities that are in higher level of development. Also, as urbanization is closely related to economic development, they may be more positive about sustainable development's social and economic support on cultural aspects of sustainability. Secondly, educational indicators could also explain the differences in the pre-service classroom teachers' attitudes. The higher rate of literacy and the higher rate of faculty or college graduates could shape the attitudes of the people living in these cities. In that way, pre-service classroom teachers' attitudes towards cultural diversity and living together with people from different cultures might be more positive.

Moreover, with regard to the environmental aspects, the findings indicated that the pre-service classroom teachers living in the cities of higher level of development

had more positive attitudes towards environmental sustainability, as compared to the pre-service classroom teachers living in the lower level of development. The reason of the influence of the level of development of the cities on teachers' attitudes towards environmental sustainability might also be explained by the indicators of the level of development by SEGE (The Ministry of Development, 2013). From these indicators, quality of life indicators may create the differences in the attitudes of pre-service classroom teachers. For instance, among the quality of life indicators, the electricity consumption of a residential area per capita and the number of private cars per ten thousand are also the causes of environmental problems of a city. For that reason, although the higher levels in electricity consumption and the higher number in the use of private cars show higher levels of development of the cities, they also damage the environment. As the people living in those cities come across such problems more often, they are more aware of environmental issues like energy consumption, alternative energies, recycling and environmental protection. For that reason, they may have positive attitudes towards sustainable development as a solution to these problems. Moreover, as Kılıç and Yücel (2013) have explained, there is a relationship between economic situation of a city and the protection of the environment. It is stated that, sometimes better economic situations bring environmental problems. For that reason, protection of environment gain higher importance. Therefore, as the people living in the cities of higher level of development have better economic conditions, they focus on the protection of environment more.

However, for the socio-economic factor, the results indicated that in contrast to the environmental and cultural factors, the pre-service classroom teachers living in the 1st level of development, which is the highest level, had less positive attitudes towards sustainable development in terms of socio-economic aspects compared with the ones living in the 2nd, 5th and the 6th level of development. Although the socio-economic status of the pre-service classroom teachers living in the 1st level of development is expected to be higher, the pre-service classroom teachers living in the cities of 1st level of development had less positive attitudes towards socio-economic

sustainability. They stated that they were not sure that sustainability can reduce poverty. Also, they were not sure that sustainability can provide gender equality or equality for everyone. The reason might be that although they are living in a higher socio-economic region, they may come across the problems of poverty and inequality. Therefore, they may not be sure that sustainable development can be a solution to these problems. However, the pre-service classroom teachers living in the other cities may have a hope for the solution of these problems with socio-economic sustainability.

The other factor that was assumed to influence the attitudes of pre-service classroom teachers toward sustainable development was parents' education. The results of the study indicated that the education level of pre-service classroom teachers' fathers and mothers did not have statistically significant effect on their attitudes towards sustainable development with respect to "environmental", socio-economic" and "cultural" factors. However, Erkal, et al. (2011) emphasized that family is the beginning of the socialization process and also it is the first place where each individual is prepared for the society. Family plays an important role in shaping the behaviors of the individuals. Also, it has an important effect on the behaviors of the individuals regarding their decisions about consumption. In addition, according to Saraçlı, Yılmaz, Arslan's (2014) study, mothers' education levels has a significant effect on students' environmental behaviors. Students whose mothers have graduated from a university promise to be active environmentalists by joining in related organizations.

However, in this study, although the pre-service classroom teachers' attitudes towards sustainable development are positive, their attitudes do not change according to the education level of their parents. The reason might be related to their departments. As they are the students of education faculties and the pre-service classroom teachers of the future, they might be more conscious about their attitudes towards environmental, cultural and socio-economic issues. Also, their knowledge, values, emotions and thinking skills may shape their attitudes rather than what they learned and experienced from their parents' education level (Kollmuss and

Agyeman, 2002). As it can also be understood from the study, their curriculum provides them with some knowledge of education for sustainable development and provides learning opportunities to understand it.

5.1.2. Pre-Service Classroom Teachers' Perceived Level of Competency Regarding Education for Sustainable Development

When the pre-service classroom teachers' perceptions on their competencies regarding education for sustainable development were analyzed, the overall results indicated that the pre-service classroom teachers perceived themselves competent to fulfill the requirements of education for sustainable development.

In this study, the pre-service classroom teachers' perspectives were analyzed in the competence areas of emotions, knowledge, values-ethics and systems-thinking. The pre-service classroom teachers perceived themselves more competent in the area of emotions compared to the areas of values, systems-thinking, and knowledge respectively.

The first area that the pre-service classroom teachers felt competent was emotions. Most of them felt competent in relating the subjects regarding emotions with their own lives. They also felt competent in developing feelings of empathy and identification with other human beings, and they could show the impact of emotions on perception, judgment, and decisions in their own lives. Also, "thinking, reflecting, valuing, taking decisions and acting are inseparably tied to emotions" and emotions are "an essential part of the decision making process" (Cornelius, 1996, as cited in Sleurs, 2008). For that reason, Arnold (2004), and Otto (2000) (as cited in Sleurs, 2008) considered emotions as "the driving force and primary system for motivation". Therefore, seeing that the pre-service classroom teachers feel competent the most in emotions is the indication of their motivation for the education for sustainable development. It can be said that as they provided the driving force for the motivation for sustainable development, it could be easier to develop the other competencies of sustainable development. Also, their motivation might be used for the development of sustainable development by supporting the other areas of competencies such as values and ethics, systems thinking and knowledge with their curriculum. On the

other hand, Besong and Holland (2015) studied sustainability competencies with final year undergraduate students in Higher Education. They used The Dispositions, Abilities and Behaviors (DAB) method to determine their competencies. As a result, they found that many of the higher education learners were not willing to develop climate action plans for their communities that indicated their level of motivation. However, it is promising to see that the pre-service classroom teachers in classroom teaching departments in Turkey perceived themselves competent in emotions that are considered as the driving force for the motivation.

The findings of the study indicated that the second area that pre-service classroom teachers felt competent was values and ethics. As it is highlighted in Sleurs (2008)'s study, education for sustainable development is also founded on values, and values have a great impact on our behaviors. For that reason, for the pre-service classroom teachers, it is highly crucial that they feel competent in values and ethics. In that way, they can model values of respect, equality, justice, dignity and respect for all the people that underpin sustainable development in their classes. Also, they can encourage their students to determine a stance in the face of events. Moreover, they can encourage them to discuss their own values. As a result, the findings of the study indicated that the second area that pre-service classroom teachers feel competent was values and ethics because their curriculum paid more attention to the recognition of emotions, and values and ethics of sustainable development which are promising for the transformation of education for sustainable development into the behaviors in schools.

The third area that the pre-service classroom teachers felt competent was systems-thinking. Most of the participants believe that they can easily make students aware that schools are part of local, national and global systems and they can also make their students feel that they are all living in a system and the systems in a society have great importance. However, only some of the participants feel competent in promoting critical thinking environments for SD and organizing settings which allow learners to experience different perspectives of sustainable development. Systems thinking can also help teachers "understand and act in a

sustainable way in a local as well as a global context” (Sleurs, 2008). For that reason, it is highly important that pre-service classroom teachers should have the competencies in that area for acting in a sustainable way especially in their local contexts by analyzing the global ones. On the other hand, although the analysis of curriculum indicates that there are some learning opportunities to develop the competence of systems thinking, the perceptions of the teachers show that the level of their feeling competent in systems thinking is lower than emotions, and values and ethics. For that reason, it is highly recommended to structure the activities of developing systems thinking competence in the curriculum. In order to develop systems thinking competence, the pre-service classroom teachers need to have basic knowledge about sustainable development, and then they can think in systems and make their students think in systems.

The last area that pre-service classroom teachers felt competent was knowledge. Only some of the participants believe that they can create an effective learning environment for teaching sustainable development issues and some of them feel competent in informing students about the key concepts of sustainable development. Also, some of them can explain the economic, social and environmental aspects of sustainable development to students. They felt the least competent in selecting educational goals for ESD, by taking into account the developmental stage and the prior knowledge of the students, and the diversity within the group learners. This indicated that their knowledge about sustainable development is not enough to select educational goals for the students. In addition, from all the four areas of competency, they felt the least competent in knowledge. The reason of this might be that there are not any specific description of sustainable development and its principles, and detailed information about the importance of sustainable development in their curriculum. Therefore, the objectives of the courses should clearly be set for the establishment of sustainable development and the content of them should be organized accordingly. Also, there might be some activities for the practice of selecting educational goals for ESD and creating effective learning environments for teaching ESD issues.

When all the areas of competencies are compared, it can be seen that although the pre-service classroom teachers perceive themselves less competent in the area of knowledge and systems thinking for education for sustainable development, they perceive themselves more competent in the areas of emotions and values and ethics. This indicates that they might not be sure about their content knowledge for education for sustainable development and for that reason; it could be difficult for them to have systematic thinking for education for sustainable development. As Bertschy, Künzli and Lehman (2013) emphasized, institutions of teacher education should help teachers develop competencies that are specified according to the specific goals of sustainable development. When they have specified goals, teachers might also be aware of them, and they could have organized information about it. In that way, it could also be easier to think in systems.

Also, critical thinking, problem solving, and decision making skills are emphasized with sample activities in their curriculum, however; this does not affect their perception of competence in systems thinking much. Another reason might be that sustainable development may not be emphasized in the other courses of the curriculum. The study of Sims and Falkenberg (2013) on developing competencies for education for sustainable development in undergraduate and graduate teacher education programs at Canadian universities emphasized inter-disciplinary learning. The results of the study suggested the importance of experiential, inter-disciplinary and inter-institutional learning, and of building partnerships with colleagues, students, and community organizations.

As a result, there is a need to support the development of the competencies of pre-service classroom teachers regarding education for sustainable development in their departments further. Although they feel competent in emotions and values and ethics, their competencies of knowledge and systems thinking are also needed to be supported by clearly specified objectives and interdisciplinary learning environments.

5.1.2.1. Pre-Service Classroom Teachers' Perceived Level of Competency in relation to the Level of Development and Parents Education

This section includes the discussion of the results about the pre-service classroom teachers' perceived level of competency for education for sustainable development by the level of development of the city they live and the education level of their parents.

The results revealed that the level of development of the city the teachers live had statistically significant effect on their perceptions of competence on education for sustainable development. The level of development had statistically significant effect on pre-service classroom teachers' perceptions of competence on education for sustainable development with respect to emotions, and values. However, the level of development did not have any statistically significant effect on their knowledge and systems thinking competencies. The curriculum of classroom teaching is expected to have an effect on the competencies of knowledge and systems thinking.

In general, emotions are intertwined with values. It is difficult to draw a line between them. "Values and emotions are closely related to each other: emotions always have a valuing character and values or valuing is always also emotional." (Schmitz, 2000, as cited in Sleurs's, 2008). In addition, ESD is considered to be basically about values and especially the value of respect. Respect is at the centre and it includes the respect for others, for present and future generations, for difference and diversity, for the environment, and for the resources of the planet we inhabit (UNESCO, nd.). Therefore, this could be the reason of their being together effected from the level of development of the cities. Also, emotions and values are constructed as a result of individuals' interaction with each other and shaped by the environment they live in. Therefore, the level of development directly affects the emotions and values of the pre-service classroom teachers who live in that area.

It is not also strange that values are affected from the level of development of the cities. "Our values are shaped by the "microsystem", which is comprised of the immediate social net—family, neighbors, peer-groups, etc; by the 'exosystem' such as the media and political organizations; and 'macrosystem', the cultural context in

which the individual lives” (Fuhrer et al., 1995, as cited in Bertschy, Künzli & Lehman, 2013). Therefore, the city the pre-service classroom teachers live and its level of development shape their competence of values for education for sustainable development, because each city has its own environmental, socio-economic, political and cultural values.

In addition, in order to examine the differences between pre-service classroom teachers’ perceptions on values and emotions in terms of the level of the development of the city they live, post hoc analysis was performed. Although almost all of them agree about their feeling competent on that area, this result showed that the teachers who lived in the cities of 6th level of development, which is the lowest, perceived themselves less competent with regard to the values of ESD than the others living in the cities of higher level of development. As the findings also indicated that from the competencies of values and ethics, the one that is related to “not imposing one’s own values to students” had the lowest mean, the pre-service classroom teachers living in the cities of lower level of development might be highly attached to their own values that were shaped by that city’s own environmental, cultural, political and socio-economic values; and they might think that it would be more difficult for them to help their students develop their own values in the future without imposing their own values.

On the other hand, the results of the study indicated that the education level of pre-service classroom teachers’ fathers and their mothers did not have statistically significant effect on their perceptions of competence on education for sustainable development with respect to “emotions”, “knowledge”, “values & ethics”, and “systems-thinking”.

There could not be found any study indicating the effect of parental education level on teacher competencies for education for sustainable development. The reason might be that as they are university students most of them do not live with their family for a long time, so there may be more vital factors that affect teacher competencies in their living environments such as the development level of the cities they live or the learning opportunities their curriculum provide.

5.1.3. Relationship between Attitudes and Competencies

When the relationship between the attitudes of pre-service classroom teachers towards sustainable development and their perceived competencies of education for sustainable development was investigated, it was found that as pre-service classroom teachers reflect more positive attitudes towards sustainable development; they perceive themselves more competent in terms of education for sustainable development.

The higher levels of relationships are between the environmental and cultural attitudes and the competencies of systems thinking, values and ethics, and emotions. The relationship between the attitudes of the pre-service classroom teachers and their perceived competence of knowledge is in the lowest level. That is, when they have more positive attitudes towards environmental and cultural factors, they feel more competent in emotions, values and ethics and systems thinking; however, they do not feel more competent in knowledge area. Therefore, it could be said that the environmental and cultural attitudes and the competencies of emotions and values and ethics are related to each other. The reason might be that emotions and values could easily be affected by attitudes. However, it is expected to recognize a relationship between the competency of knowledge and the learning activities of a curriculum.

In conclusion, although this study found a relationship between the attitudes of pre-service classroom teachers towards sustainable development and their perceived competencies of education for sustainable development, there is lack of study on that area in the literature.

5.1.4. Opportunities in the Curriculum of Classroom Teaching for Developing ESD Competencies

In order to find whether the curriculum of Classroom Teaching provide learning opportunities for Education for Sustainable Development, document analysis was conducted for the courses of Life Studies Teaching, Social Studies Teaching and Science and Technology Teaching I-II. In addition, as the pre-service classroom teachers are required to analyze the curricula of Life Studies, Social

Studies and Science and Technology courses prepared by MoNE in their departments, these courses were also analyzed. As a result of the analysis, some findings were drawn.

Firstly, the findings of the study indicated that the general goals and the objectives of Classroom Teaching curriculum seemed to include goals and objectives about education for sustainable development in general. Although they were not stated in detail, the goals and objectives focused on “*the society*”, “*sustaining national and international collaboration and cooperation*”, and “*being sensitive to the society and environment*” all of which were among the basic premises of education for sustainable development. However, the Primary Education curriculum does not directly include the term “sustainable development” or “the principles” of it in its goals and objectives in detail. For this reason, there is a need of direct description of the goals and objectives regarding education for sustainable development. In that way, awareness of sustainable development for the pre-service classroom teachers could be raised firstly.

In order to see the place of education for sustainable development in detail, some courses were chosen and analyzed. As for the Life Studies Teaching, it could be said that the learning outcomes of Life Studies Teaching course did not reflect any direct outcome related to education for sustainable development. However, after the analysis of some course books, it was seen that some of the competencies of teachers were tried to be developed. This course was expected to develop pre-service classroom teachers’ competencies of “*emotions*” and “*values and ethics*” by emphasizing being respectful to the cultural values and emotions of students in designing activities. In addition, “*systems thinking*” competence was tried to be developed by critical thinking and problem solving skills.

On the other hand, the Life Studies curriculum of MoNE (Ministry of National Education) also includes the basics of education for sustainable development. For instance, within its aims raising individuals who are “sensitive to the nature and environment” and also “developing skills for keeping the nature and the environment clean and protecting them” is highlighted. For that reason, the pre-service classroom

teachers are needed to have the competencies of education for sustainable development to raise the individuals as stated in the curriculum.

As for the Social Studies Teaching course, it can be said that it aims to provide some learning opportunities for education for sustainable development. The course emphasizes “democracy education” and “values education” which are among the concepts of education for sustainable development. The content of the course and the course books also try to develop the skills of the pre-service classroom teachers for this aim. However, the content of education for sustainable development is not provided directly. It would be better to include a chapter for the description and explanation of some concepts of sustainable development especially to develop the competencies of knowledge and systems thinking.

The Social Studies Curriculum of MoNE also emphasizes “democratic values” and “human rights” such as “being respectful to everybody’s rights and values”, “being ethical” and “being tolerant to differences”. Therefore, pre-service classroom teachers are considered to develop their competence of “*knowledge*” and “*values and ethics*” in Social Studies Teaching courses in their universities. They are also expected to have knowledge about how to become “environmentally sensitive” and “how to develop organizing skills such as critical thinking and creative thinking” which requires the development of the competencies of “*knowledge*” and “*systematic thinking*”.

As for Science and Technology Teaching I-II, it can be seen that these courses basically include critical thinking, creative thinking and inquiry skills. In that way, they provide some learning opportunities for “*systems thinking*” competence of education for sustainable development. Also, the selected course book of the courses indicates “Sustainable Development” as the sub-learning areas of the course. Moreover, it could be recognized that sustainable development is integrated to the other sub-learning areas. Therefore, as a result of covering this course, the pre-service classroom teachers might develop their competencies for education for sustainable development as a whole.

Moreover, specific to this course, as for the 21st century skills, STEM Approach (Science, Technology, Engineering, and Maths), in Turkish called as FeTeMM (Fen, Teknoloji, Mühendislik, Matematik) was explained in the course book. It can be said that the skills of this approach such as critical thinking and problem solving skills, and social and intercultural skills and the skills of education for sustainable development overlaps and this provides learning opportunities for education for sustainable development. The study of this approach is expected to help pre-service classroom teachers develop their “*systems thinking*” competence for education for sustainable development.

In general, it can be said that the selected courses of Classroom Teaching do not include the content of sustainable development in all aspects. However, some basics of it are included. On the other hand, although the selected courses do not include directly the acquisition of sustainable development; through the analysis of the curriculum of some courses provided by MoNE, as the requirement of the courses, the pre-service classroom teachers are considered to recognize the requirements of those courses. Nevertheless, as the pre-service classroom teachers’ level of competence of knowledge is lower than the other competencies, there is a need for the clearly stated description of sustainable development integration to the curriculum of Classroom Teaching. As they are the future teachers, in order to carry out the aims of Life Studies, Social Studies, and Science and Technology courses, they are required to know the content of sustainable development.

On the other hand, in Turkey, there are some curriculum analyses for the learning opportunities for sustainable development and in general the findings are parallel to each other. Tanrıverdi (2009) also analyzed primary school curriculum in Turkey regarding sustainable environmental education. He found out in his study that, the learning outcomes are based on knowledge and comprehension of sustainable environmental education rather than developing skills, values and perspectives of sustainability. However, it was found helpful to improve students’ awareness and to develop positive attitudes towards environment they lived in. In

addition, the content of the curriculum was found related to the protection of our local nature, rather than sustainable environmental education.

In addition, Demirbaş (2011) analyzed the curriculum of geography course in terms of sustainable development and he found that the curriculum of Geography course aims to create awareness towards sustainable development. Also, in Kaya and Tomal's (2011) studies, the Social Studies curriculum was examined in the context of sustainable development training. As a result, it was found that although there were some learning areas related to sustainable development, some parts of the learning areas were not enough to learn about sustainable development.

The findings of the studies conducted abroad have also the similar results. Firth and Winter (2007) studied the sustainable development in geography courses in UK and they indicated the need of more structured curriculum for the reorientation of teacher education. Moreover, Jóhannesson et al. (2011), made a project about curriculum analysis and education for sustainable development in Iceland. As a result, he found out that although the Icelandic curriculum for early childhood was compulsory and upper secondary schools did not include a clear view towards education for sustainability, it provided teachers and schools with some guidance on education for sustainable development.

To sum up, the present study focused on the analysis of the learning opportunities of the curriculum of Classroom Teaching in terms of education for sustainable development. The findings of the study have indicated that although there are some learning opportunities for education for sustainable development, they are not clearly mentioned in goals, objectives and the content of the courses. Also, the learning opportunities are not well organized and detailed enough to develop the competencies of the pre-service classroom teachers especially in terms of knowledge and systems thinking. However, there are more learning opportunities for the development of the competencies of values and ethics, and emotions for education for sustainable development. For that reason, there is a need for the clearly organized curriculum of Classroom Teaching regarding the development of teacher competencies for education for sustainable development. As they will be the ones

that are going to give these courses to the primary school students, the pre-service classroom teachers should be competent enough in terms of education for sustainable development with the help of their studies in their departments.

5.2. Implications for Practice

The present study indicated the attitudes of pre-service classroom teachers towards environmental, cultural and socio-economic aspects of sustainable development. It also reflected their perceived level of competencies on education for sustainable development. The effects of their fathers' and mothers' level of education and the level of the development of the cities in which they live on their attitudes and perceived competencies were also indicated. In addition, it presented the learning opportunities provided in the curriculum of Classroom Teaching Department. Therefore, the results of the study might be used for the development of positive teacher attitudes towards sustainability and teacher competencies for education for sustainable development. Also, the current study will be helpful in determining teacher competencies for education for sustainable development by indicating the competency areas and presenting a scale for this. Moreover, it will be completely efficacious for the implementation of education for sustainable development in teacher education curricula by indicating the strengths and weaknesses of classroom teaching curriculum regarding education for sustainable development. In this section, suggestions for practice are provided regarding the integration of education for sustainable development to the teacher education curricula at universities based on the findings of the study.

The findings of the study have indicated that although pre-service classroom teachers are aware of the concept of sustainable development and have positive attitudes towards it, their basic knowledge about its principles are not so clear and their perceived level of knowledge competence is also low. It has been seen that they are not completely equipped with the knowledge about the key concepts of sustainable development, basic principles of it, selecting educational goals for it and creating powerful learning environment in classes accordingly. Also, they do not have enough information about the economic, social and cultural aspects of

sustainable development. For that reason, the curriculum of Classroom Teaching in education faculties should include some courses related to education for sustainable development. These courses could include the definition of sustainable development, its pillars, dimensions, and its goals and basic principles. Moreover, how sustainable development can be applied and taught to primary school students should also be added to the syllabus of the courses. There are some countries providing this kind of courses to their students. For instance sustainable development in education for Russia is stated as one of the most important prerequisites for sustainable development in society. The elements of sustainable development were introduced into the curriculum of St Petersburg State University including compulsory courses relevant to sustainable development in 14 faculties out of 20 (Verbitskaya, Nosava and Rodina, 2002).

In addition to this, sustainable development could be integrated to the content of all the courses emphasizing the importance of it with clearly stated goals and objectives both in theory and in practice. This also should be done in parallel with the curriculum of MoNE because its curricula include more aims for the teaching of sustainable development. If teachers are not equipped with the knowledge of sustainable development in their pre-service years, it could be difficult for them to teach it to their students. For that reason, curriculum studies of education faculties and MoNE should be done hand in hand. Also, as there are international agreements about teacher education for sustainable development, this integration should be applied to all the departments of education faculties for the sustainability of sustainable development.

The Ministry of National Education in Turkey has also some studies about teacher competencies. In 2008, it has determined some teacher competencies as generic teacher competencies and field specific competencies for subject specific training. For generic teacher competencies, some sub competencies included in “School-Family and Society Relationships” are related to education for sustainable development. For the teachers of classroom teaching, there are also eight field-specific competency areas. From these eight areas, the seventh one, which is about

individual responsibilities and socialization, has also some competencies related to education for sustainable development. However, it would be better to have a specific area related to the competencies on education for sustainable development both in generic teacher competencies and field specific competencies. On the other hand, although, MoNE has determined these subject specific competencies, they are not included among the aims of curriculum of classroom teaching. It would be better for the education faculties to work collaboratively with MoNE for determining and developing teacher competencies on education for sustainable development.

On the other hand, The Board of Higher Education (YÖK) in Turkey could constitute some comities for the research of education for sustainable development. These comities could study on finding some international sources about the theory of sustainable development and practices of it, translating the sources into Turkish, determination of the content of the courses, and integration of education for sustainable development to our teacher education curricula.

Moreover, universities could study and determine the key competencies for sustainable development and inform pre-service classroom teachers about them. Also, they might study about determining new competencies for sustainable development and how to develop the competencies of the teachers and how to revise their curriculum accordingly. In addition, in developing the competencies of pre-service classroom teachers, this study offers highly valuable information. Especially, the competencies of knowledge and systems thinking should be paid more attention in designing the curriculum. Although the learning opportunities of the curriculum for developing systems thinking seem more, the pre-service classroom teachers felt less competent in systems thinking competence. For that reason, the activities for developing systems thinking should be revised. In addition, designing national or global projects to enhance sustainable development that will require the competency of emotions, values and ethics, and especially systems thinking and knowledge could be integrated to their curriculum for the development of all their competencies of ESD and for the support of developing sustainable development.

On the other hand, the findings of the study have indicated that there is a positive relationship between the attitudes of the teachers towards sustainable development and their perceived competencies of education for sustainable development. For that reason, it is thought that if pre-service classroom teachers are informed about sustainability in detail, they will have more positive attitudes towards sustainable development. In addition to these positive attitudes, when they also get enough training about education for sustainable development, they could be more competent on education for sustainable development. As a result, they could train better equipped students with sustainable development.

Furthermore, the findings obtained from this study have indicated that the development level of the cities the pre-service classroom teachers live have an effect both on the attitudes of the teachers towards sustainable development and their perceived competency of values for education for sustainable development. For that reason, pre-service classroom teachers could be informed about these differences among different levels of development that shape their attitudes and perceptions. Also, in order to minimize these differences, the curriculum of education faculties should be revised and the instructors at these universities should be trained accordingly. In addition, pre-service classroom teachers might be given a chance to visit some universities in different levels of development with exchange programs to be informed about the reasons of the differences about the levels of development of the cities. In that way, this could also be helpful for their future jobs. When they graduate, they will work in the cities that will have different levels of development. If they could be informed about these differences in terms of sustainable development, it would be easier for them to educate their students and establish sustainable development.

5.3. Implications for Further Research

In this study, a new instrument was developed to examine pre-service classroom teachers' attitudes towards sustainable development and their perceived level of competencies on education for sustainable development. For the first part of

the instrument, more variables could be added to the instrument to analyze their effects for further studies. Also, especially for the second and the third part of the instrument, social desirability might be controlled and some studies might be carried out accordingly for further research. Curriculum analysis for learning opportunities regarding education for sustainable development could also be enlarged with observations of classes and interviews with instructors of those courses and pre-service classroom teachers.

On the other hand, qualitative research could also be conducted to obtain information about pre-service classroom teachers' attitudes towards sustainability and their perceived competencies of education for sustainable development through interviews. Also, another research might be conducted on the attitudes and competencies of teachers from different departments at universities or of the teachers teaching in different fields. Moreover, the competencies of teachers regarding education for sustainable development could be analyzed in primary, secondary or higher education institutions. These studies might be conducted through surveys, observations or interviews. Furthermore, the attitudes of students in different levels of education might also be analyzed to see to what extent sustainable development is covered in classes. In addition, although it could not be so practical, intercultural differences might also be analyzed regarding teacher attitudes and competencies. Also, the curricula of teacher education in different countries might be compared with each other regarding education for sustainable development.

Finally, as the concepts of sustainable development and education for sustainable development are relatively new, the number of the studies on these areas is quite less especially in Turkey. As a result, more research can be conducted on these areas especially in terms of teacher education as locally and globally.

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APPENDICES

Appendix A SAMPLE COPY OF THE DATA COLLECTION INSTRUMENT

ÜNİVERSİTE ÖĞRENCİLERİNİN “SÜRDÜRÜLEBİLİR KALKINMA İÇİN EĞİTİM YETERLİKLERİ” ÖLÇEĞİ

BÖLÜM 1: KİŞİSEL BİLGİLER

1. Cinsiyetiniz Kadın Erkek
2. Yaşınız 18-20 21-23 24-26 27-29
3. Öğrenim görmekte olduğunuz üniversitenin ve bölümünüzün adı nedir?

4. Babanızın eğitim düzeyi
 Okuryazar değil
 Okuma yazma biliyor ama diploması yok
 İlkokul
 Orta okul
 Lise
 Yüksekokul
 Üniversite
 Lisansüstü
5. Annenizin eğitim düzeyi
 Okuryazar değil
 Okuma yazma biliyor ama diploması yok
 İlkokul
 Orta okul
 Lise
 Yüksekokul
 Üniversite
 Lisansüstü

e sürdürülebilir kalkınmayı kapsayan bir ders veya benzeri bir eğitim aldınız mı?

Evet (Lütfen konu başlığını belirtiniz.)

Hayır

7. ‘Sürdürülebilirlik’ ya da ‘Sürdürülebilir Kalkınma’ ile ilgili kişisel düşüncenizi yansıtan üç anahtar kelime veya kısa cümle yazınız.

1. _____

2. _____

3. _____

8. ‘Sürdürülebilir Kalkınma için Eğitim’ ile ilgili kişisel düşüncenizi yansıtan üç anahtar kelime veya kısa cümle yazınız.

1. _____

2. _____

3. _____

BÖLÜM II: SÜRDÜRÜLEBİLİR KALKINMAYA YÖNELİK TUTUM

Bu bölüm sizin “sürdürülebilir kalkınma” ile ilgili tutumunuzu belirlemek amacıyla hazırlanmıştır. Lütfen aşağıda verilen ifadeleri dikkatle okuyunuz ve bu ifadelere yönelik görüşünüzü beşli ölçek üzerinde bir seçeneği işaretleyerek belirtiniz. Yanıtsız ifade bırakmayınız.

No	İfadeler/ Önermeler	Kesimle katılmıyorum.	Katılmıyorum.	Kısmen katılıyorum.	Katılıyorum.	Kesimlikle katılıyorum.
1	Sürdürülebilir kalkınmanın çevrenin korunması için gerekli olduğunu düşünüyorum.	1	2	3	4	5
2	Sürdürülebilir kalkınmanın sağlanabilmesi için mümkün olduğunca az enerji tüketilmelidir.	1	2	3	4	5
3	Çevreye zarar vermemek için alternatif enerji kullanılması gerektiğini düşünüyorum.	1	2	3	4	5
4	Mümkün olan her alanda geridönüşüme uygun ürünler kullanılması gerektiğini düşünüyorum.	1	2	3	4	5
5	Dünyada gelecek nesillere yetecek kadar çok doğal kaynak olduğu için sürdürülebilir kalkınmaya gerek <u>olmadığına</u> inanıyorum.	1	2	3	4	5
6	Sürdürülebilir kalkınmanın toplumsal kalkınmayı destekleyeceğine inanıyorum.	1	2	3	4	5
7	Sürdürülebilir kalkınmanın kadın-erkek eşitliğini sağlayabileceğine inanıyorum.	1	2	3	4	5
8	Sürdürülebilir kalkınmanın dünyadaki tüm insanlara eşitlik getireceğine inanıyorum.	1	2	3	4	5
9	Bir toplumda kültürel çeşitliliğin desteklenmesi gerektiğini düşünüyorum.	1	2	3	4	5
10	Farklı kültürlerden insanların birarada yaşayabilmesi gerektiğine inanıyorum.	1	2	3	4	5
11	Sürdürülebilir kalkınmanın ekonomik büyümeye katkıda bulunduğunu düşünüyorum.	1	2	3	4	5
12	Sürdürülebilir kalkınmanın yoksulluğu azaltacağına inanıyorum.	1	2	3	4	5
13	Sürdürülebilir kalkınma için ihtiyacımız olandan fazla ürünün <u>tüketilmemesi</u> gerektiğine inanıyorum.	1	2	3	4	5
14	Ekonomik büyümenin sürdürülebilir kalkınmadan öncelikli olması gerektiğini düşünüyorum.	1	2	3	4	5

BÖLÜM III: SÜRDÜRÜLEBİLİR KALKINMA İÇİN EĞİTİM

Bu bölüm sürdürülebilir kalkınma için eğitim konusundaki yeterliklerinizi kendi görüşleriniz çerçevesinde belirlemeyi amaçlamaktadır. Aşağıda verilen ifadeler için, bu

yeterliklere sahip olma düzeyinize yönelik görüşlerinizi beşli ölçek üzerinde bir seçeneği işaretleyerek belirtiniz. Lütfen cevapsız ifade bırakmayınız.

No	İfadeler	Kesinlikle katılmıyorum.	Katılmıyorum.	Kısmen katılıyorum.	Katılıyorum.	Kesinlikle katılıyorum.
1	Öğrencilere sürdürülebilir kalkınmanın ekonomik, sosyal ve çevresel boyutlarını açıklayabilirim.	1	2	3	4	5
2	Öğrencileri sürdürülebilir kalkınmanın temel kavramları hakkında bilgilendirebilirim.	1	2	3	4	5
3	Öğrencilerin gelişim aşamaları ve öğrenci gruplarındaki çeşitliliği de dikkate alarak “Sürdürülebilir Kalkınma için Eğitim” konusunda öğrenci kazanımları belirleyebilirim.	1	2	3	4	5
4	Sürdürülebilir Kalkınma ile ilgili konuların öğretimi için etkili öğrenme ortamları oluşturabilirim.	1	2	3	4	5
5	Kendi değerlerimi ve fikirlerimi öğrencilerime empoze etmem.	1	2	3	4	5
6	Öğrencileri olaylar karşısında kendi duruşlarını belirlemeleri konusunda cesaretlendirebilirim.	1	2	3	4	5
7	Sürdürülebilir kalkınmanın temelini oluşturan “saygı, eşitlik, adalet, onur ve çeşitliliğe saygı” gibi “değerler” konusunda onlara örnek olabilirim.	1	2	3	4	5
8	Öğrencilerin kendi “değer”leri üzerinde tartışabilmelerini sağlayabilirim.	1	2	3	4	5
9	Okulların yerel, ulusal ve küresel sistemlerin bir parçası olduğunu öğrencilerin farketmesini sağlayabilirim.	1	2	3	4	5
10	Öğrencilere her zaman bir sistemin içinde olduklarını ve toplum içindeki bu sistemlerdeki önemlerini hissettirebilirim.	1	2	3	4	5
11	Öğrencilerin sürdürülebilir kalkınma konusuna farklı açılardan bakmalarına imkan verecek farklı ortamlar düzenleyebilirim.	1	2	3	4	5
12	Sınıfta sürdürülebilir kalkınmaya yönelik eleştirel düşünceyi teşvik edici etkinlikler hazırlayabilirim.	1	2	3	4	5
13	Öğrencilerimin empati kurma yeteneklerini geliştirebilmeleri için gerekli öğrenme ortamları oluşturabilirim.	1	2	3	4	5
14	Duygularımızın içinde bulunduğumuz kültüre göre değiştiğini öğrencilerime anlatabilirim.	1	2	3	4	5
15	Öğrencilere duyguların; algılarımız, yargılarımız ve özellikle de aldığımız kararlar üzerindeki etkilerini gösterebilirim.	1	2	3	4	5
16	Duygularla ilgili konular işlenirken öğrencilerin kendi hayatlarıyla ilgili konularla ilişkilendirebilirim.	1	2	3	4	5

- Anket bitmiştir, teşekkür ederim. -

Appendix B TABLES AND FIGURES REGARDING ANALYSES

Table 1.1

The Provinces according to their Level of Development

1 st Degree of Development	2 nd Degree of Development	3 rd Degree of Development	4 th Degree of Development	5 th Degree of Development	6 th Degree of Development
İstanbul	Tekirdağ	Balıkesir	Rize	Sinop	Diyarbakır
Ankara	Denizli	Manisa	Düzce	Giresun	Kars
İzmir	Bolu	Mersin	Nevşehir	Osmaniye	Iğdır
Kocaeli	Edirne	Uşak	Amasya	Çankırı	Batman
Antalya	Yalova	Burdur	Kütahya	Aksaray	Ardahan
Bursa	Kırklareli	Bilecik	Elazığ	Niğde	Bingöl
Eskişehir	Adana	Karabük	Kırşehir	Tokat	Şanlıurfa
Muğla	Kayseri	Zonguldak	Kırıkkale	Tunceli	Mardin
	Sakarya	Gaziantep	Malatya	Erzurum	Van
	Aydın	Trabzon	Afyon	Kahramanmaraş	Bitlis
	Konya	Karaman	Artvin	Ordu	Siirt
	Isparta	Samsun	Erzincan	Gümüşhane	Şırnak
			Hatay	Kilis	Ağrı
			Kastamonu	Bayburt	Hakkari
			Bartın	Yozgat	Muş
			Sivas	Adıyaman	
			Çorum		

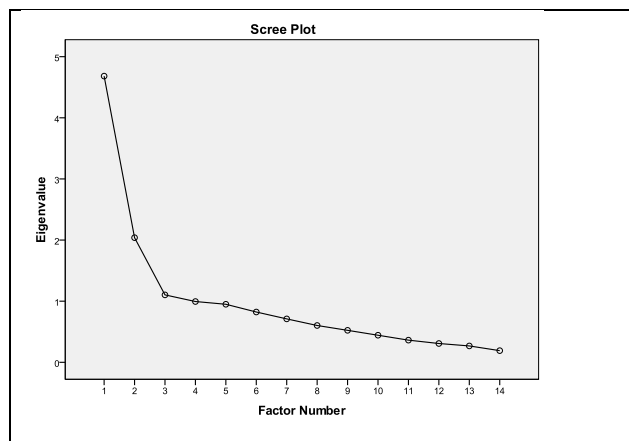
Examples from the Themes of Sustainable Development

Perception of Change and Sustainability
Protecting the Environment
Communication
Cooperation
Decision Making
Use of Resources
Recognition of National and Cultural Values
Problem Solving
Social Inclusion
Justice
Solidarity
Love of Nature
Honesty
Tolerance
Self Confidence
Sharing
Respect
Responsibility

Appendix C RESULTS REGARDING NORMALITY TESTS

Normality Test Results for the Attitudes of the Pilot Study

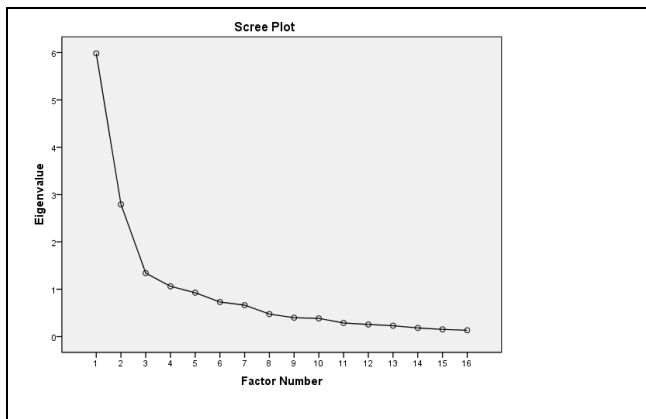
	N	Mean	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
attitude1	85	4,24	-1,487	,261	2,529	,517
attitude2	85	4,38	-,895	,261	,357	,517
attitude3	85	4,36	-,901	,261	-,264	,517
attitude4	85	4,07	-,953	,261	1,221	,517
attitude5	85	2,62	,327	,261	-,713	,517
attitude6	85	4,22	-,569	,261	-,505	,517
attitude7	85	4,25	-1,249	,261	1,573	,517
attitude8	85	3,67	-,306	,261	-,737	,517
attitude9	85	3,05	,012	,261	-,646	,517
attitude10	85	4,41	-1,771	,261	2,872	,517
attitude11	85	4,33	-1,512	,261	1,569	,517
attitude12	85	3,14	-,209	,261	-,354	,517
attitude13	85	4,13	-,652	,261	-,123	,517
attitude14	85	2,89	-,081	,261	-,761	,517
Valid N (listwise)	85					



Scree Plot for the Attitudes of the Pilot Study

Normality Test Results for the Competencies of the Pilot Study

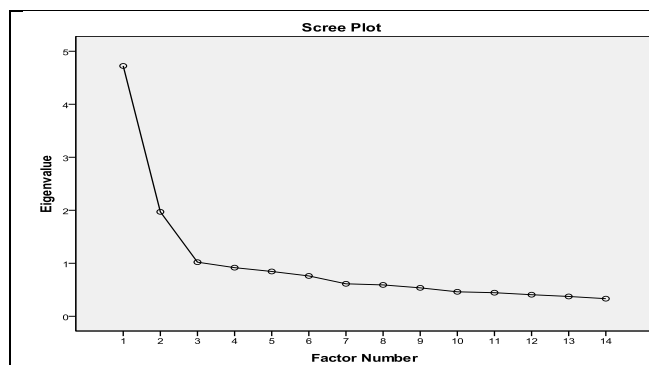
	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
competence1	90	3,26	1,107	-,475	,254	-,439	,503
competence2	90	3,51	,986	-,823	,254	,570	,503
competence3	90	3,29	,963	-,459	,254	-,176	,503
competence4	90	3,47	1,041	-,552	,254	-,002	,503
competence5	90	3,67	1,180	-,494	,254	-,553	,503
competence6	90	4,26	,855	-1,293	,254	1,949	,503
competence7	90	4,19	,911	-1,118	,254	1,033	,503
competence8	90	4,00	1,006	-1,288	,254	1,762	,503
competence9	90	3,98	,807	-,353	,254	-,485	,503
competence10	90	4,01	,800	-,424	,254	-,354	,503
competence11	90	3,77	,925	-,561	,254	-,015	,503
competence12	90	3,79	,942	-,387	,254	-,694	,503
competence13	90	4,11	,827	-,821	,254	,374	,503
competence14	90	4,01	,918	-,825	,254	,442	,503
competence15	90	3,98	,793	-,928	,254	1,769	,503
competence16	90	4,16	,806	-,687	,254	-,056	,503
Valid N (listwise)	90						



Scree Plot for the Competencies of the Pilot Study

Normality Test Results for the Attitudes of the Study

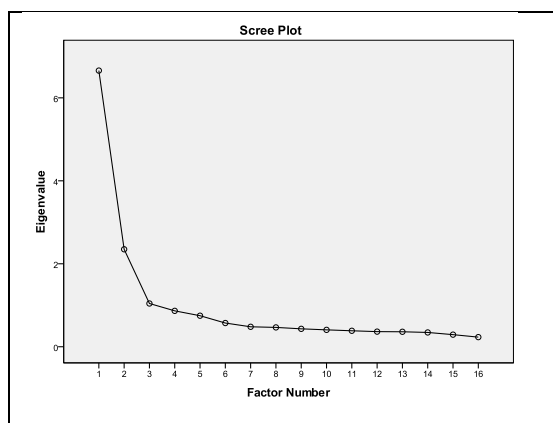
	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
attitude1	987	4,18	,900	-1,244	,078	1,823	,156
attitude2	987	3,73	1,050	-,662	,078	-,132	,156
attitude3	987	4,24	,904	-1,199	,078	1,210	,156
attitude4	987	4,38	,862	-1,494	,078	2,106	,156
attitude5	987	4,04	1,223	-1,045	,078	-,109	,156
attitude6	987	4,17	,891	-1,045	,078	,902	,156
attitude7	987	3,29	1,071	-,184	,078	-,436	,156
attitude8	987	3,38	1,083	-,263	,078	-,446	,156
attitude9	987	4,09	,890	-,998	,078	1,100	,156
attitude10	987	4,17	,881	-1,059	,078	1,066	,156
attitude11	987	4,19	,857	-,900	,078	,357	,156
attitude12	987	3,77	,955	-,435	,078	-,207	,156
attitude13	987	4,05	1,007	-1,060	,078	,743	,156
attitude14	987	3,33	1,197	-,261	,078	-,828	,156
Valid N (listwise)	987						



Scree Plot for the Attitudes of the Study

Normality Test Results for the Competencies of the Study

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
competence1	992	3,42	1,043	-,392	,078	-,273	,155
competence2	992	3,47	,989	-,330	,078	-,336	,155
competence3	992	3,36	,996	-,195	,078	-,357	,155
competence4	992	3,48	,983	-,324	,078	-,310	,155
competence5	992	3,83	1,036	-,640	,078	-,173	,155
competence6	992	4,13	,874	-1,030	,078	1,097	,155
competence7	992	4,17	,831	-,881	,078	,481	,155
competence8	992	4,03	,881	-,933	,078	1,008	,155
competence9	992	4,02	,798	-,672	,078	,606	,155
competence10	992	4,01	,819	-,694	,078	,611	,155
competence11	992	3,82	,872	-,448	,078	-,065	,155
competence12	992	3,84	,875	-,437	,078	-,282	,155
competence13	992	4,03	,814	-,590	,078	,140	,155
competence14	992	4,04	,839	-,752	,078	,519	,155
competence15	992	4,02	,804	-,680	,078	,570	,155
competence16	992	4,11	,843	-,957	,078	1,086	,155
Valid N (listwise)	992						



Scree Plot for the Competencies of the Study

**Appendix D OFFICIAL PERMISSION FROM METU HUMAN SUBJECTS
ETHICS COMMITTEE**

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER

ORTA DOĞU TEKNİK ÜNİVERSİTESİ
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20.02.2015

Gönderilen : Doç. Dr. Ahmet Ok
Eğitim Bilimleri Bölümü

Gönderen : Prof. Dr. Canan Sümer
IAK Başkan Vekili

İlgi : Etik Onayı

Danışmanlığını yapmış olduğunuz Eğitim Bilimleri Bölümü öğrencisi Neşe Soysal'ın "Öğretmen Yeterliklerinin Sürdürülebilir Kalkınma İçin Eğitim Açısından İncelenmesi" isimli araştırması "İnsan Araştırmaları Komitesi" tarafından uygun görülerek gerekli onay verilmiştir.

Bilgilerinize saygılarımla sunarım.

Etik Komite Onayı
Uygundur
20/02/2015

Prof.Dr. Canan Sümer
Uygulamalı Etik Araştırma Merkezi
(UEAM) Başkan Vekili
ODTÜ 06531 ANKARA

Appendix E TURKISH SUMMARY

TÜRKÇE ÖZET

SINIF ÖĞRETMENİ ADAYLARININ SÜRDÜRÜLEBİLİR KALKINMA İÇİN EĞİTİME YÖNELİK YETERLİK ALGILARI

GİRİŞ

Küreselleşmeyle birlikte dünyamız, üzerinde yaşayanlar için “yeni bir dünya” haline gelmiştir. Böylece hem insanlık hem doğal çevre için ekolojik, ekonomik ve sosyal açılardan yeni zorluklar da ortaya çıkmaya başlamıştır. Ekolojik açıdan bilinen en önemli sorun küresel ısınmadır. Dünyayı küresel ısınmadan koruyabilmek için, insanlar çevresel önlemler almaya başlamışlardır. Fakat, dünyayı çevre sorunlarından korumak insanlığın varlığı için yeterli değildir. Kaynakların adaletsiz bir şekilde dağıtılması sonucu, küreselleşme; yoksulluk, açlık, cinsiyet ve ırk ayrımı gibi hem ekonomik hem de sosyal sorunların ortaya çıkmasını sağlamıştır. Bu sebeple, ekonomik ve sosyal önlemlerin de alınması ihtiyacı ortaya doğmuştur. Sonunda, insanlığı bu sorunlardan koruyabilmek için sürdürülebilir kalkınma kavramı ortaya çıkmıştır.

Sürdürülebilir kalkınma kavramı küreselleşmenin yaygınlaşmasının bir sonucu olarak 1980’lerde dünya komisyonlarının toplanmalarıyla görülmeye başlanmıştır. 1982 yılında Birleşmiş Milletler Genel Kurulu “Çevre ve Kalkınma Dünya Komisyonu” ya da “Bruntland Komisyonu” adıyla anılan bir komisyon düzenlemiştir ve bu komisyon 1987’de “Ortak Geleceğimiz” başlıklı bir rapor hazırlamıştır. Raporunda, sürdürülebilir kalkınma kavramı “gelecek nesillerin kendi ihtiyaçlarını karşılayabilme kabiliyetini tehlikeye atmadan şimdiki ihtiyaçların karşılanabilmesine

imkan veren gelişme” şeklinde tanımlanmıştır (The World Commission on Environment and Development, 1987). Bir başka deyişle, sürdürülebilir kalkınma, gelecekteki ihtiyaçlarımızın karşılanabilmesi için mevcut ihtiyaçlarımızın karşılanmasında kaynakların kullanımının yeniden düzenlenmesi ve idareli kullanılması olarak kabul edilmiştir. Çevrenin korunması ve ekonomik ve sosyal kalkınmaya odaklanan raporda ayrıca, “sürdürülebilir kalkınmanın, herkesin tüm temel ihtiyaçlarının karşılanması ve daha iyi bir yaşam arzusu için bütün olanakların yaygınlaştırılmasını gerektirdiği” de belirtilmiştir (The World Commission on Environment and Development, 1987).

Daha sonra, sürdürülebilir kalkınma için fırsatlar oluşturabilmek için diğer uluslararası toplantılar düzenlenmiştir. 1992 yılında Rio de Janeiro’da, Birleşmiş Milletler Çevre ve Kalkınma Konferansı (UNCED) tarafından, “iklim değişikliği ve biyolojik çeşitlilik hakkında uluslararası anlaşmalar” hakkında toplanan Gündem 21-Dünya Zirvesi olarak bilinen, sürdürülebilir kalkınma için eyleme geçilmesi amaçlı küresel bir plan yayınlanmıştır (Kates, Parris & Leiserowitz, 2005, p.10). Bu raporda, çevresel, ekonomik ve sosyal kaygıların biraraya getirildiği bir politika oluşturarak, toplumların ve ekonomilerin geliştirilmesi üzerinde durulmuştur. Güney Afrika’da 2002 yılında Johannesburg’da toplanan Sürdürülebilir Kalkınma Dünya Zirvesi’nde kaynakların korunması ve insanların yaşam şartlarının düzeltilmesi için sürdürülebilir kalkınma politikalarının geliştirilmesi amacıyla biraraya gelinmiştir. Daha sonra yayınlanan raporda sürdürülebilir kalkınma için harekete geçilebilmesi için “dünyayı biraraya getirmeye” çalıştıkları belirtilmiştir (Johannesburg Summit 2002, 2002, p.1). Bu amaçla, BM Genel Kurulu 2005-2014 dönemini Sürdürülebilir Kalkınma için Eğitimin On Yılı olarak açıklanmıştır (United Nations Decade of Education for Sustainable Development [UNDESD], 2006). Bunları 2009 yılında Danimarka’da, 2010 yılında Meksika’da, 2011 yılında Güney Afrika’da ve 2012 yılında Brezilya, Rio de Janeiro’da düzenlenen konferanslar takip etmiştir.

Diğer yandan, sürdürülebilir kalkınmanın gereklerini yerine getirmek amacıyla Sürdürülebilir Kalkınma için Eğitim kavramı da ortaya çıkmıştır. Sürdürülebilir Kalkınma için Eğitim “geçmişteki başarılarla saygı duymayı, değer vermeyi, ve

korumayı;...tüm insanların sağlıklı ve verimli bir yaşam için yeterli yiyeceklere sahip olduğu bir dünyada yaşayabilmeyi;...yerel, ulusal ve küresel haklarına ve sorumluluklarına sahip çıkan duyarlı vatandaşlar olmayı öğrenme” olarak tanımlanır (UNDESD, 2006, p.1).

Sürdürülebilir Kalkınma için Eğitim kavramının öneminin farkedilmesiyle birlikte öğretmen eğitiminin yeniden yapılandırılması konusunun da önemi artmaya başlamıştır. Öğretmen eğitimi açısından, öncelikle, Sürdürülebilir Kalkınma Birleşmiş Milletler Komisyonu (CSD) 1998 yılında, UNESCO’dan, öğretmen yetiştirme programlarının sürdürülebilir kalkınma açısından yeniden yapılandırılması için bir rehber geliştirmesini istemiştir. Daha sonra, UNESCO da “UNESCO Sürdürülebilirlik için Öğretmen Yetiştirilmesinin Yeniden Yapılandırılması Kürsüsü”nü 28 ülkeden 30 öğretmen yetiştirme kurumunun uluslararası ağı olarak kurmuştur. Bu ülkeler Kanada (2000), Güney Afrika (2002), İsveç (2004) ve Finlandiya (2006) 'da öğretmen eğitim kurumlarının iletişimlerini sağlamak amacıyla bir araya gelmiştir.

Daha sonra COPERNICUS - KAMPUS adıyla bir organizasyon kurulmuştur. Bu organizasyonun amacı Sürdürülebilir Kalkınma için Üniversite Tüzüğü hazırlayarak Avrupa’daki üniversitelerin sürdürülebilir kalkınma konusundaki bilgilerini paylaşıp bu konuya katkıda bulunabilecekleri bir ağ oluşturmaktır. 2007 yılında yükseköğretim kurumlarının uygulamalarını Bolonya Süreci ve Sokrates programıyla ilişkilendirerek COPERNICUS Rehberi geliştirilmiştir. “Avrupa’daki 38 ülkeden 320’den fazla üniversite ve yüksek öğretim kurumu” kendi kurumlarında sürdürülebilir kalkınmaya katkıda bulunacaklarını belirterek bu tüzüğü imzalamışlardır (UNECE, n.d., p.6). Türkiye’den de Hacettepe Üniversitesi, Orta Doğu Teknik Üniversitesi, Uludağ Üniversitesi, Trakya Üniversitesi, Anadolu Üniversitesi, Boğaziçi Üniversitesi, Marmara Üniversitesi, Yıldız Teknik Üniversitesi, Ege Üniversitesi, ve Ondokuz Mayıs Üniversitesi bu tüzüğü imzalayan üniversitelerdendir.

Sürdürülebilir kalkınma için eğitimin okul öncesi eğitim müfredatlarından yetişkin eğitim müfredatlarına kadar dahil edilebilmesi için CSCT (Müfredat,

Sürdürülebilir Kalkınma, Yeterlilikler, Öğretmen Yetiştirme) Projesi UNECE (Birleşmiş Milletler Avrupa Ekonomik Komisyonları) Çevre Bakanlarının isteği üzerine 2003 yılında geliştirilmiştir. Bu projenin hedefi öğretmen yetiştirme kurumlarına sürdürülebilir kalkınma için eğitim içeren müfredat modelleri sağlamaktır. Bu projeye dayanarak “Öğretmen eğitiminde sürdürülebilir kalkınma için eğitim yeterlikleri için dinamik bir model” geliştirilmiştir (UNECE, 2008 p.30). Bu modele göre “bilgi”, “sistemik düşünme”, “duygular”, “etik ve değerler” ve “eylem” olmak üzere beş yeterlik alanı vardır. Her yeterlik alanının gereklilikleri modelde belirtilmiştir. Bu çalışmada, öğretmen adaylarının yeterlik algılarının belirlenmesinde bu model temel alınmıştır.

Dünyadaki çalışmaların da yardımıyla, Türkiye’de de sürdürülebilir kalkınma alanında çalışmalar yapılmaya başlanmıştır. Bu sebeple UNESCO Ulusal Türkiye Komisyonu “Barış ve Sürdürülebilir Kalkınma için Eğitim Bölümü”nü kurmuş ve Türkiye’de çalışmalarını devam ettirmektedir. Aynı zamanda, Türkiye 45 okulu ile 181 ülkede 10.000 eğitim kurumunun küresel bir ağı olan UNESCO Ortak Okullar Projesi Ağı (ASPnet)’nin bir üyesidir. Türkiye’de bir dizi çalışma da Milli Eğitim Bakanlığı İlköğretim Genel Müdürlüğü ve Çevre ve Orman Bakanlığı tarafından yürütülmektedir. Eko-Okullar Projesi 1995 yılında Türk Çevre Eğitim Vakfı tarafından tanıtılan çalışmalardan biridir ve o zamandan beri çalışmalarına devam etmektedir.

Diğer yandan, anne babanın eğitim düzeyi ve illerin kalkınmışlık düzeylerinin de bireylerin davranışlarının şekillenmesinde etkili olduğu konusunda çalışmalar bulunmaktadır (Erkal, Şafak & Yertutan, 2011; Iizuka, 2000). Bu sebeple, bu çalışmada anne babanın eğitim düzeyi ve illerin kalkınmışlık düzeyleri sürdürülebilir kalkınma için eğitim açısından incelenmektedir. İllerin gelişmişlik düzeylerinin belirlenmesinde Kalkınma Bakanlığının “İllerin ve Bölgelerin Sosyo-Ekonomik Gelişmişlik Sıralaması Araştırması, SEGE-2011” (2013) temel alınmıştır.

Sürdürülebilir kalkınma için eğitimin bu yüzyılda hem ülkemiz hem de dünyamız için önemli bir kavram olduğu açıktır. Bu nedenle, öğretmenlerimiz Sürdürülebilir Kalkınma için Eğitimin temaları hakkında bilgi sahibi olmalı ve aynı

zamanda çocuklarımızı sürdürülebilir kalkınmanın eylemcileri olarak hazırlamak için gerekli yetkinlikler ile donatılmış olmalıdır. Sınıf öğretmenliği bölümü dördüncü sınıf öğrencileri geleceğin öğretmenleridir ve onların öğrencileri de sürdürülebilir dünyanın birer üyeleri olacaktır. Sürdürülebilir bir dünya gerçekleştirebilmek için, sürdürülebilir kalkınma ile ilgili temel kavramlar, eğitim kurumları tarafından benimsenmelidir. Bu nedenle, öğretmen adaylarının yeterliklerinin ve öğretmen yetiştiren kurumların müfredatlarının analizi ihtiyacı ortaya çıkmıştır. Özellikle ilköğretim kurumları, öğrenciler için temel eğitim teşkil ettiği için, ilköğretim kurumlarındaki öğretmenlerin sürdürülebilir kalkınmayı sağlamak için belirli yeterliklere sahip olmaları gerekmektedir. Ancak, günümüzde, ülkemizde ve dünyada, insanların sürdürülebilir kalkınma konusundaki bilgileri sınırlıdır. Bu nedenle, toplumdaki bireylerin sürdürülebilir kalkınma konusundaki bilgilerini artırmak için, öğretmenlerin sürdürülebilir kalkınmaya yönelik tutumları ve sürdürülebilir kalkınma için eğitim ile ilgili yeterliliklerinin analizinin bir ihtiyaç olduğu görülmektedir.

Çalışmanın Amacı

Bu çalışma, ebeveynlerinin eğitim düzeyi ve yaşadıkları şehrin gelişmişlik düzeyi açısından, sınıf öğretmeni adaylarının kalkınmaya yönelik tutumlarını ve sürdürülebilir kalkınma için eğitim hakkında algılanan yeterliklerini analiz etmeyi amaçlamaktadır. Bu nedenle, ilk olarak, sürdürülebilir kalkınma konusunda sınıf öğretmeni adaylarının tutumları incelenmiştir. Daha sonra, CSCT projesinin "Öğretmen Eğitiminde ESD Yeterliliklerin Dinamik Modeli"nde belirtilen yeterliliklerine dayanarak, sürdürülebilir kalkınma için eğitim hakkında sınıf öğretmeni adaylarının algılanan yeterlikleri incelenmiştir. Ayrıca, sınıf öğretmeni adaylarının sürdürülebilir kalkınmaya yönelik tutumları ve sürdürülebilir kalkınma için eğitim hakkındaki yeterlik düzeyi algıları arasındaki ilişki analiz edilmiştir. Son olarak, sınıf öğretmenliği müfredatının bu yetkinliklerin geliştirilmesi için gerekli öğrenme fırsatlarını içerip içermediği analiz edilmiştir. Bu amaçla, aşağıdaki araştırma soruları bu çalışmanın çerçevesini belirlemiştir:

1. Sınıf öğretmeni adaylarının sürdürülebilir kalkınmaya yönelik tutumları nelerdir?
 - 1.1. Sınıf öğretmeni adaylarının sürdürülebilir kalkınmaya yönelik tutumlarında yaşadıkları şehrin gelişmişlik düzeyi açısından önemli farklılıklar var mıdır?
 - 1.2. Sınıf öğretmeni adaylarının sürdürülebilir kalkınmaya yönelik tutumlarında anne ve babalarının eğitim düzeyi açısından önemli farklılıklar var mıdır?
2. Sınıf öğretmeni adayları sürdürülebilir kalkınma için eğitime yönelik (1) bilgi, (2) sistematik düşünme, (3) duygular ve (4) değerler ve etik yeterlik alanları açısından kendilerini ne kadar yeterli olarak algılamaktadırlar?
 - 2.1. Sınıf öğretmeni adaylarının bu yeterlik algılarında yaşadıkları şehrin gelişmişlik düzeyi açısından önemli farklılıklar var mıdır?
 - 2.2. Sınıf öğretmeni adaylarının bu yeterlik algılarında anne ve babalarının eğitim düzeyi açısından önemli farklılıklar var mıdır?
3. Sınıf öğretmeni adaylarının sürdürülebilir kalkınmaya yönelik tutumları ve sürdürülebilir kalkınma için eğitime yönelik yeterlik düzeyi algıları arasında bir ilişki var mıdır?
4. Sınıf öğretmenliği müfredatı sürdürülebilir kalkınma için eğitim konusunda sınıf öğretmeni adaylarının yeterliklerini geliştirmek için gerekli öğrenme fırsatlarını sağlamakta mıdır?

Çalışmanın Önemi

Sürdürülebilir kalkınma kavramı üzerindeki önemin artmasıyla tüm dünyadaki insanların gelişmesi için gereken eğitim ihtiyacı da gittikçe önem kazanmaktadır. Bu nedenle, Sürdürülebilir Kalkınma için Eğitim kavramı oluşturulmuştur.

Sürdürülebilir kalkınma için eğitim “insanların birbirlerinden ve birbirleriyle birlikte öğrendikleri ‘öğrenen toplum’a ulaşabilmek için gerekli çeşitli yolların toplamı” olarak tarif edilir (UNESCO, 2011a, parag.2). Bu öğrenmenin, çevresel, ekonomik ve sosyal olmak üzere üç bileşeni vardır ve hepsi birbiriyle ilişkilidir.

Çevresel sürdürülebilirlik olmadan, sosyal ve ekonomik sürdürülebilirliği sağlamak zordur. Bu açıdan sürdürülebilirliğini sağlamak, eğitim hedeflerinin yeniden yapılandırılmasını gerektirmektedir. Eğitimin amaçlarının yeniden yapılandırılmasından sonra, sürdürülebilir kalkınma için eğitim müfredatlarda yerini almıştır. Bu çalışma öğretmen adaylarının sürdürülebilir kalkınmanın farklı açılara karşı tutumlarının sunulması bakımından yararlı olacaktır. Bu şekilde, öğretmen adaylarının tutumlarından sürdürülebilir kalkınma için eğitim hedeflerinin belirlenmesinde faydalanılabilir.

Müfredatta yapılan değişiklikler ile, öğretmen yetiştirme ihtiyacı da ortaya çıkmıştır. Bu nedenle, COPERNICUS KAMPÜS sürdürülebilir kalkınma için öğretmen yetiştirme önemini vurgulamaktadır. Öğretmenler, öğrencilerin sürdürülebilir kalkınma konusundaki algılarını şekillendirdikleri için, öğretmen yetiştirme ne kadar önemli olduğu da vurgulanmaktadır. Bu sebeple, sürdürülebilir kalkınmanın müfredatlara eklenmesi ve yükseköğretim kurumlarında kalite güvencesi sağlanması için yönergeler sağlar (UNECE , n.d.). Öğretmen yeterliklerinin analizi ile, bu çalışma, sürdürülebilir kalkınma için eğitime yönelik öğretmen yeterliklerinin belirlenmesinde yararlı olacaktır, ve sonuç olarak, bu yeterlikler öğretmen yetiştirme müfredatlarına entegre edilebilir.

Ayrıca, araştırmalar göstermektedir ki, temel eğitim, bir ulusta sürdürülebilir kalkınmanın sağlanmasında anahtar bir role sahiptir ve o ulusun gelişmesindeki bir diğer anahtardır. Temel eğitim sayesinde, okuma-yazma oranı ve yaşam standardı artar. Süresi ülkeden ülkeye değişmekle birlikte temel eğitim birçok ülkede zorunludur. Ayrıca, temel eğitim ve ilköğretim öğretmenleri ilk yıllarında çocukların zihinlerinde sürdürülebilir kalkınma için temel sağlarlar. Bu nedenle, sürdürülebilir kalkınma için eğitim, özellikle temel eğitim kurumları aracılığıyla, akademik alan gözetmeksizin, eleştirel düşünme becerileri, ve organizasyon ve analiz becerileri geliştirilerek sağlanmalıdır. Temel eğitimin bu öneminin bilincinde olarak, bu çalışmada, sürdürülebilir kalkınma için eğitim açısından ilköğretim müfredatı analiz edilmektedir. Bu şekilde, sürdürülebilirliğin müfredata nasıl entegre edildiği de analiz edilmektedir. Bu nedenle, bu çalışma sürdürülebilir kalkınma için eğitimin

sınıf öğretmenliği müfredatındaki yerini göstermektedir. Bu sayede sürdürülebilir kalkınma için eğitim konusunda sınıf öğretmenliği müfredatındaki öğrenme fırsatlarının belirlenmesi açısından da faydalı olması beklenmektedir.

Gelişmekte olan bir ülke olarak Türkiye'nin de sürdürülebilir kalkınmayı geliştirmesi gerekmektedir. Sürdürülebilir kalkınmada, hükümet, medya ve sanayi alanlarındaki karar alma aşamalarında görev alan insanlar kalkınmayı sürdürülebilmek için anahtar bir role sahiptirler. Bu nedenle, eğitim sektörü sürdürülebilir kalkınmayı teşvik etmekte birincil öneme sahiptir. Öğretmenlerimiz de bireylerin gelişimini teşvik etmek ve bu konuda öğrenen toplumu yaratmak için önemli bir rol üstlenmektedirler. Öğrencilerin kendilerine güvenmelerini ve bugünkü ve gelecekteki eylemlerinin sorumluluklarını almalarını sağlamalıdır. Öğretmen yetiştirme kurumları olarak eğitim fakülteleri, sürdürülebilir kalkınma için eğitimin geliştirildiği temel kurumlardır. Ancak, sürdürülebilir kalkınma konusu ile ilgilenen bir öğretmenin belirli yeterliklere sahip olması gerekmektedir. Bu çalışma aynı zamanda öğretmenlerin sürdürülebilir kalkınmaya yönelik tutumlarının yansıtılmasına ek olarak, önerilen yeterliklere sahip olmaları açısından durumlarının betimlenmesi bakımından da yararlı olacaktır.

Öte yandan, sürdürülebilir kalkınmaya yönelik tutumları ve sürdürülebilir kalkınma için eğitim hakkındaki yeterlikleri etkileyebilecek bazı faktörler vardır. Ebeveynlerin eğitim düzeyi ve bölgelerin gelişmişlik düzeyi bu önemli faktörlerden bazılarıdır. Erkal ve meslektaşları, (2011) ailenin sosyalleşme sürecinin bir başlangıcı olduğu ve aynı zamanda her bireyin topluma hazırlandığı ilk yer olduğunu vurgulamaktadır. Bu nedenle, aile, bireylerin davranışlarını şekillendirmede önemli bir rol oynamaktadır. Aile üyelerinin eğitim düzeyi de bireylerin davranışlarını etkileyebilir. Bu nedenle, bu çalışma anne ve babalarının eğitim düzeylerinin öğretmen adaylarının sürdürülebilir kalkınmaya karşı tutumları ve yeterlik algıları üzerindeki etkisini gösterecektir.

Bireylerin tutumlarının şekillenmesinde sosyo-ekonomik faktörlerin önemini vurgulayan çalışmalar da bulunmaktadır. Örneğin Kılıç ve Yücel (2013) yoksulluk gibi sosyo-ekonomik sorunlar ortadan kaldırılmadıkça, bireylerin çevresel sorunlara

odaklanmasının çok zor olduğunu belirtmiştir. Ayrıca, Iuzuka (2000) gelişmiş ülkeler ve gelişmekte olan ülkelerin vatandaşlarının çevreyle ilgili konulara yönelik farklı bakış açılarının olduğunu belirtmiştir. Buna ek olarak, Türkiye'de, Kalkınma Bakanlığı da "İllerin ve Bölgelerin Sosyo-Ekonomik Gelişmişlik Sıralaması Araştırması" (SEGE-2011, 2013) olarak adlandırılan bir çalışma yürütmüş ve illeri bazı göstergelere göre sıralandırmıştır. Bu göstergeler, aynı zamanda öğretmen adaylarının tutumlarının ve yeterlik algılarının analizi için de önemli olabilir. Bu çalışmanın, öğretmen eğitimi müfredatının zenginleştirilmesi için, sosyo-ekonomik durumun sürdürülebilir kalkınmaya yönelik tutuların ve sürdürülebilir kalkınma için eğitimle ilgili yeterliklerin etkilerini açıklamaya katkıda bulunması beklenmektedir.

Bu çalışmada, öğretmenlerimizin ESD için ne kadar hazır olduklarını görmek için, sınıf öğretmeni adaylarının sürdürülebilir kalkınma ile ilgili tutumları ve sürdürülebilir kalkınma için eğitim ile ilgili yeterlik algıları belirlenmektedir. Ayrıca, sınıf öğretmeni adaylarının sürdürülebilir kalkınmaya yönelik tutumları ve sürdürülebilir kalkınma için eğitime yönelik yeterlik algıları arasındaki ilişki incelenmiştir. Anne babalarının eğitim düzeyleri ve yaşadıkları şehirlerin kalkınmışlık düzeylerinin onların tutum ve yeterlik algıları üzerindeki etkileri de incelenmiştir. Buna ek olarak, temel eğitimin sahip olduğu yüksek önem sayesinde, ilkokul öğretmenlerinin rollerinin önemi de artmaktadır. Bu nedenle, sınıf öğretmenliği müfredatının öğretmen adaylarının sürdürülebilir kalkınmaya yönelik yeterliklerini geliştirmek için öğrenme fırsatları sağlayıp sağlamadığı da analiz edilmektedir. Bu çalışma, sınıf öğretmeni adaylarının sürdürülebilir kalkınma için eğitim açısından daha güçlü yeterliklere sahip olabilmeleri için, sınıf öğretmenliği müfredatının geliştirilmesi ve zenginleştirilmesine katkıda bulunacaktır.

Özetle, bu çalışmanın bulgularının, sınıf öğretmeni adaylarının sürdürülebilir kalkınmaya yönelik tutumlarını ve aldıkları yeterlik düzeylerini sergileyerek, karar vericiler ve eğitim fakülteleri için anlamlı bir geribildirim sunması beklenmektedir. Ayrıca, ebeveynlerinin eğitim düzeyi ve buldukları illerin gelişmişlik düzeyinin etkileri de karar vericiler için değerli bilgiler sağlayacaktır. Aynı zamanda, sürdürülebilir kalkınma için eğitim yeterlikleri ile donatılmış

geleceğin öğretmenlerini yetiştirmek için gereken müfredatın entegrasyonu için, öğretmen yetiştirme müfredatlarında bulunan sürdürülebilir kalkınma düzeyini göstermek de hedeflenmektedir. Ayrıca, bu çalışmanın, Türkiye'deki bu konuyla ilgili yapılan araştırmaların eksikliğini kapatarak, öğrenen toplum için bir anahtar niteliği taşıyan sürdürülebilir kalkınma için eğitimin küresel dünyası için yerel bir analiz sunacaktır.

ALANYAZIN TARAMASI

Alanyazın taraması sonuçları göstermiştir ki, sürdürülebilir kalkınma için eğitim konusunda sınırlı sayıda araştırma bulunmaktadır. Özellikle Türkiye'de bu konudaki araştırmaların sayısı daha da düşüktür.

Yapılan araştırmalar incelendiğinde ise, Türkiye'de ve diğer ülkelerde hem nicel hem de nitel araştırmaların yapıldığı görülmüştür. Bu araştırmalar genellikle öğretmenlerin ve öğrencilerin sürdürülebilir kalkınmayla ilgili tutumları ve görüşleri üzerine odaklanmaktadır. Bazıları da çeşitli alanlardaki müfredatların sürdürülebilir kalkınma için eğitim açısından incelenmesine dayanmaktadır. Bu çalışmalar çoğunlukla anketler, görüşmeler ya da yarı yapılandırılmış görüşmeler ve örnek olay incelemeleri yoluyla yapılmıştır. Çalışmalarda yaş, cinsiyet, okul ortamı ve konular gibi demografik değişkenlerin sürdürülebilir kalkınma için eğitim üzerindeki etkileri araştırılmıştır. Genellikle kimya, coğrafya ve fen bilimleri dersleri ile, okul öncesi eğitim, liseler, lisans ve lisansüstü eğitim alanında çalışmalar bulunmaktadır. Çalışmaların sonuçları hem öğretmenlerin hem de öğrencilerin sürdürülebilir kalkınmaya karşı olumlu bir tutum sergilediklerini göstermektedir. Aynı zamanda yapılan çalışmalarda, sürdürülebilir kalkınma kavramının öğretmenler ve öğrenciler için yeni olduğunun ve bu sebeple bu konuda eğitim almaları gerektiğinin altı çizilmektedir. Ayrıca sürdürülebilir kalkınma konusundaki perspektifleri de çevresel açılara odaklanmaktadır. Sürdürülebilir kalkınma için eğitimle ilgili yeterlikler alanındaki çalışmaların da model önerisi üzerinde olduğu görülmektedir. Müfredat değerlendirme çalışmaları da genellikle

coğrafya ve dil öğretimi alanlarında olup, yüksek öğretim ve teknik eğitim kurumları üzerinde odaklanmaktadır.

YÖNTEM

Bu çalışmada, nicel ve nitel olmak üzere iki aşamadan oluşan karma yöntemlerden sıralı açıklayıcı desen kullanılmıştır. Bu araştırma deseni doğrultusunda, öncelikle sınıf öğretmeni adaylarının sürdürülebilir kalkınmaya yönelik tutumları, sürdürülebilir kalkınma için eğitime yönelik yeterlik algıları ve bu tutum ve algıları arasındaki ilişkiye dair nicel veriler toplanıp analiz edilmiştir. İkinci aşamada sınıf öğretmenliği müfredatının sürdürülebilir kalkınma için eğitim konusunda öğrenme imkanları sağlayıp sağlamadığı nitel araştırma yöntemi ile toplanan verilerin analizi yapılarak incelenmiştir. Daha sonra bu veriler, ilk aşamadaki analiz sonuçlarını desteklemek amaçlı kullanılmıştır. Bu araştırma deseni araştırma problemini daha iyi anlayabilmek için kullanılmıştır. Çünkü nitel veriler katılımcıların araştırma konusu hakkındaki görüşleri üzerine derinlemesine bilgi edinmeyi sağlar ve toplanan nicel verilerin açıklanıp tanımlanmasına katkıda bulunurlar (Creswell, 2003; Rossman & Wilson, 1985; Tashakkori & Teddlie, 1998, as cited in Creswell & Plano Clak, 2011).

İlk bölümde, nicel bir çalışma olarak tarama deseni kullanılmıştır. Çünkü tarama desenleri özellikle tutumlar ve tercihler, inançlar ve tahminler ya da davranış ve deneyimler gibi mevcut durumların doğasını açıklayabilme amacıyla kullanılırlar (Cohen, Manion ve Morrison , 2007). Bu çalışmada tarama deseni sınıf öğretmeni adaylarının sürdürülebilir kalkınmaya ilişkin tutumlarını, sürdürülebilir kalkınma için eğitime yönelik yeterlik algıları ve bu tutum ve algıları arasındaki ilişkiyi analiz etmede kullanılmıştır.

Araştırmanın evrenini Türkiye'deki devlet üniversitelerinin sınıf öğretmenliği bölümünde okuyan son sınıf öğrencileri oluşturmaktadır. Örneklemi belirlemek için öncelikle sosyo-ekonomik gelişimleri arasındaki farklar göz önüne alınarak Türkiye'nin 6 bölgesi incelenmiştir. Daha sonra bu bölgelerde sınıf öğretmenliği bölümü bulunan üniversiteler belirlenmiştir. Son olarak da deneyimleri, erişilebilirlikleri ve öğrenci sayıları göz önüne alınarak her bölgeden üniversiteler

seçilmiştir. Dolayısıyla, seçilen üniversitelerde sınıf öğretmenliği 4. sınıfta bulunan bütün öğrenciler araştırmanın örneklemini oluşturmaktadır. Her bölgeden 3 üniversite seçilerek toplamda 18 üniversiteden veri toplanması hedeflenmiştir. Fakat seçilen üniversitelerden 12 tanesine ulaşılabilmiş ve toplamda 1008 öğretmen adayından veri toplanmıştır (Tablo 1).

Tablo 1.

Veri Toplanan Üniversiteler

1. Bölge	2. Bölge	3. Bölge	4. Bölge	5. Bölge	6. Bölge
Uludağ Üniversitesi N=112	Çanakkale 18 Mart Üniversitesi N=80	Karadeniz Teknik Üniversitesi N=105	Afyon Kocatepe Üniversitesi N=74	Gaziosmanpaşa Üniversitesi N=101	Kars Kafkas Üniversitesi N=95
Gazi Üniversitesi N=20	Trakya Üniversitesi N=96		Sivas Cumhuriyet Üniversitesi N=45	Atatürk Üniversitesi N=71	
	Pamukkale Üniversitesi N=72		Hatay Mustafa Kemal Üniversitesi N=111		

Araştırmanın verileri, araştırmacı tarafından geliştirilen ve üç bölümden oluşan “Sınıf Öğretmeni Adaylarının Sürdürülebilir Kalkınma için Eğitime Yönelik Tutum ve Algılanan Yeterlikleri Ölçeği” isimli veri toplama aracı kullanılarak elde edilmiştir. Birinci bölümde, katılımcıların demografik bilgilerine ilişkin sorular bulunmaktadır. İkinci bölümde, sınıf öğretmeni adaylarının sürdürülebilir kalkınma ile ilgili tutumlarını ölçmeye yönelik “Sınıf Öğretmeni Adaylarının Sürdürülebilir Kalkınmaya Yönelik Tutumları Ölçeği” adlı ölçek bulunmaktadır. Son olarak, üçüncü bölümde de öğretmen adaylarının algılanan yeterlikleriyle ilgili olan “Sürdürülebilir Kalkınma için Eğitim konusunda Algılanan Yeterlikler Ölçeği” bulunmaktadır.

Nitel verilerin analizinde betimsel istatistik ve çok yönlü varyans analizi (MANOVA) kullanılmıştır. Aynı zamanda korelasyon analizlerinden yararlanılmıştır. İkinci olarak, betimsel döküman analizi yapılmıştır. Nitel veriler sınıf öğretmenliği öğretim programının seçilen derslerinin incelenmesiyle toplanmıştır.

Nitel veriler, amaçlı örnekleme yöntemiyle, Hacettepe Üniversitesi AKTS (Avrupa Kredi Transfer Sistemi) Bilgi Paketi, sınıf öğretmenliği bölümü müfredatından seçilen “Hayat Bilgisi Öğretimi, Sosyal Bilgiler Öğretimi ve Fen ve Teknoloji Öğretimi I-II” dersleri, bu derslerin materyellerinden seçilen “Hayat Bilgisi Öğretimi ve Öğretmen Klavuzu (Sönmez, 2005), Sosyal Bilgiler Öğretimi (Öztürk, 2015), Kuramdan Uygulamaya Sosyal Bilgiler Öğretimi (Kabapınar, 2014)”, Kuramdan Uygulamaya Fen ve Teknoloji Öğretimi (Çepni, 2015)” ders kitapları, ile Milli Eğitim bakanlığı tarafından hazırlanan “Hayat Bilgisi, Sosyal Bilgiler ve Fen ve Teknoloji” derslerinin müfredatları incelenerek elde edilmiştir.

Nitel verilerin analiz aşamasında, öncelikle literatüre göre, sürdürülebilir kalkınmanın temaları belirlenmiştir. Daha sonra, dökümanlar anlamlı kümeler oluşturulması açısından incelenip, araştırma soruları doğrultusunda analiz edilmiştir.

BULGULAR

Sonuç olarak, tanımlayıcı istatistikler, sınıf öğretmeni adaylarının sürdürülebilir kalkınmanın, çevresel, kültürel ve sosyo-ekonomik açılarına ilişkin olumlu bir tutum sergilediklerini göstermiştir. Ayrıca, çıkarımsal istatistik sonuçları da yaşadıkları illerin kalkınma düzeylerinin sınıf öğretmeni adaylarının sürdürülebilir kalkınmaya yönelik tutumları üzerinde etkisi olduğunu göstermiştir. İllerin kalkınmışlık düzeylerinin, sınıf öğretmeni adaylarının sürdürülebilir kalkınmaya yönelik kültürel açıdan tutumlarında sosyo-ekonomik ve çevresel açılara oranla istatistiksel olarak daha anlamlı etkisi olduğu görülmüştür. Ancak, sınıf öğretmeni adaylarının anne ve babalarının eğitim düzeyinin “çevresel”, “sosyo-ekonomik” ve “kültürel” faktörler açısından sürdürülebilir kalkınmaya yönelik tutumları üzerinde istatistiksel olarak anlamlı bir etkisi görülmemiştir.

Sürdürülebilir kalkınma için eğitim ile ilgili sınıf öğretmeni adaylarının kendi yeterliklerine algıları analiz edildiğinde, genel olarak, sınıf öğretmeni adaylarının sürdürülebilir kalkınma ile ilgili eğitim ihtiyaçlarını karşılamak için kendilerini yeterli buldukları görülmüştür.

Sınıf öğretmeni adayları, diğer yeterlik alanları ile karşılaştırıldığında duygular alanında kendilerini daha yeterli olarak algılamaktadırlar. Daha sonra, sırasıyla değerler, sistematik düşünme ve bilgi açısından yeterli hissetmektedirler. Sonuçlar aynı zamanda, yaşadıkları illerin kalkınmışlık düzeylerinin, sınıf öğretmeni adaylarının sürdürülebilir kalkınma için eğitim konusundaki yeterlik algılarının üzerinde istatistiksel olarak anlamlı bir etkisi olduğunu göstermiştir. Yaşadıkların illerin kalkınmışlık düzeyleri sınıf öğretmeni adaylarının sürdürülebilir kalkınma için eğitim konusundaki yeterlik algılarından duygular ve değerler üzerinde istatistiksel olarak anlamlı bir etki oluşturmuştur. Ancak, bilgi ve sistematik düşünme yeterlikleri üzerinde istatistiksel olarak anlamlı bir etkisi olmamıştır. Buna ek olarak, sınıf öğretmeni adaylarının anne ve babalarının eğitim seviyesinin yeterlik algıları üzerinde istatistiksel olarak anlamlı bir etkisi olmadığı görülmüştür.

Sınıf öğretmeni adaylarının sürdürülebilir kalkınmaya yönelik tutumları ile sürdürülebilir kalkınma için eğitim konusundaki algılanan yeterlikleri arasındaki ilişki incelendiğinde, öğretmen adaylarının sürdürülebilir kalkınmaya yönelik daha olumlu tutumlar sergiledikçe, kendilerini sürdürülebilir kalkınma için eğitim açısından daha yeterli algıladıkları görülmüştür.

Sınıf öğretmenliği müfredatının sürdürülebilir kalkınma açısından gerekli öğrenme olanakları içerip içermediğine bakıldığında ise, çalışmanın bulguları göstermektedir ki, müfredatta bazı öğrenme fırsatları bulunmasına rağmen bunlar derslerin amaçları, hedefleri ve içerikleri kısmında açıkça belirtilmemektedir. Ayrıca, öğrenme olanakları sınıf öğretmeni adaylarının özellikle bilgi ve sistematik düşünme yeterliklerini geliştirebilecek kadar detaylı ve organize edilmiş değildir. Ancak, sürdürülebilir kalkınma için eğitim ile ilgili değerler ve etik, ve duygular yeterliklerinin geliştirilmesi için daha fazla öğrenme olanakları bulunmaktadır.

TARTIŞMA

Sınıf öğretmeni adaylarının sürdürülebilir kalkınmaya yönelik tutumlarını inceleyen ilk araştırma sorusunun sonucunda olumlu tutumlar sergiledikleri görülmüştür. Aynı zamanda faktör analizi sonucunda sınıf öğretmeni adaylarının tutumlarının şekillendiren “çevresel, kültürel ve sosyo-ekonomik” olmak üzere üç faktörün bulunduğu görülmüştür. Ayrıca, Corney (2006); Mckeown, (2002); Summers ve Childs (2007); ve Summers, Childs, ve Corney (2005)’in çalışmaları da sürdürülebilir kalkınmanın üç boyutu olduğunu göstermiştir. Bu çalışmanın bulguları, öğretmen adaylarının sürdürülebilir kalkınmaya yönelik tutumlarının çevresel ve kültürel açılardan sosyo-ekonomik açılara göre daha olumlu olduğu görülmüştür. Birdsall 2014; Alkış & Öztürk, 2007; Summers, Corney, & Childs, 2004, Tuncer, Tekkaya, ve Sungur, 2006’ un çalışmalarında da öğretmen adaylarının çoğunlukla çevresel faktörlere odaklandıkları görülmüştür. Bunun sebebi, sürdürülebilir kalkınmanın çevresel boyutunun diğer kültürel ve sosyo-ekonomik boyutlarla karşılaştırıldığında, kavranmasının daha kolay olmasıdır. Zaten ilk başlarda da çevrenin korunması, sürdürülebilir kalkınmanın öncelikli kavramları arasında yer almaktaydı. Aynı zamanda, sosyo-ekonomik ve kültürel sürdürülebilirliğin sağlanmasının, çevresel sürdürülebilirliğin sağlanmasından daha zor olması da sınıf öğretmeni adaylarının bu faktörlere karşı tutumlarının daha az olumlu olmasının bir diğer sebebi olabilir.

Yaşadıkları şehirlerin gelişmişlik derecesinin sınıf öğretmeni adaylarının sürdürülebilir kalkınma açısından tutumları üzerinde etkisi olduğu bulunmuştur. Bu etki, sosyo-ekonomik ve çevresel faktörlerle karşılaştırıldıklarında, daha çok kültürel faktörler açısından görülmektedir. Kültürel faktörler açısından incelendiğinde ise, daha yüksek kalkınmışlık düzeyine sahip şehirlerde yaşayan sınıf öğretmeni adayları, diğer şehirlerde yaşayanlara göre daha olumlu tutumlar sergilemektedirler. Bunun sebebi, kalkınmışlık göstergeleri ile açıklanabilir. Demografik göstergeler açısından incelendiğinde, göç alma ve şehirleşme oranı bu şehirlerde daha yüksektir. Bu da o şehirlerin daha fazla göç aldığını gösterir. Bu sebeple de bu şehirlerdeki kültürel çeşitlilik diğer şehirlerle karşılaştırıldığında daha fazladır. Sonuç olarak, kalkınmışlık

düzeyi yüksek olan bu şehirlerde yaşayan öğretmen adaylarının bu konuda daha bilinçli olması ve bu sebeple daha olumlu bir tutum sergilemeleri beklenmektedir.

Çevresel faktörler açısından incelendiğinde de, bulgular, gelişmişlik düzeyi daha yüksek olan şehirlerde yaşayan sınıf öğretmeni adaylarının daha düşük düzeylerdeki yaşayanlara oranlara çevresel faktörlere karşı daha olumlu tutumlar sergiledikleri görülmüştür. Bu farkın yine illerin gelişmişlik düzeylerini belirleyen göstergelerden kaynaklandığı düşünülmektedir. Örneğin, yerleşim yerlerinde hane başına düşen elektrik tüketimi oranı ve kullanılan özel araç sayısı bu göstergelerden bir kaçıdır. Bu oranların yüksek olması, gelişmişlik düzeyinin bir göstergesidir, ancak bu yerlerde yaşayan öğretmen adayları, bu tür konularla daha sık karşılaştıkları için; enerji tüketimi, alternative enerji, geridönüşüm ve çevrenin korunması gibi konulara karşı daha duyarlıdırlar. Zaten, Kılıç ve Yücel (2013) 'in de belirttiği gibi, bir şehrin ekonomik durumu ile çevre korunması arasında bir ilişki vardır. Ekonomik düzeyin daha iyi olması, daha fazla çevresel sorun yaratmasına rağmen, ekonomik düzeyi yüksek olan bu şehirlerde yaşayan insanların çevrenin korunmasına daha fazla önem verdiği görülmektedir.

Sosyo-ekonomik açıdan bakıldığında ise, gelişmişlik düzeyi daha yüksek yerlerde yaşayanların, diğerlerine göre daha az olumlu tutumlar sergiledikleri görülmüştür. Bunun sebebi, daha iyi sosyo-ekonomik durumlarda yaşadıkları için yoksulluk ve eşitsizlik gibi sosyo-ekonomik sorunlar hakkında daha az bilinçli olmaları olabilir. Fakat diğer bölgelerde yaşayanlar, bu sorunlarla daha çok karşılaştıkları için, sürdürülebilir kalkınmayı bu sorunlara bir çözüm olarak görüyor olabilirler.

Diğer yandan, anne babalarının eğitim düzeyinin sınıf öğretmeni adaylarının sürdürülebilir kalkınmaya yönelik tutumları üzerinde bir etkisi bulunamamıştır. Bunun sebebi de onların okudukları bölümle ilgili olabilir. Sınıf öğretmeni adayları, eğitim fakültesi öğrencileri ve geleceğin öğretmenleri olarak çevresel, kültürel ve sosyoekonomik olaylara karşı daha duyarlı olabilirler. Bilgileri, değerleri, duyguları ve düşünme becerileri de tutumlarını ailelerinin eğitim düzeylerinden daha fazla etkiliyor olabilir (Kollmuss ve Agyeman, 2002). Ayrıca, müfredat incelemesinden de

anlaşıyor olabileceği gibi, bölümlerindeki derslerin müfredatları da onları sürdürülebilir kalkınma konusundaki bilgilendirmektedir. Bu sebeple, ailelerinin okur yazar olmaması ya da lise ya da üniversiteden mezun olmasının sınıf öğretmeni adaylarının sürdürülebilir kalkınmaya yönelik tutumları üzerinde bir etkisi yoktur.

Sınıf öğretmeni adaylarının sürdürülebilir kalkınma için eğitime yönelik yeterlik algıları incelendiğinde de genel olarak bu konuda kendilerini yeterli buldukları görülmüştür. Yeterlik alanları arası karşılaştırma yapıldığında ise, sınıf öğretmeni adaylarının “duygular” alanında kendilerini daha yeterli buldukları görülmüştür. Daha sonra sırasıyla değerler, sistematik düşünme ve bilgi alanlarında kendilerini yeterli olarak algılamaktadırlar. Yani, öğretmen adayları duygular ve değerler alanlarında kendilerini daha yeterli algılamakta, sistematik düşünme ve bilgi alanlarında daha az yeterli olarak algılamaktadırlar. Bu durum da sürdürülebilir kalkınma için eğitim konusunda sahip oldukları bilgilerden emin olmamalarından kaynaklanıyor olabilir. Bu sebeple de sürdürülebilir kalkınma için eğitim konusundaki sistematik düşünme yeterliklerini de geliştirilmemiş olarak algılıyor olabilirler. Bertschy, Künzli and Lehman (2013)’ın da belirttiği gibi öğretmen yetiştirme kurumları öğretmenlerin sürdürülebilir kalkınma için eğitim konusunun belirli amaçlarına göre belirlenmiş yeterliklerini geliştirmede yardımcı olmalıdır. Bu kurumların sürdürülebilir kalkınma için eğitim amaçları belirli olduğunda, öğretmenler de bu konuların daha çok farkında olurlar ve daha organize bilgilere sahip olduklarından daha sistematik düşünebilirler. Aynı zamanda müfredatlarının da bu alanları geliştirecek etkinliklere odaklanması önemlidir.

Diğer yandan araştırmanın bulguları göstermiştir ki, sınıf öğretmeni adaylarının yaşadıkları şehirlerin kalkınmışlık düzeylerinin, sürdürülebilir kalkınma için eğitim konusundaki yeterlik düzeyleri arasından duygular ve değerler üzerinde etkisi bulunmaktadır. Fakat bilgi ve sistematik düşünme açısından etkisi bulunmamaktadır.

Genel olarak bakıldığında duygu ve değerler zaten içiçedir ve onları birbirlerinden bir çizgi ile ayırmak pek mümkün değildir. Bu sebeple de kalkınmışlık düzeyinin hem duygular hem de değerler üzerinde bir etkisinin bulunması çok

olağandır. Aynı zamanda, duygular ve değerler, insanların birbirleri ve çevreleriyle iletişiminden de etkilenir. Buldukları illerin kalkınmışlık düzeyleri insanların duygu, düşünce ve davranışlarını da şekillendirebileceği için, dolayısıyla duygu ve değerler alanındaki yeterlikleri üzerinde de etkisi bulunmaktadır.

Diğer yandan, gelişmişlik düzeyinin en alt düzeyi olan 6. gelişmişlik bölgesinde yaşayan sınıf öğretmeni adaylarının değerler alanında kendilerini diğer gelişmişlik düzeyinde yaşayanlara göre daha az yeterli hissetmektedirler. Bu öğretmenlerin kendi değerlerini şekillendiren, buldukları bölgenin ekonomik, çevresel ve kültürel değerlerine daha çok bağlı oldukları düşünülebilir ve bu sebeple, gelecekte, öğrencilere bunlardan bağımsız, kendi değerlerini oluşturmalarını öğretmenin zor olabileceğini düşünüyor olabilirler.

Anne babalarının eğitim düzeylerinin ise sınıf öğretmeni adaylarının sürdürülebilir kalkınma için eğitime yönelik yeterlik algıları üzerinde bir etkisi bulunamamıştır. Bu da üniversite öğrencileri olarak bir çoğunun zaten anne ve babasıyla yaşamamasından kaynaklanıyor olabilir. Bunun yerinde yaşadıkları çevredeki diğer bireylerle ilişkileri ve aldıkları eğitimin etkisinin olduğu tahmin edilmektedir.

Sınıf öğretmeni adaylarının sürdürülebilir kalkınmaya yönelik tutumları ile sürdürülebilir kalkınma için eğitim alanındaki yeterlik algıları arasındaki ilişki incelendiğinde, tutumlarının daha olumlu olduğunda, yeterlik algılarının daha yüksek olduğu görülmektedir. Bu ilişki, çevresel ve kültürel faktörlere ilişkin tutumları ile duygular, değerler ve sistematik düşünmeye ilişkin yeterlikleri arasında daha yüksek; ancak bilgi düzeyinde daha düşüktür. Bu da duygu ve değerlerin tutumlardan kolayca etkileniyor olmasından kaynaklanabilir. Fakat bilgi alanındaki yeterliğin daha farklı faktörlerle ilişkili olması beklenmektedir. Bilgi alanındaki yeterliğinin sınıf öğretmenliği müfredatının içeriği ile ilişki olması beklenmektedir.

Sınıf öğretmenliği müfredatının sürdürülebilir kalkınmaya yönelik içerdiği öğrenme ortamları incelendiğinde de, sürdürülebilir kalkınma için eğitim yeterliklerinin geliştirilmesi açısından daha iyi düzenlenmiş bir sınıf öğretmenliği müfredatına ihtiyaç olduğu görülmektedir. Öğretmen adaylarının, gelecekte

sürdürülebilir kalkınma için eğitim konusunda ilkokul öğrencilerini yetiştirecekleri düşünüldüğünde, bölümlerindeki çalışmalarının onları bu konuda yeterli duruma getirecek kadar yeterli öğrenme ortamları sunuyor olması gerekmektedir.

ÖNERİLER

Bu çalışmanın bulguları sınıf öğretmeni adaylarının sürdürülebilir kalkınma kavramının farkında olmalarına ve sürdürülebilir kalkınmaya karşı olumlu tutum sergilemelerine rağmen, onun ilkeleri konusundaki temel bilgilerinin çok net olmadığını ve algıladıkları bilgi yeterlik seviyesinin de düşük olduğunu göstermektedir. Çok net görülmektedir ki, sınıf öğretmeni adayları, sürdürülebilir kalkınmanın anahtar kavramları, temelleri, bu konuda eğitsel hedeflerin belirlenmesi ve sınıflarında buna dayanarak etkili öğrenme ortamları yaratılması konusunda yeterince bilgiye sahip değildirlere. Ayrıca, sürdürülebilir kalkınmanın, ekonomik, sosyal ve kültürel yönleri hakkında da yeterli bilgiye sahip değiller. Bu nedenle, eğitim fakültelerindeki sınıf öğretmenliği müfredatının ilk yılında Sürdürülebilir Kalkınma için Eğitime dayalı dersler verilmelidir. Bu dersler sürdürülebilir kalkınmanın tanımını, temellerini, boyutlarını, amaçları ve temel ilkelerini içerebilir. Ayrıca, sürdürülebilir kalkınmanın ilkokul öğrencilerine nasıl uygulanabileceği de müfredata eklenmelidir. Bazı ülkelerde bu tür dersler verilmektedir. Örneğin, Rusya'da eğitimdeki sürdürülebilir kalkınma, toplumdaki sürdürülebilir kalkınma için bir ön şart olarak kabul edilmektedir. Sürdürülebilir kalkınmanın temelleri 20 fakültenin 14'ünde sürdürülebilir kalkınma ile ilgili zorunlu dersler olarak St Petersburg Devlet Üniversitesi müfredatına girmiştir (Verbitskaya, Nosava ve Rodina, 2002).

Buna ek olarak, sürdürülebilir kalkınma diğer derslerin içeriğine de eklenebilir. Bu derslerde sürdürülebilir kalkınmanın önemi vurgulanarak, açıkça ifade edilmiş hedefler ile hem teorisi hem de uygulaması derslerin içeriğine entegre edilebilir. Bu aynı zamanda MEB müfredatına paralel olarak yapılmalıdır çünkü MEB müfredatı sürdürülebilir kalkınma öğretimi için bazı hedefler içermektedir. Öğretmenler sürdürülebilir kalkınma hakkında bilgiye sahip olmazlarsa, bunları öğrencilerine

öğretmeleri de zorlaşacaktır. Bu nedenle, eğitim fakültelerinin ve MEB'nin müfredat çalışmaları aynı doğrultuda yapılmalıdır. Sürdürülebilir kalkınma için öğretmen eğitimine ilişkin uluslararası anlaşmalar da bulunduğu için, bu zorunlu ders ve entegrasyon çalışmaları eğitim fakültelerinin tüm bölümlerinde sürdürülebilir kalkınmanın sürdürülebilirliği için yapılmalıdır.

Türkiye'de Yükseköğretim Kurulu (YÖK), sürdürülebilir kalkınma için eğitimin araştırılması için bazı komiteler de oluşturabilir. Bu komiteler, sürdürülebilir kalkınmanın hem teorisi hem de uygulaması üzerinde uluslararası kaynak bulma, ve sürdürülebilir kalkınma için eğitimin öğretmen yetiştirme müfredatlarına entgre edilmesi üzerine çalışabilir.

Milli Eğitim Bakanlığı, 2008 yılında genel alan yeterlikleri ve özel alan yeterlikleri olmak üzere öğretmen yeterliklerini belirlemiştir. Genel alan yeterlikleri arasında “Okul-Aile ve Toplum İlişkileri” alanındaki alt yeterlikler sürdürülebilir kalkınma için eğitim ile ilgili yeterlikler içermektedir. Sınıf öğretmenleri özel alan yeterlikleri ise sekiz alandan oluşmaktadır ve bunlardan yedincisi olan bireysel sorumluluklar ve sosyalleşme alanı da sürdürülebilir kalkınma için eğitim ile ilgili alt yeterlikler içermektedir. Ancak, hem genel yeterlikler hem de özel alan yeterlikleri içinde, sürdürülebilir kalkınma için eğitim alanına ait yeterliklerin de ayrı birer başlık haline açıklanabilir. Diğer yandan, bu şekilde belirtilen yeterlikler bile sınıf öğretmenliği müfredatında bulunmamaktadır. Bu sebeple, eğitim fakültelerinin müfredatları revize etmeleri ve Milli Eğitim Bakanlığı ile birlikte sürdürülebilir kalkınma için eğitim yeterliklerinin belirlenmesinde koordine bir şekilde çalışması gerekmektedir.

Üniversiteler ise sürdürülebilir kalkınmanın anahtar yeterlikleri konusunda çalışmalar yapıp bunları belirleyebilir ve bu konuda aday öğretmenleri bilgilendirebilir. Ayrıca, bu konuda yeni yeterlikler belirleyebilir, öğretmenlerin bu yeterliklerini nasıl geliştireceklerini bulabilir ve müfredatların buna göre nasıl revize edilebileceklerini belirleyebilirler. Müfredat geliştirirken de öğretmen adayları bu alanlarda kendilerini daha az yeterli hissettikleri için özellikle bilgi ve sistematik düşünme yeterliklerine odaklanabilirler. Aynı zamanda, yerel ya da küresel olarak

sürdürülebilir kalkınma projelerinin yapılması da müfredeta eklenebilir. Böylece öğretmen adayları hem tüm yeterliklerin pratiğini yapmış, hem de sürdürülebilir kalkınmanın sağlanmasına yardımcı olmuş olurlar.

Çalışmanın bulguları, sınıf öğretmeni adaylarının sürdürülebilir kalkınmaya karşı tutumları ile sürdürülebilir kalkınma için eğitime yönelik yeterlikleri arasında olumlu bir ilişki olduğunu göstermektedir. Bu sebeple, eğer sınıf öğretmeni adayları, sürdürülebilir kalkınma konusunda daha bilgili olurlarsa, sürdürülebilir kalınmaya karşı daha olumlu olacaklar ve kendilerini daha yeterli hissedeceklerdir. Böylece, sürdürülebilir kalkınma konusunda daha donanımlı öğrenciler yetiştirebileceklerdir.

Sınıf öğretmeni adaylarının yaşadıkları şehirlerin gelişmişlik düzeyinin hem sürdürülebilir kalkınmaya karşı tutumları hem de sürdürülebilir kalkınma için eğitimin değerler yeterliği algıları üzerinde etkisi bulunmaktadır. Bu sebeple, sınıf öğretmeni adayları, bu etkiler hakkında bilgilendirilmelidir. Bu farklılıkların azaltılması için de eğitim fakültelerinin müfredatları revize edilmeli ve öğretim görevlileri bu konuda eğitilmelidir. Aynı zamanda, sınıf öğretmeni adaylarına değişim programları yardımıyla, farklı gelişmişlik düzeyinde bulunan üniversiteleri ziyaret etme fırsatı tanınabilir. Bu aynı zamanda mezun olduklarında farklı gelişmişlik düzeyindeki şehirlerde de çalışmak zorunda kalabilecekleri için faydalı olacaktır. Sürdürülebilir kalkınmanın açısından bu farklılıklar konusunda bilgilendirilen öğretmenlerin öğrencilerini bu konuda yetiştirmeleri ve sürdürülebilir kalkınmayı sağlayabilmeleri daha kolay olacaktır.

SONRAKİ ÇALIŞMALAR İÇİN ÖNERİLER

Sınıf öğretmeni adaylarının sürdürülebilir kalkınmaya karşı tutumları ve sürdürülebilir kalkınma için eğitim hakkındaki yeterlikleri konusunda bilgi edinebilmek için bu konularda görüşmeler yoluyla nitel araştırmalar da yapılabilir. Ayrıca, öğretmenlerin tutumları ve yeterlikleri hakkında başka bir araştırma da üniversitelerin farklı bölümlerinde ya da farklı alanlarda öğretmenlik yapan öğretmenler üzerinde yapılabilir. Öğretmenlerin sürdürülebilir kalkınma için eğitime yönelik yeterlikleri de ilkökul, orta öğretim ya da yüksek öğretim kurumları

düzeyinde analiz edilebilir. Bu çalışmalar, anket, gözlem ya da görüşme teknikleri ile yapılabilir. Sosyal istenirlik de bu çalışmalarda kontrol edilebilir ve bu doğrultuda arařtırmalar yapılabilir. Aynı zamanda, öğrencilerin tutumları da farklı eğitim düzeylerine göre, sürdürülebilir kalkınmanın sınıflarda ne ölçüde işlendiğinin tespit edilmesi amacıyla analiz edilebilir. Ayrıca çok pratik olmasa da, sürdürülebilir kalkınmaya yönelik tutumlar ve yeterlikler açısından kültürlerarası farklılıklar da incelenebilir. Farklı ülkelerdeki öğretmen yetiştirme müfredatları sürdürülebilir kalkınma açısından birbirleriyle karşılaştırılabilir. Sürdürülebilir kalkınma ve sürdürülebilir kalkınma için eğitim kavramları henüz çok yenidir. Bu nedenle özellikle Türkiye’de bu alandaki çalışmaların sayısı oldukça azdır. Sonuç olarak bu alanlarda, özellikle yerel ve küresel anlamda, öğretmen yetiştirme konusunda daha fazla araştırma yapılabilir.

Appendix F CURRICULUM VITAE

PERSONAL INFORMATION

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EDUCATION

PhD	METU, Curriculum and Instruction	2016
MS	Trakya University, Educational Administration	2006
BA	METU, Foreign Language Education	2003
High School	Edirne Anatolian Teacher Training High School	1998

WORK EXPERIENCE

2014- Present	Marmara University School of Foreign Languages	EFL Instructor
2007-2013	Atilim University Dept. of Foreign Languages	EFL Instructor
2011-2012	Atilim University Dept. of Foreign languages	Vice Director
2004-2006	TOBB ETU Dept. of Foreign Languages	EFL Instructor

ARTICLES & PROCEEDINGS

- Soysal, N. (2012). Review of Teacher Competency Studies in Turkey. *American International Journal of Contemporary Research*. 3 (2) pp.104-108.
- Soysal, N. (2011). A Self-regulated Learning Based English Course for University Students. *Practice and Theory in Systems in Education*. 3(6) pp. 211-220.
- Soysal, N. & Yildirim, A. (2010). University Students' Perceptions and Experiences of Web Based Learning Support. *6th International ELT Research Conference Proceedings*. 99 (1) pp. 208-21.

Appendix G TEZ FOTOKOPİSİ İZİN FORMU

ENSTİTÜ

Fen Bilimleri Enstitüsü	<input type="checkbox"/>
Sosyal Bilimler Enstitüsü	<input checked="" type="checkbox"/>
Uygulamalı Matematik Enstitüsü	<input type="checkbox"/>
Enformatik Enstitüsü	<input type="checkbox"/>
Deniz Bilimleri Enstitüsü	<input type="checkbox"/>

YAZARIN

Soyadı : SOYSAL

Adı : NEŞE

Bölümü : Eğitim Bilimleri Bölümü (Eğitim Programları ve Öğretim)

TEZİN ADI (İngilizce):

Pre-Service Classroom Teachers' Perceived Competencies on Education for Sustainable Development

TEZİN TÜRÜ : Yüksek Lisans Doktora

1. Tezimin tamamından kaynak gösterilmek şartıyla fotokopi alınabilir.
2. Tezimin içindekiler sayfası, özet, indeks sayfalarından ve/veya bir bölümünden kaynak gösterilmek şartıyla fotokopi alınabilir.
3. Tezimden bir (1) yıl süreyle fotokopi alınamaz.

TEZİN KÜTÜPHANEYE TESLİM TARİHİ: