ENVIRONMENTAL EDUCATION IN EARLY CHILDHOOD TEACHER TRAINING PROGRAMS: PERCEPTIONS AND BELIEFS OF PRE-SERVICE TEACHERS

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

BY

ZİŞAN GÜNER

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF SCIENCE
IN
THE DEPARTMENT OF EARLY CHILDHOOD EDUCATION

JUNE 2013

Approval of the Graduate School of Social Sciences

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ABSTRACT

ENVIRONMENTAL EDUCATION IN EARLY CHILDHOOD TEACHER TRAINING PROGRAMS: PERCEPTIONS AND BELIEFS OF PRE-SERVICE TEACHERS

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June 2013, 146 pages

This study aimed to describe pre-service early childhood teachers' perceptions of environmental education in teacher training programs, their beliefs about the integration of environmental education into early childhood education, and also to investigate the relationship between their perceptions and beliefs. Mixed methods sequential explanatory design was used. Data were collected from pre-service early childhood teachers (N=470) using Perceptions of Pre-service Teachers towards Environmental Education in Teacher Training Programs (PTEE) and Beliefs of Pre-service Teachers about Integration of Environmental Education into Early Childhood Education (BIEE) scales which were developed by the researcher. To elaborate the quantitative data, interviews were conducted with 9 participants.

The results showed that pre-service teachers' perceptions of environmental education in their training programs are neither insufficient nor sufficient. The interviews revealed insufficiencies in these programs due to some reasons including limited time and the absence of a separate environmental education course. Moreover, there were some sufficiencies in offering environmental education experiences for pre-service teachers throughout coursework, practicum and internship.

The results unfolded that pre-service teachers had availing beliefs about the integration of environmental education into early childhood education. Analysis of the qualitative data indicated that participants believed the significance of this integration owing to its contributions to children's whole development and learning, children's acquisition of environmental outcomes. They also reflected beliefs about the ways for this integration such as integrating environmental education into different activities. Lastly, a positive correlation between pre-service early childhood teachers' perceptions and beliefs was found.

Keywords: Environmental Education, Pre-service Teacher Education, Perceptions, Beliefs, Pre-service Early Childhood Teachers

ÖZ

OKULÖNCESİ ÖĞRETMEN YETİŞTİRME PROGRAMLARINDA ÇEVRE EĞİTİMİ: ÖĞRETMEN ADAYLARININ ALGILARI VE İNANIŞLARI

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Haziran 2013, 146 sayfa

Bu çalışmanın amacı okulöncesi öğretmen adaylarının lisans programlarındaki çevre eğitimine yönelik algılarını ve çevre eğitiminin okulöncesi eğitime entegre edilmesine yönelik inanışlarını, ve onların algı ve inanışları arasındaki ilişkiyi incelemektir. Bu çalışmada nicel ve nitel araştırma desenleri kullanılmıştır. Örneklem Ankara ilindeki öğretmen yetiştirme programına kayıtlı 470 öğretmen adayından oluşmaktadır. Bu çalışmada araştırmacı tarafından geliştirilen Öğretmen Adaylarının Öğretmen Yetiştirme Programındaki Çevre Eğitimine Yönelik Algıları Ölçeği (PTEE Scale) ve Öğretmen Adaylarının Çevre Eğitiminin Okulöncesi Eğitimle Bütünleştirilmesine Yönelik İnançları Ölçeği (BIEE Scale) uygulanmıştır. Nicel verileri detaylandırmak için, 9 katılımcı ile görüşmeler gerçekleştirilmiştir.

Sonuçlar okulöncesi öğretmen adaylarının öğretmen yetiştirme programlarındaki çevre eğitimine yönelik algılarının ne yetersiz ne de yeterli olduğunu göstermiştir. Görüşmeler bu programlardaki yetersizliklerin zaman

sınırlılığı, çevre eğitimi ile ilgili ayrı bir dersin olmayışı gibi bazı sebeplerden kaynaklandığını ortaya çıkarmıştır. Ayrıca, bulgular öğretmen adaylarına ders ve staj kapsamında çevre eğitimi ile ilgili uygulamalar sağlamada programın yeterlik olduğunu göstermiştir.

Sonuçlar öğretmen adaylarının çevre eğitiminin okulöncesi eğitime entegre edilmesine yönelik yararı olan inanışlara sahip olduğunu göstermiştir. Nitel veriler öğretmen adaylarının çevre eğitiminin okulöncesi eğitime entegre edilmesini neden gerekli gördüğünü açıklamaya yardımcı olmuştur. Öğretmen adayları bu entegrasyonun önemine çocukların bütünsel gelişim ve öğrenmesine, ve onların çevresel kazanımlar edinmelerine yönelik katkıları olduğu için inanmaktadır. Öğretmen adayları ayrıca çevre eğitimini farklı etkinliklere entegre edilmesi gibi yollarla çevre eğitiminin entegre edilebileceğine yönelik inanışlarını sergilemiştir.
Son olarak, okulöncesi öğretmen adaylarının algıları ve inanışları arasında pozitif bir ilişki olduğu tespit edilmiş olup, bu ilişki nitel verilerle desteklenmiştir.

Anahtar Kelimeler: Çevre Eğitimi, Hizmet Öncesi Öğretmen Eğitimi, Algılar, İnanışlar, Okulöncesi Öğretmen Adayları

To My Family, and Mustafa Alpaslan

ACKNOWLEDGEMENTS

First of all, I would like to express my appreciation to my supervisor Assist. Prof. Dr. Refika Olgan, for her endless supervision, for giving valuable advices, for sharing her academic experiences with me, and for helping me from the very beginning of this study to the end. Everything that I have learned from her elaborated my points of view about early childhood education research field, professionalism, and academia.

Next, I am grateful to my co-supervisor Prof. Dr. Jale Çakıroğlu for her continuous encouragement, for her worthy constructivist critics, and for helping me in every step of this study. I feel myself very lucky about that I had the chance to know and study with her. Her studies and approaches deeply influenced me and taught me the importance of being a life-long learner.

It seems to be difficult for me to express my thanks to my family members, Kemal-Nimet Güner, Nesrin-Erhan Yayla in just one paragraph, on account of their endless love and support which make me the luckiest daughter in the world. Although they are far away from me, I always feel their hearts and minds with me and I always try to do my best with the help of their everlasting love and trust. A million thanks!!

A very special thanks to my engage, my colleague, and my life…Mustafa Alpaslan, without whom this master thesis would not have gone along as smoothly. He always motivated me with his advices and appreciations even though I sometimes felt tired during the thesis process. Knowing his support on my shoulders made me feel more willingness to accomplish this study and encouraged to create further ones.

I would like to present my sincere appreciation to all teacher candidates for their positive approach and participation to this study, and also the faculty members welcomed me throughout data collection. During the thesis process, I would like to

express many thanks to Ass. Prof. Dr. Çiğdem Haser, for sharing her valuable time with me during qualitative data analysis and her contributions to this process. I would like to present my deep gratitude to Ass. Prof. Dr. Feyza Tantekin-Erden, for her consultancy ever, for her warmth, and for her appreciations about my academic progress. I would like to express my sincere thanks to Dr. Volkan Şahin for his comprehensive guidance for this study and help during data collection process. Special thanks to my undergraduate lecturer, Prof. Dr. Teoman Kesercioğlu since he is a turning point in my life to choose this job. He always believed in me, taught me to compete with my own potential and love my job.

I am very thankful to Prof. Dr. Gelengül Haktanır, Prof. Dr. Berrin Akman and Assoc. Prof. Dr. Sinan Erten for their worthy opinions about and contributions to scale development process.

I would like to thank my thesis committee members, Assoc. Prof. Dr. Esen Uzuntiryaki-Kondakçı, Assoc. Prof. Dr. Gaye Tuncer-Teksöz and Ass. Prof. Dr. Çiğdem Haser. I believe that this study became more qualified with their worthy suggestions.

Many thanks to my colleagues and my friends, Celal İler, Aykut Bulut and Meltem Mecdi. They made me feel more energetic, happier with their support and friendship.

Finally, I thank to TÜBİTAK for their scholarship which strengthened me to be more successful and facilitated conducting this study.

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LIST OF ABBREVIATIONS

BIEE: Beliefs of Pre-service Teachers about Integration of Environmental Education into Early Childhood Education

CHE: Council of Higher Education

EETAP: Environmental Education and Training Partnership

M: Mean

MoNE: Ministry of National Education

N: Number of Participants

NAAEE: The North American Association for Environmental Education

NAEYC: The National Association of the Education of Young Children

PTEE: Perceptions of Pre-service Teachers towards Environmental Education in Teacher Training Programs

SD: Standard Deviation

SE: Standard Error

UNCED: The United Nations Conference on Environment and Development

UNEP: The United Nations Environment Programme

UNESCO: United Nations Educational, Scientific and Cultural Organization

WCED: World Commission on Environment and Development

σ^2: Variance

CHAPTER I

INTRODUCTION

Increasing human population all over the world has been indicated as one of the reasons of the environmental problems due to its several impacts on the environment such as global warming, deforestation, and loss of biodiversity (Cohen, 2003). Considering the underlying causes of these problems, we could see negative attitudes and unconscious behaviors of human beings toward nature and the environment. They are not only the reasons for these problems, but also they are influenced by consequences of the problems.

Such environmental problems have been on the agenda of national and international conferences all over the world. Environmental problems and their reasons have first been widely debated in Stockholm Conference in 1972. People's responsibilities towards the environment were discussed and some principles in the conference directly paid attention to the role of people in conserving and improving the environment in terms of the well-being of environmental heritage for current and next generations (UN, 1972). In addition to the reasons for the environmental problems and the principles, environmental education was advocated as resolutions on environmental problems in this conference owing to its contributions to the enhancement of the environment through raising awareness among people to conserve and improve conditions of the earth all together (UN, 1972).

Afterwards, the need for environmental education has been stressed by both intergovernmental forums and documents for approximately four decades: The Belgrade Charter (United Nations Educational, Scientific and Cultural Organization, UNESCO, 1976), The Tbilisi Declaration (UNESCO, 1977), The Brundtland Report (World Commission on Environment and Development, WCED, 1987), The Rio

Earth Summit (The United Nations Conference on Environment and Development, UNCED, 1992), the Johannesburg Summit (UN, 2002) and the United Nations Environment Programme (UNEP, 2008). The need and importance of environmental education has been stressed during these years, and the goals of such an education program were described. Moreover, it was decided that environmental education should be handled by individuals who have the knowledge, attitude and skills to deal with environmental problems. During these conferences, the integration of environmental education into education at all levels was also suggested (UNESCO, 1977).

Considering the integration of environmental education into all education levels, early childhood education could be seen as the first step to take an action, since it is the very beginning of education for children from 0 to 8 years old (NAEYC Position Statement, 2009). Early experiences are highly important to support young children's both physical, cognitive, language, social-emotional development and learning in different content areas (NAEYC Position Statement, 2009). With respect to the significance of early experiences, brain research findings pointed to the contributions of these experiences to children's brain development as well. It is believed that as children have a chance to engage in stimulating experiences, their brain development will be supported (Gordon & Browne, 2007).

Early childhood education is not only a very critical period for sustaining children's whole development and learning, but it is also an important period to integrate environmental education into education (Wilson, 2010). Previous studies illustrated the reasons for integrating environmental education in early childhood education (Davis, 1999; Palmer, 1999; NAAEE, 2010; Wilson, 1993, 1994, 1996, 2010). One of the reasons is related to contributions of this integration to children's whole development and their learning (Wilson, 1993). As children experience with nature, their physical, cognitive, language, social and emotional developmental domains are enhanced, and they have varied opportunities to learn in an effective way by actively exploring the environment and engaging in nature related materials.

Another reason for integrating environmental education into early childhood education is that it contributes to children's acquisition of environmental outcomes.

Providing environmental education to young children was urgently proposed to support their understanding of environment and to help them gain environmental sensitivity, positive attitudes towards the environment, environmental values and environmentally responsible behaviors (Basile & White, 2000; Chawla, 1998; Chawla & Cushing, 2007; Elliot, 2010; Owens, 2005; Wilson, 1993). Furthermore, Wilson (1993) claimed that environmental education supports children's appreciation and respect for the environment to improve the quality of the environment.

Yet another reason for integrating environmental education into early childhood education is the similarities between environmental education and early childhood education. Both types of education adopt similar teaching approaches which enable children learn actively considering their interests and needs (Wilson, 1993). Davis (1998) also laid emphasis on the link between environmental education and early childhood education mentioning that these fields emphasize an integrated approach which provides a number of connected activities to support children's learning. For these reasons, integrating environmental education into early childhood education has been suggested rather than teaching environmental education as an extra subject matter (Davis, 1998; NAAEE, 2010; Wilson, 1993).

In addition to the reasons for integrating environmental education into early childhood education, the ways of integrating environmental education into education were stated in previous studies. The first one is the incorporated environmental education model of Palmer (Palmer, 1998) which has three consistent components in order to acquire productive results from environmental education practices for all education levels: education about environment, education in or from environment, and education for environment. It is believed that learners gain environmental awareness, skills such as exploration of the environment, positive attitudes and values about, and behaviors for the welfare of the environment via application of this model. Moreover, Wilson (2010) specifically explained the ways of integrating environmental education into early childhood education. She suggested a number of ways for early childhood teachers to accomplish this integration during their educational planning, organizing and practicing procedures. Some of these ways are integrating environment related objectives into other subject areas, teacher's

demonstrating an individual interest about the environment, and using nature related materials.

In order to integrate environmental education into early childhood education as proposed in literature, early childhood teachers as implementers and guiders of early childhood education play a key role (Davis, 1998; Elliot, 2010; Wilson, 1996, 2010). For example, Wilson (1996) emphasized the role of early childhood teachers to conduct successful environmental education. She asserted that teachers should be a good model for children to take care of the earth, conduct outdoor activities continuously, and make children active in their learning experiences about the environment. Furthermore, as put forward by Davis (1998), early childhood teachers should raise children as conscious individuals toward the environment and as motivated individuals to collaboratively protect the environment and improve its quality.

In this sense, pre-service teacher training programs have an important mission to raise pre-service early childhood teachers' awareness about their roles to integrate environmental education into early childhood education before they begin their profession. Davis (1998) mentioned one of the missions of pre-service teacher training programs as preparing future practitioners of environmental education through giving place to environmental education as integrated into undergraduate courses. One of the indicators of this endeavor can be pre-service teachers' perceptions regarding environmental education given in these programs. That is to say, how they view or approach environmental education in their programs relying on their experiences (Susuwele-Banda, 2005). Furthermore, the determination of pre-service teachers' perceptions of environmental education in their programs is important, since it would give feedback for the current functioning of pre-service teacher training programs. In parallel with this, McKeown-Ice (2000) draws attention to evaluate environmental education in pre-service teacher training programs by examining perceptions of pre-service teachers as one of the important elements of these programs.

To evaluate environmental education in pre-service teacher training programs, a number of studies were conducted in different countries (Ashman, 2010;

Franzen, 2012; Hanchet, 2010; Heimlich, Braus, Olivolo, McKeown-Ice, & Barringer-Smith, 2004; Lin, 2002; McKeown-Ice, 2000; Meredith et al., 2000; Miles & Cutter-Mackenzie, 2006; Towler as cited in Lin, 2002). Some of the studies on pre-service teacher training programs were conducted to reveal the current situation of environmental education in pre-service teacher training institutions on a national level such as in Canada (Towler as cited in Lin, 2002; Hanchet, 2010; Lin, 2002) and in the US (Ashman, 2010; Franzen, 2012; Heimlich et al., 2004; Mastrilli, 2005; McKeown-Ice, 2000; Meredith et al., 2000). The findings of these studies concerning the integration of environmental education into pre-service teacher education showed that there is a need to develop general statement or policy for the better integration of environmental education into pre-service education levels (Heimlich et al., 2004; McKeown-Ice, 2000).

In addition to the influence of pre-service teacher training programs on preparing pre-service early childhood teachers with the roles and competencies to effectively integrate environmental education into early childhood education, the significance of taking pre-service teachers' beliefs into consideration was underlined to improve environmental education in pre-service teacher training programs (Plevyak, Bendixen-Noe, Henderson, Roth, & Wilke, 2001). The significance of the determination of pre-service teachers' beliefs during their undergraduate education was stressed in several studies by explaining its long-lasting effects on future teaching practices (Begum, 2012; Johnson & Hall, 2007; Nespor, 1985; Pajares, 1992). For instance, Pajares (1992) advocated that understanding of teacher beliefs is vital so as to comprehend the underlying reasons of teachers' behaviors or teaching actions. Similarly, Nespor (1987) demonstrated that teachers' beliefs mostly influence their actions, teaching efforts and energies in preparing and/or organizing activities. Furthermore, Begum (2012) mentioned the factors that affect teachers' beliefs about environmental education. One of the influential factors on these beliefs might be the way teachers themselves learned environmental education from their teachers when they were students. In this context, investigation of pre-service teachers' beliefs would provide feedback for pre-service teacher training programs,

their curricula and the practices to be followed in those programs to shape teacher candidates' beliefs (Pajares, 1992).

Last but not least, beliefs and perceptions were stated to be as interrelated constructs in the literature (Brookhart & Freeman, 1992; Calderhead & Robson, 1991; Clark & Peterson, 1986; Pajares, 1992; Richardson, 2003). For example, Richardson (2003) remarked that pre-service teachers' beliefs have a strong influence on their learning during undergraduate years. Furthermore, beliefs impact on pre-service teachers' perceptions or evaluations of a variety of experiences they gained in the program. Furthermore, the investigation of pre-service teachers' beliefs and perceptions is recommended for some reasons. One is related to the evaluation of the effectiveness of pre-service teacher training programs in preparing future teachers and another is about the importance of beliefs and perceptions for pre-service teachers' ongoing development during undergraduate years (Minor, Onwuegbuzie, Witcher, & James, 2002).

Considering the environmental education in pre-service early childhood teacher training programs in Turkey, there were serious shortcomings in terms of environmental education content and practices because the Turkish Council of Higher Education (CHE, 2007b), which is an institution responsible for higher education in Turkey, did not propose any undergraduate compulsory and elective courses related to the environment and environmental education for the training of pre-service early childhood teachers. In early childhood teacher training programs, there is only one compulsory course called Science Education, but when its description is examined, there is not much content about environmental education. Thus, the investigation of the content and practices of environmental education in pre-service early childhood teacher training programs, pre-service teachers' beliefs about the integration of environmental education into early childhood education and the possible relationship between these perceptions and beliefs are particularly necessary in Turkish context.

1.1. Purpose and Significance of the Study

The concepts of the integration of environmental education into education has been widely discussed and recommended for many years (NAAEE, 2010; Palmer, 1998; UNESCO, 1977; Wilson, 2010), and several reasons behind such an integration were put forward. One is related to its outcomes for children's whole development and learning (NAAEE, 2010; Wilson, 1994). Environmental education is considered to contribute to both children's healthy development (Clements, 2004) and effective learning (Edwards & Cutter-Mackenzie, 2011). Another reason is about the environmental outcomes of integrating environmental education into early childhood education. This integration is stated as beneficial for children's gaining environmental understanding, environmental sensitivity, positive attitudes towards the environment, environmental values, and environmentally responsible behaviors which are the essential components for the well-being of the earth (Davis, 1998; Wells & Lekies, 2006; Wilson, 2010). Yet another reason is the similarity between the fields of environmental education and early childhood education in terms of their theoretical backgrounds and educational implications (Wilson, 1993). Both fields stress child-centered educational implications and aim to support children's development and learning. Despite its significant outcomes, there are some shortcomings in educational practices and early childhood curriculum in terms of environmental education. For that reason, Davis (1999) recommended that environmental education should be integrated into early childhood education programs in order to minimize these shortcomings and make it easier to reach the aforementioned goals of environmental education.

At this point, pre-service teacher training programs play a significant role in training future early childhood teachers with the essential competencies to integrate environmental education into early childhood education in an expected way. The sufficiency of this training first most probably depends on the perceptions of pre-service early childhood teachers about the content and practices of environmental education in their undergraduate program.

Otherwise, it does not seem possible that teacher educators can be sure about the effectiveness of their instruction in preparing pre-service early childhood teachers as future implementers of environmental education. Concerned with the future practices of pre-service teachers, Meredith et al. (2002) drew attention to the role of pre-service teacher training programs. In this sense, the sufficiency of pre-service teacher training programs in providing environmental education is linked with pre-service teachers' perceptions. Both have pivotal effects on teaching practices. Thus, several researchers including McKeown-Ice (2000) advocated for the necessity of research studies aimed at examining environmental education in pre-service teacher training programs considering the perceptions of pre-service teachers. Hence, there is a need to describe pre-service early childhood teachers' perceptions of the sufficiency of environmental education in their undergraduate programs.

In addition, the role of teacher beliefs has been a key concern in the educational field over the last several years (Kagan, 1992; Nespor, 1987; Pajares, 1992). However the researchers tended to describe beliefs in many ways by using different terminologies such as teacher thinking (Clark & Peterson, 1986; Nespor, 1987), what a person says or does (Rokeach, 1968), implicit assumptions (Kagan, 1992), they came up with the idea of its effects on teacher actions or behaviors. Considering the effects of beliefs on further teaching practices (Kagan, 1992; Plevyak et al., 2001; Pajares, 1992), the determination of pre-service early childhood teachers' beliefs and refinement of these beliefs into positive ones should be a priority of teacher educators. Thus, the current study aims to describe pre-service early childhood teachers' beliefs about the integration of environmental education into early childhood education.

As previously stated, the previous studies remarked the association between teachers' beliefs and perceptions (Brookhart & Freeman, 1992; Calderhead & Robson, 1991; Clark & Peterson, 1986; Pajares, 1992; Richardson, 2003). For example, Pajares (1992) stated that beliefs strongly influence perceptions and accordingly teaching practices. Similarly, it was claimed that pre-service teachers' beliefs about teaching any subject matter is linked with how they approach their

undergraduate programs (Calderhead & Robson, 1991). As well as the influence of beliefs on perceptions, offered experiences in the context of undergraduate courses would have an impact on shaping pre-service teachers' beliefs (Nettle, 1998; Ng, Nicholas, & Williams, 2010; Stuart & Thurlow, 2000). For example, Nettle (1998) demonstrated that experiences during teaching practice had a potential to change pre-service primary teachers' existing beliefs about the variables to support students' learning. Namely, pre-service teachers' prior beliefs about teaching ways (e.g., using structuring learning) to support students' learning changed before and after teaching experience. In a similar way, Stuart and Thurlow (2000) revealed the role of teaching experiences within methods classes in raising awareness of pre-service teachers' beliefs about teaching and learning process of mathematics. For the current study, it is assumed that pre-service early childhood teachers' abovementioned perceptions and beliefs could affect each other. Namely, either pre-service early childhood teachers' beliefs about integrating environmental education into early childhood education might affect their perceptions of environmental education in their undergraduate program or their undergraduate program experiences might shape their beliefs about this integration. For this reason, this study also intends to explore the relationship between pre-service teachers' beliefs and perceptions.

As for the participants, the majority of the previous studies collected data from the faculty members to investigate environmental education in pre-service elementary and secondary education teacher training programs (Heimlich et al., 2004; Lin, 2002; Mastrilli, 2005; McKeown-Ice, 2000; Meredith et al., 2002). These studies mainly investigated the effect of an environment-related course on pre-service teachers' environmental interests, attitudes and perceptions (Brown, 2000; Hoeg, 2010; Nelson, 2010) rather than examining environmental education in pre-service teacher training programs. Still, there are few studies exploring environmental education undergraduate programs from pre-service teachers' points of views (Chang, 1998; Miles, Harrison, & Cutter-Mackenzie, 2006). However, there are no studies conducted with pre-service early childhood teachers to describe environmental education content and practices in their training programs in the

accessible literature. Moreover, previous studies intended to explore pre-service teachers' and in-service teachers' beliefs about teaching environmental education at primary and secondary education level (Begum, 2010; Forbes & Zint, 2010; Sia, 1992; Tan & Pedretti, 2010). Although there is a study which explored the change in pre-service early childhood teachers' self-efficacy beliefs about environmental education after an intervention program (Moseley & Utley, 2008), there are no studies investigating pre-service early childhood teachers' beliefs about the integration of environmental education into early childhood education.

As regards Turkey, there are several studies which explored environmental education in undergraduate programs from the perspectives of pre-service science teachers and pre-service primary teachers (Meriç & Tezcan, 2005; Yılmaz & Gültekin, 2012). With respect to pre-service early childhood teacher training programs, the studies substantially focused on the general evaluation of pre-service early childhood teacher training programs in terms of courses and practices (Güler, 1994; Küçükoğlu & Kızıltaş, 2012; Şahin, Kartal, & İmamoğlu, 2013). As for the belief studies, there is only one study examining pre-service and in-service primary teachers' self-efficacy beliefs about environmental education (Aydın, 2008), but no studies have been conducted with pre-service early childhood teachers with the purpose of describing their perceptions of the sufficiency of environmental education in their training programs and their beliefs about the integration of environmental education into education in the accessible literature.

In the light of the above-mentioned studies, the current study was conducted with 470 sophomore, junior and senior pre-service early childhood teachers in Ankara by utilizing researcher-developed surveys to explore their perceptions about the content and practices of environmental education in the teacher training programs and their beliefs about the integration of environmental education into early childhood education. The surveys also aimed to examine whether there is a relationship between pre-service teachers' perceptions and beliefs. Moreover, to reveal pre-service teachers' perceptions and beliefs thoroughly, semi-structured interviews were used.

In order to describe pre-service early childhood teachers' abovementioned perceptions and beliefs and also to investigate the link between their perceptions and beliefs, the following research questions are addressed:

1. What are the perceptions of pre-service early childhood teachers about the sufficiency of environmental education in pre-service teacher training programs they attended?

2. What are the beliefs of pre-service early childhood teachers about the integration of environmental education into early childhood education?

3. Is there a relationship between pre-service early childhood teachers' perceptions of the sufficiency of environmental education in their pre-service teacher training programs and their beliefs about the integration of environmental education into early childhood education?

1.2. Definitions of Key Terms

Environmental education: "It is an action process related to the work of almost all subject areas. It is concerned with the dynamic relationships between men and nature. It aims at improving the environmental quality" (UNESCO, 1977, p.7). In this study, environmental education refers to learners' understanding of the role of human beings on the natural environment, and showing action to improve the quality of the environment.

Perception: "views or opinions held by an individual resulting from experience and external factors acting on the individual" (Susuwele-Banda, 2005, p.13). In the current study, perception refers to pre-service early childhood teachers' opinions about the sufficiency of environmental education in pre-service teacher training programs they attended based upon their experiences throughout undergraduate education.

Belief: "It is an individual's judgment of the truth or falsity of a proposition, a judgment that can only be inferred from a collective understanding of what human

beings say, intend, and do" (Pajares, 1992, p. 316). In this study, beliefs corresponds to pre-service early childhood teachers' judgment or agreement level about the significance of integrating environmental education into early childhood education.

CHAPTER II

LITERATURE REVIEW

The review of literature includes seven sub-topics which indicate the reasons for and ways of the integration of environmental education into early childhood education within different perspectives. It also includes why pre-service early childhood teacher training programs are important in training of future early childhood teachers who will be key persons to integrate environmental education into early childhood education. The sub-topics are named as: the need for environmental education, the reasons for integrating environmental education into early childhood education, the ways of integrating environmental education into early childhood education, the role of early childhood teachers in practicing environmental education, the mission of pre-service teacher training programs in preparing early childhood teachers with essential roles for environmental education, beliefs in environmental education practices, and current pre-service early childhood teacher education in the context of Turkey.

2.1. The Need for Environmental Education

One of the underlying reasons of the environmental problems has been indicated as increasing human population owing to increasing resource use, consumption and accordingly environmental change (Sage, 1996). Furthermore, environmental problems all around the world were deeply discussed in the United Nations Conference on Human Environment in Stockholm in 1972. Herein, the significance of environmental education was put into words in the Belgrade Charter that was held in 1975. Environmental education was deeply discussed by describing its goals, objectives and principles in Tbilisi (UNESCO, 1978). In this conference,

the need for environmental education to deal with the environmental problems was pointed out through indicating some recommendations. One of these recommendations was about its integration into formal education with the purpose of helping learners gain environmental knowledge, understanding, values, and skills essential for overcoming the environmental problems. In this regard, the goals of environmental education were described in the Tbilisi declaration as follows (UNESCO, 1978):

- to foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas,
- to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment,
- to create new patterns of behavior of individuals, groups and society as a whole towards the environment (p. 26).

It can be stated that the goals of environmental education are based on training persons who are aware of, concerned about the environment and its various problems and have knowledge, skills and positive attitudes to conserve and improve the environment individually or collaboratively. The role of education for the environmental matters was under discussion during the Tbilisi conference. According to the conference report, environmental education should be integrated into all education levels from early childhood education to higher education. When the past, current and future of environmental education status evaluated, the goals of environmental education indicated in Tbilisi Conference are still valid and promising for the future of environmental education field (Potter, 2010).

Fifteen years later, United Nations Conference on Environment and Development organized in Rio de Janeiro, Brazil produced Agenda 21 and Rio Declaration as essential sources of the conference. Agenda 21 is composed of major environmental problems such as water pollution, energy consumption and deforestation and provides some principles about solutions for these problems in the twenty first century by stressing on the necessity for environmental education

(UNESCO, 1992). Rio Declaration is more related to the responsibilities of governments for dealing with the environmental problems and the solutions which are handled from economic, social, and political perspectives. Furthermore, it is believed that educating learners to become responsible individuals for the environment and making them active participants to create resolutions against these problems plays a crucial role in minimizing and preventing varied influences of these problems (UNESCO, 1992). On the issue of environmental responsibility, Hungerford and Volk (1990) asserted that educating learners who show and act environmentally responsible behaviors for the protection and improvement of the environment should be one of the major goals of environmental education. At this point, they reviewed objectives of environmental education noted in Tbilisi Declaration in 1977 and they advocated that these objectives are prerequisite variables for learners to gain environmentally responsible behaviors.

Moreover, improving individuals' environmental literacy should be one of the basic goals of environmental education so as to have people acquire environmental responsibilities to protect and improve the quality of the environment (NAAEE, 2010; Roth, 1992). In brief, environmental education is a crucial need in our century to educate environmentally literate learners who have knowledge, values, attitudes, skills and participation to deal with the environmental problems the earth faces and to improve qualification of the environment for the current and next generations.

2.2. The Reasons for Integrating Environmental Education into Early Childhood Education

Previous studies showed the positive outcomes of early childhood education in supporting and improving children's cognitive development (Burger, 2010; Camilli, Vargas, Ryan, & Barnett, 2010), language development and communication skills (Burchinal et al., 2000; Schliecker, White, & Jacobs, 1991), and social-emotional development (Mashburn, 2008). National Association for the Education of Young Children provided a guideline which includes why early years are critique period for whole development and learning of children and how early childhood educators guide and facilitate this period (NAEYC, 1996) and revised it in 2009.

According to this guideline, successful and effective early childhood education programs could contribute to children's various developmental domains and learning.

In such kind of a critique period for development and learning, the importance of environmental education in early years has been overemphasized in previous studies (Basile & White, 2000; Chawla, 1998, 1999; Cobb, 1998; Davis, 1998; Wilson, 1993, 1994, 1995, 1996, 2010). Rationale behind the importance of environmental education in the early years could be explained in many ways. First and foremost, early childhood education is an important period which aims to support children's psychomotor, cognitive, social-emotional and language development and also nurture their health and personality (Anderson et al, 2003; Bredekamp, 2011), in other words early childhood education intends to contribute to children's whole development consisting of these developmental areas.

Related to physical development, environmental education enables children's active engagement in the natural environment through numerous physical movements such as climbing trees, planting, watering plants and collecting stones (Wilson, 1995). Similarly, Bagot (2005) elaborated on the benefits of outdoor play activities for children's healthy physical development. Recent research has shown that mothers of children whose ages vary between 3 and 12 viewed that spending time in the nature and playing outdoor games promote children's psychomotor skills. On the other hand, number of children spending time outdoors in the U.S.A was found to decrease when compared with the previous generation due to the developing home technology and the safety concerns. In the lights of these findings, researcher suggested that early childhood teachers should provide environmental education opportunities for children to grow in a healthier development (Clements, 2004).

With respect to cognitive development area, as children interact with the nature, explore the environment surrounding them, they could realize characteristics of the natural world through some mental processes such as describing the objects they observe, classifying these objects considering their characteristics. Thus, children could learn "the physical characteristics of the natural world –e.g., hardness of a rock, the stability of an eggshell" (Wilson, 1995, p.5).

Concerning language development, environmental education could support children's language development since children need to share their ideas about the environment, observations and varied experiences in the natural world with others (Wilson, 2010). By doing so, children could have opportunities to both communicate with each other and also gain new vocabulary about the environment.

Regarding social-emotional development, Wilson (1993) stated that environmental education not only aims to promote children's sense of curiosity, it also aims at children's gaining some social-emotional skills such as respect others, and appreciate the wonders of the environment. For instance, each young child could have a pet in the kindergarten. Thus, he or she could learn taking care of it through feeding and loving. Additionally, children could learn respecting living things and their needs. Furthermore, early environmental education exposure supports children's social interaction with others (NAAEE, 2010).

The next claim, the potential of environmental education in fostering children's learning has been indicated in the literature (Chawla, 1998; Hungerford & Volk, 1990; NAAEE, 2010; Torquati, Gabriel, Jones-Branch, & Leeper-Miller, 2010; Wilson, 1994, 2010).

There are a variety of perspectives on children's learning (Adelman, 2000; Essa, 2003). For instance, Piaget put into words how children learn during early years in his constructivist learning theory. According to him, young children could easily learn through their own active explorations and varied hands-on experiences (Essa, 2003). John Dewey reflected parallel points with Piaget's ideas. He also stressed the importance and contributions of early experiences and learning by doing on children's efficient learning (Dewey, 1938). Reggio Emilia approach was influenced by previous ideas on children's learning. It is based on its philosophical principles which consider children's inner curiosities and individual interests. Thus, diverse opportunities should be provided to children, and learning environment should be created for children to learn through active explorations, investigations, and experiences in accordance with their interests and curiosities (Bell, 2010). Regarding children's learning, their direct experiences with the environment was an issue emphasized by other theorists such as Froebel and Pestalozzi. Both advocated

that young children should learn with the help of their direct observations and experiences by following their own needs and interests (Adelman, 2000). In addition to the concrete experiences and active explorations, Vygotsky paid attention to the role of the interaction between the child and the adult to facilitate and enhance his learning (Zaretskii, 2009).

In this respect, as children interact with the natural world, they begin to learn what they wonder about, how to take care of the environment and how to solve environmental problems. Thereby, the roots of lifelong learning have been established from early years (NAAEE, 2010). Wilson (2010) mentioned that environmental education facilitates and enhances children's learning because it provides numerous opportunities for children to learn by investigating, directly experiencing and doing which are seen as the essential components of effective learning. For instance, children could include their all five senses during environmental education. They could see, feel, taste, hear and smell all living and non-living objects in the environment. Think about a child who is observing flowers on the ground, touching, watering and then smelling them. This kind of learning would most probably have much more long-lasting effects rather than direct teaching in the classroom. Furthermore, children could explore the natural environment by "observation, experimentation, data collection, prediction, analysis, and reporting discoveries" (Torquati et al., 2010, p. 98). Thereby, children's cognitive processes are activated, as well.

There are also some research studies to indicate the benefits of environmental education for children's learning (Edwards & Cutter-Mackenzie, 2011; Gülay-Ogelman, 2012). For example, the study of Edwards and Cutter-Mackenzie (2011) showed that early childhood teachers' utilizing a combination of different play types including open-ended play, modeled play and purposefully framed play to teach environmental concepts regarding biodiversity to children between the ages of four and five provided some contributions to children's learning about the environmental concepts in a social classroom environment. Likewise, the research project about soil conservation conducted with children aged of 5 to 6 revealed that environmental education practices through using different indoor and outdoor activities such as

music, drama, telling stories, and parent involvement activities significantly made contributions to children's learning about soil relevant knowledge (Gülay-Ogelman, 2012).

Furthermore, the importance of environmental education for children's acquisition of environmental outcomes which include environmental understanding (Elliot, 2010), environmental sensitivity (Chawla, 1998), positive environmental attitudes (Basile, 2000; Wilson, 1993), environmental values (Owens, 2005; Pramling-Samuelsen & Kaga, 2008), and environmentally responsible behaviors (Basile & White, 2000; Chawla & Cushing, 2007) was claimed.

The need for environmental education in early years was also linked with children's inner curiosities and interests about their surrounding environment (Wilson, 1996). Relying on their interests and curiosities, they tend to explore the environment and ask many why and how questions related to the environment. Therefore, they need to be educated and guided in order to support their existing curiosities and interests. Thus, children gain environmental understanding and knowledge by answering the questions on their minds such as how the birds fly and why the soil is brown. As Wilson (1995, p.11) indicated, children are in the critique period to gain "appreciation of the natural environment", "respect and caring for the world of nature". Therefore, Wilson (1995) asserted that early childhood education programs should primarily aim at supporting children's acquisition of understanding and appreciation of the natural environment. If children's interests in the environment are answered in a guided atmosphere, they could appreciate, respect for and value the integrity of the environmental system. Elliot (2010) also laid emphasis on the essentials of children's gaining environmental understanding. She explained that when children gain an initial understanding about the environment from the early years, this could be a motivating source for them to promote their substantial interest and wonders about the environment. In addition, gaining positive environmental attitudes is essential for children to become an active participant for caring and improving the environment which could have an impact on their future life (Wilson, 1993), otherwise they in all likelihood produce inappropriate behaviors

towards the environment (e.g., over consuming) (Wilson, 1995). Similarly, Hungerford and Volk (1990) paid attention to the interdependence of environmental understanding or knowledge, environmental attitudes and environmental behaviors. If a child gains environmental knowledge from the early years, he or she is likely to shape positive attitudes and values towards the environment and then he or she will reflect his environmental knowledge and positive attitudes to his current and future environmental actions. Similarly, learners' acquisition of environmentally responsible behaviors is expressed as one of the major goals of environmental education (Sauvé, 1996). Regarding formation of these behaviors, Chawla and Cushing (2007) identified early years as the critical process in which environmental actions (e.g., recycling) are initially gained in the school yard and the local environment. Moreover, gaining an understanding about the environment, skills and values are significant for young children to become life-long learners and transform all of these into environmentally responsible actions (Basile & White, 2000).

In parallel with these ideas, Davis (1998) considered including environmental education in early childhood education as essential. She upholded that environmental education should be taught to young children not only because they are our future, but also with the intention of we are their future.

Basing on the worthwhile contributions of environmental education to children's whole development and learning and their acquisition of environmental outcomes, the integration of environmental education into early childhood education has been underlined and suggested in the literature (Davis, 1998, 1999; NAAEE, 2010; Wilson, 1993, 1994, 2010). For instance, Wilson (1993) pointed out the similarities between early childhood education and environmental education. She suggested this integration depending on the similarities in terms of both theoretical backgrounds they are based upon and their implications. First similarity is about teaching approaches they adopted. Both advocated child-centered approach rather than teacher-directed with the purpose of providing active learning experiences for children. Thus, children could learn through following their own interests, wonders, and developmental needs. Similarly, children could learn about the environment by

following their inner curiosity and needs. In parallel with this idea, Davis (1998) emphasized the connection between environmental education and early childhood education. She claimed that both of these fields adopt an integrated curriculum approach which enables learners construct their own learning with the help of varied connected experiences. Moreover, it was reported that philosophical background and implementations of environmental education in early years is affected by early childhood education. For this reason, environmental education for young children is considered from a holistic, integrated point of view in order to bring up children as environmentally conscious and sensitive citizens (Environment Protection Authority, EPA, 2003). Correspondingly, environmental education was taken into consideration as not an extra or add-on subject in the literature (Davis, 1998; Wilson, 1993). Concerned with such kind of a structure for environmental education, NAAEE (2010, p.6) specified that "Environmental education does not have to be a separate activity or "subject," and is best integrated with experiences in a variety of curricular areas (literacy, creative arts, mathematics, science, health, daily routines)". In consequence, there is a need for the integration of these fields to accomplish both the goals of environmental education (Davis, 1999) and the goals of early childhood education (Wilson, 1994) as well.

2.3. The Ways of Integrating Environmental Education into Early Childhood Education

In addition to putting into words the reasons of the integration of environmental education into early childhood education, the studies also elaborated on how to integrate environmental education into early childhood education. One of these studies is Palmer's model of environmental education valid for all educational degrees (Palmer, 1998). The other is Wilson's suggestions and guideline for this integration (Wilson, 2010). Both studies drew attention of the researchers in environmental education.

For environmental education practices to be effective at all educational levels, Palmer (1998) constructed an integrated model which consisted of three interrelated components, education about environment, education in or from environment, and education for environment. The first one is related to learner's acquisition of essential environmental knowledge, concepts and understanding to evaluate what is happening around the world. The second one requires learner's engagement with the environment and thus gaining first hand experiences from the environment by promoting environmental knowledge, understanding and some skills necessary particularly to become a problem solver and explorer of the environment related topics. The last one is about enabling learners for the exploration of the interrelationship between human and the environment and their roles in conserving and contributing to the well-being of the environment. Along with these explorations and learning, children could improve their attitudes and values necessary for the reflection of behaviors to conserve the earth and contribute to its quality. Through application of this model at early childhood education level, it could be possible to reach the aforementioned goals of early childhood education (UNESCO, 1977).

Wilson (2010) clarified some ways for the integration of environmental education into early childhood education. The first way is to enable children to experience in the natural environment such as planting, watering the flowers and feeding the pets in the school yard with their peers. The second way is to make children active during these kinds of experiences through organizing learning environment which facilitates children's constructing their learning on their own. At this point, she stated some factors which could influence children's learning. One of these factors is children's enjoyment or having fun from these experiences because as children have fun from the experiences they engage, their learning becomes more effective and long-lasting. Another factor is activating all the senses of children during their learning. As children use their five senses during their experiences, their learning is also fostered. The third way is to organize field trips to the natural environment so that children learn the environment through first hand experiences and foster their sense of wonder about the aesthetic and the goodness of the

environment. The last one is about the integration of environmental education into indoor environment by suggesting the use of nature-related materials (e.g., pine cone, stones, and leaves) and nature-related children literature.

Considering both Palmer's model of environmental education (Palmer, 1998) and Wilson's guideline (Wilson, 2010) for the integration of environmental education into early childhood education, this kind of integration is essential for improving children's gaining environmental understanding, sensitivity, values, positive attitudes towards the environment and pro-environmental behaviors as well as fostering their whole development and learning. This integration could also be effectively practiced by early childhood teachers through following children's interests, wonderings and prior learning about the environment, organizing a learning environment which is responsive to children's actively construction of their own learning, exploration of what they wonder about within the help of using their diverse senses (e.g., touching leaves, planting, smelling ground smell after rain, observing movements of ants in the school garden), creating an atmosphere where children freely share their feelings, ideas and solutions about the varied environmental topics such as climate change and water consumption, lastly incorporating environmental education into early childhood education ranging from children's daily routines, different activities (e.g., science, mathematics, drama, music, and art) to teaching materials in the classroom.

2.4. The Role of Early Childhood Teachers in Practicing Environmental Education

Herein, early childhood teachers play an important role as implementers of environmental education activities with young children. Their roles and competencies in practicing environmental education were emphasized and some recommendations for the teachers were stated in the literature (Chawla, 1998; Davis, 1998; Elliot, 2010; Wilson, 2010). First and foremost, early childhood teachers

should be responsible for children's learning and active engagement with the environment (NAAEE, 2010).

In addition, Davis (1998) mentioned that early childhood teachers play a facilitator role in forming children's long lasting environmental attitudes and values. Moreover, Elliot (2010) elaborated that early childhood teachers should be "mentor" with the purpose of scaffolding children's learning about the environment (p.69). Furthermore, Wilson (2010) clarified the roles of early childhood teachers in integrating environmental education into early childhood education. According to her, teachers should be "facilitator", "enabler" and "consultant" rather than directly teaching something to children about the environment (p.25). Facilitator role requires teachers preparing and organizing the learning environment in which children could learn by the active exploration and the discoveries. Enabler role necessitates teachers directing children perceive themselves as active problem solvers, explorers and learners. Lastly, consultant role entails teachers being good observers of children to realize their needs, interests, and diversities and answering of their wonderings. What is more, she focused on teacher's showing personal interest towards the environment and modeling children through environmentally responsible behaviors rather than just telling how to care with the environment, how to protect it and improve its quality.

Described roles of early childhood teachers to implement environmental education fit into the specifications of UNESCO-UNEP (1990) for "environmentally educated" teachers. It was pointed out that the teachers should have some parallel qualities including knowing what to teach as environmental education content, how to teach environmental education (e.g. appropriate educational philosophy, teaching methods, contemporary theories related to learning and planning instruction) and how to evaluate it. Furthermore, they should also be competent about environmental education teaching skills to utilize their background knowledge.

In this sense, early childhood teachers should have these competencies or characteristics to integrate environmental education into early childhood education in an efficient way.

2.5. The Mission of Pre-service Teacher Training Programs in Preparing Early Childhood Teachers with Essential Roles for Environmental Education

Pre-service teacher training programs could be seen as responsible for educating pre-service early childhood teachers to educate future teachers equipped with the mentioned roles. The need for environmental education from pre-service teacher training years has already been an overemphasized issue for years for many reasons. UNESCO (1975) draw attention to the role of pre-service teacher education programs in training pre-service teachers who must have environmental awareness and also proficiencies, attitudes and skills since they would become future implementers of environmental education. One of the major goals of pre-service teacher training programs in the UNESCO report was determined as to equip pre-service teachers with teaching competencies in environmental education (Wilke, Peyton, & Hungerford, 1987). Similarly, Environmental Education and Training Partnership (EETAP) identified the need for environmental education at pre-service teacher education level. These training programs could enhance pre-service teachers' environmental education teaching strategies and accordingly support their students' becoming environmentally literate citizens (EETAP, 2004). Furthermore, NAAEE (2004) identified some standards for both pre-service and in-service teacher training programs to educate teachers who are expected to integrate environmental education during their teaching. These standards are as follows: environmental literacy, fundamentals of environmental education, professional responsibilities of the environmental educator, planning and implementing environmental education, fostering learning, and assessment and evaluation. Environmental literacy requires reasoning the environmental problems, learning about their causes and effects, and lastly motivating to take action for solutions. Fundamentals of environmental education about knowing its meaning, principles, development over time, and its varied implications. Professional responsibilities of the environmental educator was stated as being responsible for constructing an active learning environment, being a role model for the students, motivating students to learn through utilizing different

instructional techniques, and being lifelong learner to contribute to their professional lives. Planning and implementing environmental education necessitates identifying students' characteristics, needs, interests, and developments, organizing instruction through considering their individual characteristics, using different instructional methods, materials and technology, integrating environmental education into curriculum. Fostering learning is related to creating a learning atmosphere where students could construct their environmental learning through inquiring, collaborating with peers and democratically sharing their views and beliefs. Lastly, assessment and evaluation was described as an important part for teachers to receive feedback about students' learning and progress, their instruction and the program. Thus, they could evaluate environmental education practices in a broad perspective and improve their instructional practices. Consequently, the role of pre-service teacher training programs has always been overemphasized in preparing pre-service teachers to be implementers of environmental education.

At this point, the determination of pre-service early childhood teachers' perceptions of the sufficiency of environmental education in pre-service teacher training programs is vital to examine to what degree their programs equip them with the expected roles for environmental education since the perception refers to a person's view or approach something as a result of his or her experiences (Susuwele-Banda, 2005). In the current study, pre-service early childhood teachers' perceptions are about their approach or evaluation of environmental education in their programs relying on their experiences during undergraduate education. Furthermore, previous studies underlined the significance of investigating pre-service teachers' perceptions before they graduate the program (Minor et al., 2002; Pajares, 1992) so as to give feedback for pre-service teacher training programs and support pre-service teachers get efficiency from the program as much as possible.

With the purpose of evaluating environmental education in pre-service teacher training programs, a number of studies were conducted (Ashmann, 2010; Franzen, 2012; Hanchet, 2010; Heimlich et al., 2004; Lin, 2002; Mastrilli, 2005; McKeown-Ice, 2000; Meredith et al., 2002; Miles et al., 2006). Some of these

researches initiated to examine environmental education in pre-service teacher training programs (elementary and/or secondary education level) by studying faculty members such as deans, head of departments, and teacher educators (Ashmann, 2010; Hanchet, 2010; Heimlich et al., 2004; Lin, 2002; Mastrilli, 2005; McKeown-Ice, 2000). The result of these studies showed that time constrain is the common barrier to influence environmental education at pre-service level. Furthermore, lack of financial support was found to be an influential factor for environmental education in pre-service teacher training programs (Lin, 2002; Mastrilli, 2005; McKeown-Ice, 2000). In addition to these barriers, the studies remarked that the integration of environmental education was limited with few courses such as science and social studies (Ashmann, 2010; Lin, 2002; McKeown-Ice, 2000; Mastrilli, 2005). Moreover, some of these studies linked the insufficiencies in environmental education at pre-service education level with the policy concerns (McKeown-Ice, 2000; Heimlich et al., 2004). For example, McKeown-Ice (2000) remarked that pre-service teacher training programs have difficulty to train future teachers to teach about environmental education due to the lack of institutionalization. Similarly, absence of an institutionalization, namely environmental education not being mandated in pre-service teacher training programs was indicated as a barrier (Heimlich et al., 2004).

In addition, Meredith et al. (2002) examined environmental education in pre-service teacher training programs which include early childhood, elementary and secondary education levels in Ohio State, USA. This study showed that environmental education exposure among all licensure levels was found to be the worst in pre-service early childhood undergraduate program. The underlying reason of this insufficiency was associated with limited time and absence of a state requirement for environmental education.

As for the studies conducted with pre-service teachers, most of the research in environmental education area has focused on the impact of environment-related courses on pre-service teachers' environmental interests, attitudes, environmental perceptions and their cooperative learning skills through investigation of

environmental events (Brown, 2000; Hoeg, 2010; Nelson, 2010; Samaras, Howard, & Wende, 2000). The scope of these studies was not parallel with the current study. On the other hand, there are few studies which intend to explore pre-service teachers' perceptions of environmental education in their undergraduate programs (Chang, 1998; Miles et al., 2006). For example, Chang (1998) studied with pre-service teachers in twelve majors such as early childhood education and elementary education in Taiwan. It was initiated to describe pre-service teachers' locus of control, attitudes towards the environment and their perceptions of learning and teaching environmental education. As for their perceptions, the subjects' agreement level of the statements about environmental education training (e.g., institutions commitment to offer environmental education training for pre-service teachers) was explored. The results illustrated that there is a need for the inclusion of environmental education into pre-service teacher training programs.

Furthermore, Miles et al. (2006) studied with junior and senior pre-service teachers to present the role of primary level teacher training programs in Australia in preparing future teachers in terms of environmental knowledge and experience. The results showed that pre-service teacher training program was insufficient to prepare pre-service teachers to teach environmental education in terms of providing environmental education content and practices. Moreover, they mentioned that the results were also similar in early childhood teacher training level.

In the light of the findings of these descriptive studies which aim to reveal effectiveness of environmental education in pre-service teacher training programs, it is possible to realize similar reasons for insufficiency of pre-service teacher training programs in preparation of future teachers with the competencies to teach environmental education. Moreover, these studies were also similar to each other in terms of their participants. Almost all studies were conducted with faculty members, deans, and instructors. At this point, McKeown-Ice (2000) recommended for the further researches to study with pre-service teachers so as to investigate the effectiveness of pre-service teacher training programs in terms of infusing environmental education.

In the context of Turkey, the studies which initiate to examine pre-service teacher training programs in terms of environmental education were conducted with pre-service science teachers and pre-service primary teachers (Meriç & Tezcan, 2005; Yılmaz & Gültekin, 2012). For instance, the study of Meriç and Tezcan (2005) demonstrated that there is a need to include environmental education courses to pre-service science teacher training programs as being in developed countries such as USA and Japan. Furthermore, the study remarked that there should be a collaborative work with schools to support pre-service science teachers' teaching practices and prepare them for effective teaching. In a similar study, Yılmaz and Gültekin (2012) investigated the views of senior pre-service primary teachers about their teacher training programs in terms of placing environmental issues. In this study, whereas pre-service teachers found their program as sufficient in terms of supporting their environmental sensitivity, environmental knowledge and consciousness, they found the program as insufficient due to the lack of allocated time for environmental education, theory-laden courses. Thus, the researchers recommended the incorporation of environmental education into other courses, prioritizing elective courses on environmental education and offering practice-based environmental education activities in pre-service teacher training programs.

As to the studies at pre-service early childhood teacher training programs, the studies mostly focused on the investigation of the quality of these programs in preparing future early childhood teachers (Güler, 1994; Küçükoğlu & Kızıltaş, 2012; Şahin et al., 2013). These studies evaluated the efficiency of pre-service early childhood teacher training programs in terms of program objectives, courses and practices. The common finding of these studies was the lack of practice as one of the major insufficiencies in pre-service early childhood teacher training programs. Accordingly, Güler (1994) suggested that allocated time for practice should be increased, pre-service teachers should go schools to observe classroom environment beginning from first year of undergraduate program and also elective courses should be determined considering pre-service teachers' needs and interests. Similarly, Şahin

et al. (2013) pointed out that pre-service early childhood teachers' needs and interest should be considered in organizing course content and practices.

As shown in previous studies, there is not any study with the purpose of evaluating environmental education in pre-service early childhood teacher training programs from pre-service early childhood teachers' perceptions. Therefore, one of the purposes of this study is to describe the content and practices of environmental education in pre-service early childhood teacher training programs by examining the perceptions of pre-service early childhood teachers.

2.6. Beliefs in Environmental Education Practices

Belief has been defined in many ways in the literature (Clark & Peterson, 1986; Kagan, 1992; Pajares, 1992; Rokeach as cited in Pajares, 1992). Belief refers to a kind of reflection of an individual's expressions or actions (Rokeach as cited in Pajares, 1992). Furthermore, Pajares (1992) linked belief with a person's judgment or evaluation of the accuracy or falsity of a statement relying on his or her intentions and behaviors. In addition, belief was specifically expressed by associating with teachers thought process and their actions (Clark & Peterson, 1986; Kagan, 1992). In conclusion, previous studies were aligned with the idea of the influence of beliefs on behaviors.

Related to the influential role of beliefs on educational practices, Pajares (1992, p.326) says that "there is a strong relationship between teachers' educational beliefs and their planning, instructional decisions, and classroom practices". Pre-service teachers' or teachers' beliefs and truths could affect their preparation, practices and teaching outcomes. Similarly, Johnson and Hall (2007) stated that teachers' beliefs could have an effect on their planning, instructional practices, and students' learning.

Concordantly, the investigation of pre-service teachers' beliefs before they begin teaching was urgently suggested (Pajares, 1992; Plevyak et al., 2001).

According to Pajares (1992), obtaining pre-service teachers' beliefs concerning teaching was quite necessary to collect feedback for the teacher training programs and its components as followed curriculum and educational practices. Examination of pre-service teachers' beliefs was also recommended for pre-service teacher training programs to promote pre-service teachers' availing beliefs by revealing their prior beliefs because shaping existing beliefs could be challenging and takes time (Clark & Peterson, 1986; Kagan, 1992).

Regarding pre-service teachers' beliefs about integrating environmental education into their teaching, the significance of undergraduate years has been overstressed to shape and improve their beliefs (Alvarez, de la Fuente, Perales, & Garcia, 2002; Moseley, Reinke, & Bookout, 2002; Plevyak et al., 2001).

In addition to the significance of these years, pre-service teachers' beliefs about environmental education play an important role on their enthusiasm to teach this subject matter (Miles et al., 2006). Hence, as pre-service teacher training programs play a vital role to prepare pre-service early childhood teachers to integrate environmental education into their teaching, pre-service early childhood teachers' beliefs about this integration would most probably influence their further environmental education practices.

There are several previous research studies related to pre-service and in-service teachers' beliefs about teaching environmental education (Begum, 2010; Forbes & Zint, 2010; Sia, 1992; Tan & Pedretti, 2010). For instance, Forbes and Zint (2010) investigated elementary teachers' beliefs about environmental education. The researchers revealed that pre-service teacher training programs and the courses such as methods courses on environmental education would influence the way of their teaching about environmental education like tending to use inquiry method. In a similar way, Begum (2012) claimed that teacher beliefs about teaching environmental education might be shaped by how environmental education was taught to them. At this point, their prior environmental education learning experiences play a key role in their beliefs and accordingly teaching practices. On the other hand, Tan and Pedretti (2010) demonstrated that elementary and secondary

school teacher' beliefs about and practices in environmental education differ. Therefore, the researchers pointed out the significance of pre-service teacher training and professional development to minimize this difference.

Concerned with the studies conducted at early childhood education level, the majority of the studies were purposed to describe early childhood teachers' beliefs about outdoor play and natural learning environments (Chakravarthi, 2009; Renick, 2009; Oh, 2010) rather than beliefs about integration of environmental education into early childhood education. Yet, Moseley and Utley (2008) investigated the effect of practicing the Global Learning and Observations to Benefit the Environment (GLOBE) curriculum on pre-service early childhood teachers' self-efficacy beliefs about teaching environmental education. The researchers found that the curriculum only supported pre-service early childhood teachers' outcome expectancy beliefs, in other words their beliefs about the impact of environmental education teaching on students' learning. Therefore, this study highlighted the importance of teacher candidates' being aware of the influence of their beliefs on their further environmental education practices.

In Turkey, the studies were mainly aimed to investigate pre-service early childhood teachers' environmentally responsible behaviors, environmental attitudes, environmental sensitivity and environmental literacy (Çabuk & Karacaoğlu 2003; Erten, 2005; Kandır, Yurt, & Kalburan-Cevher, 2012; Teksöz, Şahin, & Ertepınar, 2010). On the other hand, there was a study which investigates Turkish pre-service and in-service primary teachers' self-efficacy beliefs about environmental education (Aydın, 2008). The study showed that self-efficacy beliefs about environmental education were statistically related with taking the course or courses about the environment and environmental science. As a result, the researcher stressed the importance of providing environmental education in pre-service teacher training programs to support pre-service teachers' beliefs about environmental education.

As illustrated in this section, although there are some studies conducted with pre-service and in-service teachers at elementary and secondary education level to explore their beliefs about environmental education, the literature does not include

many studies conducted with pre-service early childhood teachers with the same intend. Therefore, aim of the current study is to reveal pre-service early childhood teachers' beliefs about this integration.

In the light of previous belief studies, it can be said that early childhood teachers' future practices about the integration of environmental education into early childhood education could be influenced by both the quality of pre-service teacher training programs and their beliefs about this integration. In this context, previous studies remarked on the interplay between teacher beliefs and perceptions (Brookhart & Freeman, 1992; Calderhead & Robson, 1991; Clark & Peterson, 1986; Richardson, 2003). For example, Clark and Peterson (1986) pointed out that beliefs not only influence teachers' actions, they also have an impact on their perceptions. Similarly, the effects of pre-service teacher beliefs on their learning and teaching approaches (Richardson, 2003) and also their interpretation of the course material and practices (Calderhead & Robson, 1991) during teacher training programs were maintained.

As well as the effects of beliefs on the perceptions, the role of pre-service teacher training programs in forming pre-service teachers' beliefs about teaching with a variety of educational experiences, particularly teaching practices in the context of university courses was asserted (Nettle, 1998; Ng et al., 2010; Stuart & Thurlow, 2000). Accordingly, it was assumed that pre-service early childhood teachers' beliefs about the integration of environmental education into early childhood education could influence their perceptions of environmental education in pre-service early childhood teacher training programs (or vice versa). Therefore, the present study also aims to investigate the possible relationship between pre-service teachers' aforementioned perceptions and beliefs.

2.7. Pre-service Early Childhood Teacher Education Programs in Turkey

Pre-service early childhood teacher training lasts four years in faculties of education. Throughout for years, there are a total of 57 courses related to subject matter knowledge and skills, teaching profession, and general culture (CHE, 2007a).

There are 28 courses in the program about subject matter knowledge and skills. Some of them are Development in Early Childhood Period I-II, Children's Literature, Drama, and Science Education. Among the courses, pre-service early childhood teachers take Science Education course in their fifth semester. This course is the only one which might be related to environmental education because its description includes the importance of science and nature, methods of teaching basic science concepts and scientific thinking skills in early childhood, preparing hands on activities (CHE, 2007b).

There are thirteen courses related to knowledge and skills on teaching profession. Some of these courses are Methods of Teaching I-II, Curriculum in Early Childhood Education, Assessment and Evaluation, School Experience and Practice Teaching I-II. Pre-service early childhood teachers Methods of Teaching course in their third semester. Furthermore, they take School Experience course in their third year of education and they also have teaching practices in preschools in the context of Teaching Practice I-II courses in their fourth year (CHE, 2007b).

16 of the courses are related to general culture such as Community Service and Research Methods. In addition, the determination of elective courses for the education of pre-service teachers has been recommended by considering the characteristics and needs of training programs, and the new trends in education (CHE, 2007a).

CHAPTER III

METHODOLOGY

In this chapter, first, the research design was stated. Second, sampling, data collection instruments, and procedures were mentioned in two separate sections as quantitative and qualitative phase of the study. Third, assumptions and limitations of the study were provided. On the whole, this chapter provides a general view of the methodology of the study.

3.1. Research Design

The mixed methods sequential explanatory design was adopted for the current study. This design has some advantages since it provides the researchers possibilities to deeply investigate the quantitative results with the help of qualitative data (Ivankova et al., 2006). As a consequence, the qualitative data validates and extends the quantitative results (Creswell, 2009).

Regarding the methodologies adopted in previous studies, most of the studies utilized survey designs to investigate environmental education in pre-service teacher training programs (Heimlich et al., 2004; Lin, 2002; Mastrilli, 2005; McKeown-Ice, 2000; Meredith et al., 2000) and qualitative approaches such as interviews and observations to describe teachers' beliefs about environmental education (Begum, 2012). However, the number of studies which used survey and interview to determine in-service teachers' beliefs was few (e.g., Tan & Pedretti, 2010). Using qualitative methods is indeed important to deal with the lack of survey research and also to investigate the data in depth (Yin, 2003). For the purposes of the present

study, both quantitative and qualitative data are integrated with the intent of answering research questions of the study in an efficient way.

First, with the purpose of obtaining quantitative data from the participants, surveys were utilized. As a second step, the data acquired through the qualitative method was examined in detail (Creswell, 2003; Ivankova, Creswell, & Stick, 2006). By doing so, it is believed that the weaknesses of survey research in investigating the context in details could be minimized (Yin, 2003).

The quantitative phase aimed to investigate pre-service early childhood teachers' perceptions of the content and practices of environmental education in pre-service teacher training programs and also to explore their beliefs about the integration of environmental education into early childhood education. Additionally, it was intended to examine the possible relationship between pre-service early childhood teachers' perceptions and beliefs using Perceptions of Pre-service Teachers towards Environmental Education in Teacher Training Programs (PTEE) (Öğretmen Adaylarının Öğretmen Yetiştirme Programındaki Çevre Eğitimine Yönelik Algıları Ölçeği) and Beliefs of Pre-service Teachers about Integration of Environmental Education into Early Childhood Education (BIEE) Scale (Öğretmen Adaylarının Çevre Eğitiminin Okulöncesi Eğitimle Bütünleştirilmesine Yönelik İnançları Ölçeği) specially developed and pilot tested for this study. The second phase, on the other hand, intended to deeply explain pre-service early childhood teachers' perceptions and beliefs with qualitative case study approach (Merriam, 1998; Yin, 2003).

3.2. Quantitative Phase

3.2.1. Participants and Sampling Procedures

The target population of this study was all pre-service teachers pursuing undergraduate education in early childhood education programs at 16 universities in Central Anatolia Region. Accessible population of this study was determined as all

pre-service early childhood teachers studying in early childhood education programs at five universities in Ankara.

The sample was approximately one third of the target population. One of these universities was private (University E) and other four universities were state universities (University A, B, C, and D). Convenient and purposeful sampling methods were utilized for sampling procedure. Convenient sampling method was used to easily reach the participants, and purposeful sampling was used to study with pre-service early childhood teachers who take Science Education course which might be related to environmental education in higher education program provided by Council of Higher Education (CHE, 2007b). All universities which have early childhood education undergraduate program were selected with the purpose of making the data more representative. Science Education course is offered in the fifth semester of pre-service early childhood teachers in all selected universities except for University C. Pre-service early childhood teachers in University C take this course in their third semester. For this reason, sophomore students in University C participated in the study. A total of 470 pre-service early childhood teachers studying in these five universities participated in the study in the academic year of 2011-2012. The total number of participants according to gender from each university is provided in Table 3.1.

Table 3.1

The Number of the Questionnaire Respondents from Each University in Ankara according to Gender

Selected Universities	Female		Male		Total	
	N	%	N	%	N	%
University A	153	32.6	8	1.7	161	34.3
University B	92	19.6	10	2.1	102	21.7
University C	79	16.8	5	1	84	17.8
University D	85	18.2	6	1.2	91	19.4
University E	32	6.8	-	-	32	6.8
Overall	441	94	29	6	470	100

Of the subjects, 94% of them were female and 6 % were male. Ages of the subjects ranged from 21 to 32. Most of them were at the age of 23 (n=163, 34.7%) and 22 (n=116, 24.7%).

Furthermore, some items related to environmental concern such as being a member of environmental organization, reading books and following the media about the environment (Chawla, 1998) were asked to the participants in the demographic information section of the scales. The descriptive statistics about the participants' demographic information are stated in Table 3.2. Nearly 80 % of the subjects (n=374) took a course about the environment and almost 70 % of them (n=327) watched documentaries about the environment. On the other hand, 95% of them (n=446) did not follow a journal about the environment and 92.8% of them (n=436) were not a member of an environmental foundation.

Table 3.2

Descriptive Statistics about the Questionnaire Respondents

Related Items	Yes (%)	No (%)
Taking a course about the environment	374 (79.6%)	96 (20.4%)
Following a journal about the environment	24 (5.1%)	446 (94.9%)
Reading a book about the environment	202 (42.9%)	268 (57.1%)
Watching documentaries about the environment	327 (69.5%)	143 (30.5%)
Being a member of an environmental foundation	34 (7.2%)	436 (92.8%)

3.2.2. Data Collection Instruments

Development process of PTEE Scale and BIEE Scale and description of the procedures for ensuring validity and reliability of the instruments were explained in detail in the following sections.

3.2.3. Development Process of the Instruments

Throughout the development process of the scales, some steps were followed to ensure both construct and content validity of the instruments. For the construct validity of the scales, considering the related literature, an initial item pool development, pilot testing and factor analysis were carried out, respectively. For the content validity, three experts were consulted for the clarity of the language of items and the suitability of the items in both scales for the target population. Two of the

experts had doctoral degree in the field of early childhood education. Another had doctoral dissertation about biology and environmental education.

3.2.3.1. Validity and Reliability Analyses of Perceptions of Pre-service Teachers towards Environmental Education in Teacher Training Programs (PTEE) Scale

An initial item pool of 32 was developed for the PTEE scale reviewing the related literature about environmental education in pre-service teacher training programs (Heimlich et al., 2004; Lin, 2002; Mastrilli, 2005; McKeown-Ice, 2000; Meredith et al., 2002; Miles et al., 2006; NAAEE; 2004; Powers, 2004). Then, the clarity and suitability of the items in the scale were judged by the experts for the content validity. The number of items in the PTEE scale was reduced to 30, and some of the items were revised by changing some statements in the items to make them easier to understand for pre-service early childhood teachers in the light of the recommendations of the experts.

The revised form of PTEE scale (30 items) was piloted with the participation of 332 pre-service early childhood teachers comprised of 33 males and 299 females. The participants who took Science Education course were included in the pilot study because this course was offered to all pre-service early childhood teachers in their fifth semester, and it was the only course which could be considered in the domain of environmental education (CHE, 2007b). The participants in pilot study were comprised of 199 junior and 133 senior pre-service early childhood teachers from University F and University G in the west part of Turkey based on convenient sampling. The implementation of PTEE scale took approximately 10 minutes.

Exploratory factor analysis was utilized to examine the factor structure of the instrument. Before conducting exploratory factor analysis, assumptions of the analysis consisting of sample size, factorability of the correlation matrix, outliers among cases and linearity were checked (Tabachnick & Fidell, 2007). Regarding sample size, Tabachnick and Fidell (2007) determined criteria which requires the

number of participants should be at least five times of the number of items in the scale for the pilot study. For the pilot study, the sample size composed of 332 pre-service early childhood teachers and the number of items was 30. By doing so, the sample size assumption was ensured. For verifying the factorability of the correlation matrix, Kaiser-Meyer-Olkin (KMO) sampling adequacy measure value, Barlett's test of Sphericity value and the correlation matrix were examined. The KMO measure value was found to be .927. and the Barlett's test of Sphericity value (X^2=4387.985 and *p*=.000) was found to be statistically significant. According to Hutcheson and Sofraniou (1999), the values for KMO higher than .90 were accepted as very good values. Moreover, the correlation matrix included correlation coefficients of .3 and more for many pairs of items. All these results showed that continuing the exploratory factor analysis was appropriate (Tabachnick & Fidell, 2007). In regard to linearity assumption, there was no need to check this assumption since the sample size was adequately high (Pallant, 2007). Furthermore, pilot study did not indicate any outliers.

After meeting the assumptions, as an extraction technique Principal Component Analysis (PCA) was used and oblique rotation (direct oblimin) was preferred for the rotation method which lets the possible correlation among factors (Field, 2009). Kaiser (1960) recommended that initial eigenvalues should be equal to or above 1 in order to make consistency among factors. Considering this, the factor analysis for the pilot study revealed four factors which have initial eigenvalues more than .1 and explains 61.8 cumulative percentage of the variance. But, it has a tendency to overestimate the number of factors to retain (Field, 2009). For this reason, examination of scree plot was helpful to determine the number of factors when there are particularly many factors which have initial eigenvalues above 1. (Pallant, 2007). The scree plot is provided in Figure 3.1.

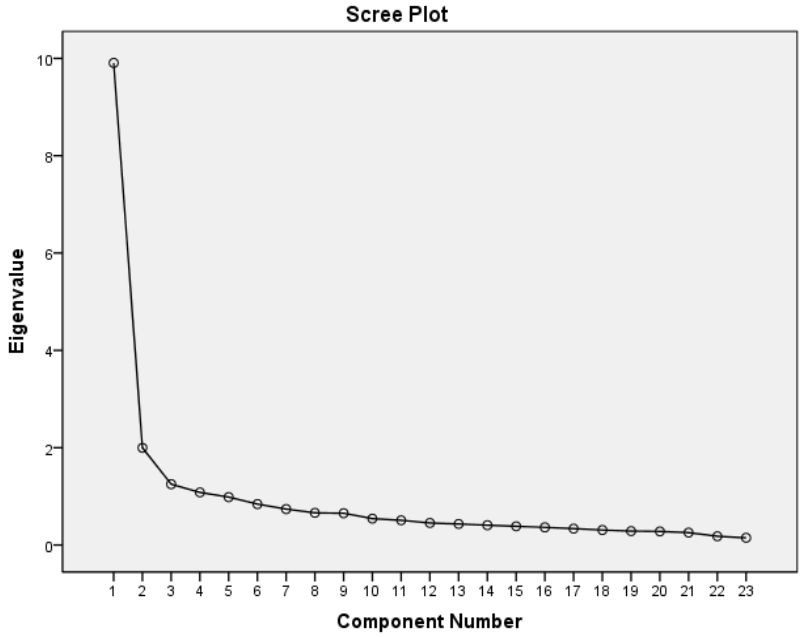

Figure 3.1 Scree Plot of the PTEE Scale

In the factor analysis, there are four factors that have initial eigenvalues above .1, but the Scree plot showed two clear cuts. After considering both results, it was decided to limit factors in two. For this reason, there were finally two factors basing upon both Kaiser criteria and examination of Scree plot. For the interpretation of the factors, Field (2009) suggested to examine factor loadings of each item in the pattern matrix table of factor analysis. Although there are a variety of different ideas about the factor loadings value, in the present study the factors which had at least .30 loadings were accepted (Stevens, 2009). In the study, minimum factor loading was determined as .40 considering the sample size because it was pointed out that selecting .40 for the factor loadings facilitates the interpretation of analysis (Field, 2009). In addition to this, Pallant (2007) stated that the minimum value for the number of items loading on each factor should be three. Furthermore, it was recommended that there should be no or few item crossloadings in the data (Costello & Osborne, 2005). Relying upon the recommendations, total seven items were removed from the final version of the instrument. In the final structure of the PTEE scale, the analysis produced a 23-item scale composed of two-factor structure (For the further information, please contact with the author). The first factor, the Practice

accounted for 43.16 % of the variance, while the second factor, the Content accounted for 8.6% of it. Both factors totally explain the cumulative percentage of the variance was 51.76 above the expected value as .40 percent (Kline, 1994). Factor loadings of the factors are presented in Table 3.3.

Table 3.3 *Factor Loadings for the Rotated Factors of the PTEE Scale*

	Factor Loading	
Item	Practice	Content
Item 20	.80	
Item 19	.75	
Item 17	.75	
Item 22	.72	
Item 14	.70	
Item 18	.68	
Item 15	.68	
Item 16	.68	
Item 23	.65	
Item 25	.64	
Item 21	.64	
Item 11	.59	
Item 27	.47	
Item 28	.44	
Item 2		-.85
Item 1		-.82
Item 3		-.82
Item 4		-.80
Item 5		-.74
Item 6		-.71
Item 9		-.70
Item 10		-.66
Item 8		-.61
Eigenvalues	9.90	1.9
% of variance	43.16	8.6

Reliability analysis of the preliminary study was examined calculating Cronbach Alpha value. According to Cronbach (1951), the values above .80 represent good reliability. Therefore, PTEE scale might be accepted as a valid and reliable instrument. The Cronbach alpha values for each dimension and the whole scale could be seen in Table 3.4.

Table 3.4

Reliability Coefficients for Each Factor of PTEE Scale

Factor Name	Number of Items in the Factor	Cronbach Alpha Reliability Coefficient
Content	9	.91
Practice	14	.91
Total	23	.93

After utilization of the final form of the PTEE scale with the participation of 470 pre-service early childhood teachers in Ankara, confirmatory factor analysis by LISREL 8.8 software program was utilized to confirm the construct validity of a two-factor structure of the PTEE scale.

The previous studies showed that there are some accepted values of goodness of fit to test the model (Hoyle, 1995; Hu & Bentler, 1999; Tabachnick & Fidell, 2007; Ullman, 2001). For the current study, these goodness of fit indices were used as: the ratio of chi-square to degrees of freedom (X^2/df) (Diamantopoulos & Siguaw, 2000), Normed Fit Index (NFI) (Hu & Bentler, 1999), Comparative Fit Index (CFI) (Hu & Bentler, 1999), Root Mean Square Error Estimation (RMSEA) (Browne & Cudeck, 1993), Root Mean Square Residual (RMR) (Diamantopoulos & Siguaw, 2000), Standardized Root Mean Square Residual (SRMR) (Diamantopoulos & Siguaw, 2000). The accepted values for these fit indices are indicated as follows: the

maximum value for X^2/df as 5.0 (Wheaton et al., 1977) and the minimum value for it as 2.0 (Tabachnick & Fidell, 2007), acceptable boundary for RMSEA as a value equal to or less than .08 (Browne & Cudeck, 1993), the expected values for the GFI greater than .90 (Hooper, Coughlan & Mullen, 2008; Miles & Shevlin, 1998). Concerned with RMR value, Diamantopulus and Siguaw (2000) stated that the values becoming closer to zero for RMR, the better fit occurs between the model and the data. Acceptable values for SRMS require being less than .05 (Diamantopoulos & Siguaw, 2000). Lastly, the values for NFI and CFI as .95 or higher than it show a well fit (Hu & Bentler 1999; Schreiber et al., 2006).

Relying upon the expected values for goodness of fit between the model and the data, The results of confirmatory factor analysis revealed a reasonably good fit between the tested model of the two factor-structure model and the obtained data (X^2/df=5.8, RMSEA=.1, GFI=.80, RMR=.05, SRMR=.05; NFI=.96, CFI=.97). Figure 3.2 presents the model specification and the parameter estimates. As can be observed from this figure, all items provided significant contributions to the model, estimations varying from .67 to .90 for Practice and from .57 to .87 for Content. Additionally, two factors of the PTEE scale (Practice and Content) had a high correlation as .81.

Concerned with presenting internal consistencies, Cronbach alpha values were found to be .95 for the entire scale and .92 for Content and .94 for Practice. In addition, the correlation of each item in the factor dimension had high correlation equal or above .40. Hence, each item was distinctive in respect of measuring the participants' addressed perceptions when the correlation is above .30 (Tabachnick & Fidell, 2007).

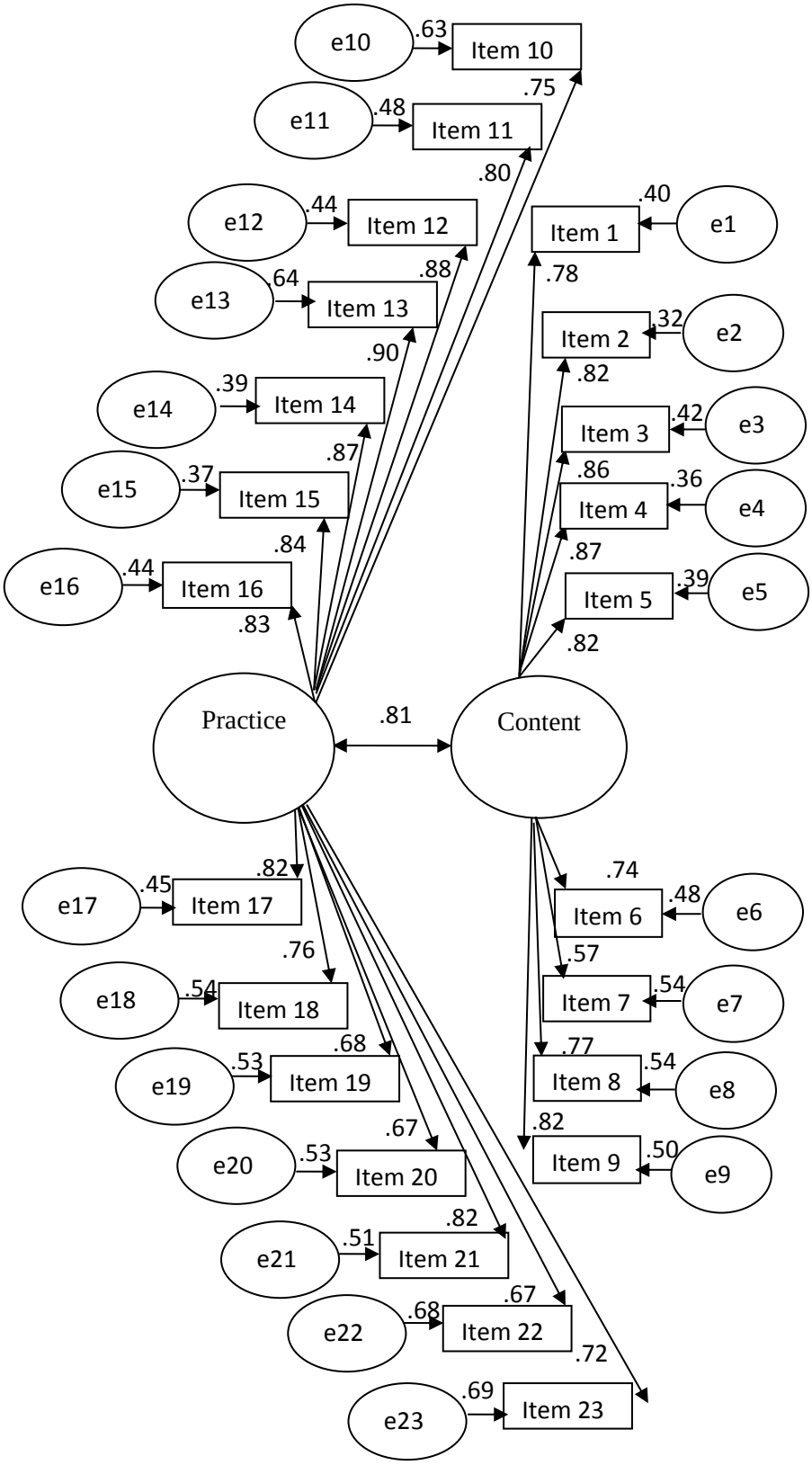

Figure. 3.2. Specified Model of Factorial Structure for the PTEE Scale

3.2.3.2. Validity and Reliability Analyses of Beliefs of Pre-service Teachers about Integration of Environmental Education into Early Childhood Education (BIEE) Scale

An initial item pool of 56 was developed for the BIEE scale considering the previous studies related to the beliefs (i.e., Begum, 2012; Forbes & Zint, 2010; Pajares 1992), the necessity of the integration of environmental education into early childhood education (NAAEE 2010; Wilson 1993, 1994, 1996, 2010). Then, the aforementioned experts, one of whom had doctoral dissertation about biology and environmental education and the others had doctoral degree in the field of early childhood education, stated their opinions again about the scale for the content validity of the BIEE scale. Depending on their recommendations, essential revisions including changing some statements in the items were done to ensure the clarity and the suitability of the items for the participants. After taking expert opinions, the revised form of the BIEE scale (56 items including 7 negative items and 49 positive items) was also conducted with 332 pre-service early childhood teachers after the administration of the PTEE scale. The administration of the BIEE scale took approximately 20 minutes.

In order to verify the construct validity of Beliefs of Pre-service Teachers about Integration of Environmental Education into Early Childhood Education (BIEE) scale, exploratory factor analysis was performed. Initially assumptions of the analysis composed of sample size, factorability of the correlation matrix, outliers among cases and linearity were examined (Tabachnick & Fidell, 2007). The sample size composing of 332 pre-service early childhood teachers and the number of the items was 56 items. Therefore, the sample size criteria proposed by Tabachnick and Fidell (2007) was ensured because the number of participants was more than five times of the item number in the scale. For ensuring the factorability of the correlation matrix assumption, KMO sampling adequacy measure value, Barlett's test of Sphericity value and the correlation matrix were investigated. The correlation matrix provided some correlations equal .3 or greater among many item pairs, Barlett's test of Sphericity value was found as statistically significant (X^2=3120.561; p=.000) and

the KMO value was calculated as .921 which is interpreted as a good value (Hutcheson & Sofraniou, 1999). In addition, three outliers of the mean scores from the BIEE scale were removed from the data as recommended by Pallant (2007). Under these circumstances, conducting exploratory factor analysis was understood as quite adequate because all assumptions above were ensured.

After ensuring the assumptions, extraction technique was determined through adopting Principal Component Analysis (PCA) and oblique rotation method (direct oblimin) suggested to be selected for exploratory factor analysis in the literature (Field, 2009; Tabachnick & Fidell, 2007). Regarding initial eigenvalues, Kaiser (1960) stated that they should be equal to or above 1 so as to provide consistency between factors. Relying on this statement, the factor analysis revealed three factors more than 1 which explain 61.6 cumulative percentage of the variance. In addition to initial eigenvalues of the factors, scree plot was examined by considering the recommendation of Field (2009). Otherwise, there could be many factors having initial eigenvalues above 1 (Pallant, 2007). The scree plot is presented in Figure 3.3.

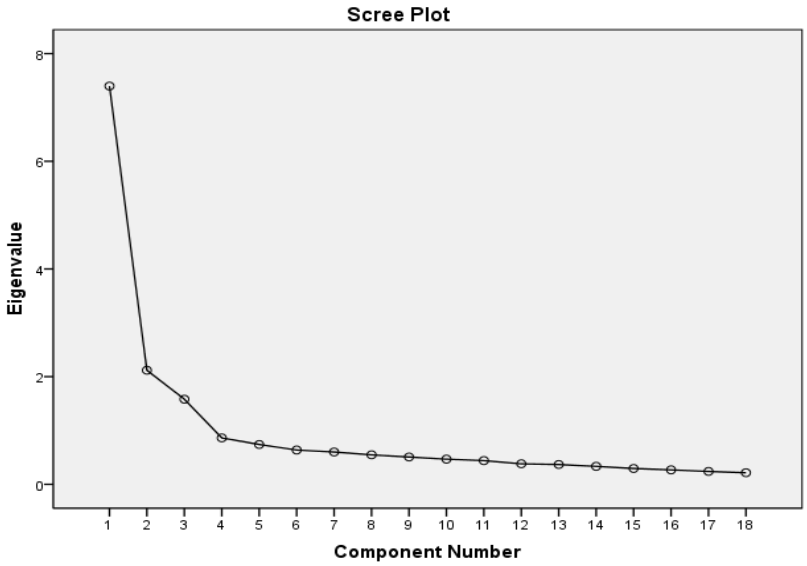

Figure 3.3. Scree Plot of the BIEE Scale

Factor analysis produced three factors which have initial eigenvalues above 1. When the Scree plot was considered, there are three clear cuts as well. To make interpretation of the factors, the recommendation of Field (2009) was followed.

According to this recommendation, researchers should check factor loadings of each item in the pattern matrix table. For this study, the factors which have at least .30 factor loadings were adopted based upon the recommendation of Stevens (2009). To make interpretation of analysis easier, minimum factor loading interval was decided as .40 in connection with the sample size in the study (Field, 2009). Furthermore, Pallant (2007) stated that each factor should have at least three items. In addition, Costello and Osborne (2005) suggested that there should be no or few item crossloadings for the best fit to the data. This implies that the item distinctly represents and/or measures the maximum loaded factor. In the lights of these recommendations, total 38 items were omitted from the scale. The final form of the BIEE scale has 18 items (For the further information, please contact with the author). It has three factors, the first one, Development-Learning factor accounted for 41.1% of the variance, the second one, Environmental Outcomes factor accounted for 11.7% of the variance, and the third one accounted for 8.7% of it. All of the factors explain the cumulative percentage of the variance as 61.65 which is higher than the expected value as .40 percent (Kline, 1994). Factor loadings of three factors are presented in Table 3.5.

Table 3.5

Factor Loadings for the Rotated Factors of the BIEE Scale

Item	Factor Loading		
	Development-Learning	Environmental Outcomes	Learning Environment
Item 19	.811		
Item 16	.804		
Item 17	.788		
Item 15	.755		
Item 18	.749		
Item 24	.665		
Item 8		-.886	
Item 6		-.880	
Item 5		-.849	
Item 7		-.828	
Item 10		-.822	
Item 9		-.793	
Item 13		-.520	
Item 46			.805
Item 45			.783
Item 43			.768
Item 48			.539
Item 51			.514
Eigenvalues	7.39	2.11	1.58
% of variance	41.1	11.7	8.7

Note. Extraction Method: Principal Component Analysis. Rotation Method: Direct Oblimin

Cronbach Alpha values were calculated to ensure the reliability of the BIEE scale. Acceptable value for reliability was indicated to be in the range of .60 and .70, and the values equal or above .80 were the indicators of good reliability (Cronbach, 1951). Considering these values and ranges, the BIEE scale was accepted to be a

valid and reliable instrument. The reliability values for each dimension and the entire scale are indicated in Table 3.6.

Table 3.6

Reliability Coefficients for Each Factor of BIEE Scale

Factor Name	Number of Items in the Factor	Cronbach Alpha Reliability Coefficient
Development-Learning	6	.87
Environmental Outcomes	7	.92
Learning Environment	5	.74
Total	18	.91

Furthermore, confirmatory factor analysis was performed to verify construct validity of a three-factor structure of the BIEE scale after obtaining data from 470 pre-service early childhood teachers in Ankara.

In the lights of suggested values for fit indices in the literature, results from the confirmatory factor analysis showed a well fit with the three-factor structure of the BIEE scale and obtained data (X^2/df =3.7, RMSEA=.07, GFI=.89, RMR=.04, SRMR=.04; NFI=.97, CFI=.98). The model specification and parameter estimates are presented in Figure 3.4. As can be seen from the figure, all items significantly contributed to the tested factor structure, estimations ranging from .41 to .49 for the Environmental Outcomes and from .44 to .52 for the Development-Learning, and from .38 to .43 for the Learning Environment. Additionally, three components of the BIEE (Development-Learning, Environmental Outcomes and Learning Environment) were highly correlated to each other varying between .72 and .75.

Moreover, Cronbach alpha values were calculated to show internal consistencies. They were found .87 for the Development-Learning, .90 for the Environmental Outcomes and .79 for the Learning Environment factor. Moreover,

each item in the related factor structure provided quite high correlations above .40 which refers to be distinctive in measuring the participants' aforementioned beliefs.

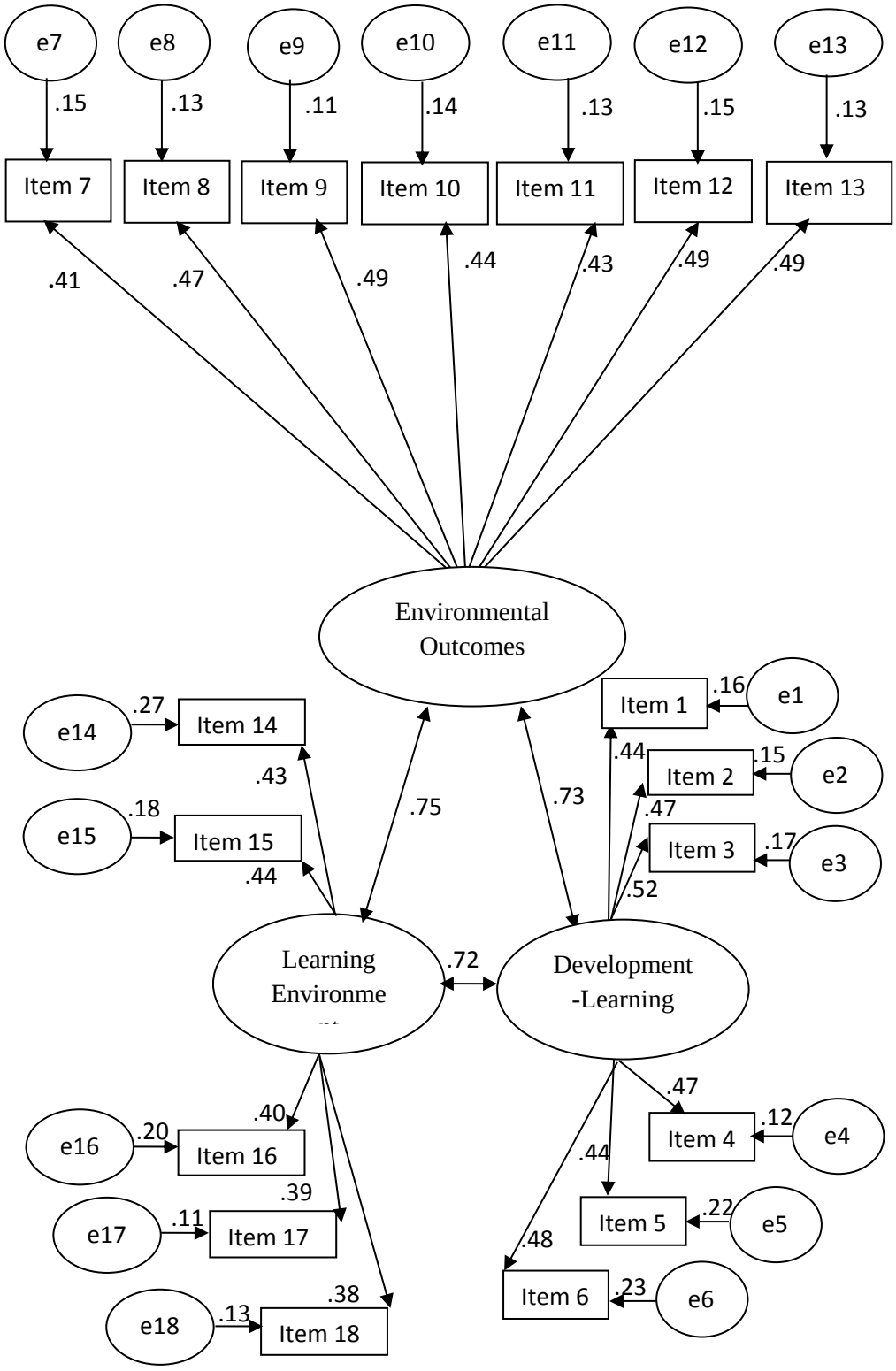

Figure 3.4 Specified Model of Factorial Structure for the BIEE Scale

3.2.4. Description of the Instruments

3.2.4.1. Perceptions of Pre-service Teachers towards Environmental Education in Teacher Training Programs (PTEE)

One of the data collection instruments, PTEE, has 23 Likert type items where 1 corresponds to quite insufficient and 5 quite sufficient. With this scoring, the minimum score on the PTEE scale which a participant could gain was 23, meaning that pre-service teacher training program was highly insufficient in terms of the content and practices of environmental education. The maximum score on the scale was 115, indicating that pre-service teacher training program was highly sufficient in providing environmental education content and practices. Items describe the sufficiency of pre-service teacher training programs in environmental education based on two factors. The first one was pre-service early childhood teachers' perceptions of the content of environmental education in pre-service early childhood teacher training programs, namely how sufficient their programs in preparing future teachers for the fundamentals of environmental education (i.e., historical development of environmental education) (Content) which has 9 items. The second one was pre-service early childhood teachers' perceptions of the practices of environmental education in pre-service early childhood teacher training programs, that is how sufficient their programs in preparing them as future implementers of environmental education (i.e., conveying instructional methods on environmental education) (Practice) including 14 items. Sample items from each factor are represented in Table 3.7.

Table 3.7

Examples of Items in the Final Form of PTEE Scale

Factor	Sample Items
Content	Item 2. In supporting pre-service early childhood teachers' interests about the environment and environmental topics
	Item 3. In offering inquiry-based environmental education
Practice	Item 13. In practicing environmental education in outdoor learning environments (e.g., park, museum)
	Item 19. In integrating environmental education into Science Education course in early childhood undergraduate program

3.2.4.2. Beliefs of Pre-service Teachers about the Integration of Environmental Education into Early Childhood Education (BIEE)

Another instrument, BIEE Scale has 18 Likert type items where 1 corresponds to strongly disagree and 5 corresponds to strongly agree. The minimum score on the BIEE scale that a participant could receive was 18 indicating the non-availing belief about the integration of environmental education into early childhood education. The maximum score on the scale was 90 addressing the availing belief about this integration.

The scale consisted of three factors related to the integration of environmental education into early childhood education. These factors are named 'Contributions of the integration of environmental education into early childhood education for children's development and learning' (Development-Learning) including 6 items,

‘Contributions of the integration of environmental education into early childhood education for children's attainment of environmental knowledge, skills, attitudes and behaviors’ (Environmental Outcomes) composing 7 items, and ‘Requirements for learning environment for the integration of environmental education into early childhood education’ (Learning Environment) containing 5 items. Sample items in BIEE Scale are provided in Table 3.8.

Table 3.8

Examples of Items in the Final Form of BIEE Scale

Factor	Sample Items
Development-Learning	Item 5. Integration of environmental education into early childhood education plays a facilitator role in children’s learning other subject areas (e.g., mathematics, science)
Environmental Outcomes	Item 13. Integration of environmental education into early childhood education helps children to gain environmental awareness and sensitivity
Learning Environment	Item 18. School backyard should be used as learning environment for integration of environmental education into early childhood education

3.2.5. Data Collection Process

Data collection process for the actual study started taking essential permissions initially from Human Subjects Ethics Committee at Middle East Technical University and then from the early childhood education programs in the selected universities.

The scales were administered in the classroom settings to the participants by the researcher. Before data collection, the purpose of the study and the importance of their voluntariness as a participant were emphasized. Furthermore, the participants were informed that their identities would not be declared anywhere after data collection in order to make them feel more confident. Both the PTEE and the BIEE scales were administered to pre-service early childhood teachers once at the beginning of the class with the permission of their instructor. First, the participants were asked to fill out the demographic information part of the scales and then the PTEE and the BIEE scales. It took 20 minutes for pre-service teachers to respond to the items in the questionnaires.

3.2.6. Data Analysis Process

Demographic information of the participants was obtained through the first part of the PTEE and BIEE scales, and presented by means of frequency and percentage. To handle the missing data, the pairwise case was used **(**Tabachnick & Fidell, 2007). Additionally, both descriptive and inferential statistics were utilized to analyze the quantitative data obtained from the scales through the initial three research questions of the study. Regarding the first and the second research questions, minimum-maximum values, means and standard deviation were used throughout the descriptive analysis. Furthermore, Pearson Product-Moment Correlation was implemented for the exploration of the third research question. The research questions were stated as follows:

1. What are the perceptions of pre-service early childhood teachers about the sufficiency of environmental education in pre-service teacher training programs they attended?

2. What are the beliefs of pre-service early childhood teachers about the integration of environmental education into early childhood education?

3. Is there a relationship between pre-service early childhood teachers' perceptions of the sufficiency of environmental education in their pre-service teacher training programs and their beliefs about the integration of environmental education into early childhood education?

3.2.7. Internal Validity

For the verification of the study, it is essential to explain internal and external validity. Internal validity refers to whether "…observed differences on the dependent variable are directly related to the independent variable…" or "they are not due to some other unintended variable" (Fraenkel & Wallen, 2006, p. 169). Taking this description into consideration, subject characteristics, mortality (loss of subjects), location and instrumentation are some threats to the internal validity of the current study.

The threat of subject characteristics is derived from some specific characteristics of participants on any variable that is aimed to be measured in the context of the study (Fraenkel & Wallen, 2006). Pre-service early childhood teachers' existing interests in and teaching of the environment might influence their perceptions of the content and practices of environmental education in pre-service teacher training programs they attended and their beliefs about the integration of environmental education into early childhood education. This threat is a limitation of the study. For that reason, the results of the present study have been discussed considering this limitation.

Mortality threat is related to loss of the participants from the study due to not completing the questionnaire in the process of the study (Fraenkel & Wallen, 2006). The purpose of the study and the voluntary basis of the study were explained to the participants in detail before starting data collection. In the current study, mortality occurred when three of the participants gave up filling out the scale during data collection. These questionnaires were eliminated from the study.

Location threat could undesirably affect the responses of participants due to the place in which data are collected (Fraenkel & Wallen, 2006). Data collection was conducted in regular classroom environments in teacher training programs with similar characteristics. Therefore, the location threat did not cause a problem for this study.

Instrumentation threat is derived from some changes in the instrument throughout data collection, characteristics of data collector, and data collector bias (Fraenkel & Wallen, 2006). The researcher explained the purpose of the study before implementation in order to eliminate the instrumentation threat. The implementation of scales took approximately 20 minutes since the scales were Likert type questionnaire and did not include open-ended questions. The underlying reason was to avoid the instrumentation threat during data collection process.

According to Fraenkel and Wallen (2006, p.104), "The extent to which the results of a study can be generalized determines the external validity of the study". They advocated that considering both "the nature of the sample and the environmental conditions" is important in terms of generalizability of the study (p.104). In the current study, the participants were formed of conveniently sampled sophomore, senior and junior pre-service early childhood teachers who enrolled in pre-service early childhood teacher training programs in Ankara. At this point, generalizability threat could occur due to the use of convenience sampling. Therefore, characteristics of the participants were provided in detail to enable generalizability for the contexts in which the participants have similar demographic information (e.g., environmental interest) and experiences.

3.3. Qualitative Phase

3.3.1. Participants

For the qualitative phase of the study, participants were selected so as to elaborate on the quantitative data in detail (Yin, 2003). Regarding the selection of the

participants for qualitative studies, Ivankova et al. (2006) addressed the absence of a guideline for researchers about case selection in mixed design studies. However, they suggested using descriptive statistics (e.g., demographic information variables) for this procedure. In this study, the researchers aimed to create heterogeneous group of individuals so as to investigate the quantitative data with the contribution of different perspectives of the participants (Bogdan & Biklen, 1998; Creswell, 2003). In accordance with this aim, the interview participants were determined considering all the subjects' mean scores from the PTEE scale and their demographic information in the study. The BIEE scale was not regarded in this process because the average of the mean scores of the subjects was quite positive and had respectively low variability (M=4.49, SD=.39). The average of mean scores of the subjects from the PTEE scale was 3.1 with a standard deviation of .77. Five of the interview participants were selected around the average mean scores (M=3.1) from the PTEE scale. Two of the participants were determined among the subjects whose the PTEE scale average mean scores were quite positive (around M=4). Lastly, the average the PTEE mean scores of the rest of the participants were quite negative (around M=2).

As regards demographic information variables, some questions about taking a course about the environment, following a journal about the environment, reading a book about the environment, watching documentaries about the environment, and being a member of an environmental foundation were asked. Considering demographic information variables of the participants, five of them indicated that they took a course about the environment (P1, P3, P5, P7, and P9). In the categories of following a journal and reading a book about the environment, only P2 among the participants indicated that she usually follows a journal about the environment and reads environment-related books. For the question of watching documentary, more than half of the participants (P1, P2, P5, P7, and P9) stated that they prefer watching documentaries about the environment-related topics such as environmental problems, habitats of animals, and water cycle. Related to being a member of an environmental foundation, only P2 said that she has been a member of Greenpeace for a year. The

answers of the participants who took part in the qualitative part of the study are also presented in Table 3.9

Table 3.9

Demographic Information about the Interviewees

Related Items	Yes	No
Taking a course about the environment	5	4
Following a journal about the environment	1	8
Reading a book about the environment	1	8
Watching documentaries about the environment	5	4
Being a member of an environmental foundation	1	8

Furthermore, the participants indicated that they took an elective course about the environment during their undergraduate education. The courses are Education and Awareness for Sustainability (P1, P5, P8, and P9) in University C and Nature and Environment (P3 and P7) in University A. Finally, nine female participants between the ages of 21 and 27 from the sophomore, junior and senior year of undergraduate education were selected for the interviews from University A, University C and University D.

3.3.2. Interview Protocol Development

A semi-structured interview protocol was formed based upon the research questions indicated below and the preliminary results gathered from the PTEE and BIEE scales.

In the first part of the protocol, three open-ended questions concerned with personal information were asked. These variables addressed taking a course about the environment, following a journal about the environment, reading a book about the environment, watching documentaries about the environment, being a member of an environmental foundation. In the second part, there are twelve questions to elaborate the first research question in the quantitative part related to perceptions of pre-service early childhood teachers about the content and practices of environmental education in pre-service teacher training programs. In the third part, six questions were asked to the participants to deeply investigate the second research question in the quantitative phase concerning their beliefs about the integration of environmental education into early childhood education. A pilot interview was conducted with three participants who participated the quantitative phase of the study to ensure the clarity and usability of the interview questions. Pilot interview first enabled the researcher to gain experience about how to interview in an effective way, and then it assisted in the refinement of some flaws in the structure of some questions. Based on the pilot interview, structures of some certain questions were revised by adding new probing questions including how and why questions. Some samples of interview questions are provided in Table 3.10.

Table 3.10

Sample Questions from the Interview Protocol

Interview Protocol Sections	Sample Question Number	Sample Question
Perception	3	How do you evaluate your undergraduate program (sufficient/insufficient) in terms of drawing environmental awareness?
	5	How do you evaluate your undergraduate program (sufficient/insufficient) in terms of placing environmental education in outdoor environments such as parks and museums?
	12	How do you evaluate your undergraduate program in terms of environmental education overall (sufficient/insufficient)?
Belief	1	Do you think that integrating environmental education into early childhood education is necessary or not? (advantages, disadvantages)
	2	What do you think about the effects of the integration of environmental education into early childhood education on children's development?
	3	What do you think about the effects of the integration of environmental education into early childhood education on children's learning?

3.3.3. Data Collection Process

Semi-structured interviews were conducted with purposefully sampled participants one to one. Interview date was predetermined through communication with the participants and a reminder call was done to the participants one week before. At the beginning of each interview, the purpose of the study, the ethical issues composing confidentiality, informed consent, information and voluntariness were explained to the participants. The interviews were conducted in an empty classroom which was silent. Throughout the interviews, the participants were encouraged to answer the questions in depth to gain more insight about their perceptions and beliefs on the aforementioned topic. For that reason, "yes" or "no"

questions providing short answers were avoided and the participants were asked to explain their sentences sometimes by supporting the examples or experiences they lived (Bogdan & Biklen, 1998). Each interview session approximately took an hour. All interviews were audiotaped and then transcribed to prepare data for the analysis (Bogdan & Biklen, 1998).

3.3.4. Data Analysis Procedure

The interview data was analyzed through the analysis steps of Creswell (2009) for this study. According to Creswell (2009), there are six main steps to analyze qualitative data as follows: organizing and preparing the data, making sense of the whole data, coding, describing, representing, and interpreting the data. In this study, these steps were conducted in the same order. First of all, the interview data was transcribed and carefully scrutinized. Second, the data was read in order to obtain general ideas of the participants and these ideas were noted to be a guide for the researcher throughout the analysis process. Third, the participants' statements were separated into categories of thoughts that were labeled with relevant terms found in the literature. Fourth, the codes were listed and organized based on the responses of each participant for each of the related interview questions. Fifth, visuals, figures and tables were profited to establish links among the emerged patterns in the data. Last, the data was interpreted in consideration with the literature and the researcher's personal experiences and impressions in the field of study.

3.3.6. Quality of the Study

There are different strategies to ensure the quality of the qualitative research. Some of these strategies which involve member checking, triangulation, thick description, peer reviews and external audits are frequently used by the researchers (Creswell & Miller, 2000). For the current study, triangulation and peer reviews were used to ensure the trustworthiness. Patton (1999) pointed out four types of

triangulation strategies. The one is methodological triangulation which requires combination of observations, interviews, questionnaires, and the second is data triangulation using varied data sources to ensure the consistency among the sources, the third is multiple reviewer triangulation for examining the findings by different investigators, and the fourth is theory triangulation that intend to use different theoretical perspectives in one study. Among these triangulation strategies, methodological triangulation was utilized through using different data collection tools, surveys and interviews in order to compare the data gathered from quantitative and qualitative methods. In addition to methodological triangulation, the peer review was used in ensuring trustworthiness through consulting another person's examinations on the different aspects of the study (Creswell, 2003). Peer reviewing was conducted through taking reviews of the researchers in the field of education. Furthermore, a qualitative researcher was consulted during the analysis.

Regarding reliability of the study, providing thick descriptions about the data is one of the ways to ensure reliability. It enables the readers to easily understand and make connection between the perspectives of the researcher and the study (Merriam, 1998). For this study, the profiles of each participant and the context were provided in details to make the study more meaningful for the readers. Another way to ensure reliability is to conduct intercoder agreement which requires working of independent researchers on the same transcription through examining whether codes are consistent (Silverman, 2002). With this aim, the three of the interview transcriptions about the perceptions and the beliefs were randomly selected and analyzed by two coders. The first coder was the researcher and the second coder was a researcher in the field of education who had an experience in qualitative research. The researcher trained the second coder about environmental education in pre-service early childhood teacher training programs and the scope of the current study before the data analysis. First, the coders individually read and analyzed the data. Then, the agreements of the coders on the codes were transformed into numerical for perceptions and beliefs separately by using interrater reliability formula of Miles and Huberman's (1994) (reliability = number of agreements / (total number of agreements + disagreements). The agreement rate was found to be as .91 for

perception transcriptions and .96 for belief transcriptions. This rate shows that the data coding process is highly consistent across the coders since the lower boundary for the numerical value for this agreement was stated as 80% (Miles & Huberman, 1994).

3.4. Assumptions and Limitations of the Study

This study has some limitations in terms of the implementation process of scales and the sampling procedure. Regarding implementation process of the instruments, it was assumed that pre-service early childhood teachers provided their answers to the questionnaires honestly. Concerned with the sampling procedure, the subjects in the current study were selected from second, third and fourth year levels of the early childhood education programs in Ankara. This kind of sampling can be a limitation for generalizability of the study because using accessible population might limit the generalizability (Fraenkel & Wallen, 2006). For the qualitative part of the study, the qualitative data obtained from the interviews are limited with the answers of nine participants and the information gathered from the interview protocol.

CHAPTER IV

RESULTS

This chapter aims at illustrating the results of both quantitative and qualitative parts of the study. First, descriptive statistics on pre-service early childhood teachers' perceptions of environmental education in pre-service teacher training programs and their beliefs about the integration of environmental education into early childhood education are provided. Then, inferential statistics to indicate the possible relationship between pre-service early childhood teachers' aforementioned perceptions and beliefs are given. Last, the interview findings are offered.

4.1. Descriptive Statistics for Pre-service Teachers' Perceptions of Environmental Education in Pre-service Early Childhood Teacher Training Programs

Descriptive statistics were calculated to describe pre-service early childhood teachers' perceptions of the sufficiency of environmental education content and practices in pre-service teacher training programs in order to prepare them as implementers of environmental education. The responses ranged from "quite insufficient" (1) to "quite sufficient" (5). Descriptive results for pre-service teachers' perceptions are presented in Table 4.1.

Table 4.1

Descriptive Statistics for Pre-service Teachers' Perceptions

Factors	Min.	Max.	*M*	*SD*
Content	1	5	2.9	.81
Practice	1	5	3.2	.82
Overall	1	5	3.1	.77

The overall mean score of pre-service early childhood teachers' perceptions of environmental education in pre-service teacher training programs was 3.1 (*SD*=.77). The mean score of participants' perceptions for the content of environmental education was 2.9 (*SD*=.81), and was 3.2 (*SD*=.82) for the practice of environmental education. In other words, on a 5-point Likert type scale, pre-service early childhood teachers' overall perceptions of environmental education, perceptions of environmental education content (i.e., how sufficient their programs in preparing them for the fundamentals of environmental education and also supporting their acquisition of environmental outcomes such as environmental awareness), and perceptions of environmental education practice (i.e., how sufficient their programs in preparing them for planning and implementing of environmental education such as instructional methods; and assessing and evaluating environmental education) in their training programs can be regarded as "neither insufficient nor sufficient" with their general mean values around midpoint 3. Some of item examples in PTEE scale and their frequency distributions are provided in Table 4.2.

Table 4.2

Sample of Items in the PTEE Scale and Their Frequency Distributions

Item Examples	Quite insufficient	Insufficient	Undecided	Sufficient	Quite sufficient
Perceptions					
In integrating environmental education into Science Education course	2.4	14.8	17.8	43.3	21.8
In practicing environmental education in outdoor learning environments (e.g., park, museum)	12.2	23.8	14.3	40.5	9.2
In offering education about how to assess environmental education	6.2	30.2	34.3	24.2	5.2
In offering opportunities to examine a variety of educational and instructional materials about environmental education	5.6	28.5	19.7	37.3	9

As seen in Table 4.4, while 43.3% of the subjects perceived their program as sufficient in terms of integration of environmental education into Science Education course in the program and also 37.3 % of them evaluated their program as sufficient in offering educational and instructional materials about environmental education, 40 % of the subjects found it as sufficient in offering environmental education in outdoor settings. In a similar vein, nearly 30 % of the subjects found their program as insufficient in offering education about environmental education assessment strategies.

4.2. Descriptive Statistics for Pre-service Teachers' Beliefs about Integration of Environmental Education into Early Childhood Education

Descriptive statistics were also calculated to demonstrate pre-service early childhood teachers' beliefs about integration of environmental education into early

childhood education within its components, development-learning, environmental outcomes and learning environment. The responses ranged from “strongly disagree” (1) to “strongly agree” (5). The results are presented in Table 4.3.

Table 4.3

Descriptive Statistics for Pre-service Teachers’ Beliefs

Factors	Min.	Max.	*M*	*SD*
Development-Learning	1	5	4.40	.48
Environmental Outcomes	1	5	4.54	.45
Learning Environment	1	5	4.54	.45
Overall	1	5	4.49	.39

Concerning pre-service early childhood teachers’ beliefs about integrating environmental education into early childhood education, the overall mean score was found as 4.49 with a standard deviation value of .39. Regarding the components of the participants’ beliefs, the mean was 4.40 (SD=.48) for Development-Learning, 4.54 for both Environmental Outcomes (SD=.45), and Learning Environment (SD=.45). On a 5 point scale, this implies that the participants might have availing beliefs about integrating environmental education into early childhood education in sub-dimensions of the scale. In other words, pre-service teachers believed in the contributions of environmental education to children’s whole development and learning (Development-Learning), its contributions to children’s acquisition of environmental outcomes such as children’s gaining positive environmental attitudes (Environmental Outcomes), and lastly they believed the necessity of organizing a responsive learning environment (e.g., using nature related materials) to integrate environmental education into early childhood education (Learning Environment).

In addition to the descriptive statistics about beliefs, some item examples and related frequency distribution values are displayed in Table 4.4.

Table 4.4

Sample of Items in the BIEE Scale and Their Frequency Distributions

Item Examples	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
Beliefs					
Integrating environmental education into early childhood education increases children's interests and curiosities about the environment	0	0.2	2.1	34	63.6
Schoolyard should be organized as a learning environment throughout integrating environmental education into early childhood education	0	0.2	.9	27.2	71.7
Integrating environmental education into early childhood education supports children's whole development	0	1.5	4.9	42.8	50.7

As shown in Table 4.4, 63.6 % of the subjects had availing beliefs about the effects of integration of environmental education into early childhood education on children's interests and curiosities about the environment. In addition, the majority of them (71.7%) strongly agreed with the necessity of organizing a learning environment by using school yard throughout the integration. Furthermore, 42.8 % of the participants got availing beliefs about the contribution of this integration to children's whole development.

4.3. Inferential Statistics

Pearson product-moment correlation analysis was conducted to explore the third research question, which was asked to examine possible relationship between pre-service early childhood teachers' perceptions of the sufficiency of environmental

education in pre-service teacher training programs and their beliefs about the integration of environmental education into early childhood education. The statistical assumptions of this analysis were checked before conducting the analysis.

4.3.1. The Relationship between Pre-service Early Childhood Teachers' Perceptions and Beliefs

4.3.1.1. Assumptions of Pearson Product-Moment Correlation Analysis

Before utilizing Pearson product-moment correlation analysis, the assumptions of level of measurement, related pairs, independence of observations, normal distribution, linearity, and homoscedasticity were checked (Hutcheson & Sofroniou, 1999).

Field (2009) described level of measurement as the correlation between the variable to be measured and the scores what is being measured. This study had two dependent variables as the mean scores of perceptions of pre-service teachers towards environmental education in teacher training programs and the mean scores of pre-service teachers' beliefs about integration of environmental education into early childhood education. They were continuous at interval level. Hence, the level of measurement assumption was ensured.

In this study, related scores of the subjects were satisfied since each subject has related pairs of scores on the two variables of the correlation. Regarding the assumption of the independence of observations, it was assumed that any subjects influence each other throughout the implementations of the scales as previously mentioned. Concerned with the normal distribution assumption, the subjects' mean scores on each dependent variable were checked to be whether normally distributed or not. Considering the related skewness and kurtosis values all of which were between -2 and +2, it could be asserted that this assumption was provided (Kunnan, 1998). Table 4.5 presents these values in detail. Additionally, normal like distribution

of the mean scores obtained from the PTEE and the BIEE scales were illustrated in histograms together with corresponding curves, Normal Q-Q plots and boxplots (see Appendix A).

Table 4.5

Skewness and Kurtosis Values of PTEE and BIEE Mean Scores

N	PTEE Mean Scores		BIEE Mean Scores	
	Skewness	Kurtosis	Skewness	Kurtosis
467	-.11	-.54	-.28	-1.04

Concerned with the linearity assumption, the relationships between the variables should be in the form of straight or linear line (Hutcheson & Sofroniou, 1999). Regarding homoscedasticity assumption, it refers that "the variability in scores for one continuous variable is roughly the same at all values of another continuous variable" (Tabachnick & Fidell, 2007, p. 85). A scatterplot was drawn so as to check these assumptions. It is demonstrated in Figure 4.1.

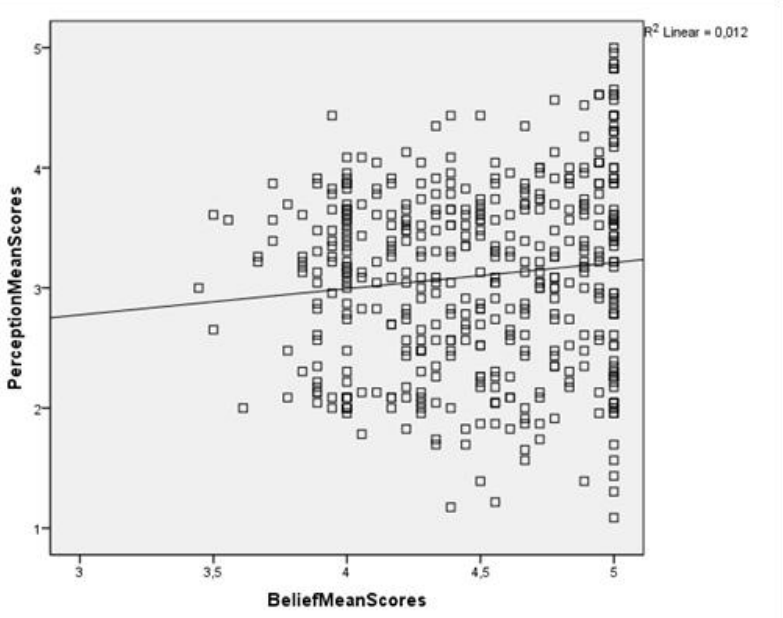

Figure 4.1 Scatterplot of the PTEE and the BIEE Mean Scores

When this figure was examined, the drawn line showed that the linearity assumption was ensured. Moreover, the direction of the relationship was positive because the PTEE mean scores increased hand in hand with the BIEE mean scores. Related to the homoscedasticity assumption, the line represented that the variability of mean scores on both dependent variables were nearly similar.

4.3.1.2. The Relationship between the Pre-service Early Childhood Teachers' Perceptions and Beliefs

After ensuring assumptions of the analysis, Pearson product moment correlation was utilized to examine the relationship between pre-service early childhood teachers' perceptions and beliefs. Furthermore, the correlation analysis was used with the purpose of investigating the possible correlation between the factors of the PTEE and the BIEE scales.

The results of the correlation analysis showed that there was a positive correlation between pre-service early childhood teachers' perceptions of the content and practices of environmental education in pre-service teacher training programs and their beliefs about the integration of environmental education into early childhood education (r=.11, p<.01). It is possible to say that as pre-service early childhood teachers' perceptions increase, their beliefs about the integration of environmental education into early childhood education also increase. Although there was a significant correlation, its strength was small (Cohen, 1988). This might be sourced from the greatness of the sample size (Cohen, 1992). The coefficient determination was calculated through squaring the r value, and it was found as .1. It means that the subjects' scores in the PTEE scale explained 1 percent of the variance in their scores in the BIEE scale. The results of the correlation analysis between the PTEE and BIEE scales and among their factors are presented in Table 4.6.

Table 4.6

Correlation between Pre-service Early Childhood Teachers' Perceptions and Beliefs

	Content	Practice	Development-Learning	Environmental Outcomes	Learning Environment	Belief
Content	-	.759**	.098*	.033	.012	
Practice		-	.194**	.084	.061	
Development-Learning			-	.648**	.617**	
Environmental Outcomes				-	.618**	
Learning Environment					-	
Perception						.111**

**p<.01 *p<.05

As Table 4.6 was examined, content and practice dimensions of the PTEE scale was significantly correlated (r=.76, *p*<.01). That is, if the subjects perceive environmental education content as sufficient/insufficient, they also perceive environmental education practices in their training programs in a similar way. Also, the dimensions of the BIEE scale showed statistically significant correlation as: Development-Learning and Environmental Outcomes (r=.64, *p*<.01), Development-Learning and Learning Environment (r=.61, *p*<.01), Learning Environment and Environmental Outcomes (r=.61, *p*<.01). As the subjects believe in the contribution of integrating environmental education into early childhood education to children's development and learning, they also believe in its contributions to children's acquisition of environmental outcomes. Furthermore, as the subjects believe in the contributions of this integration to children's development and learning and their

acquisition of environmental outcomes, they believe in the organization of learning environment to integrate environmental education into early childhood education.

Furthermore, the results presented in Table 4.8 indicated significant relationships between the factor pairs of Content and Development-Learning (r=.09, p<.05), and Practice and Development-Learning (r=.19, p<.01) dimensions. Namely, the subjects' experiences in environmental education content and practices in their programs might have an impact on shaping their beliefs about the contributions of integrating environmental education into early childhood education to children's development and learning.

4.4. Qualitative Findings

4.4.1. Pre-service Teachers' Perceptions of Environmental Education in Pre-service Early Childhood Teacher Training Programs

The findings were reported to describe pre-service early childhood teachers' perceptions of the sufficiency of environmental education in their undergraduate programs in details. The participants' perceptions were described in two parts as environmental education content and environmental education practices in pre-service early childhood teacher training programs.

4.4.1.1. Environmental Education Content

Environmental education content in pre-service early childhood teacher training programs connotes supporting environmental interest of pre-service early childhood teachers, drawing their environmental awareness, supporting their inquiry skills on environmental education, and conveying environmental knowledge.

Six out of nine participants perceived their undergraduate program insufficient and they also claimed the reasons for the insufficiency of environmental education content.

Concerning supporting environmental interest, four out of nine participants stressed that environmental education is addressed in a limited content with some courses such as Education and Awareness for Sustainability, Community Service and Science Education in their training programs. These participants stated that their environmental interest was partially supported within the context of some courses, but they found it insufficient due to limited allocated time.

> The instructor of Science Education course sometimes mentioned environmental issues. These kinds of things raised my interest towards the environment. But, it is not actually sufficient because of limited time (P6).

Furthermore, one of the participants particularly drew attention to the importance of Education and Awareness for Sustainability course in supporting her environmental interest by stating: "I found the [undergraduate] program insufficient in terms of supporting environmental interest. But, if I did not take sustainability course, I could feel myself less interested in environmental topics" (P5).

Regarding environmental awareness, three out of nine participants agreed on that drawing environmental awareness is limited with some courses including Education and Awareness for Sustainability and Science Education, Environment and Nature. Although they indicated that drawing environmental awareness is poor in the program due to limited time within the context of some courses, one of the participants specifically emphasized the importance of environment-related course for the development of environmental awareness. "If I did not take Education and Awareness for Sustainability course, I would not gain environmental awareness, even environmental sensitivity" (P1).

Furthermore, three out of nine participants denoted attitudinal barriers to drawing environmental awareness. For example, P9 drew attention to the importance of attitudinal barriers of the instructors. She explained that "Teacher educators might think that environmental education is not very important to include pre-service teacher training programs due to the fact that it is something to be learned by pre-service teachers' own effort".

As regards to supporting inquiry skills, six out of nine participants agreed on that this is also limited with some courses, specifically in Science Education course.

Two of them shared their own experiences in terms of inquiry process (P3 and P5). They agreed with the idea that expecting pre-service teachers to investigate about environmental education in the context of assignments would not effectively support their inquiry skills. Furthermore, one of the participants (P9) claimed that "the instructors did not say us how to reach knowledge about environmental education".

Related to conveying environmental knowledge, three out of nine participants perceived it as insufficient due to absence of a separate course on environmental education (P5 and P7) and the courses being theory-laden (P3).

For example, P7 indicated that "it is insufficient due to the absence of an environmental education course which aims to educate us about the environment, environmental problems, and also teaching environmental education". Furthermore, P3 said that "courses are theory-laden and do not support long-lasting learning".

As opposed to the participants who perceived environmental education content as insufficient, three out of nine participants found it sufficient. Concerned with supporting environmental interest, one of the participants mentioned about the variety of shared videos and internet resources on environmental education especially in Science Education course. She clarified that "these examples supported my environmental interest" (P2). Another participant emphasized that the instructor's teaching strategy in Environment and Nature course promoted her active participation to the course and support her environmental interest with the help of "discussions in class" (P7).

Related to drawing environmental awareness, the role of family and individual experiences about the environment might be important. One of the participants explained underlying reason of the sufficiency of drawing environmental awareness in the program by interrelating with "her background experiences from family, social environment and media" (P8)

Two participants agreed on the idea that the assignments and requirements in the context of Science Education course supported their inquiry skills on environmental education. As in their expressions below:

> We had a portfolio assignment in Science Education course. In this context, we were required to prepare 10 science activities in various subjects. At least three of them were expected to be about environmental education. While preparing the activities, I searched and found more than three activities related to environmental education. Such an assignment motivated me to investigate [about environmental education] (P2).

> I can't say that all courses in the program supported my inquiry skills on environmental education. Environment and Nature course exactly supported my skills since the instructor expected us to learn by active investigation (P7).

Relevant to conveying environmental knowledge, two of the participants also explained the reason of their perception through relating to "daily life experiences" and "the instructors' sharing of their experiences in environmental education" (P8).

Pre-service early childhood teachers in general proposed certain suggestions to improve environmental education content in their programs. All of the participants concentrated on the need for a separate course on environmental education which has some of the following characteristics: "elective course before School Experience course" (P2), "a course including both varied environmental concepts and its pedagogy" (P7), "a course which is interesting for future teachers" (P3), and "a must course with environmental education practices in schools" (P4).

Additionally, two participants highlighted to the mission of the instructors in "sharing their knowledge about environmental education obtained international educational sources" (P4) and "providing varied environmental education activity examples to support our environmental knowledge" (P3).

Lastly, concerned with supporting inquiry skills on environmental education, two of the participants suggested that pre-service teachers' needs should be taken into account by the instructors during planning the course content. For instance, P5 suggested that "To support inquiry skills on environmental education, pre-service teacher training programs should consider our individual needs with the help of pre-assessment and then planning the course should be based on our needs."

In summary, six participants perceived environmental education content as insufficient owing to being limited with some courses and attitudinal barriers of

teacher educators towards the need of environmental education. On the other hand, three participants perceived environmental education content as sufficient by connecting this sufficiency with the variety of environmental education related examples in the context of courses, the instructors' teaching strategies and the role of assignments in courses, personal background experiences on environmental education. In the light of these perceptions, all participants agreed with the suggestion of the necessity of a separate course on environmental education. Furthermore, the mission of instructors in planning the course content considering pre-service teachers' needs was underlined.

4.4.1.2. Environmental Education Practices

Environmental education practices in pre-service teacher training programs denotes offering environmental education experience during coursework and/or practicum, conveying instructional methods and assessment strategies on environmental education, representation of environmentally friendly behaviors (modeling), integrating environmental education into coursework, accessing environmental education resources, and offering field experiences (outdoor learning).

Six participants perceived environmental education practices as insufficient. They clarified their reasons associated with environmental education practice in their training programs.

Related to offering environmental education experience (coursework, practicum, and internship), two participants believed that it is limited with some courses such as Science Education and Practice Teaching. However, one of the participants indicated that "I found it insufficient because we did not have environmental education experience throughout coursework and practicum" (P8)

As regards to conveying instructional methods and assessment strategies on environmental education, all of the participants stressed that there is no emphasis to provide instructional methods and assessment strategies on environmental education. They explained its possible reasons as providing general knowledge about instructional methods and assessment strategies without associating with environmental education. Related to instructional methods, P3 explained that

conveying instructional methods on environmental education was limited with some courses in the program. She shared her experiences as "Instructional methods were taught in general in Methods of Teaching course. There was not any information about how to teach environmental education. But, the instructor of Science Education course mentioned about [environmental education] teaching strategies to young children" On the other hand, one of the participants explained that there was no emphasis on environmental education teaching strategies in the context of courses, but she drew attention the role internship in learning how to teach environmental education through "observing teachers' practices with young children" (P9).

In relation to the representation of environmentally friendly behaviors (modeling), five participants pointed out that there was no demonstration of environmentally friendly behaviors whereas two of the participants indicated that there was modeling to some degree in the context of some courses such as Science Education and Environment and Nature through verbal directions to pre-service early childhood teachers like "turn off the lights before going outside" (P2), and "don't leave litter in class and put them into recycle bin" (P7).

With respect to integrating environmental education into coursework, six participants remarked that there was no integration of environmental education into different subject areas due to "the lack of allocated time and already tight program" (P1), "the independence of the subject courses" (P4), "the low priority for environmental education in teacher training programs" (P9). However four of the participants emphasized its possibility through providing some integration examples into particularly Science Education course:

> I think that it could be integrated to some degree. For example, environmental education could be integrated into different units such as earth and space, and life science in the context of Science Education course (P1).

> Integrating environmental education into Science Education course might be possible by using environment-related resources [books, journals…] and connecting the links between the units such as the water cycle and the habitats of animals (P5).

With reference to accessing environmental education resources, five participants stated that they did not have any access to environmental education resources such as books, journals, and documentaries in the context of the teacher training program. Two of these participants thought that accessing environmental education resources could be in the context of Science Education course. For example, one of them (P3) said that "There was not any access to environmental education resources in the program. I think that different examples of resources such as nature related books could be showed us during Science Education course".

On the contrary, one of the participants who took Education and Awareness for Sustainability course shared her experiences in terms of accessing environment-related resources.

> In the context of the course, we watched videos about the environmental events like environmental pollution and climate change. And then, I searched on the internet, and found some cartoon videos about how to tell children about the importance of water. At this meaning, this course guided us. But, accessing the varied resources [books, videos…] about the environment was limited with this course (P1).

Lastly, offering field experiences (outdoor learning) to pre-service teachers was found to be insufficient by all of the participants since they did not have such kind of experience directly related to environmental education due to limited time and already tightness program. For example:

> We did not participate to any field trips [concerning environmental education] during undergraduate education. I think that it is due to the overloaded program of undergraduate education (P1).

> There has not been any organization about field trips [related to environmental education] in the faculty because of the priority of major courses [about subject matter knowledge and skills, teaching profession…] in the program (P2).

Eight of the participants actually pointed out that offering field experiences (outdoor learning) to pre-service teachers is a crucial component of the

environmental education practices in teacher training programs by indicating: “necessary for us to learn by doing and then to practice with children in our profession” (P1), “field trips are effective for us to learn the process of practicing it with young children” (P2), and “learning becomes more meaningful for us when it is learned by directly experiencing throughout fieldtrips” (P8). Yet, one of the participants (P3) stated that it is not necessary to organize field trips in teacher training programs. In her words, “I do not think that instructors are able to take their students to the field trips. … I do not think it is necessary at all.”

In addition to the insufficiencies oriented for environmental education practices in pre-service teacher training programs, there were also sufficient points seen about offering environmental education experiences (coursework, practicum, and internship), integrating environmental education into coursework, and accessing environmental education resources.

Seven participants agreed on the sufficiency of the program in terms of providing environmental education experience during coursework and internship:

> I found it sufficient. For example, some of my friends practiced their activities about recycling in the class. Thus, we observed some exemplary activities on environmental education in Science Education course (P1).

> We had an opportunity to implement our activities with children in preschool last year in Science Education course. It was our first experience with children.. It was great. Moreover, some of us practiced environmental education activities since we were free to select any topic related to science. Hence, I found it sufficient (P6).

> In Science Education course, we prepared science activities. Some of our friends prepared environment-related activities. We first practiced the activities in class and took feedback from the instructor. Then we practiced revised version of the activities with children. It was effective for us to learn how to implement the activities with children (P9).

Regarding integrating environmental education into coursework, three participants perceived the integration of environmental education into coursework as sufficient such as by “the variety of examples on environmental education in the

courses, particularly in Science Education course" (P2) and "the integration of environmental education into the topics in Science Education course" (P7).

Finally, three participants indicated that teacher training program offered them a variety of environmental education resources through "videos about the environmental events" (P1), and "providing internet sources about environmental education" (P2). In addition to providing environmental education resources, one of the participants (P8) laid emphasis on that teacher training program offered some opportunities for pre-service teachers to prepare instructional materials like nature-related books in the context of Children's Literature course.

Related to the environmental education practices, the participants maintained some suggestions. First, eight participants emphasized using outdoor environments and they recommended using outdoor environments in teacher training programs.

> It might be organized in the context of an environment-related course. For instance, we could participate to field trips [outdoor learning] and work in group projects on the environment (P2).

> Such kind trips [to the natural environments] should be organized in the university so as to support our environmental awareness (P7).

> I want to share one of my experiences. One day, I was sitting outside and it is raining. I saw that a worm appeared at the edge of the stone. I took a photo with the purpose of using it in a science activity with children in the future. If we participate in outdoor activities in the context of undergraduate courses, we will learn how to observe the environment and learn how to teach it. Therefore, it is necessary (P4).

Second, four participants recommended combination of theory and practice. For example, theory and practice should be combined by "providing opportunities for pre-service teachers to implement environmental education with children for long-lasting learning" (P3), and "enabling practice based education by interacting with the environment and learning by doing after getting theoretical knowledge on environmental education" (P6).

Last, regarding instructional methods and assessment strategies on environmental education, four participants came up with a common idea. They

highlighted that both instructional methods and assessment strategies related to environmental education should be included in the context of Science Education course by "planning environmental education activities and taking feedback from the instructor about learning process, instructional methods and assessment strategies" (P6), "offering education about how to teach and assess environmental education in early years" (P7).

All in all, nine of the participants perceived conveying instructional methods and assessment strategies on environmental education, and offering field experiences (outdoor learning) as insufficient due to limited course time and negative attitudes of the instructors. In addition, the majority of the participants perceived that environmental education practices including representation of environmentally friendly behaviors (modeling), integrating environmental education into coursework, accessing environmental education resources are insufficient. Furthermore, only two of the participants perceived the program as insufficient in offering environmental education experience throughout course and/or practicum. In spite of these, the existence of some sufficiency, particularly offering environmental education experiences in pre-service teacher training programs was emphasized by almost all of the participants. In addition to these, three participants perceived integration of environmental education into coursework and access to environmental education resources as sufficient despite in the context of some courses. The participants suggested using outdoor environments, combining theory and practice, inclusion of environmental education instructional methods and assessment strategies into Science Education course.

4.4.2. Pre-service Teachers' Beliefs about the Integration of Environmental Education into Early Childhood Education

The findings were presented to describe pre-service early childhood teachers' beliefs about the integration of environmental education into early childhood education in depth. Their beliefs were described in two parts including participants' beliefs about the reasons for this integration including its contributions to children's development and learning and to their acquisition of environmental outcomes; and

the ways of this integration comprising organizing a learning environment. The underlying reason of setting such a categorization (reasons and ways) is to elaborate pre-service teachers' beliefs regarding three factors of the BIEE scale (Development-Learning, Environmental Outcomes, Learning Environment) on new dimensions (e.g., integrating environmental education into different activities).

Nine of the participants provided availing beliefs about the reasons of and ways for integrating environmental education into early childhood education. On the other hand, all of the participants (N=9) pointed out beliefs about the barriers which they could meet while integrating environmental education into early childhood education.

4.4.2.1. Beliefs about the Reasons of Integrating Environmental Education into Early Childhood Education

In this section, the participants' beliefs about the reasons of integrating environmental education into early childhood education are presented within the contributions of this integration to children's development and learning, and their gaining environmental outcomes in order. All of the participants believed in the importance of integration of environmental education into early childhood education for its contributions to children's development in different domains and learning, their acquisition of environmental outcomes.

4.4.2.1.1. The Contributions of the Integration of Environmental Education into Early Childhood Education to Children's Development and Learning

The participants' beliefs about the significance of the integration of environmental education into early childhood include its contributions to children's whole development (physical, cognitive, language and social-emotional developmental domains), and their learning (e.g., becoming lifelong learner, concrete learning). Furthermore, their beliefs about the significance of this integration are related to the similarities between the fields of environmental education and early childhood education.

Related to beliefs about the contributions to children's whole development, majority of the participants claimed that the integration of environmental education into early childhood education contribute children's different developmental areas.

Seven out of nine participants believed that this integration enhance children's physical development through different activities composing particularly outdoor activities such as "gardening activities" (P1), "nature walks" (P2, P4, P6, and P8), and "field trips" (P8).

In addition to the contributions of outdoor activities on children's physical development, two participants stressed the assistance of indoor activities to children's physical development such as: "Children's fine motor skills could be improved during a science experiment about environmental education" (P2).

> When I integrate environmental education into drama activities, I enable children to describe themselves through acting physical movements. This kind of an indoor activity supports their physical development (P5).

Regarding cognitive development, all of the participants agreed on that the integrated environmental education activities contribute to children's cognitive development by engaging their minds to solve varied environmental problem cases. In other words, they came up with the idea that children's cognitive development is supported, since they are engaged in producing solutions for the environmental problems. Moreover, four participants maintained that the integrated environmental education activities support children's cognitive development by enabling them to gain "critical thinking and problem solving skills" (P4), "reasoning and questioning about environmental events" (P1 and P2) during the activities.

In addition, all of the participants believed the contribution of integrated environmental education activities to children's language development. Six participants emphasized that the integrated activities provide opportunities for children to express their ideas about their experiences and to communicate each other. Two participants only focused gaining new vocabulary about environmental concepts throughout the learning process such as by "reading nature related books" (P6). Furthermore, one of the participants (P4) explained its contributions by

emphasizing both gaining new vocabulary about the environment and learning how to start communication.

All of the participants maintained the contributions of integrated environmental education activities to children's social-emotional development through supporting some of their skills such as "working in pairs, forming and developing peer relations" (P1, P2, P4, and P7), "empathizing with other living things" (P3, P4, and P7), and "empathizing and respecting for the nature and the living things" (P5, P8, and P9).

Four participants associated the integrated environmental education activities with the group activities. For this reason, they believed that these kinds of activities enhance children's "group working skills" (P7), "peer relations" (P2) "learning social rules like sharing" (P1).

Furthermore, one participant drew attention to the necessity of integrating environmental education into early childhood education by expressing the goals of these fields to "educate and prepare children to improve their existing capacity, and to promote their life quality, and to support their development in different areas" (P9).

Concerned with the beliefs about the contributions of integrating environmental education into activities to children's learning, seven participants believed that integrated environmental education activities play a key role on children's becoming lifelong learner such as enabling children to learn by "doing and experiencing in an active way" (P1), "comprehending the importance of the environment and developing environmental awareness" (P7), "directly engaging with the natural environment" (P4), and "the help of a number of concrete activities" (P6).

Furthermore, two participants affirmed that the integration of environmental education into early childhood education offers children's learning in a concrete way. To give an example:

> Young children learn by doing and playing. Integrated environmental education activities offer children to learn in a concrete way because children could go outside, observe the environment and directly engage in the environment by touching and smelling. These kinds of experiences support children's concrete learning (P4).

> As far as I observed in internship, children like learning by doing and experiencing. Hence, rather than warning children not to harm animals, integrating environmental education into drama activities would be more effective to support children's learning (P5).

Lastly, two participants mentioned the influence of this integration on children's learning as a motivation source. To illustrate:

> Children are already interested in the environment. Since they have inner interest, integrating environmental education into other activities is a motivating factor for their learning (P2).

To summarize, all of the participants believed the significance of integrating environmental education into early childhood education by stressing its contributions to children's different developmental areas (physical, cognitive, language, and social-emotional) and their learning. Furthermore, one of the participants advocated the need for integration of environmental education into early childhood education by the reason of the similarities between these fields.

4.4.2.1.2. The Contributions of the Integration of Environmental Education into Early Childhood Education to Children's Acquisition of Environmental Outcomes

The beliefs of pre-service early childhood teachers about the contributions of the integration of environmental education into early childhood education consist of children's acquisition of environmental interest, environmental understanding, environmental sensitivity, environmental attitudes, and environmentally responsible behaviors.

Regarding the beliefs about the contributions of integrating environmental education into early childhood education to children's acquisition of environmental outcomes, all of the participants stressed the possibility of children's gaining some environmental outcomes with the support of integrated environmental education activities such as by "supporting children's environmental interest since they have inner curiosity and interest about the environment" (P3), "influencing first children's environmental interest, and then their environmental attitudes and lastly their

behaviors towards the environment" (P5), "shaping their sensitivity towards the environment" (P6), "transforming negative attitudes towards the environment into positive ones" (P8)**,** and "offering opportunities for children to engage with the environment to facilitate their environmental understanding" (P2). One participant shared her experience in practicum and believed the contributions of integrating environmental education into early childhood education to children's gaining environmentally responsible behaviors by indicating:

> …the teacher planted flower with children in school garden and then explained children how to take care of these flowers. Each child was responsible for taking care of his/her flower in the garden. Therefore, integrating environmental education into early childhood education might support children to gain such kinds of good behaviors [environmentally responsible behaviors] (P6).

Furthermore, one of the participants (P9) mentioned about its contributions to children's acquisition of environmental outcomes through interrelating with "the goals of environmental education**.**"

Eight participants stated their beliefs through emphasizing the significance of early years as a critical period to support children's gaining environmental outcomes. For example, the participants explained its significance by laying emphasis on "teaching environmental education as much as earlier" (P1), "the importance of early years to train environmentally conscious citizens for the future" (P3), and "the difficulty of acquisition of environmental outcomes in further ages" (P9).

To sum up, all of the participants believed in the contributions of this integration to children's gaining environmental outcomes including environmental interest, environmental understanding, environmental attitudes, environmental sensitivity, and environmentally responsible behavior.

4.4.2.2. Beliefs about the Ways of Integrating Environmental Education into Early Childhood Education

In this section, the participants' beliefs about how to integrate environmental education into early childhood education are presented within the participants' beliefs about a variety of ways to integrate environmental education into early childhood education. These ways are organizing a responsive learning environment,

integrating environmental education into different activities, going outside whenever possible, and teacher's showing a sense of wonder about the environment.

All of the participants believed in the necessity of organizing a responsive learning environment to integrate environmental education into early childhood education. They highlighted using of different centers, nature related materials, putting of a recycle bin in the classroom, feeding of pets or plants, and using school garden as a learning environment.

Regarding the learning environment, seven participants pointed out using different centers throughout this integration which involving reading, art, science, and dramatic play center. For example: "Nature related books might be put into reading center to support children's acquisition of environmental conscious" (P1), "In the art center, there could be some natural materials like pine cone, stones, leaves we collected from the environment" (P4) and "We could use science center anyway by planting or feeding pets" (P9)

Six participants recommended using nature related materials throughout this integration. Three of them explained its reasons as: "to provide children hands-on experiences and to make them acquire environmental understanding about the characteristics of the materials" (P7), "to support children's creativity for using nature related materials in art activities" (P4), and "to strength their learning by doing like collecting these materials from the environment and then using them in different activities" (P1).

In addition to using different learning centers and nature related materials, five participants maintained putting a recycle bin in the classroom so as to support children's learning about environmental education and their gaining of environmentally responsible behaviors by "directly experiencing" (P2 and P9) and with the help of "recycling the materials used in class" (P7 and P8). Moreover, one of the participants stated her belief about using school garden as a learning environment by sharing her experience in Science education course as:

> To integrate environmental education into early childhood education, school garden should be designed as a learning environment. For instance, I found an activity about environmental education while I was investigating for the portfolio assignment in Science Education course.

> The activity was about collecting organic food waste like orange zest and vegetables in a jar with children and then obtaining compost. After that, they used it to grow vegetables and fruits in the garden (P2).

In addition, all participants agreed with the feasibility of integrating environmental education into a number of activities in early childhood classrooms. They provided integrated environmental education activity examples with different activities including drama, language, science, art, music, mathematics, and free play.

Six participants offered their integrated environmental education activities with drama, language activities such as by "role playing activities as if children were trees in a forest" (P1), "enabling children's role playing as if they were fishes in a dirty lake" (P4), "the dramatization of some human behaviors like dropping litter to show the connection between human and environmental pollution" (P2), "reading nature related books" (P6 and P8), and "teaching what [an environmentally friendly behavior] should be or a life cycle of an alive, how all of them are worthy by inspiring from a story" (P7).

In addition, one of the participants who believed in the possibility of integrating environmental education into drama activities shared her experience in Drama course. She stated:

> I observed an activity during my investigation for Drama course. It was about environmental pollution. In the activity, there is a child who weared a trash can and dramatizing as if she were upset due to the fact that people threw litter on the ground. Accordingly, environmental education could be integrated into such kind of activities [drama activities] (P8).

Two participants presented their examples with mathematics and art activities. For example:

> It might be integrated into mathematics. We could collect stones and pines cones with children and then group them according to colors and sizes. By doing so, we could work about small and big concepts. Furthermore, we could enable children to engage with nature related materials (P4).

> I could integrate environmental education into different activities. For instance, we could put waste materials in a box after an art activity or we could do a recycle bin for our classroom in the art activity (P5).

Three participants offered the integration of environmental education into daily routines by "emphasize water conservation and tell children how they use water while the activity of brushing teeth following breakfast" (P1), into music activities by "teaching nature related songs" (P6), and into free play activities by "putting different pictures, natural materials from the environment, stories about the environment into learning centers" (P7).

Furthermore, three out of nine participants illustrated the integration of environmental education into science activities by "doing experiments about the environment" (P3), and "going outdoors and observing the environment" (P4).

Lastly, three participants proposed going outside whenever possible as a way of integrating environmental education into early childhood education. They advocated the necessity of going outside with children throughout this integration with its some outcomes on children as follows:

> I believe that learning should be absolutely supported in outdoor environment. For instance, as children spend time with animals and feed them in school yard, they love them and gain positive attitudes towards animals. Moreover, their social-emotional development is enhanced (P4).

> I think that a well-organized outdoor environment can contribute to children in gaining environmental consciousness and interacting with the environment (P5).

> I think that environmental education activities should not be limited with the indoor activities. Children's learning should be continued with outdoor activities like growing vegetable and fruits in garden. For me, it is important to strength their learning by practices (P7).

Furthermore, one participant illuminated the role of early childhood teacher during this integration. She illustrated:

> In the context of Nature and Environment course, I prepare a recycling activity and practice it with children in a preschool classroom. I observed that children were willing to learn about recycling. Hence, teacher should be a role model for children to take their attention on environmental topics and show environmentally responsible behaviors [recycling] to integrate environmental education into early childhood education (P7).

However, participants believed the feasibility of integrating environmental education into early childhood education, and they stressed that they might come across with some barriers due to some factors. Four out of nine participants particularly believed that they might have barriers resulting from family attitudes towards outdoor activities owing to “safety concerns” (P1) and school administration attitudes towards environmental education such as “perceiving outdoor activities as time consuming” (P3).

In addition to these, the participants emphasized the logistic barriers due to “absence of a school garden for outdoor activities” (P2), “shortage of funding for field trips” (P3), and “lack of environmental education resources and materials” (P4). Moreover, one participant (P5) maintained that she might meet some barriers in integrating environmental education into early childhood education by virtue of “the lack of environmental education experiences such as preparing environmental education activities in undergraduate program”.

To sum up, the participants clarified the ways of integrating environmental education into early childhood education by organizing a responsive learning environment (e.g., using different centers, using nature related materials, putting recycle bin in classroom), integrating environmental education into different activities such as drama, art and mathematics, spending time in outdoors whenever possible, and early childhood teachers’ modeling of environmentally responsible behaviors. On the other hand, they pointed out some barriers for this integration which involve attitudinal barriers, logistic barriers and the lack of emphasis on environmental education in their undergraduate education.

CHAPTER V

DISCUSSION

This chapter includes discussion of the research findings of the study in relation to previous studies and presents their implications for teacher educators and curriculum developers in pre-service early childhood teacher training programs in Turkey. It also makes recommendations for further research studies.

5.1. Pre-service Early Childhood Teachers' Perceptions of Environmental Education in Pre-service Teacher Training Programs

Quantitative part of the study revealed that pre-service early childhood teachers' perceptions of environmental education in their training programs can be interpreted as "neither insufficient nor sufficient". In other words, while some of the participants could perceive the program as sufficient, others could perceive it as insufficient. Similarly, previous studies unfolded both weaknesses and strengths of environmental education in pre-service teacher training programs (Lin, 2002; Mastrilli, 2005).

Regarding environmental education content, pre-service early childhood teachers evaluated their programs in supporting their environmental interest and conveying environmental knowledge as sufficient. As opposed to the quantitative results, the follow-up component of this study clarified that environmental education content is mostly limited with some courses (e.g., Science Education, Education and Awareness for Sustainability) and limited time is also obstructing to support pre-service teachers' environmental interest. Moreover, according to the participants environmental education content is insufficient due to the absence of a separate course on environmental education to convey environmental knowledge. Similarly, previous research indicated that environmental education content is often covered in some courses particularly science-related courses (Lin, 2002; Mastrilli, 2005; McKeown-Ice, 2000; Miles et al., 2006). Furthermore, McKeown-Ice (2000)

reported that environmental education content is restricted with limited time due to the priority of other mandated courses in pre-service teacher training programs. In parallel with the finding of absence of a separate course on environmental education in the current study, Lin (2002) found that the majority of pre-service teacher training programs in Canada do not provide a separate course on environmental education. Correspondingly, the researcher concluded that environmental education has low priority in pre-service teacher training programs. The underlying reason of this finding in the current study might be regarded as the lack of emphasis on environmental education in pre-service early childhood teacher training programs, since there is not any separate course about environmental education in pre-service teacher training programs (CHE, 2007b). Moreover, it might be related to the lack of faculty member specialized in environmental education, since the participants maintained that environmental education is restricted with environment-related elective courses which are given by one faculty member in pre-service teacher training programs.

In addition, the quantitative results revealed that pre-service teachers found environmental education content insufficient in offering an inquiry-based environmental education in their programs and also supporting their inquiry skills on environmental education. In a similar vein, the interviews showed that environmental education content is insufficient to support pre-service teachers' inquiry skills on environmental education because they stated that they had limited opportunities to investigate environmental education within the context of some assignments such as portfolios in limited number of courses (e.g., Science Education). In the literature, the use of alternative assessment strategies like portfolio in the context of environmental education undergraduate courses was found to play an important role in supporting pre-service teachers' inquiry skills as well as their learning (Tal, 2005). Moreover, NAAEE (2004) explained the suitability of using inquiry for environmental education content. Thus, offering such opportunities through course assignments might enhance active investigation and pre-service early childhood teachers' inquiry skills. The insufficiency of emphasis on supporting inquiry skills

about environmental education calls for the necessity of using inquiry-based environmental education throughout the courses.

Concerned with environmental education practice, some of the remarkable results illustrated that pre-service early childhood teachers perceived their program as neither insufficient nor sufficient in offering education about environmental education assessment strategies, accessing environmental education resources due to the approximate percentages in their responses. Additionally, the follow-up interviews indicated that there was no emphasis on how to assess environmental education in their training programs due to limited time and absence of a separate course on environmental education. This result might be stemmed from the absence of a course focusing on environmental education in higher education program (CHE, 2007a).

As to accessing environmental education resources, while quantitative results showed that pre-service early childhood teachers perceived it sufficient, the interviews generally showed that there is limited access to environmental education resources (e.g., using videos, internet sources) in pre-service early childhood teacher training programs. In the literature, environmental education resources generally refers to the printed government resources such as Project WILD, Project Learning Tree, Project WET (McKeown-Ice, 2000; Meredith et al., 2002; Heimlich et al., 2004) and environmental education magazines (Powers, 2004). Accordingly, there are certain environmental organizations in Turkey such as The Turkish Foundation for Combating Soil Erosion, for Reforestation and the Protection of Natural Habitats (TEMA) and Environmental Protection and Packaging Waste Recovery and Recycling Trust (ÇEVKO) who also provides various printed resources (e.g., magazines, books) regarding the environment. In this respect, the insufficiency of accessing environmental education resources could be interpreted as the instructors' using only videos and internet resources rather than printed resources. Heimlich et al. (2004) pointed out a similar problem in pre-service teacher training programs in using environmental education resources. They also discovered that there was a lack of awareness about the use of environmental education resources during undergraduate education. Accordingly, the underlying reason of the insufficiencies in

accessing environmental education resources in the current study might be related to the lack of awareness for using different types of environmental education resources in pre-service early childhood teachers training programs.

Furthermore, the quantitative results showed that pre-service early childhood teachers evaluated their programs as sufficient in integrating environmental education into Science Education course, requiring environmental education experience (coursework, practicum, and internship), and offering field experiences (outdoor learning).

As to the integration of environmental education into Science Education course, the previous studies highlighted that there is a tendency to integrate environmental education into science-related courses (Lin, 2002; McKeown-Ice, 2000; Miles et al., 2006) rather than its integration into other subject areas in pre-service teacher training programs. Regarding the significance of this integration, Miles et al. (2006) asserted: "Without the inclusion of effective environmental education at the pre-service level there is not the opportunity for prospective teachers to develop theoretically based understanding of teaching philosophies, methods, beliefs and knowledge in this area" (p.51). The qualitative follow-up then showed the integration of environmental education mostly occurs in the context of Science Education course in the program. On the other hand, the interviews demonstrated that the integration of environmental education into other courses was insufficient due to limited time, low priority for environmental education in the program and the independence of subject courses. The participants also linked their perception with the emphasis of the mandatory courses related to subject matter knowledge and skills and teaching profession in pre-service teacher training programs. Limited time was indicated as a factor which decreases the possibility of integrating environmental education into coursework in pre-service teacher training programs (Mastrilli, 2005; Meredith et al., 2002). In this sense, tightness of the higher education program might prevent allocating extra time for environmental education. In addition, offering environmental education in pre-service teacher training programs has been associated with faculty interest and knowledge about environmental education (McKeown-Ice, 2000). Accordingly, being low priority for environmental education in pre-service

teacher training programs in Turkey might be due to the lack of faculty interest about environmental education. The participants' perceptions of the underlying reasons for the insufficiencies of this integration might be related to their experiences in the program because Calderhead and Robson (1991) stressed the influential role of prior formal experiences on pre-service teachers' perceptions and evaluations of their undergraduate courses. In other words, if they learn environmental education in the context of certain courses (e.g., Science Education), they could perceive that the courses in the program are independent.

With regards to requiring environmental education experience (coursework, practicum, and internship), both quantitative and qualitative results revealed that pre-service early childhood teachers were sufficiently prepared for environmental education by having environmental education experience throughout coursework, practicum and internship. This finding was quite anticipating considering the significance of having environmental education observation and/or practice opportunities in schools (Grace & Sharp, 2000). Interestingly, the result of the current study is different from previous studies which indicated environmental education teaching experience in schools as one of the major shortages in pre-service teacher training programs (Ballantyne, 1995; Beckford, 2008; Meredith et al., 2002; Miles & Cutter-Mackenzie, 2006). This difference between the findings of the current study and the previous studies might be related to the priorities in pre-service teacher training programs in Turkey in offering practicum experiences. The program of pre-service early childhood teacher training programs in Turkey offers some courses on teaching profession and skills such as School Experience and Teaching Practice I-II (CHE, 2007b). In the context of these courses, pre-service early childhood teachers are required to go pre-schools to observe educational practices and also practice their pre-planned activities.

Related to offering field experiences (outdoor learning), the quantitative results showed that pre-service early childhood teachers perceived it as sufficient in the program. On the contrary, the follow-up interviews displayed that the participants did not have any field experiences (outdoor learning opportunities) during their undergraduate education. This difference could be owing to the differences in the

nature of quantitative and qualitative research methods. Qualitative data plays a complementary role to support and elaborate the quantitative data with the detailed information of the participants (Creswell, 2008). The interviews explained its underlying reasons as limited time and attitudinal barriers of the instructors about the significance of environmental education. Similar with this finding, Mastrilli (2005) denoted that the teacher educators of pre-service elementary teachers frequently prefer using cooperative learning strategies, and inquiry in their classes rather than outdoor teaching strategies. Yet, outdoor teaching strategies were accepted as an appropriate teaching way for environmental education. In the literature, the role of outdoor experiences on the individuals' further environmental practices such as gaining environmental concern and conservation skills towards the environment is important were emphasized (Chawla, 1999; Palmer & Suggate, 1996). On the other hand, insufficiency of offering field experiences during undergraduate years was not surprising considering lack of such kind of outdoor education opportunities in pre-service teacher training programs (Mastrilli, 2005; Ernst & Tornabene, 2012). For example, Ernst and Tornabene (2012) urgently suggested the need for using outdoor environment in undergraduate programs to shape pre-service early childhood teachers' perceptions of usability of outdoor environments in early years and their further practices.

5.2. Pre-service Early Childhood Teachers' Beliefs about the Integration of Environmental Education into Early Childhood Education

Overall pre-service early childhood teachers' beliefs about the integration of environmental education into early childhood education were found to be quite positive in three dimensions of the scale (Development-Learning, Environmental Outcomes and Learning Environment). That is to say, most of the participants had availing beliefs about the integration of environmental education into early childhood education. Furthermore, semi-structured interviews elaborated why's and how's of pre-service early childhood teachers' beliefs about this integration.

Related to the contributions of environmental education to children's whole development and learning (Development-Learning), the quantitative results revealed

that pre-service early childhood teachers believed that the contributions of this integration to children's whole development (i.e., psychomotor, cognitive, language, social-emotional development) and their learning. In other words, they believed the significance of this integration since it contributes to children's varied developmental areas, facilitates their learning other subject areas (e.g., mathematics, science), and supports their becoming lifelong learners. Their beliefs about the contributions of this integration to children's whole development and learning were parallel to Wilson's (2010) statement for this integration because she stressed that integrating environmental education is essential for children, namely for their healthy development in all areas and learning. The follow-up interviews supported and extended the quantitative results. The participants supported the integration of environmental education into early childhood education thinking that it would help physical, cognitive, linguistic and social-emotional development and learning.

As a matter of fact, the participants mainly linked physical development with the outdoor activities such as gardening, nature walks and field trips. Previous studies aligned with this finding since they stressed that children's engagement within the natural environments, spending time outdoors contribute to children's development, particularly their physical development (Fjørtoft, 2004; Louv, 2005; Wilson, 1994, 2010). As regards cognitive development, the interviews showed that the integration of environmental education into early childhood education supports children's critical thinking, problem solving skills and reasoning about environmental events. This finding is consistent with several studies which revealed that environmental education supports children's variety of cognitive skills such as problem solving, categorization of things (e.g., living/nonliving) (Basile, 2000; NAAEE, 2010; Wilson, 2010). The participants also believed that this integration could have positive effects on children's language development, helping them gain new vocabulary about the environment and share their experiences with others. Likewise, Wilson (2010) highlighted that children need to share their experiences in the environment and children's communication skills are supported during this sharing of experiences. Lastly, the participants connected social-emotional development with this integration. They believed that it fosters development of

sensitivity for the environment and living things, respect for the environment, as well as also supporting peer relations in group work. Environmental experiences promote children's social-emotional development, producing individuals who care for and respect the environment (Bohling-Philippi, 2006; Wilson, 2010). The importance of environmental education in early years for the development of peer communication and team work skills have also been indicated in the literature (NAAEE, 2010).

The findings showed that pre-service early childhood teachers' beliefs about the contribution of this integration to children's whole development seems to be parallel with the previous studies. Although there are not any courses about environmental education except for Science Education in pre-service early childhood undergraduate program (CHE, 2007b), participants' beliefs about the contributions of this integration to children's varied developmental areas might be influenced by the courses on subject matter knowledge and skills such as Development in Early Childhood Period I-II in their undergraduate programs (CHE, 2007a). Since they gain subject matter knowledge about child development in different areas throughout these courses, they might associate the effects of this integration with children's development (CHE, 2007b).

The participants stated that integrating environmental education into early childhood education could also help children to learn by doing and exploring children learn by doing and exploring. On account of these beliefs, they agreed with the contribution of this integration to children's active learning and even to lifelong learning skills. This finding was consistent with the literature (Chawla, 1998; Hungerford & Volk, 1990; NAAEE, 2010; Torquati et al., 2010; Wilson, 1994, 2010). Actually, children can have a variety of opportunities during this integration by exploring and observing their surroundings. Such kinds of activities play a significant role in supporting learning (Torquati et al., 2010; Wilson, 2010). The importance of environmental education at early ages was also expressed in the North American Association for Environmental Education (NAAEE, 2010). In this report, integrating environmental education into early childhood education was suggested for its role in making children become lifelong learners. Almost all of the participants' beliefs about children's learning were consistent with the previous

studies, which focused on the possible effects of field experiences in schools on pre-service teachers' beliefs (Nettle, 1998; Ng et al., 2010). For instance, Ng et al. (2010) indicated that pre-service teachers' beliefs are generally influenced by their experiences throughout courses particularly teaching profession courses in pre-service teacher training programs. In this sense, the participants' beliefs about the contributions of this integration to children's learning might be shaped with the help of teaching profession courses such as School Experience and Practice Teaching I-II (CHE, 2007a). After all, pre-service early childhood teachers have opportunity to observe children in preschools within the context of these courses in their program (CHE, 2007b).

In addition to the abovementioned benefits of integrating environmental education into early childhood education, the results showed that pre-service early childhood teachers believed the contributions of environmental education to children's acquisition of environmental outcomes (Environmental Outcomes). Namely, they agreed with the benefits of this integration for children's gaining environmental outcomes such as environmental interest, environmental understanding, respect for the integrity of the environment, and environmentally responsible behavior. Previous studies aligned with the participants' beliefs (Basile & White, 2000; Chawla & Cushing, 2007; Elliot, 2010; Wilson, 1995, 1996). For example, Wilson (1996) drew attention the need of environmental education in early years to support children's existing interests about the environment. In addition, Elliot (2010) stressed the significance of these years for children's acquisition of environmental understanding which provides a basis for the support of their environmental interest. Moreover, early years were determined as a critique period for children to learn respecting for and appreciation of the natural world (Wilson, 1995). As regards environmentally responsible behaviors, the researchers overemphasized on early years to encourage children's active participation to protect and improve the environment (Chawla & Cushing, 2007). The follow-up interviews also displayed the significance of this integration for children's acquisition of environmental outcomes such as environmental interest, environmental attitudes and environmentally responsible behaviors. This finding was supported with the

literature where primary school teachers laid much emphasis on some of environmental outcomes, particularly acquisition of environmental attitudes (Cutter-Mackenzie & Smith, 2003). Both quantitative and qualitative results showed that pre-service early childhood teachers had availing beliefs about the contributions of the integration of environmental education into early childhood education to children's gaining environmental outcomes. The reason of the participants having such availing beliefs might be related to the participants' demographic characteristics. That is to say; the majority of the participants indicated that they had taken a course on environment. Environment-related courses might support the participants' gaining general knowledge about the environment and accordingly they might shape availing beliefs about the significance of environmental education for children's gain of environmental outcomes.

As for the beliefs about the requirements for learning environment for the integration of environmental education into early childhood education (Learning-Environment), pre-service early childhood teachers believed the organization of a responsive learning environment. In other words, the pre-service teachers believed the necessity of organizing a learning environment by using nature related materials, offering a democratic atmosphere where children share their ideas, and using school garden so as to integrate environmental education into early childhood education. Their beliefs about the requirements for learning environment throughout the integration mostly coincide with the literature (Wilson, 1993, 2010). Regarding organizing a learning environment, Wilson (1993) suggested the enrichment of learning environment by bring the outdoors in, namely using nature related materials to integrate environmental education into early childhood education. She also advocated the significance of creating a learning environment where children freely share their ideas and experiences about the environment.

The interviews affirmed that pre-service early childhood teachers validated their beliefs about the necessity of organizing a learning environment for this integration, participants mostly underlined using different learning centers in classroom, nature related books and nature related materials. In addition to these, putting recycle bins in classrooms and planting and feeding pets were pointed out to

support children's taking responsibility for the environment. Wilson (1993, 2010) asserted the use of nature related materials to support children's learning through sensory experiences. Furthermore, she advocated sharing nature related stories with children to enhance their gaining environmental outcomes like appreciation for of the environment. Moreover, Lee and Ma (2006) indicated that regular recycling activities in preschools such as making recycled papers, putting waste materials into recycle bin contributed to children's acquisition of recycling behaviors. Considering the effects of beliefs on teaching practices, the participants' beliefs about the need of putting recycle bin in classroom could be possibly accepted as an indicator of their further practices considering the effects of beliefs on teaching practices (Pajares, 1992).

The follow-up interviews also refined the quantitative results with the help of participants' beliefs about the ways of the integration of environmental education into early childhood education. The findings showed that participants believed the necessity of the integration of environmental education into different activities. This was parallel with the literature where the integration of environmental education into different subject areas was indicated as a popular approach (Hart & Nolan, 1999). In the same way, Wilson (2010) recommended for early childhood educators to integrate environmental education into dramatic play about the nature and language activities with the help of nature-related children stories. In addition, McNaughton (2004) put forwarded the benefits of using both stories and drama in environmental education to support children's active learning about the environmental events, problems and their solutions rather than being passive recipients. Although Kagan (1992) noticed pre-service teachers' beliefs about teaching are already shaped before entering teacher education programs, previous studies has shown the possibility of experiences throughout teacher education programs in influencing pre-service teachers' beliefs with the help of courses and field experiences (Ambrose, 2004; Grossman, 1992; Ng et al., 2010; Raymond, 1997). Considering abovementioned effect of undergraduate courses and field experiences, the participants' beliefs about the integration of environmental education into different activities might be derived from the possible effect of courses on subject matter knowledge and skills and

teaching profession (CHE, 2007a). In pre-service early childhood teacher training programs in Turkey, pre-service early childhood teachers gain knowledge about curriculum, a variety of curriculum models (e.g., integrated curriculum, High Scope, Montessori) in the context of Curriculum in Early Childhood course and they also examine Ministry of National Education early childhood education program (MoNE, 2006, 2012) which suggests early childhood teachers' planning integrated activities during Practice Teaching I-II courses (CHE, 2007b).

The participants' beliefs on going outdoors as part of the integration differed to some extent from the existing literature. A few participants agreed with going outside whenever possible throughout this integration. However, using outdoors was frequently recommended to foster children's familiarity with the environment (Wilson, 2010), their healthy development (Louv, 2005), and their acquisition of environmental outcomes like environmental concern (Chawla, 1999). Just a few participants believed using outdoors in this integration. This may be due to their prior learning experiences in outdoors during their formal education because pre-service early childhood teachers indicated that they did not participate in any outdoor activities during undergraduate training. Related to this, Begum (2012) indicated that teachers' beliefs about environmental education could be influenced by their own learning experiences.

In addition, only one participant believed in the role of teacher during this integration. She specified teacher behaviors such as showing a sense of wonder about the environment and modeling for children by sharing her experiences in an elective course on environment in undergraduate program. This finding might be related to the participant's experiences during this course because she explained that she had a chance to observe children's motivation to learn about recycling in a pre-school classroom. Therefore, this experience might have an impact on shaping availing beliefs about the role of early childhood teachers in the representation of such behaviors. As to the effect of experiences on beliefs, Kagan (1992) noted that a teacher's experiences in classrooms would form his or her beliefs and accordingly teaching practices. Therefore, this finding seems to be important due to the possibility of further teaching practices in environmental education. The current

finding also validated the significant role of the teachers in environmental education which were stressed by previous review studies (Chawla, 1998; Wilson, 1993). For instance, Wilson (1993, p.20) underlined the importance of teachers' role in environmental education, "for it is the teacher's own sense of wonder which will sustain the young child's love of nature." Furthermore, the importance of teacher's modeling was advocated as a source of shaping environmentally sensitivity which is related to being interested in the environment and its protection and improvement (Chawla, 1998).

Lastly, the interviews pointed out beliefs of pre-service early childhood teachers' about the barriers to this integration. Although both quantitative and qualitative results revealed availing beliefs about the integration of environmental education into early childhood education, the interviews showed that there are some barriers pre-service early childhood teachers come across such as families' safety concerns for outdoor activities and lack of funding throughout this integration. These barriers were mostly aligned with the literature (Ham & Sewing as cited in Bruyere et al., 2012 & Simmons, 1998). For instance, lack of funding was described as a logistic barrier for environmental education (Ham & Sewing as cited in Bruyere et al., 2012). The finding concerning the participants' beliefs about the barriers for environmental education might show that they have some prejudices because they have not entered their teaching profession yet. It might be related to their previous schooling experiences even when their primary school years because belief studies mostly drew attention the construction of beliefs about teaching by observing as a student before entering colleges (Kagan, 1992; Nettle, 1998).

5.3. The Relationship between Pre-service Early Childhood Teachers' Perceptions and Beliefs

The results unfolded a positive correlation between the mean scores of pre-service teachers' perceptions of the sufficiency of environmental education in pre-service teacher training programs and their beliefs about the integration of environmental education into early childhood education. The existing literature as well widely focuses on the interrelatedness between teacher belief and perceptions

(Brookhart & Freeman, 1992; Calderhead & Robson, 1991; Clark & Peterson, 1986; Richardson, 2003). For example, Calderhead and Robson (1991) revealed that pre-service primary teachers' preexisting beliefs as regards teaching profession before entering undergraduate program strongly influence their interpretation of the experiences gained in undergraduate courses. Similarly, Richardson (2003) maintained that pre-service teacher beliefs strongly influence their approaches to learning and teaching during teacher training programs. Subsequently, some of the previous research studies on beliefs stressed the role of pre-service teacher training programs on shaping pre-service teachers' beliefs about teaching with the help of field experiences and assignments in coursework (Nettle, 1998; Ng et al., 2010; Stuart & Thurlow, 2000). In the light of these studies, the results of the current study might be elucidated in two ways. On the one hand, it may be possible to say that pre-service early childhood teachers' beliefs about the integration of environmental education into early childhood education might have an impact on their perceptions of the sufficiency of environmental education in their programs; in other words, their beliefs might shape their interpretation of the sufficiency of environmental education content and practices in their programs. On the other hand, their beliefs about the integration of environmental education into early childhood education might be shaped by relying on their perceptions of the sufficiency of environmental education, which were resulted from their related program experiences during coursework and internship.

In addition, the results demonstrated that there were only significant relationships between the pairs of pre-service teachers' perceptions of the environmental education content and their beliefs about the contribution integration of environmental education to development and learning; and their perceptions of the environmental education practice and their beliefs about the contribution integration of environmental education to development and learning. The relationship between two dimensions of the perceptions and the development and learning dimension of the beliefs can be attributed to the undergraduate courses related to child development and learning. Considering CHE (2007a), these courses can be forwarded as Development in Early Childhood Period I-II and Practice Teaching I-II.

Pre-service early childhood teachers are required to learn about children's different developmental areas (e.g., cognitive, language development), the concepts and characteristics about child development in the context of Development in Early Childhood Period I-II. Moreover, pre-service teachers are expected to prepare weekly activities considering early childhood education program (MoNE, 2006, 2012) which includes goals and objectives related to different developmental areas (CHE, 2007b). In addition, the following interviews displayed the links between the perceptions of environmental education in pre-service teacher training programs and the beliefs about the contribution of the integration of environmental education to children's development and learning, and their acquisition of environmental outcomes. Furthermore, the participants associated their experiences, which seen as an indicator of perceptions (Susuwele-Banda, 2005), in undergraduate courses (e.g., Science Education, Practice Teaching) with their beliefs about the requirements of the organization of learning environment for the integration of environmental education. The participants' availing beliefs might illustrate the importance of offering opportunities for pre-service teachers in the context of coursework and/or practicum. These results are supported with the study of Kagan (1992), which remarked on that field experiences play an essential role to shape pre-service teachers' beliefs.

The correlation analysis did not indicate any significant relationship between the pairs of other dimensions under pre-service teachers' perceptions and beliefs except for the relationships between the pairs of pre-service teachers' perceptions of the environmental education content and their beliefs about the contribution integration of environmental education to development and learning; and their perceptions of the environmental education practice and their beliefs about the contribution integration of environmental education to development and learning. This might be related to the limited effect of program experiences in shaping pre-service teachers' beliefs. The previous belief studies pointed that pre-service teacher training programs could partially change and/or influence pre-service teachers beliefs (Ambrose, 2004; Gill, Ashton & Algina, 2004) since pre-service teachers have already formed beliefs about teaching before entering teacher education programs by

observing teaching and learning environments as students in many hours (Kagan, 1992; Lortie, 1975; Pajares, 1992). Though there were not significant correlations between these dimensions of pre-service teachers' perceptions and beliefs, the interview data demonstrated that the role of experiences throughout coursework and practicum in influencing pre-service teachers' beliefs about the contributions of the integration of environmental education into early childhood education to children's acquisition of environmental outcomes. In addition, the interviews displayed the link between pre-service teachers' perceptions relying on their experiences in coursework and internship and their beliefs about the ways of integrating environmental education into early childhood education. The interviews presented the importance of practicum opportunities in real learning environments with children since the participants associated their observations about environmental education practices in preschools with their beliefs about the requirements and/or expectations for the integration of environmental education (e.g., teacher's organizing school garden as a learning environment). The role of such kind of opportunities and the collaboration with practicum schools have been emphasized in previous studies (Grace & Sharp, 2000; Meriç & Tezcan, 2005). Herein, this finding might demonstrate that pre-service early childhood teacher training programs have a potential to affect future teachers' abovementioned beliefs about this integration and also their judgments about the sufficiency of environmental education they received in the training programs basing on their experiences in the context of courses.

5.4. Implications

This study concluded with remarkable results for environmental education in pre-service early childhood teacher training programs in Turkey. Furthermore, there are some recommendations from the pre-service early childhood teachers' voices for the improvement of environmental education in pre-service teacher training programs. Accordingly, the implications were presented for educational practices.

Pre-service early childhood teachers' perceptions of the sufficiency of environmental education in their undergraduate programs can be regarded as "neither insufficient nor sufficient". Correspondingly, the below suggestions can be

forwarded to enhance the quality of environmental education in pre-service teacher training programs.

Regarding environmental education content in training programs, environmental education was perceived to be limited with few courses, which was a noteworthy finding, indicated by the participants. Related to this, all of the participants suggested the need for a separate course related to environmental education. Similarly, Yılmaz and Gültekin (2012) suggested the necessity of offering elective courses related to environmental education in pre-service teacher training programs. On the other hand, offering courses focusing on environmental education might be depended on the faculty interest because McKeown-Ice (2000) found the faculty interest and/or knowledge about environmental education as one of the major factors which influence environmental education component in pre-service teacher training programs. Correspondingly, the findings highlighted the need for a national guideline or standards for environmental education in pre-service teacher training programs. In this sense, the current study can also be considered as supporting the suggestion of the need for a national guideline to systematically prepare future early childhood teachers as implementers of environmental education.

Additionally, the results underlined the significance of supporting pre-service teachers' inquiry skills about environmental education. Indeed, great emphasis was placed on using well-suited instructional methods to environmental education such as discussions, cooperative learning strategies, and inquiry to support pre-service teachers' effective preparation for future environmental education (Mastrilli, 2005; NAAEE, 2004).

As to the environmental education practices, the results emphasized the lack of training about how to teach and assess environmental education. The participants recommended the integration of instructional methods and assessment strategies for environmental education into Science Education course. Previous studies indicated the suitability of science-related undergraduate courses for including environmental education (McKeown-Ice, 2000; Miles et al., 2006). Moreover, Yılmaz and Gültekin (2012) recommended the consideration of environmental education which could be linked with other undergraduate courses in training programs. At this point, there

should be a collaborative work among the instructors of different courses (e.g., Assessment and Evaluation, Science Education) in pre-service early childhood teacher training programs to facilitate the integration of environmental education into coursework.

Although quantitative results demonstrated the sufficiency of field experiences (outdoor learning) in pre-service teacher training programs, the interviews illustrated the lack of emphasis on outdoor learning opportunities for pre-service early childhood teachers. Using outdoor environments in teacher training programs was urgently suggested to support pre-service early childhood teachers' both perceptions of using outdoors and future related practices with children (Ernst & Tornabene, 2012). Considering its significance, the faculties should be encouraged to organize field experiences on campus and local environment in the active participation of pre-service early childhood teachers.

As regards offering environmental education experiences in coursework and/or practicum, the results implied its sufficiency. Grace and Sharp (2000) proposed that the lecturers in undergraduate programs should encourage pre-service teachers to prepare environmental education activities with the help of teachers so as to minimize the gap between theory and practice in pre-service teacher training programs. Similarly, the significance of collaborating with practice schools was highlighted to support pre-service science teachers' educational practices and also to minimize the difference between theory and practice (Meriç & Tezcan, 2005). It seems to be essential for pre-service teacher training programs to offer environmental education experiences as much as possible to support pre-service early childhood teachers' learning about environmental education by their experiences with children. Furthermore, allocated time for School Experience, Practice Teaching I-II courses in the program could be increased considering their contributions to pre-service early childhood teachers.

Pre-service early childhood teachers' beliefs about the integration of environmental education into early childhood education were found to be quite positive. Previous studies underlined the potential effect of beliefs on further teaching behaviors (Pajares, 1992; Kagan, 1992; Richardson, 2003). As an

exemplary instance, Chakravarthi (2009) concluded that early childhood teachers' beliefs about the benefits of outdoor play might influence their initiatives to provide outdoor learning opportunities for children. In this sense, pre-service early childhood teachers' availing beliefs about the integration of environmental education might indicate that they could initiate to integrate environmental education into their teaching when they begin their profession. In the literature, providing opportunities for pre-service teachers to reflect their beliefs during undergraduate education and to observe and experience teaching practices in schools were suggested to support their beliefs (Richardson, 2003). In brief, teacher educators should arrange for such opportunities to support and enhance pre-service early childhood teachers' beliefs about this integration.

There was a significant relationship between pre-service early childhood teachers' perceptions and beliefs. This was also supported by the participants' program experiences. This relationship is encouraging for teacher educators with the possible effects of the program on shaping pre-service early childhood teachers' beliefs about the integration of environmental education into early childhood education. Furthermore, pre-service early childhood teachers' beliefs might influence their interpretation of environmental education content and practices in their programs. Considering the interrelationship between perceptions and beliefs, teacher educators should pay attention to the collaborative development of pre-service early childhood teachers' aforementioned perceptions and beliefs.

5.5. Recommendation for Further Research Studies

This section presents recommendations for the researchers to guide further research directions on environmental education in pre-service early childhood teacher training programs and to point out the significant points need to be studied. These recommendations are as follows:

This study was initiated to evaluate environmental education in pre-service teacher training programs through the perceptions of pre-service early childhood teachers. In order to draw different perspectives, policy makers and faculty members could also be involved.

Although this study only included pre-service early childhood teachers, examination of the perceptions and beliefs of in-service early childhood teachers is thought to be important to reveal the sufficiencies and insufficiencies in pre-service early childhood teacher training programs to prepare them as the implementers of environmental education. Accordingly, the PTEE and BIEE scales developed for the present study need to be utilized with early childhood teachers across different settings with different variables for the further research studies.

In this study, data were collected with the scales and follow-up interviews. Further research studies could additionally use observation methods to evaluate the environmental education content and practices in the context of the courses in the faculties of education.

In this study, data were collected from sophomore, junior and senior pre-service early childhood teachers attending universities in Ankara. For the future studies, a study could be conducted with the participation of pre-service early childhood teachers throughout the country.

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APPENDICES

APPENDIX A

HISTOGRAMS, NORMAL Q-Q PLOTS AND BOXPLOTS FOR PTEE AND BIEE MEAN SCORES

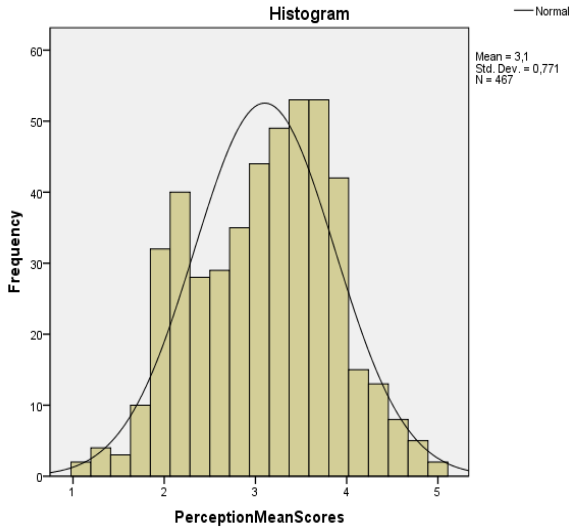

Figure A.1 Histogram of PTEE mean scores

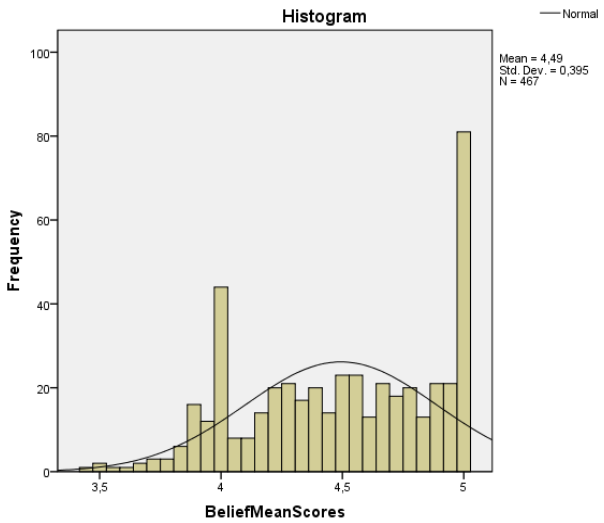

Figure A.2 Histogram of BIEE mean scores

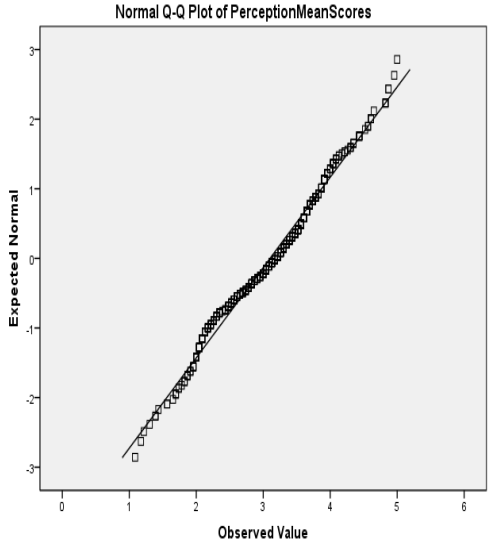

Figure A.3 Normal Q-Q plot of PTEE mean scores

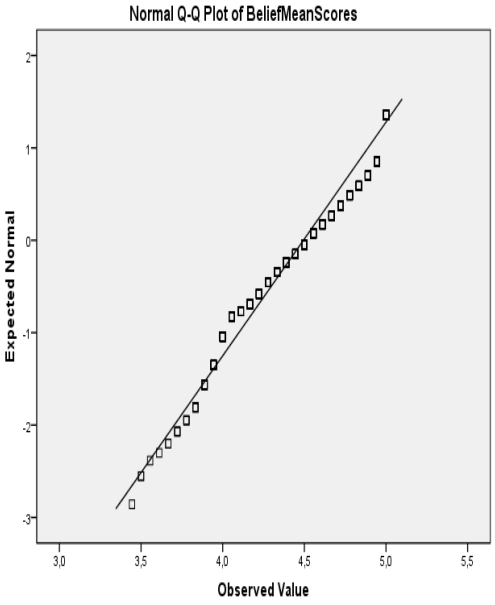

Figure A.4 Normal Q-Q plot of BIEE mean scores

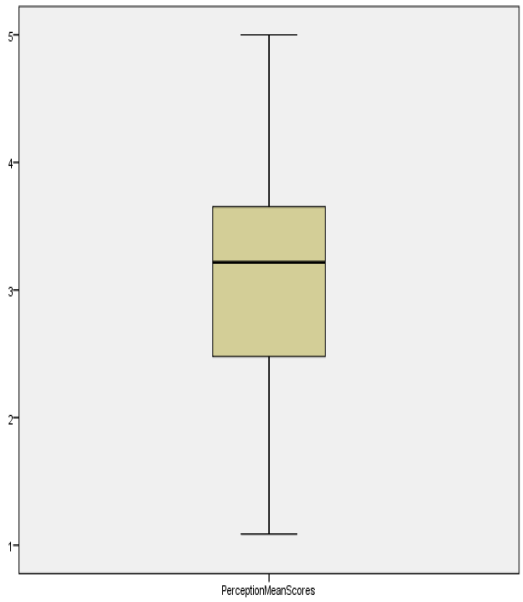

Figure A.5 Boxplot of PTEE mean scores

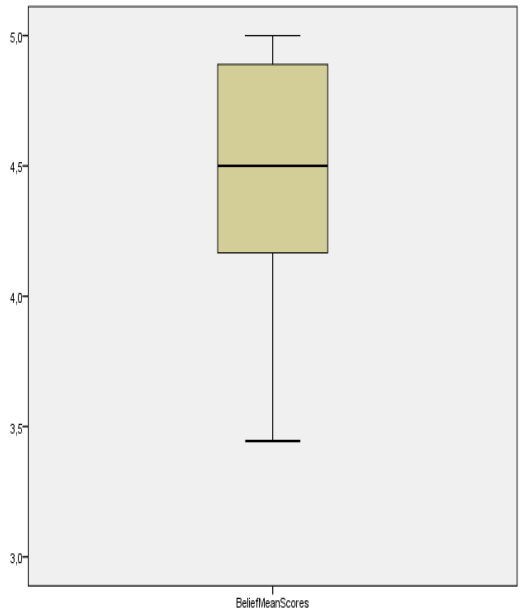

Figure A.6 Boxplot of BIEE mean scores

APPENDIX B

TEZ FOTOKOPİSİ İZİN FORMU

ENSTİTÜ

Fen Bilimleri Enstitüsü	☐
Sosyal Bilimler Enstitüsü	X
Uygulamalı Matematik Enstitüsü	☐
Enformatik Enstitüsü	☐
Deniz Bilimleri Enstitüsü	☐

YAZARIN

Soyadı : GÜNER
Adı : ZİŞAN
Bölümü : OKULÖNCESİ EĞİTİMİ

TEZİN ADI (İngilizce) : ENVIRONMENTAL EDUCATION IN EARLY CHILDHOOD TEACHER TRAINING PROGRAMS: PERCEPTIONS AND BELIEFS OF PRE-SERVICE TEACHERS

TEZİN TÜRÜ : Yüksek Lisans [X] 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. [X]

TEZİN KÜTÜPHANEYE TESLİM TARİHİ: