Development of Environmental Education in the Korean Kindergarten Context

by

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B.A., Chonnam National University, 1997
M. Ed., University of Alberta, 2002

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ABSTRACT

Many environmental educators insist that environmental education (EE) should be started from a young age. The Korean Ministry of Education (1999) has also emphasized the importance of environmental education in early childhood by including content and objectives regarding EE in the *1999 National Curriculum of Kindergarten*. However, many Korean kindergarten teachers do not sufficiently implement environmental education in their teaching practice. To address this issue, this study aimed at investigating and overcoming barriers to fully implement EE in the Korean kindergarten context.

Four experienced Korean kindergarten teachers were involved in a fourteen-

week critical action research project that included weekly group meetings. At these group meetings, teachers reflected on the barriers preventing the full implementation of EE in their classrooms and discussed possible environmental education actions to be attempted in the following week. These actions, individually implemented in teachers' classrooms, were reviewed at subsequent group meetings. Data from group meetings and teacher lessons were used to analyze the effectiveness of this critical action research project for developing environmental education.

At the beginning stages of this study, Korean kindergarten teachers felt strongly uncomfortable participating in group communication. However, through the continuous encouragement of the researcher and with the involvement of participants who have similar educational backgrounds, age, and working experiences, participants came to actively engage in group communication. Participants in this study identified the following barriers to fully implement EE in kindergartens: insufficient understandings and awareness of EE, reluctant attitudes towards the environment, lack of educational support and resources, low parental involvement, and discomfort about going on a field trip to environments.

Teachers came to understand the importance, objectives, potential topics, and teaching methods of early childhood environmental education. While implementing

environmental education in their classrooms, teachers recognized possibilities for environmental education through connections with children's daily lives and previous activities conducted in their classrooms. Teachers also identified that critical action research through group communication provided practical and useful knowledge of their educational practices. Teachers' improved pedagogical knowledge and awareness about EE increased their confidence to teach environmental education.

To lessen the burden of going on a field trip to environments, teachers provided children direct experiences in the environment surrounding schools and during school picnics. Teachers also actively participated in environmental activities with children. These direct experiences of the environment helped teachers and children appreciate the beauty of the environment and change their reluctant attitudes towards the environment. By providing parents children's products produced during EE, teachers were also able to help parents develop an interest in environmental education.

While most educational research in Korean kindergartens is conducted by university-based researchers, this research inquiry revealed that action research by the effective partnership with a university-based researcher can encourage the confidence and passion of Korean kindergarten teachers to reflect and resolve issues arising from their experiences and to change educational practices.

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Thanks for being with me, God
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Thanks for continuous encouragement, David
Thanks for lovely support, Family

I would like to dedicate this to my missing father-in-law.

CHAPTER 1

This study focused on the investigation of individual awareness and educational practices regarding early childhood environmental education in Korea. Through critical action research, this research inquiry also intended to develop the full implementation of environmental education in Korean kindergartens. This chapter describes the social and educational context of environmental education in Korea, necessity of EE starting from a young age, and purposes and research questions of this study.

Understanding Environmental Education in a Korean Context

There were outstanding developments and changes in science, education, industry, economy, and technology in Korea with the introduction of Western culture after World War II. In order to overcome economic difficulties that occurred during the Korean War, Korea pursued economic growth as the most important and committed national aim between the 1950s and the 1970s (Park, Jung, Choi, Choi, Lee, & Noe, 2003). During this focus on economic growth, Korea did not mention environmental concerns or even a regard for environmental impacts of economic growth until the beginning of the 1970s.

However, “as environmental problems came to be serious, Korea began to make

efforts to conserve the environment from the mid 1970s" (Park et al, 2003, p. 33). In response to these problems, Korea established social and private organizations to protect the environment and solve environmental problems. The Korean government declared the *Environmental Protection Charter* in 1978 as an indicator for the more systematic expansion of environmental conservation. However, until the mid 1980s, consideration of environmental issues was still limited to journalists, scientists, politicians, or environmentalists, who understood the seriousness of environmental issues (Park, et al., 2003). Accordingly, the government and environmental organizations identified the need to promote public awareness of environmental problems by infusing environmental education (EE) into public schools. In order to infuse environmental education in public schools, the Ministry of Education included the need and the importance of environmental education in the *National Curriculum of Elementary, Middle, and High Schools* from the beginning of the 1980s.

Concerns for Environmental Education in the Curriculum of Korea

Ministry of Education stated the necessity of an effective environmental education policy in the *4th National Curriculum of Elementary, Middle, and High Schools* in 1982, and described environmental education as one of the eight

contemporary required fields of education in *the 5th National Curriculum* in 1987. The content of environmental education was integrated into various subjects of the *4th and 5th National Curriculum*.

Ministry of Education (1992, 1998) moreover included designated subjects on environmental education in the *6th and 7th National Curriculum of Elementary, Middle, and High Schools*. The subject *Environment* was included in middle school education and *Environmental Science* and *Ecology and Environment* were designated for high school education (Ministry of Education, 1992, 1998). In addition to the designated subjects, environmental content was integrated into other fields of the curriculum as follows:

> In the case of elementary education, the content of environmental education was included in 8 subjects, such as social studies, ethics, and science, etc. Environmental education was integrated into 7 subjects, especially in social studies, for middle school education. On the other hand, the concepts and objectives of environmental education for high school education were related to 18 subjects and placed emphasis on ethics. (Seo, 2002, p. 43)

Although there is no designated subject for environmental education in the *National Curriculum of Kindergartens*, Ministry of Education (1999) emphasizes implementing environmental education in kindergarten through integration into some fields of the curriculum. The potential content and objectives of environmental education are included in Language, Physical Health, Expression, Inquiry, and Social Relationships

in the *6th National Curriculum of Kindergartens* (see Appendix A). Some objectives of Social Relationships, Expression, and Inquiry prescribed in the *6th National Curriculum of Kindergartens* are significantly related to environmental education. These are (the Ministry of Education, 1999):

- to develop social adaptation skills by taking an interest in the immediate society and environment in which children live
- to develop curiosity by exploring the artistic elements in objects and nature
- to develop a sense of esthetics by appreciating objects, nature and various works
- to develop the ability and attitude to think scientifically about natural phenomena and their environment (pp. 6-33)

Environmental education in public schools was also supported by the Ministry of Environment, educational organizations, and the Educational Law in Korea, as described in the next section (Choi et al., 2002; Ministry of Education, 1999; Nam, 1995).

Efforts to Develop and Generalize Environmental Education in Korea

In order to pursue the systematic development and implementation of environmental education in public schools, "Ministry of Environment began to choose and support exemplary schools of environmental education from 1985" (Soe, 2002, p. 45). Ministry of Environment chose the eight exemplary schools for environmental education from kindergarten to high school every two years between 1985 and 1996, and provided support funds and materials. Over the past ten years, the Ministry of

Environment has extended the numbers of exemplary schools from 8 to 15 between 1997 and 1998, and then to 26 schools between 1999 and 2000 (Choi et al., 2002).

Next, the Korean Society for Environmental Education, established in 1989, pursued the academic development of environmental education. The Korean Society for Environmental Education "informed about the importance of environmental education in seminars, and encouraged and generalized research related to environmental education through the *Korean Journal of Environmental Education*" (Park et al., 2003, p. 38). The Korean Educational Development Institute focused on more practical support for school environmental education by continuing "to do research and carry out activities related to environmental education in primary and secondary schools" (Nam, 1995, p. 2). It provided textbooks, television programs, teacher education programs, and materials for more effective implementation of environmental education (Choi, Kim, Seo, Han, & Kim, 1988; Nam, 1995; Park et al., 2003). Through these efforts "research results and outcomes of various scholarly endeavors have been applied to and implemented in schools" (Nam, 1995, p. 2).

Lastly, the Korean Ministry of Government Legislation prescribes the agenda related to education of kindergarten, elementary, and middle schools in *Elementary/Middle Educational Law.* According to the Ministry of Education (1999),

the *6th National Curriculum of Kindergarten* is "proclaimed as a national curriculum framework based on the *Elementary/Middle Educational Law*, which is geared to the fulfillment of the educational goals and objectives of kindergartens throughout the country" (p. ii). According to Article 23(1) of the educational law, the school (kindergarten) has to follow the prescribed National Curriculum; thus compliance with the curriculum is a legal requirement for schools (the Korean Ministry of Government Legislation, 2006). It dictates that teachers must follow the national curriculum, including the content and objectives of environmental education, and have the duty of implementing environmental education in their classrooms.

Current Situation of Environmental Education in Public Education of Korea

The Ministry of Environment (2001) indicated that although some middle schools and high schools were implementing components of environmental education, the percentages of these schools were not high. Moreover, the numbers of schools implementing EE was slight in the case of kindergarten. The insufficient implementation of environmental education in kindergarten is also identified in a pilot study conducted in 2005. In order to know the awareness and implementation of environmental education in Korean kindergarten classrooms, this researcher individually interviewed 10 Korean kindergarten teachers in 2005. Interviews were conducted in a semi-structured format

based on a set of open-ended questions related to the following areas (see the interview protocol in Appendix B):

- Awareness of environmental education
- Connection of environmental education with current teaching
- Awareness of environmental education in the kindergarten curriculum
- Obstacles of environmental education in schools
- Elements for effective environmental education
- Awareness of the importance/necessity of environmental education
- Awareness of environmental issues
- Awareness of issues and lifestyle

Korean kindergarten teachers involved in the interview of the pilot study recognized the seriousness of environmental problems, and identified air pollution, water pollution, waste, and noise as the most serious problems in Korea. Many teachers were aware of the necessity of environmental education, and believed that they were implementing environmental education in the classes. Teachers also pointed out the topics of conservation of the environment, living things, change of seasons, and the earth as environmental content included in *the 6th National Curriculum of Kindergartens*.

However, some teachers participating in the pilot study did not have any idea about environmental education. Most of the teachers understood environmental education only in relation to protecting the environment and solving environmental problems. In the light of environmental educators' emphases on developing children's sense of respect, wonder, beauty, and caring for the environment during first few years

of life, as well as skills and knowledge (Davis, 1998; Kemple & Johnson, 2002; Wilson, 1996; Wilson, Kilmer, & Knauerhase, 1996), the above kindergarten teachers may have a very limited view of environmental education for young children.

In addition, according to the kindergarten teachers of the pilot study, environmental activities commonly implemented in kindergarten were limited to recycling, raising small animals and plants, or going on field trips to the zoo. These teachers also indicated the following barriers to implementing environmental education in the Korean kindergarten context: lack of teachers' knowledge and awareness, lack of materials and resources, lack of support from community and parents, and the urbanized environment of kindergarten. Most of these barriers mentioned by the teachers of the pilot study are similar to those identified by Korean environmental educators (Choi et al., 2002; Kim & Han, 2002; Park, et al., 2003).

First of all, teachers of the pilot study are not aware of the importance and the appropriate content of environmental education for young children. These teachers mention that environmental education can be more effectively implemented by social organizations than through public education, because social and private organizations can provide various activities and programs for an intensive period, in natural places, and with specialists. In addition, although many educators emphasize the development

of attitude, interest, and wonder of the environment in environmental education for young children, most kindergarten teachers in the pilot study consider the conservation of the environment as the most important content of environmental education in kindergarten (Choi, 1997; Choi et al., 2002; Hyun et al., 2003).

The second barrier to implement environmental education in a Korean kindergarten context is the insufficient background of teachers and the unsatisfactory provision of educational opportunities to teachers. There are few universities that have departments educating environmental teachers in Korea, such as "National University of Education, Educational University of Gongju, Soonchun University, and Daegu University" (Choi, 2002, p. 136). However, these universities focus on "educating environmental education teachers who will work in middle and high schools" (Choi, 2002, p. 143). In other words, there are no kindergarten teachers who major in or even take courses in environmental education. In addition, "there are rarely any opportunities for kindergarten teachers to improve their knowledge of environmental education through workshops, conferences, or seminars" (Hyun et al., 2003, p. 31). Accordingly, teachers who are interested in environmental education but do not have confidence tend to refer to materials and resources. However, because most textbooks and resources of environmental education are focused on middle and high school, there are almost no

resources and materials for kindergartens and kindergarten teachers feel that there are difficulties even in referring to the materials and resources (Park, et al., 2003).

Furthermore, kindergarten teachers should often plan outdoor activities in EE to provide direct experiences to children. Whereas some EE activities can be implemented in places near the school, such as playgrounds or backyards, many activities require special places such as parks, mountains, rivers, the ocean, zoos, or museums. When teachers go on a field trip far from the school with young children, they need many assistants, such as parents or staffs to supervise children (Hyun et al., 2003). In order to provide a detailed explanation related to the environment, "teachers also need the partnership with specialists" (Hyun et al., 2003, p. 32). However, most kindergarten teachers in the pilot study mentioned difficulties in finding assistance from parents, specialists, and members of the community in Korea for such field trips.

The teachers of the pilot study also identified the urbanized school environment of Korean kindergarten as another difficulty implementing environmental education. Korean kindergartens, especially those in the city, "are surrounded by an artificial environment rather than a natural environment" (Kim & Han, 2002, p. 65). Some kindergartens even do not have a playground or a backyard, and local parks do not contain a variety of wildlife and natural places. However, "because the direct

experiences in various natural places at a young age are significant in developing children's appropriate interest in, attitude towards, and awareness of nature" (Hyun et al., 2003, p. 30), kindergarten teachers need to plan field trips to natural places. Many Korean kindergarten teachers in the pilot study considered environmental education a burden since it involved various field trips to the distant places and this requires a lot of time, finances, and the assistance of others.

In addition to the above barriers, environmental educators point to unsatisfactory support from the Ministry of Education, such as insufficient content in the curriculum, lack of a supervisory system, and a shortage of funds (Choi et al., 2002; Hyun et al., 2003; Park et al., 2003). In short, the barriers to fully implementing environmental education in Korean kindergartens are related not only to the insufficient awareness and knowledge of the individual but also to the unsatisfactory support of the educational systems and general society.

Understanding the Importance of Early Childhood Environmental Education

Many environmental educators in Korea and in other countries insist that environmental education has to begin from a young age (Bower, 1998; Cobb, 1977; Cohen & Horm-Wingerd, 1993; Davis, 1998; Kemple & Johnson, 2002; Russo, 2001; Shin & Lee, 2000; Wilson, 1996; Wilson et al., 1996). These researchers believe that environmental experiences at a young age are necessary to develop children's attitudes, wonder, sense of respect, and responsibility for caring for the environment. This belief is supported by an understanding of "critical periods" in a child's development (Wilson, 1996, p. 28). The understanding of critical periods implies that "environmental experience in the critical phase of the early learning years can determine subsequent development in environmental education" (Tilbury, 1994, p. 11).

Moreover, if children do not establish the above senses and attitudes during early childhood, children's environmentally inappropriate "attitudes and feelings are hard to overcome and serve as obstacles to later learning about the natural world" (Wilson et al., 1996, p. 57). Thus, environmentally appropriate senses and attitudes are developed by various experiences in critical periods and provide the direction and impetus for future learning of the environment (Brown, 1991; Cobb, 1977; Tilbury, 1994; Wilson, 1996). However, children, especially in Korea, do not have many

opportunities to experience various environments because of urbanization and technological development, and are often exposed from a young age to a damaged environment through experience and the media (Davis, 1998; Wilson, 1996; Wilson et al., 1996). Accordingly, environmental education from a young age has significant value in that it provides children the various experiences of the environment and may foster children's environmentally appropriate attitudes, sense of respect and beauty of the environment, and responsibility to take care of the environment during a critical phase of life.

Environmental educators also insist on the necessity of the connection between early childhood education and environmental education because "environmental education fits well with the hands-on approach and philosophy of early childhood" (Bower, 1998, p.16; Kemple & Johnson, 2002; Wilson, 1995). According to the constructivist theory proposed by Jean Piaget, young children learn about the world through exploratory actions on the environment. The constructivist theory has its impact in the modern hands-on approach that is the most fundamental belief within various fields of early childhood education (Oltman, 2002). Because most environmental activities are conducted by children's direct experiences indoors and outdoors, young children who actively explore the world are "excellent candidates" for environmental

education (Wilson, 1995, p. 4). In addition, environmental education provides children many chances to interact with nature and others. Through the various interactions offered in environmental education, children are able to improve in all the various developmental domains, such as the aesthetic, affective, cognitive, communication, sensorimotor, and socioemotional (Pringle, Hakverdi, Cronin-Jones, & Johnson, 2003; Wilson, 1995). Accordingly, environmental education satisfies the major purpose of early childhood education for developing the whole child (Wilson, 1995).

Lastly, although some environmental educators insist on the necessity of starting environmental education from a young age, other educators point out that young children often experience difficulty in understanding abstract concepts emphasizing natural phenomena and complex environmental issues (Bunting & Cousins, 1985; Chung, 1999; Cohen & Trostle, 1990). However, the above argument can be countered by demonstrating children's understandings of environmental concepts, issues, and relationship, and by describing the development of children's understandings through environmental education (Cohen & Horm-Wingerd, 1993; Lavanchy, 1993; Apanomeritaki, 1995; Palmer, 1995).

For example, three to five years old children "show the evidence of consistent judgments regarding the effects of pollution, litter, and natural resource management" in

an interview with picture tasks (Cohen & Horm-Wingerd, 1993, p. 116). Four to six year-old children of Chile understand the environment as the element which influences on their daily lives (Lavanchy, 1993). In addition, most three to five year-old children who know little about waste and recycling come to understand basic concepts of waste management after participating in in-class recycling activities (Apanomeritaki, 1995). The result of this study implies "education appears to be the most powerful indicator of awareness and concern for waste management" even to young children (Apanomeritaki, 1995, p. 12).

In light of the importance of children's experiences during critical periods, the interrelationship with early childhood education, and the significant effects of EE on developing children's understandings related to the environment, environmental education has to be started from a young age. However, because children are still developing their abilities at this stage of their life, and still demonstrating a lack of logical and abstract thinking and egocentrism, environmental educators of social and private organizations may have difficulties providing programs and activities to young children (Elkind, 1989; Forman & Kuschner, 1983; Miller, 2001). Kindergarten teachers, rather, can more effectively teach environmental education with the content and objectives appropriate to young children's understandings, traits, and interests.

However, Korean kindergarten teachers are insufficiently equipped to implement environmental education in their classrooms because of individual and social barriers. Therefore, this study aimed to research how Korean kindergarten teachers fully implemented environmental education by investigating and overcoming the barriers through the reflection and change on understandings, practices, and situations of EE. The research questions of this study were as follows:

How could Korean kindergarten teachers fully implement the environmental education curriculum in their practices?

a. What barriers did Korean kindergarten teachers identify to implementing environmental education included in the National Curriculum of Kindergarten?
b. What did they believe to be the most significant barrier?
c. What possibilities existed for dealing with the barriers teachers indicated in question “b”?
d. To what extent was a teacher support/planning group useful for addressing this barrier and for encouraging individual teachers to take action?
e. What types of actions did teachers take when reflecting about how to implement EE in their classrooms?

CHAPTER 2

The Background of Environmental Education

"What is the environment?" "What is environmental education?" These questions are the most fundamental but yet complicated to environmental educators. The word *environment*, derived from old French, meaning "surroundings," includes, "the complete range of external conditions…. in which an organism lives" (Allaby, 1994, p. 138). The environment includes the biotic and abiotic factors that affect an organism (Miller, 1990). In addition to understanding the environment in connection with its physical and biological processes, definitions of the environment are often influenced by social, cultural, economic, and political considerations (Allaby, 1994; Neal & Palmer, 1990). The meaning of the environment within environmental education often focuses on the interactions between human beings and the environment. For example, Miller-Schroeder (2001) defined the environment as:

> everything around us, wherever we go. It is all of the plants, animals, people, soil, air, water, and energies that surround us…. People share the environment with many other people, plants, and animals. Everyone depends on it for their health and well-being. (p. 5)

Although Miller-Schroeder (2001) still defined the environment broadly in a children's book of environmental education, she focused on the interdependency between human beings and living/non-living things of the environment.

Considering the definition of the environment is important to environmental

educators because it influences the purpose and direction of environmental education. Sauvé (1996) outlined six perspectives to understand the environment as nature, a resource, a problem, a place to live, the biosphere, and a community project in a typology of conceptions of the environment. She then proposed pedagogical approaches and strategies of environmental education depending on particular conceptions of the environment. For example, teaching and learning strategies of EE within the perspective of the environment as a resource were "related to resource and heritage interpretation in parks and museums and campaigns for the wise use of resources. An interesting pedagogical strategy…. is the environmental audit which can be applied to energy consumption or waste management" (Sauvé, 1996, p. 11). In case of identifying the environment as a problem, environmental education focused on "how to identify, analyze and diagnose a problem, how to search for and evaluate different solutions, how to conceptualize and execute a plan of action, how to evaluate the process and ensure a constant feedback, etc" (Sauvé, 1996, p. 11).

Sauvé's suggestion of pedagogical approaches to environmental education depending on conceptions of the environment is only an example outlining the relationships between conceptions of the environment and the directions of environmental education. The definition of the environment and the direction of

environmental education have been changed by contemporary concerns for the environment and environmental issues. In order to understand historical concerns for the environment and influences on environmental education, this chapter will begin with reviewing how environmental education has been defined and developed internationally and in Korea during the last thirty years. It will then discuss the current implementation of environmental education in public education in Korea. Lastly, this chapter will focus on the rationale and possibility on early childhood environmental education.

International Development of Environmental Education

Environmental education has a long history. According to Daudi and Heimlich (2002), "primary antecedents of environmental education were nature study, outdoor education, and conservation education" (p. 10). Although there was not the direct mention of the term *environmental education*, these approaches have significant meaning as the starting point of environmental education in that they involved the environment and environmental problems in the educational context (Heimlich, 2002). Thomas Pritchard, Deputy Director of the Nature Conservancy in Wales, first used the term *environmental education* in 1948 while mentioning "the need for an educational approach to the synthesis of natural and social sciences, suggesting that it might be called *environmental education*" (Daudi & Heimlich, 2002, p. 10).

The concerns about environmental education truly surfaced in the 1960s with the publication of *Silent Spring* by Rachel Carson in 1962. *Silent Spring* provided a publicly accessible account of environmental issues and made the public aware that pollution affected the biogeochemical cycles on which all life depends (Hawkins & Vinton, 1973; Miller, 1990). This book brought an outcry from the public for environmental protection in Canada and the United States, and led to the formation of the United States Environmental Protection Agency (EPA) in 1970. Becoming aware of environmental problems and the interrelationship of the environment, the public also began to recognize environmental education as a significant way to solve problems and to protect the environment. A definition of environmental education was eventually formulated by the International Union for the Conservation of Nature and Natural Resources (IUCN)[1] in 1970:

> Environmental education is the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture, and his biophysical surroundings. Environmental education also entails practice in decision-making

[1] International Union for the Conservation of Nature and Natural Resources (IUCN), called as World Conservation Union, is an international organization founded in 1948 to encourage the preservation of wildlife, natural environments, and living resources. It is consisted of private individuals, nongovernmental organizations, and governments. The IUCN promotes research in the preservation of threatened species, ecology, sustainable development, and environmental law, education, and training.

> and self-formulation of a code of behavior about issues concerning environmental quality. (as sited in Taskin, 2003, p. 2)

As the public awareness of environmental education was increased, environmental education was actively developed and defined in the 1970s. The United Nations Educational, Scientific, and Cultural Organization (UNESCO) convened the International Environmental Education Workshop at Belgrade in 1975. According to the *Belgrade Charter* developed through this conference, environmental education should:

> develop a world population that is aware of, and concerns about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations, and commitment to work toward solutions of current problems and the prevention of new ones. (United Nations Educational, Scientific, and Cultural Organization, 1976, p. 2)

Because UNESCO held this conference in response to the international concern about the environment, which was becoming degraded, the resolution of environmental problems became the main goal of environmental education in the *Belgrade Charter*. Moreover, the *Belgrade Charter* provided a worldwide definition and purpose of environmental education and became the foundation of the international development of environmental education.

In order to extend the work done at Belgrade in 1975, the United Nations Educational, Scientific, and Cultural Organization –United Nations Environment Program (UNESCO-UNEP) held the Tbilisi conference in 1977, in Georgia (USSR),

which proposed the following goals of environmental education:

a. to foster clear awareness of, and concern about, economic, social, political and ecological inter-dependence in urban and rural areas
b. to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment
c. to create new patterns of behavior of individuals, groups and society as a whole toward the environment. (as cited in Taskin, 2003, p. 5)

This conference also developed twelve principles for the international development of environmental education in an *Action Plan for International Environmental Education* (see Appendix C). In addition to focus on solving environmental problems and creating new patterns of behaviour, these principles extended the range and meaning of environmental education. These principles included the need to start environmental education from a young age in formal and non-formal educational practices. These principles also indicated the necessity to include local, regional, national, and international perspectives and cooperation to solve environmental issues in environmental education. During the next two decades, these principles, along with the *Belgrade Charter,* influenced the international development of environmental education programs and policies.

Another environmental conference, the Moscow Congress, was held in Moscow, USSR in 1987. A significant point mentioned in the Moscow Congress was that environmental education should educate “the personnel needed for the rational

management of the environment in view of achieving sustainable development" (UNESCO-UNEP, 1988, p. 6). This statement introduced the new direction of environmental education toward sustainable development. The World Commission on Environment and Development, set up in 1983 by the United Nations, also indicated the concerns for sustainable development in the book, *Our Common Future* in 1987. According to the description in *Our Common Future*, education for sustainable development was defined as the need to "instill a greater awareness of everyday environmental factors. Facilities for education beyond primary school must be expanded to improve skills necessary for pursuing sustainable development" (World Commission on Environment and Development, 1987, pp. 112-113). This book did not directly mention the relationship between environmental education and sustainable development. However, after this document was published, sustainable development became a new and significant direction of environmental education and internationally began to appear in environmental conferences, policy proposals, and curriculum development.

In the 1990s, efforts on environmental education were focused on implementing EE in public schools and concern for sustainable development. The United States Environmental Protection Agency (EPA), for example, developed an Environmental Education Division (EED) in 1993 "to advance and support national and international

environmental education efforts, to develop an environmentally conscious and responsible public, and to inspire in all individuals a sense of personal responsibility for the care of the environment" (p. 2). Moreover, the goals presented by the Environmental Education Division (EED), included a commitment to "educate and motivate youth to protect and preserve our environment" (United States Environmental Protection Agency, 1993, p. 4), which was directly related to the necessity of environmental education in the K-12 public school context.

The North American Association for Environmental Education (NAAEE)[2] initiated the National Project for Excellence in Environmental Education in 1993 and provided the various guidelines for environmental education from 1996. For example, NAAEE (1996) developed the *Environmental Education Materials: Guidelines for Excellence* to help developers of activity guides, lesson plans, and other instructional materials of environmental education. NAAEE continued to design and revise the *Environmental Education Collection: A Review of Resources for Educators* for environmental educators, the *Excellence in Environmental Education: Guidelines for*

[2] NAAEE established in the United States as the National Association for Environmental Education in 1971 as a professional association to promote environmental education and support individuals and groups engaged in environmental education. In order to reflect growing Canadian and Mexican involvement, membership, and leadership, the association changed the name to the North American Association for Environmental Education in 1983.

Learning for learner from pre K to 12, and the *Guidelines for the Preparation and Professional Development of Environmental Educators* for the preparation and continuing education of school teachers and other environmental educators between 1993 and 2004. These efforts of NAAEE aimed at promoting the implementation of environmental education by providing balanced, scientifically accurate, and comprehensive programs and resources of environmental education.

The UN General Assembly held the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992, called the Earth Summit. Although goals of environmental education were addressed in this conference, environmental education was a small part of a larger effort to improve literacy and education of sustainable development in UNCED (Hammond, 1998; Jickling, 1992; Orr, 1992). In December of 1997, UNESCO sponsored a conference on Environment and Society: Education and Public Awareness for Sustainability, held in Greece. This conference claimed educational requirements for sustainability. UNESCO extended the vision of sustainable development and education in the 2002 Johannesburg Summit. Education was defined as an important instrument to change the knowledge, values, behaviours and lifestyles appropriate to achieve sustainability and stability (UNESCO, 2002). The Summit proposed a Decade of Education for Sustainable Development to

inform the reoriented vision of sustainable development and education, and the United Nations General Assembly proclaimed a Decade of Education for Sustainable Development for the period 2005- 2014. The common objectives and outcomes of the conference reflected the previous belief of the UN that environmental education was to promote sustainability and to prepare the public to support its implementation.

Development of Environmental Education in Korea

As environmental education was emphasized in *Belgrade Charter* in 1975 and *Tbilisi Declaration* in 1977, Korean educators began to recognize the need for EE and attempted to introduce EE to Korea through the cooperation with universities and environmental institutions in the 1970s (Park, et al., 2003). For example, since the Seoul National University first opened the graduate school of the environment in 1973, the graduate school and the department related to the environment and environmental education were established in other universities. The Korean Educational Development Institute (KEDI)[3] conducted the Environmental Education Seminar in Korea in 1977

[3] KEDI, established with funding from Korean government in 1972, is the educational research institute of Korea. It aims at the improvement of public education by developing missions, contents, objectives of education appropriate to the Korean context and searching ways to solve the educational problems. KEDI mainly focuses on curriculum development, educational program development for kindergarten, elementary, middle, and high schools, and management

and began research for developing the curriculum of environmental education in 1979.

Begun in the 1970s, environmental education was developed with dual systems in Korea as follows:

> Research and implementation of environmental education in schools have mainly been the job of governmental institutions such as the Korean Educational Development Institute (KEDI), the Ministry of Education, and the Ministry of Environment. Private organizations and associations have been involved in educating and informing the general public about environmental issues through various activities and programs. (Nam, 1995, p. 2)

Environmental Education developed by governmental institutions is called school environmental education, and EE conducted by private organizations is called social environmental education in Korea (Lee, 2002). Many social and private associations are still offering various environmental programs to the public. However, before school environmental education was emphasized in the late 1980s, social environmental education played a more significant role to motivate the public to be aware of the environment and environmental issues.

Influential organizations of social environmental education were the Environmental Campaign Association, the Environment and Pollution Research Group, the Green Family, the Korean Environment, Scouts, the YWCA, the YMCA, the Korean Institute of Environmental Education, and the Korean Institute of Environmental

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of educational information and resources.

Administration (Lee, 1993; Lee, 2002; Park et al., 2003). The YMCA provided every year various environmental programs appropriate to different age groups like young children, teenagers, and youth (Chung, 1993). The Environment and Pollution Research Group[4] offered high school students environmental programs about forest ecology, the relationship between air pollution and the ecology of forest, and noise pollution (Lee, 1993). Recognizing housewives' impacts on environmental issues and children's behaviors, some organizations and the Ministry of Environment sponsored campaigns and advertisements to lessen environmental pollution by changing housewives' behaviours (Choi, 1994; Kim, 1996; Kim, 1997; Noh, 1994).

Although providing various programs depending on their purposes and characteristics, the private and social associations commonly tried to "make the public be aware of environmental issues and establish environmentally appropriate attitudes, values, and behaviors through various experiences of the environment and environmental issues" (Lee, 2002, p. 83). Social environmental education is still significant in that "it can overcome limitations of school environmental education by

[4] The Environment and Pollution Research Group is the private environmental institution of Korea established by environmentalists in 1989. It focuses on conducting research in the environmental pollution, providing information and resources, supporting environmental activities and programs of other institutions, and implementing environmental education for the public and environmental educators.

including different age groups, employing more competent environmental teachers, planning various periods, and using diverse places" (Lee, 2002, p. 83). Social environmental education also has benefits in working with voluntary participants, providing direct experiences in the environment, and introducing a specific and detailed explanation through partnership with specialists (Park et al., 2003).

The development of school environmental education was activated by the inclusion of the statement on environmental education in the curriculum. The Korean Ministry of Education first described that "environmental education has to be implemented throughout the whole spectrum of educational activities" in the 1982 *4th National Curriculum of Elementary, Middle, and High Schools* (Nam, 1995, p. 2). As "the content related to environmental education was indicated as one of the eight important areas of Korean education in the 1987 *5th National Curriculum of Elementary, Middle, and High Schools"* (Park et al., 2003, p. 37), the Ministry of Education (1987) demonstrated a stronger emphasis on school environmental education. In order to disseminate school environmental education, the Ministry of Environment began to choose and operate exemplary schools in 1985 and still provides supporting funds and materials (Soe, 2002). The Korean Educational Development Institute also made an effort at providing materials and doing research for a more effective implementation of

environmental education in public schools. The representative research and materials developed by KEDI in the late 1980s and in the early 1990s were as follows (as cited in Park et al., 2003, pp. 39-40):

- · research to develop school environmental education (1987)
- · man and the environment (for elementary schools, 1988)
- · human beings and the environment (for middle schools, 1989)
- · life and the environment (for high schools, 1991)
- · research about the awareness of students and teachers of elementary and middle schools towards environmental education (1991) and
- · research to prepare the revision of the 6th National Curriculum for the future development of school environmental education (1991)

The 1992 *6th National Curriculum of Elementary, Middle, and High Schools* expedited school environmental education by including designated subjects of environmental education in the curriculum. The subject *Environment* for middle schools aimed at "encouraging appropriate values and attitudes towards environmental problems through comprehensive understanding of the environment and enhancing participation and action in various activities to make a healthy environment" (as cited in Choi et al., 2002, p. 28). The objectives of *Environmental Science* for high schools were "to understand the interrelationship between human beings and the environment, to have attitudes and values for environmental conservation, and to establish environmental values appropriate to improve the quality of the environment" (as cited in Choi et al., 2002, p. 28).

As environmental education was emphasized in the national curriculum, many environmental educators analyzed the environmental education curriculum and developed teaching methods and materials for the future effective implementation in public education (Chea, Noh, & Min, 2002; Koo, Kim, Kim, & Kwon, 2001; Lee & Park, 2000; Nam, 1995; Park, Chang, & Stapp, 1999; Shin, 2000). Nam (1995) analyzed the characteristics, topics, and objectives of *Environment* and suggested "the necessity to develop a textbook and to improve teacher's quality for more effective teaching of this subject" (p. 10). Park et al. (1999) developed "a new environmental textbook of high schools to achieve the four goals such as knowledge and information, skills, values and attitudes, and behaviors and participation" (p. 211).

Although there was not a significant change, environmental education was still emphasized in the *7th National Curriculum of Elementary, Middle, and High Schools*. The objectives and content of environmental education were similar to those of the *6th National Curriculum of Elementary and Middle Schools*. However, *Environmental Science* was changed to the *Ecology and the Environment* in the *7th National Curriculum of High Schools*. The objectives of the *Ecology and the Environment* were also modified to:

A. learn the fundamental knowledge of ecosystem and the environment, acquire the necessary skills to solve environmental problems, and apply above

knowledge and skills to enact the environmental conservation and to solve problems;

B. establish appropriate values of the environment, as having proper attitudes and values of ecosystem and the environment; and

C. have the responsibility and enthusiasm about the protection and the solution of environmental problems, as giving motives to participate in protection and solution of environmental problems. (as cited in Choi et al., 2002, p. 29)

"Whereas the emphasis on environmental problems and environmental science was weakened, the content related to ecosystem and human beings, environmental ethics, and sustainable development was emphasized in environmental education of high schools" (Park et al., 2003, p. 46).

Environmental education in the *7th National Curriculum of Elementary, Middle, and High Schools* focused on improving children's abilities to explore the environment and to solve environmental problems, encouraging children's participation in environmental activities, and connecting with everyday life (Lee & Park, 2000). An interesting aspect in the 7th curriculum was the consideration of different focuses in environmental education, such as value-centered and cognition-centered, according to the educational level (Lee & Park, 2000). Whereas environmental education for younger children focused on developing values, attitudes, and senses of beauty, wonder, or respect, EE for older children emphasized developing skills and knowledge to know the environment and to solve the environmental problems. After the Korean Ministry of Education declared the *7th National Curriculum of Elementary, Middle, and High*

Schools, efforts to develop environmental textbooks increased as follows:

> The Korean Educational Development Institute provided the textbook *Exploration of the Environment* for environmental education in elementary schools. The Korean Educational Development Institute and the Korean Ministry of Education developed the *Environment* as the textbook of environmental education in middle schools. The Korean Ministry of Education decided the *Environmental Science, the Environmental Conservation, Environmental Skills*, and the *Environmental Ecology* as approved textbooks of environmental education in high schools. (Park et al., 2003, p. 46)

Furthermore, environmental educators considering textbooks as important materials to effectively implement environmental education in schools analyzed the existing environmental textbooks for future development. Koo et al. (2001) analyzed the textbook *Environment* by the five objective categories of awareness, knowledge, attitude, skills, and participation, and suggested six types of skills for developing a new textbook.

The inclusion and emphasis of environmental education in the national curriculum significantly affected the development and generalization of school environmental education in Korea (Choi, et al., 2002; Kim & Han, 1993; Park et al., 2003). While planning and implementing a class, Korean teachers are mainly influenced by the national curriculum because of its uniform characteristic and legal nature. The Korean Ministry of Education provides the prescribed national curriculum for kindergartens, elementary, middle, and high schools. Local educational districts and individual schools are able to partially modify the content of the national curriculum

(Ministry of Education, 1999). However, because there are no provincial and local curricula in Korea, most schools and teachers refer to the national curriculum. Moreover, as already mentioned in the previous chapter, although schools should not follow exactly the curriculum, schools have a duty to fulfill the national curriculum to a certain extent (Ministry of Education, 1999). Consequently, environmental education included in the national curriculum inspires teachers to be interested in implementing environmental education in their classrooms and researchers to develop resources and materials of EE in Korea.

The Implementation of Environmental Education in Korean Public Education

Since the *6th National Curriculum* included and emphasized the designated subjects of environmental education, schools implementing environmental education have increased. Moreover, middle and high schools implementing environmental education were distributed throughout provinces and metropolitan cities from 1999 (Park et al., 2003). According to the investigation conducted by the Ministry of Environment in 2001, the percentages of schools implementing environmental education were 14.5% of middle schools and 22.0% of high schools (see Table 1). Considering the short history of school environmental education in Korea, the percentages of schools implementing EE are not low (Soe, 2002).

Table 1. The numbers of middle and high schools implementing EE by the district

School / District[5]	Middle School			High School			Total		
	Total	School (choosing EE)	%	Total	School (choosing EE)	%	Total	School (choosing EE)	%
Total	2,731	396	14.5	1,957	430	22.0	4,691	825	17.6
Seoul	352	12	3.4	279	22	7.9	632	34	5.4
Busan	157	155	98.7	127	13	10.2	284	168	59.2
Daegu	106	9	8.5	75	23	30.6	181	32	17.7
Incheon	94	9	9.6	82	17	20.7	176	26	14.8
Gwangju	70	6	8.6	58	17	29.3	128	23	18.0
Daejun	70	17	24.3	51	27	52.9	121	44	36.4
Ulsan	41	3	7.3	34	5	14.7	75	8	10.7
Kyonggi	378	15	4.0	295	43	14.6	673	58	8.6
Kangwon	160	10	6.3	111	25	21.6	271	34	12.5
Chungguk	115	102	88.7	76	34	44.7	194	136	70.1
Chungnam	186	10	5.4	106	37	34.9	292	47	16.1
Jeonbuk	192	3	1.6	128	40	31.2	320	43	13.4
Jeonnam	254	19	7.5	148	58	39.2	402	77	19.2
Kyungbuk	275	17	6.2	198	29	14.6	473	46	9.7
Kyungnam	239	7	3.0	160	33	20.6	399	40	10.0
Cheju	41	2	4.9	29	7	24.1	70	9	12.9

(as cited in Park et al., 2003, p. 47)

However, schools implementing EE were not evenly distributed in all districts. For example, whereas most middle schools in the Busan metropolitan city (98.7%) and

[5] The administrative district of Korea is consisted of seven metropolitan cities (Seoul, Busan, Daegu, Incheon, Gwangju, Daejun, Ulsan) and nine provinces (Kyoggi, Kangwon, Chungguk, Chungnam, Jeonbuk, Jeonnam, Kyungbuk, Kyungnam, Cheju). Seoul is the capital city of Korea, as well as one of metropolitan cities. Each province is divided into the city, county, gu, yeub, myeon, dong, and lee.

the Chungguk province (88.7%) were identified as implementing EE, some areas showed a significantly low percentage such as Seoul metropolitan city (3.4%), Jeonbuk province (1.6%), and Kyungnam province (3.0%). According to the Ministry of Environment (2001), the uneven distribution meant that environmental education in Korean schools might not yet be broadly realized.

In addition, most schools implementing environmental education, as shown in Table 1, were chosen as the exemplary schools by the Ministry of Environment (The Ministry of Environment, 2001). The Ministry of Environment had chosen exemplary schools of environmental education and had given financial aid through all levels of education since 1985 (Choi et al., 2002). The Ministry of Environment chose and supported 8 exemplary schools every two years between 1985 and 1996 (see the Table 2).

Table 2. Exemplary schools of EE (1985-1999)

Level / Total	Kindergarten	Elementary	Middle	High
89	11	34	36	8

(as cited in Seo, 2002, p. 46)

The number of exemplary schools was extended to 15 in the 7th plan (1997-1998) and to 26 in the 8th plan (1999- 2000) (the Ministry of Environment, 2001).

However, the implementation of environmental education concentrated on exemplary schools implies, in general, that schools are not interested in and confident

yet to implement environmental education in their classrooms without the educational and financial support. In short, although there are increased efforts to improve and disseminate school environmental education in Korea, countrywide implementation remains elusive.

Environmental Education in Korean Kindergarten

The 1999 *6th National Curriculum of Kindergartens* started to include and emphasize environmental education in Korean kindergartens (Hyun et al., 2003; Ministry of Education, 1999). Differing from the provision of the designated subjects of EE in the curriculum for middle and high school, environmental content and objectives for kindergarten are integrated into the fields of the curriculum. Accordingly, efforts of educators and teachers focused on identifying the objectives and content integrated into the curriculum for the future implementation of EE appropriate to young children (Hyun et al., 2003; Korean Institute of Childcare Information, 1998; Seoul Metropolitan Office of Education, 1993; Yun & Cho, 1993; Yun & Park, 1998).

The Korean Institute of Childcare Information[6] (1998) mentioned that environmental education for young children focused on establishing awareness and

[6] The Korean Institute of Childcare Information is established by the Korea Childcare Teachers Association in 1995 to provide information and resources required for the development of childcare works.

attitudes, acquiring knowledge and skills, and motivating participant actions. Yun and Park (1998) described objectives of environmental education appropriate to young children as follows:

> The objectives of early childhood environmental education are for young children to be interested in the environment, to recognize the importance of environmental conservation, to have attitudes to take care of and improve the environment, to acquire the knowledge and skills to protect the environment, and to take actions to protect the environment. (As cited in Hyun et al., 2003, p. 19)

In a word, environmental education for young children in Korea seeks to not only improve children's knowledge and skills but also to enhance the awareness, attitudes, and actions of children in the environment.

Korean environmental educators and government agencies also identified that environmental education for young children was related to the familiar environment to children such as water, soil, air, animals, plants, or waste (Hyun et al., 2003; Seoul Metropolitan Office of Education, 1993; Yun & Cho, 1993). According to Hyun et al. (2003), the Ministry of Environment indicated that environmental education for young children focused on "experiencing clean water, air, and soil, protecting animals and plants, and reducing noise and waste" (p. 20). Yun and Cho (1993) mentioned that early childhood environmental education aimed at teaching about the environment and environmental issues of the surroundings, such as water, air, soil, noise, waste, Earth,

and the place we live. In addition, the Seoul Metropolitan Office of Education[7] (1993) provided materials for early childhood environmental education that contained the content of water, air, soil, noise, waste, food, reduction of resources, and protection of the environment.

On the basis of the above suggestions, I analyzed the *6th National Curriculum of Kindergartens* to identify the objectives and the content of environmental education integrated into the most recent curriculum of Korea. The possible content of environmental education in the *6th National Curriculum of Kindergartens* is presented in Appendix A. The following objectives of Social Relationships, Expression, and Inquiry are related to environmental education (Ministry of Education, 1999):

> · to develop social adaptation skills by taking an interest in the immediate society and environment in which children live
> · to develop curiosity by exploring the artistic elements in objects and nature
> · to develop a sense of esthetics by appreciating objects, nature and various works
> · to develop the ability and attitude to think scientifically about natural phenomena and their environment (pp. 6-33)

However, environmental education in kindergarten is in a very early stage in Korea because of its short history and efforts. In contrast to the initiative to emphasize environmental education in the curriculum for elementary, middle, and high schools

[7] The Office of Education is the local educational administration located in each province and metropolitan cities in Korea. The Seoul Metropolitan Office of Education is an Office of Education supervising the overall business of education of Seoul city.

since the early 1980s, environmental education for kindergarten only began to be emphasized in the end of 1990s (Hyun et al., 2003; Ministry of Education, 1999). In addition, educators and researchers concentrated on developing environmental education in elementary, middle, and high schools rather than in kindergarten.

As a result, Korean kindergartens, except for a few exemplary schools, rarely implement environmental education in their classrooms, despite the requirement for environmental education in the curriculum (Hyun et al., 2003). Although many teachers believe that they implement environmental education in their classrooms, environmental education is not included in daily schedule and activities in Korean kindergartens. Some teachers occasionally implement a few activities, such as recycling, raising animals, and growing plants, in the classroom like extracurricular activities. Moreover, most teachers do not have an understanding of the underlying goals of environmental education or posses a range of appropriate teaching strategies, and rarely implement EE in their classrooms.

However, in light of emphases on the importance starting EE from a young age in Korea and in other countries, I feel that Korean kindergarten teachers need to recognize the necessity of EE and implement EE in connection with various subjects of daily classes. In order to support the necessity of early childhood environmental

education, the following section will detail the rationale for kindergarten teachers to have to implement EE in their classrooms.

Rationale of Early Childhood Environmental Education

> Ali slowed her small steps, released my hand, then crouched to the sidewalk. As she peered downward, the Texas autumn sunlight bounced brilliantly off her copper-penny hair. Our walk was interrupted; a fallen leaf, green and still soft, had captured her attention. A chubby finger reached delicately to trace the vein of the leaf. Not yet 3, she paused for what was a rare period of quiet and prolonged observation. “It’s just a leaf,” I thought with adolescent boredom, although I didn’t mind the wait. Absently, I sat next to her on the sidewalk. She raised her smiling eyes to look at me, and said simply, “It’s pretty,” then dropped her gaze again to resume her study. (Kemple & Johnson, 2002, p. 210)

> A 5-year-old was with his parents at a party one evening and noticed several caterpillars on the sidewalk; his friends were interested for a short period and then went off to play. The 5-year-old, worried about the insects, began moving the ones on the sidewalk carefully to the grass where he felt they would be in less danger. (Basile & White, 2000, p. 57)

When should EE begin? Is it possible to start EE from a young age? How much can young children understand the environment and concepts related to environmental issues? Why should EE begin from the very early years of life? What environmental content should be the focus of teachers' concerns when targeting young children?

Many environmental educators recognized and emphasized the importance of early childhood environmental education (Basile & White, 2000; Cobb, 1998; Davis,

1998; Kemple & Johnson, 2002; Oltman, 2002; Palmer & Suggate, 2004; Wilson, 1993, 1995, 1996). Wilson (1993, 1995, 1996) strongly insisted on the necessity of starting environmental education from a young age. While Cobb (1998) suggested the integration of environmental education and science education, he mentioned that "effects must begin at an early age and continue through all levels of education" (p. 8). Considering the integration of environmental education into the curriculum, Ramsey, Hungerford, and Volk (1992) also argued that environmental education needed to be emphasized from kindergarten. They posed the following questions about starting EE at an early age: "How can EE curricula reasonably be framed? Can appropriate new courses be inserted into the curriculum? Can appropriate EE strategies be infused into existing curricula? Can existing curricula be appropriately modified and environmentalized?" (p. 37).

As the emphasis on early childhood environmental education was strengthened in western countries for last twenty years, environmental educators made efforts to identify and support the following reasons and possibilities for starting EE from a young age: early childhood is the critical period to develop various senses that are required for later learning (Brown, 1991; Tilbury, 1994; Wilson, 1995, 1996; Wilson et al., 1996), the theories and philosophies of early childhood education fit well with environmental

education (Bower, 1998; Bredekamp, 1987; Oltman, 2002; Pringle et al., 2003; Wilson, 1996), and young children can understand environmental phenomena and improve their knowledge and attitude related to the environment and environmental issues through EE (Apanomeritaki, 1995; Basile & White, 2000; Palmer & Suggate, 2004). This section will detail the above rationale of early childhood environmental education on the basis of the assertions and research results of the environmental educators.

Regarding Early Childhood as the Critical Period for Environmental Education

In recent years, many young children increasingly have limited contact with the environment because "recreation tends to be indoors (such as watching TV and doing computer); transportation tends to be by car or other motor vehicle rather than walking" (What Can I Teach My Young Child about the Environment[8], 1997, p. 3). In addition to the technological development, Louv (2006) also identified following causes of urban and suburban children's isolation from the environment: a lack of neighborhood parks, lack of opportunity, lack of time and money for parents who might otherwise take them

[8] It is the title of a brochure based on "the 1996 ERIC Digest, *Starting Early: Environmental Education during the Early Childhood Years*, written by Ruth A Wilson for the Eric Clearinghouse for Science, Mathematics, and Environmental Education. This publication was prepared by ACCESS ERIC with the fund from the Office of Educational Research and Improvement, U.S. Department of Education" (What Can I Teach My Young Child about the Environment, 1997, p.6). Because it does not indicate the author's name, the researcher of this study uses the title of this brochure.

out of the city, and new technology. Moreover, many schools of Korea and North America have lessened outdoor time, such as recess (Clements, 2001; Louv, 2006; What Can I Teach My Young Child about the Environment, 1997). Louv (2006) described the lessened time for physical education and recess in USA:

> As the federal and state governments and local school boards began to push for higher test scores in the early part of the decade, about a dozen states halved or even canceled recess. They consider such breaks a waster of potential academic time, or too much of a liability, or there is concern over violence on the playground. (p. 98)

Consequently, regardless of where they live, young children spend most of their time "in settings or doing activities that keep them [young children] essentially isolated from the natural world" (What Can I Teach My Young Child about the Environment, 1997, p. 3).

However, direct experiences of the environment are important for the physical and emotional health of young children, because:

> Nature offers something that the street or gated community or computer game cannot….exposes the young directly and immediately to the very elements from which humans evolved: earth, water, air, and other living kin, large and small. Without that experience, we forget our place; we forget that larger fabric on which our lives depend. (Louv, 2006, p. 97)

In short, without enough experiences in the environment, children are hard to achieve a healthy degree of familiarity with their environment (What Can I Teach My Young Child about the Environment, 1997). What is worse, young children who do not sufficiently experience the environment may develop fearful and anxious responses to the

environment (Bixler, Carlisle, Hammitt, & Floyd, 1994; Cohen, 1984; Hyun et al., 2003; Wilson, 1996; Wilson et al., 1996). According to Bixler and colleagues (1994), young children who did not have much experience in the environment:

> identified snakes and insects as the most commonly feared elements of nature, over half of the respondents also expressed fear of plants. Another surprising aspect was children's frequent use of the words diseased, dirty, and disgusting in referring to different elements of nature. (as cited in Wilson et al., 1996, pp. 56-57)

In order to prevent the establishment of the above attitudes and feelings about the environment, environmental educators recommended that children develop a sense of respect, wonder, beauty, and caring for the environment through various and sufficient experiences in the environment (Kemple & Johnson, 2002; Russo, 2001; Wilson, 1993; Wilson, 1996; Wilson et al., 1996).

This premise is supported by the idea of the critical period that "experiences of the first five or six years of life have a critical impact on all areas of children's subsequent development" (Feeney, Christensen, & Moravcik, 2001, p. 105). On the basis of the importance and significant effects of early experiences in the critical period, environmental educators insisted on the necessity of starting environmental education from a young age (Browne, 1991; Russo, 2001; Stapp, 1978; Tilbury, 1994; Wilson, 1996). Indicating the underestimated importance of the early learning years in environmental education, Tilbury (1994) mentioned that "environmental experience in

the critical phase of the early learning years can determine subsequent development in environmental education" (p. 11). Brown (1991) demonstrated the importance of early childhood environmental education to form children's attitudes from three years old. Starting environmental education from a young age is also emphasized because children's established attitudes and feelings are hard to alter later. Moreover, children's attitudes have an effect on environmental education by influencing on children's direct experiences in the environment (Wilson et al., 1996).

Satisfying the Philosophy and Objectives of Early Childhood Education

Environmental educators believe that "environmental education fits well with the hands-on approach and philosophy of early childhood" (Bower, 1998, p. 16). Philosophers and educators of early childhood education, such as Pestalozzi, Froebel, Piaget, Montessori, and Dewey, appreciate that children learn and develop their knowledge through direct experiences with the environment and others (Davis, 1998; Hendrick & Chandler, 1996; Katz, 1987; Miller, 1996). Describing young children's unique attributes in physical, cognitive, social, and emotional development differing from any other age groups, psychologist Jean Piaget proposed the constructivist theory related to children's learning through direct experiences. Hendrick and Chandler (1996) explained the constructivist theory of Piaget as follows:

> Children can learn through observation but this kind of learning does not afford the children the same opportunities as actually being involved in the discovery oriented, hands-on process. What a child does, a child learns. The more often a child engages in an experience, the more the learning that is based on the experience is cemented. This is one reason that children love to repeat the same activity. Knowledge is not something that is poured into the child by an external source, but something the child has to construct for herself or himself. (p. 17)

Piaget asserts that children construct knowledge from the physical and social exploratory actions. Exploration is then focused on making sense of the world by interpreting experiences (Oltman, 2002).

In light of the constructivist perspective, children are understood as beings who construct knowledge that is personally meaningful and is a result of active involvement (Pringle et al., 2003). In addition to providing a new perspective about children, constructivist theory formed the basis of the modern interactive approach, called the "hands-on approach", in early childhood education (Oltman, 2002). While discussing the development of curriculum and teaching strategies based on the hands-on approach for future early childhood education, Katz (1987) mentioned that:

> contemporary research confirms the view that young children learn most efficiently when they are engaged in interaction rather than in merely receptive or passive activities. Young children should be interacting with adults, materials, and their surrounding in ways which help them make sense of their own experience and environment. They should be investigating and observing aspects of their environment worth learning about, and recording their findings and observations through talking, paintings and drawing. Interaction that arises in the course of such activities provides a context for much social and cognitive learning. (p. 1)

Direct experiences and explorations emphasized in early childhood education also have a significant meaning in environmental education for young children. According to Neal and Palmer (1990), “first hand experience is an essential element of an environmental approach as it allows the environment to communicate directly with the young learners through real people, problems and successes” (p.134). Pringle et al. (2003) also mentioned that the interaction with adults, peers, materials, and surroundings “provides opportunities for them (children) to connect with the natural environment around them” (p. 7). After all, active and hands-on learning is also the most important approach in environmental education for young children (Oltman, 2002). Furthermore, children learn about the world through hands-on interaction like touching, patting, digging, poking, shaking, listening to, smelling, pouring, and playing around, with something new and interesting in their environment (Bredekamp, 1987; Wilson, 1995). Therefore, young children are identified as “excellent candidates” for environmental education (Wilson, 1995, p. 4), and pairing of young children and environmental education is both natural and desirable (Roger Tory Peterson Institute, 1991; Wilson, 1995).

Moreover, environmental education properly satisfies the main objective of early childhood education, which is to develop the whole child (Oltman, 2002; What

Can I Teach My Young Child about the Environment, 1997; Wilson, 1995, 1996). As Piaget's theory about children's development became widely popular in the mid 1980s, educators began to criticize traditional early childhood education that focused more on academic growth through direct instruction (Essa & Young, 2003). Early childhood educators began to be interested in programs and curricula appropriate to the attributes of a child's developmental stage (Essa & Young, 2003). According to the requests of early childhood educators, the National Association of the Education for Young Children (NAEYC) defined and provided specific standards of developmentally appropriate practice that was based on "knowledge of the development of children's abilities, interests, and culture" and considered that "all areas of development—physical, social, emotional, and cognitive—are important" (Bredekamp, 1987; Gestwicki & Bertrand, 2003, p. 34).

Most early childhood educators currently consider "optimal child and family development as the most important goal" of early childhood education (Gestwicki & Bertrand, 2003, p.34). The Ministry of Education (1999) also states in the current *National Curriculum of Kindergartens* that early childhood education is:

> a fundamental education for the overall development of children, and the basic skills and aptitudes that are needed in children's daily lives. The specific goals are….to promote healthy development of the mind and body, to help children acquire basic living habits and adopt a cooperative attitude toward others, to

> enable children to express their own thoughts and feelings in creative ways, to promote the use of proper language, and to help children learn to think for themselves when they are faced with problems in daily life. (Ministry of Education, 1999, p. 3)

Accordingly, while planning even one activity or program, early childhood educators try to enhance various aspects of children's development (Blenkin & Kelly, 1996; Essa & Young, 2003; Gestwicki & Bertrand, 2003; Oltman, 2002).

Environmental educators demonstrated the influences of environmental education on child development to support the importance of starting environmental education from a young age (Miles, 1987; Sebba, 1991; What Can I Teach My Young Child about the Environment, 1997; Wilson, 1995, 1996). Working on children's relationships to the environment, Sebba (1991) concluded that "the child has a unique affinity to the environment" and such affinity "is connected to his/her development" (p. 411). The brochure *What Can I Teach My Young Child about the Environment* (1997) described that "positive interactions with the natural environment are an important part of healthy child development, and these interactions enhance learning and the quality of life over the span of one's lifetime" (p. 3). Wilson (1995) identified experiences in the environment during early childhood as "opportunities for nurturing growth in all of the developmental domains, including adaptive, aesthetic, cognitive, communication, sensorimotor, and socioemotional" (p. 4). Environmental educators then proposed how

environmental education could help improve each domain of children's development commonly mentioned in early childhood education: physical, cognitive, social, emotional, and language development (Essa & Young, 2003; Feeney et al., 2001; Hendrick & Chandler, 1996; Ministry of Education, 1999; Violato, 1996).

Physical development

"One of the major aspects of the early years is physical growth and development. At no other time in life is there such a rapid rate of change in size, weight, and body proportion, and in increased control and refinement in the use of body parts" (Essa & Young, 2003, p. 364). In order to master gross and fine motor skills, children need a lot of experiences with various objects and much practice with diverse types of movement such as balancing, climbing, throwing, kicking, swinging, or manipulating small objects like blocks and puzzles (Hendrick & Chandler, 1996; Oltman, 2002). Environmental educators believe that EE provides various chances for children to move their bodies in new and interesting ways (Oltman, 2002; Wilson, 1995). For example, while children explore the environment, children crawl under bushes, stand in a tree house, climb over a fallen tree, and lie on the grass. Children also try to swing arms like flying birds, balance with one leg like ducks, and stretch their bodies like starfishes.

Cognitive development

Cognition involves “modes, strategies, skills, acquisition, processing, comprehension, and application” (Essa & Young, 2003, p. 372) that can be included in every activity. As children develop the cognitive skills of “classification, seriation, number concepts, temporal concepts, and spatial concepts” (Essa & Young, 2003, p. 372), their knowledge of the world, people, and lives grows. Environmental education encourages children to construct new knowledge and skills, and to apply new perspectives by offering a variety of chances to recognize and learn about the world. While taking care of tadpoles, for example, children can observe the life order and changes from tadpoles to frogs, and count the number of frog’s legs. In addition, children learn “the physical characteristics of the natural world – e.g., hardness of a rock, the stability of an eggshell or spider web, and the smoothness of an apple” (Wilson, 1995, p. 5).

Moreover, young children view the world with egocentric perspectives as follows:

> They (children) have difficulty taking another’s point of view and think everyone thinks, sees and acts like they do. They frequently talk to themselves or to their toys rather than to each other. They may think that inanimate objects such as trees or stuffed animals have human feelings and desires. They are bound by their perceptions of the world and therefore can think in only concrete terms. (Oltman, 2002, p. 20)

Environmental educators also can encourage children's broader and more logical understanding of the world by providing activities directly related to children's interests and surroundings. For instance, young children egocentrically think that the sun goes down because it is time to go to bed. However, as children observe and investigate the differences and reasons of the change of day and night in environmental education, children come to understand the world with temporal concepts beyond the egocentric perspective.

Emotional development

Healthy emotional development of young children is important because all other development depends on it (Lieberman, 1994). Children develop a sense of security, attachment, trust, independence, empathy, and self-control by having their needs met consistently, predictably, and positively, by having encouragement and opportunities for exploration, and by feeling safe in expressing their ideas, taking risks, and making mistakes (Essa & Young, 2003; Greenspan & Greenspan, 1986).

Environmental educators emphasize the development of young children's aesthetics because early aesthetic experiences have lasting significance and become a catalyst to the development of the motivation to take care of the environment (Jalongo & Stamp, 1997; Kemple & Johnson, 2002; Wilson, 1995; Wilson, 1996). Aesthetic "means

being sensitive to beauty in nature and art" and is fostered by the experience and the exploration of "the sight of snow on evergreen boughs, the smell of the earth after a spring rain, the sound of a bird singing overhead, and the feel of a kitten's fur or the moss on the side of a tree" (Wilson, 1995, pp. 4-5). Environmental education for young children through the aesthetic experiences "can instill emotional connection" and nurture "environmental responsibility, appreciation of interdependency, and emotional response to nature" (Kemple & Johnson, 2002, p. 211).

Young children have a fundamental need to care for others. This need can be partially satisfied by caring for the environment (Wilson, 1995). Young children may develop a concern for wildlife and habitats through environmental education, and these concerns can "promote greater fulfillment in one's individual life and a sense of caring for other people" (Wilson, 1995, p. 6). Experiences in the environment also foster a more positive self-concept, a stronger internal self-control, and a more improved personal and social adjustment of young children (Crompton & Sellar, 1981; Long, 1986; Wilson, 1995).

Social development

Early childhood educators also focus on children's learning of the following social rules and values that are a necessary part of socialization:

· Share and cooperate;
· Learn the rules and expectations;
· Gain skill and competence in peer interaction;
· Enter into friendships;
· Develop gender identity;
· Form a sense of morals and values; and
· Acquire a host of prosocial behaviours (Essa & Young, 2003, p. 387)

In order to appropriately develop the above skills, children need opportunities to experience and feel the world through various interactions with others (Chaille & Britain, 2003; Oltman, 2002).

Environmental education may provide plentiful interactions with people and the environment in various places to children. In the case of a field trip to the park, children interact not only with wildlife, but also with park staff, volunteer parents, a bus driver, and other visitors. Children also have to know and follow the new social rules applied just in the park. In other words, children learn about the "do's and don'ts" in public places such as the bus, the street, the park, and the washroom (Oltman, 2002, p. 15). Another opportunity may come in the form of children growing vegetables in the backyard of the kindergarten. Children may want to sprinkle vegetable seeds by

themselves. At that moment, as teachers and children decide what order to follow, children learn the social skills of sharing, taking turns, and waiting.

Language development

Before entering school, young children acquire language skills such as, "an enormous vocabulary, a fundamental grasp of the rules of grammar, and an understanding of the subtleties of the social aspects of communication" and begin to develop "the skills needed for the complex process of reading and writing" (Essa & Young, 2003, p. 375). Knowledge about the language acquisition of children is divided into nativist, behaviourist, and social communicative theories as follows:

> The *nativist* theory….maintains that human beings are born with an inherent, innate ability to formulate language….At the other extreme is the *behaviourist* approach, which emphasizes the importance of imitation, modeling, and reinforcement as playing the most significant role in language acquisition….the *social communicative* theory….that children learn about linguistic forms and rules by interacting with the people in the environment about them [italics in original]. (Hendrick & Chandler, 1996, p. 455)

Each theory has implication for teaching language to children in early childhood education. Whereas some educators provide instruction following grammatical structures, other teachers focus on social interaction with others in the environment.

In light of the range of approaches to develop children's language skills through social interaction, environmental educators believe that the environment plays a significant role in developing children's language skills because the environment "offers

innumerable possibilities of topics of conversation and is readily available as a source of language-development props and materials" (Wilson, 1995, p. 5). While participating in recycling, children may discuss with each other or ask teachers about the placement of garbage in proper containers. When children learn about local wild animals that are at risk, children hear the word *habitats* as homes of animals. "These conversations not only introduce young learners to scientific vocabulary but also facilitate the improvement of their language skills" (Pringle et al., 2003, p. 17).

Demonstrating Children's Abilities to Understand Environmental Phenomena and Issues

Most research related to environmental education is focused on elementary, middle, and high school students, rather than on young children, because many environmental educators have believed that young children do not have sufficient abilities to comprehend the abstract thinking and relationships that are required to understand environmental phenomena and issues (Bunting & Cousins, 1985; Chung, 1999; Hart & Chawla, 1981). According to Hart and Chawla (1981), "ecological thinking is highly dependent on the attainment of abstract thinking insofar as most ecological cycles are too extended in time or space or too microscopic to be directly experienced by young children" (p. 106).

However, other environmental educators argue that previous research

underestimates and misunderstands the abilities of young children. Mentioning children's persistent attempts to make sense of their complex world, Palmer and Suggate (2004) indicated:

> By the time they reach school-age, young children have considerable knowledge of the world they live in. They have sophisticated concepts of motion, causality, biology, word meanings, and number. They have also acquired a number of skills, such as language and problems-solving strategies. (p. 207)

Environmental educators, then, conducted research to demonstrate young children's understandings of environmental phenomena and issues, and the possibilities to improving children's knowledge, attitudes, skills, or concerns through environmental education (Cohen & Horm-Wingerd, 1993; Palmer, 1995; Palmer & Suggate, 2004; Pringle et al., 2003).

While Cohen and Horm-Wingerd (1993) mentioned that "inquiries of ecological awareness and concern among preschool and early grade school children.… preclude the search for meaningful evidence of early-appearing ecological awareness" (pp. 106-107), they developed appropriate age-related tasks to investigate young children's environmental awareness. The tasks depicted scenes of the polluted environment and consisted of six pairs of "picture discrimination task", five items of "picture arrangement task", and six items of "picture comprehension task" (p. 109). Cohen and Horm-Wingerd (1993) interviewed 88 preschool children, who were 3-5 years old, with the above tasks.

Although children participating in this study showed difficulties responding to the picture comprehension task due to insufficient verbal abilities, they "show evidence of consistent judgments regarding the effects of pollution, litter, and natural resource management" in the picture discrimination task and the picture arrangement task (Cohen & Horm-Wingerd, 1993, p. 116).

In order to show the development of environmental ideas between the ages of 4 and 10, Palmer and Suggate (2004) investigated children's factual knowledge about two distant environments (rainforests and polar lands), ideas about the reasons for and the effects of environmental change in these two areas, and types of reasoning used by the children in explaining the effects of environmental change. Palmer and Suggate (2004) identified the younger children's understandings about distant environments and environmental issues as follows:

> The children's factual knowledge about polar areas appears to increase throughout the age range, but is particularly marked between the ages of 4 and 6 years…Our results show an impressive demonstration of the ability of children, even as young as four years of age, to articulate the effects of environmental change on living creatures…. Occasionally by the age of 8 and certainly by the age of 10, pupils are capable of appreciating and explaining the complexity of some of the relationships that exist among plants, animals and their habitats, of providing accurate reasoned explanations of some of the effects of significant changes to global environments, and of recognizing that their own actions could affect creatures in environments at considerable distance from themselves. (pp. 221-234)

The study of Palmer and Suggate (2004) revealed children's capabilities to take a longer-

term view of issues and consequences and to make meaningful links between causes and effects of problems, as children matured between the ages of 4 and 10. Palmer and Suggate (2004) also mentioned that, “many children of a very young age are capable of relatively sophisticated thinking and reasoning” (Palmer & Suggate, 2004, p. 236), and then suggested the possibility and necessity of environmental education relating to distant environments and environmental issues from a young age.

In addition to research demonstrating young children’s understandings of the environment and the awareness of environmental issues, some researchers focused on how young children developed their understandings through environmental education (Apanomeritaki, 1995; Basile & White, 2000; Palmer, 1995; Pringle et al., 2003). Basile and White (2000) provided opportunities for teachers of an urban school district in southeast Texas to learn about environmental education and supported teachers to implement what they had learned in their classroom settings. Most teachers particularly focused on developing children’s factual knowledge about the ways living systems work, respect for living things, the process of problem solving, decision-making, and critical thinking, and environmental stewardship. After observing pre-kindergarten through third-grade children in the study, Basile and White (2000) mentioned that their research revealed “the development of a just and caring attitude among children with respect to

living things" (p. 61) and "changes in the children's behaviors toward living things" (p. 57). In order to demonstrate young children's development in this study, Basile and White (2000) provided the following examples from interviews with young children:

> **Ignacia, Age 5**
> Insects are good for dirt, like rain. And like pill bugs and ladybugs, they help everything. They help the leaves from bad insects; the ladybugs eat little insects that are bad. So we have to take care of them and not kill them or give them poison stuff; we have to be nice to them.
>
> **Beverly, Age 6**
> We must catch and release insects we find because if you keep them, they might die…I saw a mommy bird go by; it was finding food. I saw it find a worm and take it back to the nest to feed the babies. We caught a butterfly and took it to our class. We are going to release it now. We need to stop killing animals because sometimes they help us. Once my sister was about to step on a caterpillar. I yelled no and the caterpillar got away. I told her that they can help us. (p. 59)

The above examples described how young children came to have a sense of respect for living things, understand a living system, and reason the effects of their behaviours on the environment. In light of these results of the study, Basile and White (2000) finally suggested the necessity to develop children's knowledge, skills, and attitudes related to the environment through meaningful teaching and learning from early childhood.

Pringle et al. (2003) searched for the development of awareness and understanding of basic environmental concepts among 2 to 4 year old children through participation in an environmental education program implemented at a zoo. The

instructor chose one animal as a theme every day and described their physical features, ways to care for them, their homes, and foods of this animal by showing the real animal or a picture. After listening to the instruction, children constructed a model of that day's animal with their parents and played freely with various toys and games that reflected environmental themes. Lastly, in order to observe the animal of the day, children went on a fieldtrip to the zoo.

During participation in these programs, many children demonstrated development in awareness and understanding of the environment and environmental issues (Pringle et al., 2003). First of all, while interacting with peers, parents, and instructor, children developed the conceptual knowledge related to the day's topic. Children used "the words such as 'habitat' when relating to the homes of the animals and 'recycling' when referring to the placement of garbage in containers" (Pringle et al., 2003, p. 17). Preschoolers in this study also revealed developing awareness of the environment in that the children were "beginning to observe their surroundings more carefully and are developing skills for recognizing similarities and differences" (Pringle et al., 2003, p. 18). In addition, children showed "a heightened awareness of environmental issues such as recycling" (Pringle et al., 2003, p. 17). Children, for example, in this program put the plastic cups into the respective recycling container in

the corner of the classroom after they drank juices (Pringle et al., 2003).

Some environmental educators focused on the development of young children's understandings about waste management through environmental programs and activities (Apanomeritaki, 1995; Chung, 1999; Palmer, 1995). Apanomeritaki (1995) made an effort at increasing the waste management and recycling knowledge of 20 four and five year old children in Greece. After interviewing children's pre-intervention knowledge of waste management and recycling, for seven months, children participated in in-class recycling activities, visited parks and neighborhoods to observe litter, were involved in-class discussions and role-playing on litter and recycling, and went on field trips to a recycling factory (Apanomeritaki, 1995).

Differing from the results of the pre-intervention interview that revealed little knowledge about waste and recycling, the post-intervention interview indicated that nearly all of the children came to understand the basic concepts of waste management and recycling. In light of the results of this study, young children can seemingly understand and develop knowledge concerning the environment and environmental issues through environmental education, and "education appears to be the most powerful indicator of awareness and concern for waste management" (Apanomeritaki, 1995, p. 12).

In summary, environmental educators insist on starting EE from a young age because of significant effects of learning in critical periods, the correlation between early childhood education and environmental education, and possibilities to improve children's understandings related to the environment and environmental issues through environmental education. However, as described earlier in this chapter, Korean kindergartens are rarely implementing environmental education in their classrooms because of individual and social barriers. Therefore, this research project provided an opportunity for Korean kindergarten teachers to reflect and change the practices of environmental education for the full implementation of environmental education in Korean kindergartens. Participants of this research inquiry had a chance to be aware of the individual and social barriers in their classrooms by reflecting on their practices. As participants made decisions and took action for overcoming these barriers, they also experienced the individual professional growth and the improvement of environmental education practices in the Korean kindergarten context.

CHAPTER 3

Research Methodology

Quantitative research intends to statistically transform the subject world by observation, controlled experiment, and mathematical measurement (Anderson & Arsenault, 2001). In contrast, qualitative research assumes that reality is constructed by an integrated and systematic interaction, and explores and represents human behaviour in a natural setting through "description, interpretation, and self-reflective or critical analysis" (van Manen, 1991, p. 4). Traditional quantitative research methodologies attempt to predict and control the physical world, but fail to predict and control individual or social behaviour (Stringer, 1996). According to the teachers of the pilot study, the teachers and practices of environmental education in Korean kindergarten are connected with the individual and social context. Therefore, this action research inquiry was committed to the qualitative orientation to deeply and critically understand human behaviour in a social context.

The pilot study and the literature review demonstrate that environmental education in Korean kindergartens is problematic (Choi et al., 2002; Kim & Han, 2002; Park et al., 2003). In order to be aware of and transform the problematic practices of environmental education, Korean kindergarten teachers involved in this research inquiry

identified individual and social barriers to implementing environmental education by reflecting on their understandings, practices, and situations, and sought to overcome these barriers by taking action. Consequently, action research informed by a critical orientation fitted with this research inquiry, which was aimed at encouraging Korean kindergarten teachers to fully implement environmental education through reflection and actions for future development. This chapter details the rationale for choosing critical action research through group communication, the roles of the researcher, and research design of this research inquiry.

Toward a Critical Approach

Positivists tend to see the world from technical perspectives and to consider knowledge as having an instrumental value for solving problems (Greene, 1994). Moreover, positivists view social reality as objective and describe reality on the basis of value-neutral knowledge without mentioning the social and historical processes (Connole, 1998). However, educational problems:

> are problems of human and social action, socially-and historically-shaped and structured by the intentions, beliefs and worldviews of people interacting within culturally-given frameworks…the educational knowledge is framed in relation to historically- and culturally-located values about the nature and worth of education itself. (Kemmis, 1991, p. 62)

Because educational practices are related to the social, cultural, and historical contexts,

educational problems are not understood as means-end problems (Carr & Kemmis, 1986). In case of environmental education, it is initiated and developed by social, political, or economic demands and intentions in Western countries and in Korea. Environmental education satisfies the social demands to solving environmental issues (Carson, 1962; NAAEE, 1996; UNESCO, 1976; UNESCO-UNEP, 1988; U.S. Environmental Protection Agency, 1993), and meets political and economic needs supporting sustainable development (UNCED, 1992; UNESCO, 1997; World Commission on Environment and Development, 1987).

In addition, the implementation of environmental education in Korean kindergartens is related to social barriers, such as the urbanized school environment, lack of community and parental support, and insufficient provision of training programs for environmental educators, as well as individual barriers (Hwang & Nam, 2001; Kim, 1997; Kim, 2002). These barriers, socially shaped and connected to both the individual and social contexts, are hard to solve just by instrumental means, such as a focus on effective teaching methods and skills. Problematic practices of environmental education in Korean kindergarten, rather, might be transformed by teachers' constant reflection on practice and by reviewing action within cultural, social, and historical frameworks.

Critical social science depends upon the understandings and interpretations of

practitioners. The behaviours of human beings can be meaningful actions to actors and intelligible to others, when the actors impose meaning to their behaviours (Carr & Kemmis, 1986). In other words, actions involve the interpretation of actors and can be understood by grasping the meanings of actors. For example, the observed behaviours of teachers, such as reading a book, talking to a child, or playing the piano in the classroom, can be described as teaching with identification of the intentions, motives, or purposes of the teachers. Interpretive social science involves knowing meanings attached by actors to their actions (Ely, Vinz, Downing, & Anzul, 1997). Furthermore, interpretive social science deepens insight, transforms consciousness, and indirectly influences actions through self-reflection on individual actors (Connole, 1998).

The critical educational researcher needs to partially "employ interpretive techniques which allow us to understand what teachers understand themselves to be doing in a particular educational setting" (Connole, 1998; Kemmis, 1991, p. 65). This research inquiry also depended on some interpretive traits in that this study was based on teachers' reflection on their understandings and practices of environmental education. However, if the educational settings are identified as the problematic practices because of individual and social factors, the teacher's reflection may be extended beyond individual understandings and teaching. Korean kindergarten teachers involved in this

research inquiry reflected not only on their own values and purposes but also on practices and situations to recognize individual and social barriers and to change it for future improvement.

Moreover, self-reflection in critical social science go beyond those in interpretive social science because beliefs shaped by the social conditions can influence self-reflections. According to Habermas (1973), self-reflection in critical social science "brings to consciousness those determinants of a self-formative process of cultivation and spiritual formation which ideologically determine a contemporary praxis of action and the conception of the world" (p. 22). Through self-reflection, critical social science provides:

> individuals an awareness of how their aims and purposes may have become distorted or repressed and to specify how these can be eradicated so that the rational pursuit of their real goals can be undertaken….the kind of self-reflective understanding that will permit individuals to explain why the conditions under which they operate are frustrating and will suggest the sort of action that is required if the sources of these frustrations are to be eliminated. (Carr & Kemmis, 1986, p. 136)

In a word, the critical approach emancipates from constraints and transforms practices, and focuses on educational change. In light of these characteristics, this study was committed to a critical approach to reflect, emancipate, and change problematic practices of environmental education in the Korean kindergarten context.

Action Research Informed by Critical Approach

Action research is usually distinguished into "technical", "practical", and "critical" by its main aims, benefits, and the relationship between practitioners and the researcher (Carson, 1989, pp. iii-iv). *Technical* action research pursues to improve effectiveness of educational practices through co-option and dependence on the researcher. Technical action research produces valuable changes in practices in the eyes of the outsider observer. While participating in technical action research, practitioners may begin to analyze their own practices more intensively and develop self-monitoring skills used in the analyses of their practices, understandings, and situations (Carr & Kemmis, 1986).

Practical action research aims to improve practitioners' understandings and professionalism, and the researcher intends to form cooperative relationships with practitioners and assist practitioners' deliberation and self-reflection. Practitioners' experiences of assisting and facilitating roles of the researcher in practical action research may be a "stepping-stone" to *critical* action research, in which all practitioners should take responsibility in all procedures (Carr & Kemmis, 1986, p. 203). Critical action research aims:

> not only at technical and practical improvement and the participants' better understandings, along with transformation and change within the existing

> boundaries and conditions, but also at changing the system itself or those conditions which impede desired improvement in the system/organization. It also aims at the participants' empowerment and self-confidence about their ability. (Zuber-Skerritt, 1996, p. 5)

All participants of critical action research, including the researcher and practitioners, have the same responsibility in the research process. However, it is initially and practically hard to involve all participants in the research without a hierarchy in the relationship. As participants and the researcher seek to trust and encourage each other, all participants become responsible. In other words, participants of critical action research play an active role whereas those of the technical and practical action research are relatively passive. The relationship between the researcher and participants in critical action research will be detailed in the next section.

Positivistic action research intends to seek objective aspects of a social condition, while practical action research recognizes people's subjective understandings of situations. However, critical action research focuses on how situations are constituted by constraints between objective and subjective, theory and practice, and individual and society, and how situations are transformed by a change of the understanding and action enacted in the practices (Kemmis & Wilkinson, 1998). In order to reflect on the constraints existing in individuals and society and overcome these constraints, this critical action research inquiry employed dialectical analysis and group communication.

Dialectical analysis

Dialectic analysis is a method to reflect on our familiar ideologies and a process to understand our reality. According to Winter (1996), an entity is complex because it is constituted by many elements, and this complexity of any entity causes contradictions. Whereas phenomenon is a unity that only gives meaning to the constituent elements, this unity always can be divided into separable parts (Winter, 1996). Because there are contradictions between the unity and diversity in each phenomenon, the change always occurs in the phenomenon. In other words, we can draw the assumption that the future will be different from the present, on the basis of the generalization that the present is different from the past. Therefore, dialectical analysis focuses on explaining, "how and why it (phenomenon) has changed and will continue to do so" (Winter, 1996, p. 21).

Critical action research uses the dialectical analysis of rationality for clarifying the dialectical relationship between individual and society, called thought and action, and theory and practice. Individual thought and action have a significant meaning in the social and historical context as well as simultaneously form social and historical contexts (Kemmis & Wilkinson, 1998). Critical action researchers believe that "thought and action arise from practices in particular situations, and that situations themselves can be transformed by transforming the practices that constitute them and the understandings

that make them meaningful" (Carr & Kemmis, 1986, p. 184). Accordingly, critical action research involves reflection on and the transformation of understandings, practices, and situations of both the individual and society.

In this critical action research inquiry, Korean kindergarten teachers dialectically and critically participated in a self-reflective spiraling cycle to reflect on the practices, understandings, and social structures which constrain the complete implementation of environmental education in their classrooms. This self-reflective spiral basically consisted of a series of steps of planning, acting, observing, and reflecting. However, according to Kemmis and Wilkinson (1998), this process "is inadequately described in terms of a mechanical sequence of steps" (p. 21) but "is likely to be more fluid, open, and responsive" (p. 21). Korean kindergarten teachers who participated in this action research inquiry did not end at a single loop of the cycle but continued to develop the extended loop of the cycle including revised planning, acting, observing, and reflecting (see Figure 1).

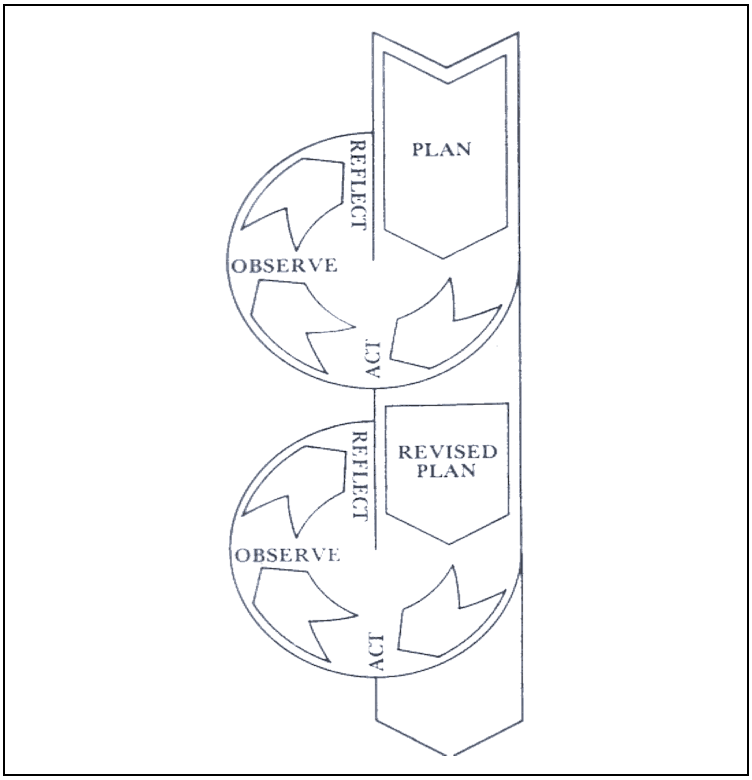

Figure1. The extended self-reflective spiraling cycle
(Kemmis & Wilkinson, 1998, p. 22)

Participants of this study experienced the dialectic relationship between retrospective understanding and prospective action in each moment of the self-reflective spiraling cycle. Each moment "looks back to the previous moment for its justification, and looks forward to the next moment for its realization" (Carr & Kemmis, 1986, p. 186). Whereas the plan is prospective to action, the plan is retrospectively constructed from the reflection. Action is thus retrospectively led by past reflection that is the basis of the plan, and is prospective towards observation and future reflection. Observation is retrospective to action and prospective to reflection. Lastly, reflection is also

retrospective to action and prospective to any revisions to the plan of action (Carr & Kemmis, 1986).

In short, during participation in the self-reflective spiral, participants of this action research inquiry had a chance to reconstruct the past by reflection, as well as to construct the future through action. For example, Korean kindergarten teachers in this study worked towards recognizing of their own understandings, identifying of the barriers to fully implementing environmental education, and planning of actions to change the problematic practices of environmental education through the self-reflective spiral. I encouraged teachers to actively participate in the spiraling cycle because the success of this process was dependent not on the faithful following of the steps but on authentic and responsible participation (Kemmis & Wilkinson, 1998).

The process of critical self-reflection can be conducted collectively or individually. The Korean kindergarten teachers in this research inquiry participated in collective self-reflection through group communication, since the problematic practices of environmental education were experienced by individuals working in social situations. These teachers also experienced social barriers to the implementation of environmental education. If educational practices are constituted in a social context, changing practices also need to be done through a social process (Kemmis & Wilkinson, 1998). The

following section details the rationale and process of group communication in this critical action research inquiry.

Group communication

Action researchers indicate that educational action research has to extend beyond individual engagement because educational action is social action and "understanding the nature and consequences of social action requires understanding the perspectives of others involved in and affected by the action" (Carr & Kemmis, 1986, p.199; Kemmis & McTaggart, 1988). Action researchers also believe that human beings are social beings who construct their language, activities, and relationship through a social context of interaction (Carr & Kemmis, 1986; Kemmis & McTaggart, 1988). Each Korean kindergarten teacher participating in this research inquiry was an individual actor in the practice, but her acts were socially framed. Accordingly, in order to understand and change their acts and practices, the research process of this action research inquiry was regarded as socially constructed and included a matter for group decision-making, as well as including individual action (Kemmis & McTaggart, 1988).

Action research looks for "changes in the use of language and discourses…. changes in activities and practices….and changes in social relationships and organizations" (Kemmis & McTaggart, 1988, p. 15-16). In other words, action

researchers aim at changing the individual work and the culture of groups. I also intended to encourage Korean kindergarten teachers to reflect and change individual and social barriers to fully implementing environmental education. However, because "changing a whole society and culture is… beyond the reach of individuals", groups of action research "work together to change their languages, their modes of action, and the social relationships and provoke changes in….society and culture" (Kemmis & McTaggart, 1988, p. 17).

Critical action research pursues the reflection and transformation of their actions, understandings, practices, and situations to reduce irrational, unjust, and unsatisfying situations (Kemmis & Wilkinson, 1998). However, because an individual's consciousness and reality are shaped in connection with the social structure, solitary self-reflection is insufficient to reflect socially constructed understandings, practices, and situations. Habermas (1973) indicated the difficulties of solitary self-reflection in that "one part of the self must be split off from the other part in such a manner that the subject can be in a position to render aid to itself…. in act of self-reflection, the subject can deceive itself" (p. 28). People can reflect more rationally on individual and social situations through group communication. According to Stringer (1996), "as they [action researchers] rigorously explore and reflect on their situation together, they

can….formulate more constructive analyses of their situation. By sharing their diverse knowledge and experience…, stakeholders can create solutions to their problems" (p. 10).

Habermas (1979) explains that communicative competence is the ability of a speaker oriented to mutual understanding to;

1. choose the propositional sentence in such a way that either the truth conditions of the proposition stated or the existential presuppositions of the propositional content mentioned are supposedly fulfilled
2. express his intentions in such a way that the linguistic expression represents what is intended
3. perform the speech act in such a way that it conforms to recognized norms or to accepted self-images (p. 29)

In other words, because a successful utterance represents something in the world, something intended by the speaker, and socially recognized expectations, participants can be enlightened and emancipated from distortions while being involved in communicative action (Habermas, 1973, 1979). According to Habermas, all speech presupposes the following of norms. However, when norms being taken for granted in speech are considered problematic, norms can be understood in the communicative action called discourse. Discourse "serves the justification of problematic claims to validity of opinions and norms" and "norms are transformed into recommendations and warnings which may be correct or appropriate but also incorrect or inappropriate" in discourse (Habermas, 1973, pp, 18-19).

Because the purpose of discourse is to achieve “a rational reassessment of the validity claims initially accepted in speech” (Carr & Kemmis, 1986, p. 142), the repressive distortions may be emancipated and rational autonomy is achieved through the communicative action. While these Korean kindergarten teachers participated in the group communication in this research inquiry, they had the opportunity to express and listen to the practices of environmental education, teachers’ intentions to environmental education, and social expectations towards environmental education. Moreover, these teachers also had chances to reassess expectations and situations to implementing EE in Korean kindergartens considered as being taken for granted through group communicative action in this research inquiry.

This research inquiry, as critical educational action research, aligned to the claims of “action research as a democratic form of social research”, and “conditions for investigating the truth of knowledge-claims are also the conditions for democratic participation in critical discussion” (Carr & Kemmis, 1986, pp. 199-200). In order to be democratic, all participants in this study sought to participate *equally* with responsibilities in group communication, as well as in all phases of planning, acting, observing, and reflection. However, it was not actually easy for all participants to have equal opportunities and same responsibilities in all procedures of the research.

According to Freire (2000), participants can be involved equally into communication and research only in a climate of mutual trust. “In the interaction it [trust] will be shown in time, whether the other side is in truth or honestly participating or is only pretending to engage in communicative action and is in fact behaving strategically” (Habermas, 1973, p. 18). Mutual trust is attained by communicative action, such as dialogue or discourse, in interaction with others (Freire, 2000; Habermas, 1973). Accordingly, I explained to all participants that communicative action “can not be reduced to the act of one person’s depositing ideas in another, nor can it become a simple exchange of ideas to be consumed by the discussants” (Freire, 2000, p. 89). No participant’s point of view was taken as the final authority and considered with greater credibility than others in this research inquiry (Winter, 1996).

Although this action research inquiry was informed by critical orientation, the relationship between the researcher and participants was modified from traditional critical action research. The following section details the roles of the researcher in this critical action research project.

Being an Outside Researcher

Early critical action researchers insisted strongly on being a researcher among practitioners instead of an outside researcher (Carr & Kemmis, 1986; Kemmis & McTaggart, 1988). Carr and Kemmis (1986) defined action research as "a form of self-reflective enquiry undertaken by participants in social situation" (p. 162). Kemmis and McTaggart (1988) stressed, "it [action research] is *not* done on other people. Action research is research by particular people on their own work, to help them improve what they do, including how they work with and for others" (p. 22). This suggestion is related to the aim of critical action research to transforming practice into praxis.

Praxis is thought in action by some critical theorists (Carr & Kemmis, 1986; Freire, 2000; Habermas, 1973). Whereas Habermas (1973) rejected the meaning of praxis as "instrumental action and technical disposition over an objectified nature" (p. 178), he interpreted praxis "as liberation from an externally imposed compulsion" on the basis of the meaning of praxis as action and interaction within a living context (p. 253). Freire (2000) described praxis in relation to word, work, and action-reflection. The word is the essence of dialogue which is a human phenomenon and the word consists of reflection and action. When either action or reflection is sacrificed by the other, the word becomes inauthentic. However, it is important to say the true word, because "to exist,

humanly, is to name the word, to change it," that is, "to say the true word….is to transform the world" (Freire, 2000, p. 88). In addition, human existence is not nourished by false words, but only by true words. "There is no true word that is not at the same time a praxis" (Freire, 2000, p. 88). In a word, praxis is work for transformation by saying true words consisting of action and reflection.

According to Carr and Kemmis (1986), whereas practice means habitual or customary action, practice also has the meaning of an informed and committed action rooted in the word praxis. Praxis means doing action based on "the commitment of the practitioners to wise and prudent action in practical, concrete, historical situation" (p. 190). In critical action research aimed at transforming practice into praxis, practitioners only can study praxis because practitioners can access understandings and commitments informing actions.

However, critical action researchers, sooner or later, began to suggest needs and ways for an outside researcher to become involved in critical action research (Grundy, 1998; Hanrahan, 1998; Hopkins, 1987; Kemmis, 1987; McTaggart, 1997). Hopkins (1987) mentioned that critical action research was more actively motivated by outsiders and the broader academic community than being limited to a practitioner-initiated inquiry. Although insisting on the importance of critical action research done by inside

researchers, Carr and Kemmis (1986) indicated that “one of the problems in educational action research is that people involved in education do not naturally form action research groups” and suggested the involvement of outsiders “in the organization of action, providing material and moral support to action-researching teachers” (pp. 200-201). Kemmis (1987) also mentioned that outsiders could be helpful to participants in an action research project depending on the situations.

The issues to include outside researchers in critical action research are extended to the partnership between university-based academic researchers and school-based practitioners (Grundy, 1998). While conducting critical action research projects, many action researchers are aware of the important role of academic researchers, and then suggest ways to establish a partnership between university-based researchers and practitioners (Brooker, Smeal, Ehrich, Daws, & Brannock, 1998; Grundy, 1998; Hanrahan, 1998; Kemmis, 1991; McTaggart, 1997). Brooker et al. (1998) recognize that “it is very difficult for teachers to adopt a critical stance about their work and practice” (p. 191). They then suggest “providing the initial stimulus….as well as ongoing support to teachers and schools” (p. 192) as the important roles of university researchers in critical action research. According to McTaggart (1997), when problematic practices are instilled as common sense, university researchers play a more significant role in

stimulating and supporting teachers' critiques of practices. Many teachers of this research inquiry were not aware of the insufficient implementation of environmental education and the social and individual barriers to completely implementing environmental education. Accordingly, in spite of being an outsider, I initiated this critical action research inquiry and stimulated teachers to reflect on the problematic practices of environmental education, serving as a "critical friend" (Carr & Kemmis, 1986, p.161; Hanrahan, 1998, p. 316).

Carr and Kemmis (1986) also identify the role of an outside researcher in a critical educational action research as a critical friend to "helping insiders to act more wisely, prudently and critically in the process of transforming education" (p. 161) and "introducing the idea of educational action research" (p. 162). Whereas Carr and Kemmis limit the role of critical friends to a helper or a facilitator, Hanrahan (1998) describes that university researchers involving in critical action research as critical friends expand their roles as part of the school system, and the teachers have simultaneously expanded their roles to become part of the research system. While working with colleagues for developing critical action research as a university researcher of Deakin University, Kemmis (1991) also expands roles of university researchers from facilitators to co-researcher or research partner. The current focus related to

collaboration in critical action research is not about who is included and excluded, but about how different groups collaborate with each other (McTaggart, 1997). Therefore, I fulfilled the role of the outside researcher as a research partner and as a "critical friend" suggested by Hanrahan (1998, p. 316). I played the following roles as a critical friend in this research inquiry:

- initiated action research and form action research group to participate in this research inquiry
- introduced action research process
- motivated and stimulated action research group to critically reflect the practices of environmental education of Korean kindergarten
- encouraged teachers to participate in the research with responsibility
- supported participants' critique and offered advice on materials
- observed and recorded participants' group communication in the meeting and action in the classroom
- gathered data and analyzed it

According to McTaggart (1997), participation of participants in critical action research is different from mere involvement as follows:

> Authentic participation…. means ownership, that is, responsible agency in the production of knowledge and improvement of practice. Mere involvement …. creates the risk of co-option and exploitation of people in the realization of the plan of others…. People often are involved in research, but rarely are they participants with real ownership of research theory and practice. (pp. 28-29)

Participants in this critical action research inquiry were also encouraged to participate in the research process with responsibility, ownership, and authenticity.

Research Design

Korean Kindergarten Context

Korean kindergarten is defined as "the school established and operated by the *Elementary/Middle Educational Law* for early childhood education" (Ministry of Education, 1999, p. 13). However, early childhood education in Korea is not compulsory yet and is not well-systemized. Although most kindergartens follow the purpose and direction suggested in the curriculum, some kindergartens focus on fostering children's specific competence in English, drawing, or music. In addition, kindergarten is understood to include diverse kinds such as national kindergartens[9], private kindergartens[10], day care centres, and preschool institutions in Korea. Kindergarten usually covers age groups of children from 3 year old to 6 year olds. In short, kindergarten in Korea has broader and more complicated meanings and forms than the Grade K in North America. However, because participants of action research have to be composed of people sharing common roles rather than sharing activities, I chose

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[9] National kindergarten is established and operated by the government in Korea. Some elementary schools have one or two classes of national kindergarten. It is almost similar to Grade K in Canada.

[10] The principal of private kindergarten has to satisfy requirements of the government to establish and operate it. However, because private kindergarten is established by individual's funds, the establisher or the principal has much stronger authority to operate it than national kindergarten.

participants from a specific kind of kindergarten (Kemmis & McTaggrt, 1988).

This research was conducted with Korean teachers working in national kindergartens because of the similar working environment, autonomy in their classes, competence, and familiarity to academic research. Above all, because national kindergartens mainly follow the national curriculum provided by the Ministry of Education and is administered by the government, teachers of national kindergartens teach children with a similar educational purpose, time schedule, and working environment. Whereas most teachers of other kinds of kindergartens are influenced by the principal and parents, teachers of national kindergartens have much stronger autonomous right to plan and implement their classes. Moreover, most teachers working in national kindergartens have a Bachelor's degree in early childhood education and pass the national examination to be teachers of national kindergartens. Accordingly, the competence of national kindergarten teachers is similar to each other and higher than teachers of other kinds of kindergartens. Many teachers in national kindergartens are also familiar with academic research because university-based researchers often conduct research in national kindergartens and some teachers are studying in university as graduate students.

A school year in Korea consists of two semesters and two vacations. The first semester is from March to July and the second semester is from September to December. The mandatory class days of kindergarten are 180 days per year (Ministry of Education, 1999). The annual schedule is as follows (Date can alter by 3 to 5 days):

- First semester: March 1- July 20
- Summer vacation: July 21 - August 21
- Second semester: August 22- December 20
- Winter vacation: December 21 - February 28

March is usually the busiest and hardest time both for children and teachers in kindergarten. Children who come to kindergarten for the first time need to adapt to a new environment, teachers, and the other children during the first few weeks. Teachers also need to adapt to children, parents, and new teachers. Kindergarten teachers usually avoid participating in research projects in March. December is also inappropriate to do research regarding environmental education for young children, because the winter in Korea, especially in December and January, is cold and humid, thus it is hard for kindergarten teachers to plan environmental activities outside or in nature. Consequently, this research inquiry on environmental education in kindergarten was conducted from September to early December for 14 weeks.

Population

In order to closely observe and intensely encourage the participation of teachers in all procedures, I selected 4 kindergarten teachers. Four teachers may seem to be low, but it was actually very difficult for research participants, working in different schools, to meet once a week after school because they had to prepare for school events and field trips, and sometimes go on official trips to the other cities. Moreover, most research participants, who were women and between 25 and 35 years old, needed to take care of their families, especially young babies, after work. The scheduling of meetings was always complicated and difficult for research participants, and none were able to participate in all group meetings of this study. However, none of research participants were absent from group communication more than twice. Passion for research and a strong consideration for others turned out to be necessary elements for conducting a critical action research inquiry through group communication in the context of Korean kindergartens.

Research participants were selected from a southern city that is one of six greater cities in Korea with a population of 1,400,000. This city is urbanized, but is close to rural areas and the environment, such as mountains, rivers, and parks. Kindergarten teachers working in this city faced difficulties in implementing environmental education within the urbanized environment. However, they could often plan environmental

education in the environment, because they could reach various natural places within one hour by car.

An on-site assistant distributed letters to all kindergarten teachers of this city, because of the researcher's geographical distance. This letter briefly explained this action research inquiry and invited teachers to participate in this research inquiry voluntarily (see Appendix D). Teachers wishing to be involved sent the permission form to the research assistant. I chose teachers having 10-15 years working experience as participants of this research inquiry. The age and educational background of these participants also was close to those of the researcher.

Procedures

This research inquiry took place for 14 weeks. I prepared a brief paper about action research, the differences between action research and other research methods teachers were accustomed to, and the roles of the researcher and participants in this research inquiry (see Appendix E). I provided this paper to participants ahead of the first meeting. In the first meeting, I and participants were introduced to each other, and discussed action research based on participants' questions of the provided paper. I kept supporting participants to familiarize to critical action research throughout this research inquiry. In order to encourage participants' involvement in group decision-making, I

asked participants to collectively decide the duration, frequency, and location for future meetings. Participants then reflected on environmental education practices in Korean kindergartens with the following questions:

- What is environmental education?
- What are the objectives and topics of environmental education for kindergarten children?
- Are you doing any environmental education activities in your class?
- If participants say yes,
  What are you doing?
  What barriers, if any, do you face when teaching EE in kindergarten?
- If participants say no,
  Why are you not teaching EE?
  What do kindergarten teachers need to teach EE?

During the next several weeks, participants reflected on the potential topics and objectives of early childhood environmental education provided in some environmental activity books. These teachers then sought to analyze the topics and objectives of EE included in the National Curriculum of Kindergarten. After improving their knowledge and awareness of ECEE by reviewing environmental activity books and National Curriculum of Kindergarten, participants began to choose a topic to plan actions and activities to take before the next meeting. I made appointments with teachers to visit their classes. While visiting classes during the weeks, I observed, made notes, and took pictures of the actions and changes of participants and children. At each meeting from the sixth meeting, participants reflected on the previous implementation of action, chose

another topic to discuss, and planned action to take. After the meeting, participants implemented planned actions in their practices for a week before the next meeting. A similar procedure was repeated during the remainder of this research inquiry.

Data Collection and Analysis

I *triangulated* data interpretation using various types of data and different data sources (Anderson & Arsenault, 2001; Goodwin & Goodwin, 1996; Johnson, 2002). I collected written and recorded data from the group communication, the implementation of action, and individual conversations. I also followed an *audit trail*, "keeping meticulous records of all sources of information used, using detailed transcripts, and taking field notes of all communications and reflective thinking activities during the research process" (Anderson & Arsenault, 2001, p. 134). Accordingly, I kept writing a research journal and did the audiotape recording of group communications.

The audiotape recordings facilitated the analysis of the group communication where the participants reflected on and changed problematic understandings, practices, and situations of environmental education. I reviewed the recordings to analyze barriers reflected on practices of EE, actions selected to overcome barriers, and changes occurred during environmental education. Research participants verified the accuracy of these analyses before starting group communication of other topics. Although this study did

not focus on children, children's products provided indirect data to demonstrate how teachers and practices of environmental education were changed through this research inquiry. Participants brought children's products produced during this research inquiry, and shared them in the group communication. If participants decided to include any child's product as a data of this study, I sent a consent letter to the parents of the child. In case of receiving parents' consent, children's products were used as a source of data for this research inquiry.

I was in all group meetings and observed the implementation of actions in the class as much as possible. I mainly listened and observed the group communication and classes. I was involved only in the discussion when the moment required my advice as a critical friend. For example, when participants asked about useful books including topics, objectives, and activities of ECEE, I provided the list of environmental activity books. However, whenever I required understanding the participants' discussion and action more precisely, I conducted informal and individual conversations with teachers. I also planned a conversation when participants had some questions and wanted to discuss ideas in more depth with me. The form of the conversation, such as duration, location, and frequency, was different according to the situation.

The data analysis began as soon as data were collected through a systematic

process. I organized the data into manageable units, combined and synthesized ideas, developed constructs, themes, pattern or theories, and illuminated the important discoveries of this research inquiry (Gall, Borg, & Gall, 1996; Goodwin & Goodwin, 1996; Johnson, 2002; Kemmis & McTaggart, 1988). After an analysis was completed, I reviewed the initial results with participants. Once data analysis had been done, a translator translated the final document from Korean to English. The findings of this qualitative action research inquiry are helpful to understand particular situations and inform similar situations rather than necessarily generalize to other situations and communities (Johnson, 2002).

In summary, this chapter provided the theoretical framework of critical action research and description of research methodology conducted by dialectical analysis, group communication, and authentic involvement. It also elucidated the roles of the researcher as an outside researcher in critical action research inquiry. This chapter detailed the research design, such as the selection of the population, research procedures, data collection and analysis.

CHAPTER 4

Tensions and Possibilities when Conducting Critical Action Research in the Korean Kindergarten Context

At the beginning stages of this study, participants often mentioned difficulties and tensions towards participating in group communication and being involved in the research inquiry with the responsibilities, authenticity, and ownership. As this inquiry progressed, research participants became involved in group communication and identified some benefits of group communication. However, participants continued to feel difficulty participating in this inquiry with responsibility, authenticity, and ownership right through to the end of this study. This chapter describes the major tensions and possibilities of critical action research conducted with the Korean kindergarten teachers in this study. Pseudonyms were selected to preserve the anonymity of the participants and children.

Tensions to Participating in Group Communication

Critical action research is conducted to improve socially-framed understandings, acts, and practices; thus, socially constructed research processes should be included in the reflection and transformation of individual actions and understandings, educational

practices, and social situations (Carr & Kemmis, 1986; Kemmis & Wilkinson, 1998). This critical action research inquiry, aimed at the development of environmental educational practices related to the individual and social context of Korea, was also conducted through social processes, such as group communication and group decision making. Through group communication, research participants reflected on the individual and social barriers to fully implementing EE, planned actions to overcoming these barriers, and reflected on actions taken in their classrooms.

Before beginning this inquiry, I worried about participants' passive participation in the group discussions because of the lack of collective communication in a Korean cultural and educational context. An academic acquaintance of the researcher had also indicated there may be some complications when conducting research through group communication with Korean teachers:

> It may be difficult for Korean teachers to actively participate in the group discussion. Korean teachers have different cultural and academic background from teachers of the Western culture. Korean teachers may be accustomed to answer the questions instead of discussing any issues because they have rarely experienced group communication and the decision making with others at home, in schools, and even in university. (Kim, August, 23, 2006, personal communication)

Indeed, Korean kindergarten teachers in this study were unaccustomed to and uncomfortable with participating in group communication. Part of this was due to their previous experiences with academic research done in the kindergarten context.

According to the discussion with research participants in the first meeting, most research was conducted by individual interviews, surveys, and the implementation of activities outlined by a university-based researcher. For example, when teachers participated in research investigating their understandings and awareness, researchers asked teachers to check a survey or to answer interview questions. In research designed to improve the implementation of education, researchers required teachers to exactly implement the designed activities. Consequently, participants usually expressed their ideas by answering questions or checking a survey provided by the researcher, rather than through making decisions via group communication.

Many research participants also mentioned that their negative attitudes toward group communication might be based on the cultural and educational backgrounds. Describing the communicative ways at home, Mihee indicated her unfamiliarity to participating in group communication in this research inquiry:

> I rarely had chances to seriously discuss, plan, reflect, and make decisions with others. I grew up in a home setting without sufficient discussion among the family members. In many cases, my parents forced me to follow them rather than seriously share our ideas….While participating in this study, it was difficult to formally participate in the group discussion to make decisions, reflect on understandings and practices, and plan the actions and activities. The group communication in this study seems to be different from chatting and talking my ideas to friends or teachers. (October, 19, 2006)

Many participants also identified the lack of opportunities to participate in group communication in the schools:

> The communicative ways in schools were similar to those at home. Students listened to the lecture of teachers and answered questions in elementary and secondary school. I rarely remember participating in group discussions in schools to reflect, plan, and make a decision. (Jungmin, October, 19, 2006)

> I also did not have the time for collective discussion in classes at university. If some professors provided time for group discussion, students looked in their books to find the answers or looked at the faces of each other. (Yujin, October, 19, 2006)

Because participants did not have chances to involving in group communication in elementary and secondary schools, they could not acquire communicative skills and were hard to participate in group discussion later. Moreover, research participants indicated that although some kindergarten teachers recognized the importance of group communication among teachers, they found it hard to regularly participate in the group meetings because of working condition. As Sumi notes,

> Some teachers know that group communication is very helpful to share administrative work, make decisions about school events, share educational information, and get advice to deal with the problematic behaviours of children. When I previously worked in another school, all teachers (we were three) tried to meet everyday in the afternoon for 30 minutes to discuss the above issues. However, group communication was restricted to 5 or 10 minutes and was limited to administrative work and school events because teachers were too busy to meet for 30 minutes everyday. (October, 19, 2006)

This revealed the difficulty of facilitating group communication among teachers even working in the same school because of the busy schedules of Korean kindergarten

teachers.

Another tension hindering active participation of research participants was the emotional burden of mentioning correct and useful answers in a group discussion and in their classrooms. This burden might come from the educational context of Korea. When research participants, who were 25-35 years old, attended elementary, and secondary school, and university, teachers and parents mostly forced students to mention the correct answer to teachers' questions. If students provided wrong answers, they were ashamed of it. Teachers and students also considered that teachers, who could not provide the exact and sufficient explanation to children's question, were not capable and professional teachers. Although this atmosphere is recently changing in the Korean educational context, many research participants in this research inquiry already had a stereotype of mentioning correct and useful answers as a member in the group communication and as a teacher in their classrooms.

During this research inquiry, the concerns of most teachers to respond with correct and useful answers were lessened by my continuous explanation and establishment of a close rapport among teachers described in the next section. However, some teachers kept worrying about whether their ideas were appropriate or not. For example, Yujin participated seriously in all procedures of this research inquiry, but did

not actively participate in group communication. In an individual conversation with Yujin conducted at the request of the researcher after the fourth meeting, she mentioned that she could not be involved in group communication because of her insufficient knowledge of EE to offer correct and useful ideas:

> I am interested in this research. I really like to take actions in the classroom with children about environmental education. I also want to mention the barriers to fully implement EE and participate in planning actions to overcome these barriers. However, because I do not have extensive knowledge about environmental education, I often wonder whether my contributions during group communication and in the classroom are right or not. While I am thinking about the correct and appropriate ideas to mention, the focus of the discussion changes to other things. (Yujin, October, 7, 2006)

Teachers' concerns to give correct and useful explanations also influenced the implementation of EE in their classrooms. During group communication, many participants indicated that they were surprised at children's questions about environmental phenomena and issues for which participants did not have any ideas. Because teachers wanted to correctly and sufficiently answer children's questions, they avoided including unfamiliar subjects of education, such as environmental education. Accordingly, it was necessary for teachers to transform their stereotype of correct and useful answers for the more active and honest involvement in group communication and for the more confident implementation of environmental education in their classrooms.

Possibilities and Benefits of Being Involved in Group Communication

At the beginning of this study, research participants felt difficulties and tensions towards participating in group communication because of their lack of previous experiences and background. However, a close rapport and friendship among participants of this study gradually promoted deeper involvement into group communication. Freire (2000) and Habermas (1973) mentioned that active and equal involvement in group communication could be accomplished in a climate of mutual trust attained through the interaction with others and through development of a close rapport.

Although I did not intend to deliberately select participants, the four teachers in this study already knew each other before participating in this study, because all had 10 – 15 years working experiences in national kindergartens in the same city. Some teachers had met during educational programs, such as seminars and workshops, and some teachers had worked together in the same school. In addition, the researcher and three of them had studied early childhood education in the same university. Research participants noted how the background and friendship among them and with the researcher played a significant role in forming a comfortable climate for group discussion, and allowed them to open minds.

> Participating in the group discussion often seemed to be difficult in the beginning of this research. However, it came to be more comfortable to sharing

> my ideas because we knew each other. I know that other teachers are good teachers, and they also know my seriousness as a teacher. Therefore, I believed that they would understand me and even my mistakes. (Mihee, November, 9, 2006)
>
> I was often reluctant to say my ideas. But, when I thought that other teachers worked in the same educational situations and understood the kindergarten context, I could ask some questions and share my opinions comfortably and honestly. (Jungmin, November, 9, 2006)

The close rapport and climate of mutual trust among participants stimulated teachers' active and honest participation in group communication and allowed them to overcome the difficulties and tensions towards being involved in group discussions. The success achieved through this rapport implies that the selection of research participants, who have similar backgrounds, may be helpful in enhancing the active, honest, and comfortable involvement of participants in group discussion. This is especially true in contexts where participants are not accustomed to group communication.

Involvement in the group communication allowed research participants to recognize the benefits of collective discussion for reflecting on their understandings, educational practices, and the social situation of environmental education. It also encouraged them to seek actions to overcome the barriers to fully implementing environmental education in their classrooms. According to participants, group communication awakened them to reflect on their habitual behaviours and awareness. Yujin described her improved critical reflection, acquired from group communication, on

her understanding and actions related to parents' involvement:

> Because children often mentioned their parents' behaviours at home, I knew there was a necessity to connect the activities, especially of EE, implemented in the classroom with parents. However, whenever I asked parents to do some activities with children at home, few parents responded. I came to stop involving parents. I then rationalized my behaviors by convincing myself that parents might not have gotten involved, in spite of my efforts to include them, because they were so busy…. However, although being in a similar situation with me, other teachers considered parents' involvement as an important element for effectively implementing environmental education for young children, and sought the ways to involve parents into EE. (November, 24, 2006)

After awakening her habitual behaviours regarding parents' involvement into environmental education, Yujin seriously participated in searching for possible ways and taking actions to involve parents during the last several weeks of this research inquiry. The detailed examples will be described in the next chapter.

In addition to critical reflection on individual understandings and acts, participants' critical reflections during group communication were extended to educational systems and social situations. For example, research participants pointed out that the teaching of the kindergarten teachers working in national kindergartens might be limited to their favorite and familiar subjects and content because the Ministry of Education provided excessive flexibility to kindergarten teachers in the National Curriculum. Participants also criticized Korean parents' expectation to developing academic skills even in kindergartens. According to research participants, before

involving in this research inquiry, they just complained about problematic practices. However, they came to critically reflect on educational practices, to discuss the causes and effects, and to look for ways to change above problematic practices, although it was hard for participants to take some actions in relation to these issues.

While criticizing problematic practices and planning actions to develop educational practices through group communication, participants developed professional confidence and began to take pride in their work. Many research participants indicated that they sometimes could not deliver sufficient and appropriate education to children because of individual and social demand. For example, participants were very busy completing sheets of activity outcomes in October and November during this research inquiry. According to research participants, the Office of Education in this city asked teachers to provide these sheets of activity outcomes for evaluating the implementation of education of kindergarten teachers. After being involved in some activities, children represented the title and impressive things of activities on these sheets. Teachers gathered and submitted these sheets to Office of Education in this city in the end of the school year. In order to finish the assigned amount of sheets of activity outcomes, teachers shortened the time to implement various activities and encouraged children to finish these sheets.

However, through the group communication, participants could discuss the above issues and plan environmental activities, providing children enough time to experience the environment and to discuss the environmental issues. Research participants also described how the implementation of these activities in their classrooms made them have a stronger pride in their careers. This implies that group communication plays a role in achieving a fundamental aim of critical action research, which is improving participants' empowerment and self-confidence (Zuber-Skerritt, 1996).

Research participants identified that another benefit of the group discussion was to facilitate teachers' understandings about appropriate approaches for EE to children of different ages; as Jungmin commented,

> All teachers chose and implemented the same activity in the classrooms in the beginning stage of this study. However, whereas teachers teaching five years old children actively described their actions and children's responses in the group meeting, teachers teaching three and four year old children mentioned that children had difficulty understanding and participating in activities. When I heard the dialogue of other teachers, I recognized that the selection of topics for EE had to be different according to the children's age, because the understanding and knowledge of five years old children was totally different from those of younger children, especially in environmental education. (December, 7, 2006)

Two of the research participants taught five years old children, and two teachers taught three and four year-old children in kindergartens. Participants, including Jungmin, mentioned that when other participants reflected on their implementations of EE and

children's responses in the group discussion, they could identify the different understandings and backgrounds of children of different ages. Participants also indicated that they could acquire information about teaching methods and materials for environmental education according to the children's ages by communicating with other teachers.

Tensions to Authentically Participating in Research

As a critical friend, I tried to be not only a facilitator but also a research partner. In other words, I sought to be a part of the school system, and encouraged the participants to be a part of the research system (Hanrahan, 1998). In this action research of environmental education, which was new to participants, the role of the researcher as a facilitator was significant, especially at the beginning, forming the research group, introducing the process of action research, and stimulating research participants' critique. While involved in group communication, observing participants' actions in their classrooms, and sharing participants' ideas in individual conversations, I gained detailed and varied understandings of participants' awareness and knowledge of EE, difficulties and requirements to implementing EE, educational situations and even participants' individual lifestyles. The following quote from my journal revealed how much my

understanding of teachers and educational practices were changed by group communication and individual conversation:

> When I planned this research inquiry, I was concerned about the difficulties in conducting action research of environmental education. For example, I was only anxious about participants' inactive involvement in this inquiry, insufficient implementation of actions, and unsatisfactory changes in participants and EE. However, educational situations reflected upon by participants through group communication and individual conversation were more complicated and practical than I considered. Collective and individual communication with participants provided the variety of information about educational practices and individual lives. The above information made me consider this research inquiry in connection with the individual and educational situation as much as I could. (Journal entry, October, 15, 2006)

The understandings of participants' lives and educational practices were extended beyond environmental education to the overall Korean educational system, and led me to design and be involved in research on Korean kindergartens as a part of school system.

Because this critical action research pursued the participants' "authentic participation" in all procedures of this study (McTaggart, 1997, p. 28), the other important role of the researcher was to encourage the participants to be involved in the research with responsibility, ownership, and authenticity. However, although I kept encouraging research participants to be research partners, they often displayed "mere involvement," creating co-option between the researcher and participants (McTaggart, 1997, p. 28). Mihee and Sumi described following awareness of academic research:

> How can we [research participants] lead group communication, plan actions,

> and make decisions of the next step of research? It is academic research and I do not have enough knowledge about environmental education. It is totally different from research I previously participated in. (Mihee, September, 8, 2006)

> The researcher always outlined the research, mentioned what I had to do, asked some questions, or implemented some activities by themselves. I just did what the researcher wanted or spared time to them. (Sumi, September, 8, 2006)

Participants believed that they did not have the confidence or knowledge to contribute to research, and tended to comply with researcher's request or direction. Moreover, although research participants identified the disconnection of educational research with educational practices, they considered that educational research was the work of the university-based researcher; as Sumi indicated,

> I understood the aims and the value of academic research. However, in many cases, the results of research were not applicable to the classrooms. Because the researcher already designed research before starting it, teachers could not say anything about research so far as the researcher did not ask. Teachers were also too busy to be concerned with research conducted by the university-based researcher. In addition, because university-based researchers learned a lot and spent much more time researching, their abilities and knowledge would be better than mine. (Sumi, November, 16, 2006)

In order to encourage participants' authentic participation, it was necessary to transform teachers' awareness of academic research. As participants listened to the explanation of this critical action research in the first meeting and received continuous encouragement from the researcher during the research procedure, participants recognized the significant value of their background, experiences, and knowledge of

children and the educational system for educational research. I also lessened my role to listen to the participants' discussion, provide resources, and observe actions taken in their classrooms. On the other hand, I encouraged participants to lead group communication by turns and to share their ideas, and provided the flexibility for participants to take actions in their classrooms appropriate to their children and the school environment. Research participants came to understand the necessity and importance of authentic involvement in educational research to improve their understandings, educational practices, and social situations. However, participants' authentic participation was the most significant challenge for the Korean kindergarten teachers and the researcher. In many cases, most research participants relied on me to lead the next part of the research, to provide professional advice, and to confirm their plans, reflections, and actions.

In short, this chapter described tensions and possibilities participants experienced while participating in this critical action research through group communication and authentic involvement. In the beginning stages of this research inquiry, participants felt difficulty becoming actively involved in group communication because of communicative ways in the cultural and educational context of Korea and emotional burden of mentioning correct and useful answers in group discussions. However, the

continuous explanation of the researcher and establishment of a close rapport among participants helped participants actively involve in group communication. Participants recognized that group communication awakened them to reflect on individual awareness and educational practices, improved their professional confidence in their works, and facilitated their understandings about teaching methods regarding EE. However, research participants could not acquire the partnership with the researcher and authentically participate in this research, because participants were totally accustomed to previous research conducted by the direction and outline of the university-based researcher.

CHAPTER 5

Barriers to Fully Implementing EE and

Actions taken by Korean Kindergarten Teachers

This chapter describes the awareness and understandings of research participants about environmental education in the beginning of the research, the barriers to fully implementing EE in their classrooms reflected upon by research participants in the first meetings and during the research, actions chosen and taken by participants to overcome barriers to fully implementing environmental education, and changes in teachers, children, and educational practices of environmental education through this research inquiry.

The Awareness and Understandings of EE in the Beginning of the Research

The collective reflections of research participants on EE were elicited by the following questions in the first meeting: What is environmental education? What are the objectives and possible topics of early childhood environmental education? Which topics included in the National Curriculum of Kindergarten might be related to EE? Which environmental activities are you doing in your classrooms? Which barriers do you face when teaching EE? What do you need to do to implement EE? Before the discussion of

EE with the above questions in the first meeting, some participants indicated that the decision to participate in this research inquiry already stimulated their interests in environmental education; as Jungmin and Yujin mentioned,

> The book the environmental education program[11] was provided by the Ministry of Environment in the last term, but teachers never read it. After deciding to participate in this research inquiry, I came to be interested in EE and these books. (Jungmin, September, 8, 2006)

> There were some activity books of EE on the shelves of the kindergarten. These books were there for a long time but I was not interested in these books. I picked one up and read it for the first time in the last week…. Moreover, when I read the newspaper and the journal, I came to be interested in words related to this study, such as the environment, environmental education, or nature. (Yujin, September, 8, 2006)

Research participants read EE activity books and paid attention to information concerning the environment and environmental education prior to the first meeting of this study. The improved interests of research participants in environmental education through reading environmental books changed their awareness of environmental education.

> Before I read these books, environmental education seemed to be difficult to understand and implement in the classroom, because I believed that EE was related to environmental pollution and protection. However, EE now seems to

[11] The early childhood environmental education programs are the teachers' guidebooks to teaching early childhood environmental education to 3, 4, and 5 years old children. These books were written by a professor of early childhood education, principals, and teachers of kindergartens under the support of the Ministry of Environment.

> be easy, fun, and connected to our daily lives. (Jungmin, September, 8, 2006)
>
> The books of EE I read previously were boring and difficult because these books contained activities and topics related to environmental pollution. However, while reading the book *the environmental education program for 3, 4, and 5 years old children*, I recognized that EE included education about the environment, as well as environmental problems. (Sumi, September, 8, 2006)

Research participants came to be aware of EE as a familiar and interesting subject that could be included in the kindergarten curriculum.

Although the interest and awareness of the participants were improved by the involvement in this inquiry, in the beginning of this study they still considered EE as education to protect the environment and solve environmental problems for their better safe and healthier lives. According to the definition of Murdoch (1993), environmental education includes education in the environment, education about the environment, and education for the environment. Education in the environment aims at establishing children's positive attitudes towards the environment by providing various and direct experiences of the environment. Education about the environment intends to enhance the knowledge of environmental phenomena and the ways in which the environment works. And lastly, education for the environment focuses on improving children's awareness of the environment and environmental problems and developing children's background and skills to solve environmental problems. In short, environmental education aims to improve children's knowledge, skills, attitudes, and actions related to the environment.

In light of the above definition of environmental education, the understandings of research participants about EE were limited to education for the environment in the discussion of the first meeting.

The participants' understandings of environmental topics and contents were also limited to specific subjects, contents, and activities. Most research participants indicated that the topic 'Earth and the environment' was directly related to environmental education. According to research participants, 'Earth and the environment', included in the Kindergarten Education Activity Guide Books[12] (The Ministry of Education, 2000), was usually implemented in October or November for a week, and related to the environmental problems and space science, such as the moon and sun. However, as seen below, the topic 'Earth and the environment' includes broader and more various contents and topics than participants understood (Ministry of Education, 2000):

Earth on which we are living
- Earth consists of soil, water, and air
- Earth has various natural phenomena that impact human beings' lives
- Earth has various resources and human beings live by using these resources

Our lives and the environment

[12] Kindergarten Education Activity Guide Books were provided by the Korean Ministry of Education in 2000 to help kindergarten teachers' preparation and implementation of education in the kindergarten context. The Ministry of Education developed these books on the basis of the contents and topics of the Korean National Curriculum of Kindergarten. This series consists of 12 books, including the outline and the book for all-day programs. The topic of the seventh book is 'Earth and the environment'.

- The ecosystem keeps balancing
- Human beings are surrounded by natural, artificial, and social environments
- Living things are interrelated to the environment

Earth and space

- Sun and moon influence living things of Earth
- There are many stars in space and Earth is one among them
- Space is the object of exploration
- Space exploration influences the future lives of human beings

The environmental problems and protection

- Various environmental problems occur because of urbanization and industrialization
- Environmental problems threaten human beings' lives
- Human beings should live in harmony with the environment and protect it for healthy and pleasant lives
- In order to form the better condition of the environment, human beings should take active actions for environmental protection

Research participants identified that the topic 'Earth and the environment' was directly related to environmental education. However, participants did not sufficiently understand the above themes and content of this topic; they just chose some activities regarding this topic from activity books and implemented those in their classrooms without consideration about the environment and understandings of environmental education.

Many research participants also identified that many topics and contents of 'Inquiry', a field of the National Curriculum of Kindergarten, were related to environmental education. However, participants did not know which topics and how these topics could be connected with environmental activities. I analyzed the potential

topics and contents of EE included in the National Curriculum of Kindergarten (see Appendix A). In addition, other environmental educators suggested possible topics and contents of EE appropriate to young children. For example, teachers of the Dong-A kindergarten[13] (2006) chose the value of the environment, soil, water, air, and energy as environmental topics. The Ministry of Environment (2006), on the basis of the National Curriculum of Kindergarten and the previous research of EE, identified the following contents of environmental education: clean life, protection of pure water, protection of fresh air, protection of unpolluted soil, plant protection, animal protection, frugality of materials, reduction of waste, food, reduction of noise, and frugality of energy. In light of the above indications of environmental educators about potential topics of EE, research participants might not have a comprehensive understanding about the content and topics of environmental education.

In addition, research participants did not implement environmental education through the various activities. Most participants mentioned that they mainly implemented EE through discussion in group meeting time with watching pictures and

[13] This kindergarten, located in Seoul, Korea, was chosen by Seoul Metropolitan Office of Education as an exemplary kindergarten for developing the environmentally appropriate consumption behaviours of children in 2004. After involving into this project for one year, teachers and the principal of this kindergarten developed this activity book to provide the materials and resources of environmental education to other kindergarten teachers who were interested in it.

videotapes on environmental pollution. However, according to Yun and Cho (1993), the content and topics of environmental education can be implemented by various activities such as group discussion, observation and experiment, field trips, and writing poems. Environmental education can also be provided to young children through games, listening to stories, watching videos, physical movement, and singing songs (Hyun et al., 2003). The Ministry of Environment (2006) emphasized that "kindergarten teachers should attempt to connect environmental education with children's lives, rather than implement environmental activities of specific topics for a short time" (p. 17). In summary, research participants did not have a comprehensive understanding of the potential topics and content of EE included in the National Curriculum of Kindergarten. In addition, participants rarely implemented varied environmental activities in their classrooms.

Choi et al. (2002) mentioned that teachers' awareness of EE and confidence to implement environmental activities are important elements for developing and generalizing school environmental education. However, according to the Korean Care and Education Information Centre (1994), Korean kindergarten teachers felt they had a lack of knowledge and did not have any ideas for integrating EE with curriculum, in spite of recognizing the seriousness of environmental problems and needs of school

environmental education (cited in Hyun et al., 2003). This study revealed the same results with the above study. In the beginning of this research inquiry, the participants did not actively reflect on the barriers to fully implementing EE because of the insufficient awareness of EE and a lack of confidence and experience implementing EE in their classrooms.

Many research participants indicated that they did not have enough knowledge because they had not engaged in environmental education in elementary, middle, and high school, as well as at university. Moreover, two participants mentioned that they had never heard of or considered EE before participating in this research inquiry. Korean kindergarten teachers, who had never experienced environmental education in schools, felt the simultaneous burden of learning and teaching an unfamiliar field. Sumi described the difficulties to initiating environmental education in their classrooms without sufficient knowledge and background:

> I often heard about the seriousness of environmental pollution in our society through the media. However, because kindergarten teachers had never learnt about environmental education, we should start to consider what environmental education is. In order to enhance the knowledge, teachers must spend a lot of time to find and read books on environmental education. Teachers must also spend time planning environmental activities appropriate to young children and preparing the materials required to implement environmental activities in the classrooms. (September, 15, 2006)

The burden of learning about and implementing a new field in their classrooms was

exacerbated by the busy time schedules and the provision of a lot of new educational research related to various fields. According to Yujin, “because kindergarten teachers teach language, social, science, music, art, and mathematics alone, teachers do not have enough time to prepare and teach a new subject” (September, 22, 2006). Mihee added, “there is a lot of academic research related to various fields such as traditional education, special education, culture education, and environmental education etc. It is hard to even understand this research” (September, 22, 2006).

Research participants also indicated their negative attitudes toward touching and exploring the environment as a significant reason which prevented the implementation of EE. Most participants showed the following negative attitudes toward the environment and environmental education:

> When I touch any animal, I can feel the bone under the skin. So, I like to watch them but hate to touch and hug animals. If I should hold a dog and rabbit to show and discuss with children, I cannot do it. However, I do not want to show these attitudes toward animals to children. (Jungmin, September, 29, 2006)

> I feel sick from the smell and the fur of animals. I heard the fur of animals causes various diseases. I also hate the eyes and beak of birds. I heard feathers of birds have a lot of insects in it. I really dislike raising animals and birds in the classrooms if I should do it as a part of EE. (Yujin, September, 29, 2006)

Jungmin and Yujin considered the environment, especially wildlife, as dangerous and creepy. They worried about implementing EE concerning animals and birds because they did not want to touch animals and birds and to raise them in the classrooms.

Research participants indicated that they had the above attitudes toward the environment because of the lack of direct experience of the environment. They were women of 25 to 35 years old. While three participants were born and grew up in urban areas, one participant was born in a rural area but grew up in the urban area from the age of eight. Accordingly, they had rarely been in the environment during the early childhood, except when they had gone on school picnics twice a year or had traveled to the beach, a mountain, or a river with family. Moreover, Mihee mentioned her attitudes toward the environment were caused by the lack of knowledge about the environment:

> Some mushrooms, birds, and spiders are poisonous, but I do not know which kinds of insects and plants are harmful to us. The pollen of flowers also causes many kinds of allergies. So, I hate to touch insects, wild plants, and even flowers. (Mihee, September, 29, 2006)

Mihee heard that some wildlife had poison. However, because she could not identify which wildlife was harmful to us, she was reluctant to touch and approach anything in a natural environment.

In light of participants' expectations and attitudes toward the environment, environmental education was not only an unfamiliar educational field with which participants had a lack of knowledge; it was rather a challenging field about which these Korean kindergarten teachers needed to change their own attitudes toward the environment by having direct experiences, improving knowledge, and transforming the

inappropriate information of the environment for the better understanding and implementation of EE in their classrooms.

While reflecting on barriers to fully implementing EE, research participants also discussed about the requisitions for the full implementation of EE in Korean kindergartens. Participants required systematic, continuous, and gradual provision of educational support for early childhood environmental education. According to research participants, the broad and effective implementation of a new field in educational practice, including environmental education, could be accomplished by emphasis in the National Curriculum of Kindergarten, the provision of educational support in workshops and seminars, and inclusion of the subject into the curriculum at the university. In addition to the provision of educational support, research participants identified the needs of the provision of the various activity books and materials concerning environmental education. Sumi highlighted the effects of appropriate resources on understanding and implementing EE in their classrooms:

> The environmental activity books I previously read were focused on the environmental pollution and protection. The activities in these books seemed to be difficult and boring to young children and to me. The activities, provided by the researcher during this research inquiry, were related to children's daily lives, included various contents of environmental education, and enhanced teachers' understandings of EE. While reading these books, I came to be more interested in EE and confident about implementing environmental activities appropriate to children. (October, 5, 2006)

According to research participants, environmental activity books and materials introducing appropriate topics and activities to kindergarten children provided teachers useful information to teaching EE and improved confidence and interests in implementing EE. For example, some environmental activity books, Sumi read prior to this research inquiry, made her consider EE as a boring and difficult subject to kindergarten children. However, when participants read environmental books and materials provided during this research inquiry, they recognized the possibilities to implement EE in their classrooms. Accordingly, various resources appropriate to early childhood environmental education should be provided to Korean kindergarten teachers.

Reflection on Additional Barriers to Fully Implementing EE during the Research

In the reflection and discussion in the beginning of this study, participants indicated the lack of understandings and awareness of EE and their negative attitudes toward the environment. While participating in this research inquiry, participants also identified the lack of parents' involvement, their excessive reliance on the Kindergarten Education Activity Guide Books, and their strong discomfort about going on a field trip as additional barriers to fully implement EE in the Korean kindergarten context. At first, many research participants recognized the necessity to include parents in environmental

education because of children's following mentions:

> When the children and I discussed the ways to reduce the air pollution, children mentioned walking, riding bicycles, and riding buses instead of using small cars. Whereas many children focused on walking and riding bicycles and refused riding cars, one child said "if my mom and I had heavy luggage after doing grocery shopping, we could not walk or ride bicycle to come home". Children then made decisions to ride cars in cases of having heavy luggage and going to distant places. Then, another child said "my mom rode a car whenever she went to even close places". According to another child, "my mom and father said that they hate to walk because it is so cold in winter and so hot in summer. They always ride a car. I have never seen them riding a bus". (Jungmin, October, 19, 2006)

> In a cloudy day, after discussing the reduction of electricity usage, a child suggested to turn off the lights of the classroom before going to recess. I had always turned off the light of the classroom but the children made a promise to turn off the light from that time. At that moment, another child mentioned that "we always turn on the light of every room at home during the evening and night even when our family is watching television in the living room". (Yujin, November, 2, 2006)

According to research participants, after implementation of environmental activities in schools, children often mentioned parents' different behaviours from EE. Participants believed that because these parents' different behaviours from EE hindered the effects of EE on establishment of children's environmentally appropriate behaviours, teachers should include parents in environmental education conducted in their classrooms.

Environmental educators also emphasized that the involvement of parents was especially necessary in implementing EE because parents' behaviours and attitudes influenced children's active participation in environmental activities and the

establishment of children's attitudes toward the environment (Hyun et al., 2003; the Ministry of Environment, 2006; Yun & Cho, 1993). The following case demonstrated how parents' behaviours influenced children's involvement in environmental activities:

> Whereas many children enjoyed touching and smelling the leaves and soil on the school picnic, some children hesitated about it. According to one child, "My mom said I should be careful about touching anything outside because many animals, insects, and plants are dirty and dangerous." The other children said "If my clothing and hands get dirty, my mom will get angry. So, I don't want to touch soil or lay down on the ground." (Mihee, October, 26, 2006)

As revealed in Mihee's indication, many Korean parents had negative understandings and attitudes toward the environment. Parents thought that most wildlife would have poison, and would be harmful to children. According to other participants, mothers did not like to implement some activities outside in rainy day because acid rain would cause a skin disease. Moreover, some parents prevented children's direct experience of the environment to keep children clean. These parents believed that dirty hands and clothing injured children's physical health. However, children whose parents had negative attitudes toward the environment were reluctant to involve in outdoor activities of EE and revealed passive attitudes toward the environment.

Although recognizing the importance of parents' involvement in environmental education for young children because of the above reasons, most research participants could not include families into EE; as Jungmin mentioned,

> In order to inform parents about the necessity of reducing the usage of cars, children made posters emphasizing walking, riding bicycles, and riding buses to keep the air clean and took the posters home. I also asked children to write the places they went by the car with their parents for three days. However, just 3 children among 20 did it. (November, 16, 2006)

When research participants provided to do simple activities as homework, most children did not do homework. Korean parents mentioned that they were too busy to participate in programs implemented in the kindergarten, because both father and mother had a full time job. In addition, some Korean parents thought involvement in environmental activities was bothersome work, because they were mainly interested in improving cognitive development and academic skills of even young children. Consequently, although children often mentioned different behaviours of their parents based on what they had learnt in kindergarten, most research participants rarely made efforts to involve parents in any activities and programs of environmental education.

The other barrier to fully implementing EE, identified by research participants, was their excessive reliance on the Kindergarten Education Activity Guide Books. The Kindergarten Education Activity Guide Books are provided by the Ministry of Education on the basis of the National Curriculum of Kindergarten to support kindergarten teachers. The National Curriculum of Kindergarten seems to be too broad and obscure to apply in educational practice because it suggests only general outlines and objectives of early childhood education. On the other hand, the Kindergarten Education Activity Guide

Books are useful for planning and preparing the implementation of education in the classrooms because they provide detailed explanations of various activities. Accordingly, most kindergarten teachers mainly referred to the Kindergarten Education Activity Guide Books—not only for designing an educational plan of a school year but also for choosing daily activities.

However, when kindergarten teachers referred to the Kindergarten Education Activity Guide Books, they picked only the activities from this book to implement in their classrooms, and ignored the content and objectives included and emphasized in the National Curriculum of Kindergarten. For example, Yujin reported:

> I passed the National Exam to be a kindergarten teacher of the public school system in 1999. While working in the kindergarten of the public school for around 10 years, I usually referred on the Kindergarten Education Activity Guide Books. Although the new edition of the National Curriculum of Kindergarten took effect on March of 2000, I did not clearly recognize the changes and emphases in it, except the new contents and topics included in the Kindergarten Education Activity Guide Books. (Yujin, October, 5, 2006)

Although Kindergarten Education Activity Guide Books are based on the National Curriculum of Kindergarten, these books provide activities without detailed explanation of objectives and emphasis. Because the National Curriculum of Kindergarten is renewed by the Ministry of Education every five or six years, teachers should read the new edition of the National Curriculum of Kindergarten to understand the recently emphasized subjects, such as environmental education and multicultural education.

However, participants mentioned that most teachers, who relied on these books, did not understand reasons, necessity, or importance of EE, in spite of implementing environmental activities in their classrooms. Many research participants also considered the topic 'Earth and the environment', included in the Kindergarten Education Activity Guide Books, as a topic of EE and only implemented the activities related to this topic. However, research participants had missed the other topics and content of EE included in the various fields of the National Curriculum of Kindergarten.

The last barrier to fully implementing EE was the burden of going on a field trip in the context of Korean kindergartens. The provision of direct experiences in the environment is a significant teaching method for the effective implementation of early childhood environmental education. Hyun et al. (2003) emphasized the importance of environmental education through direct experiences in the environment because these experiences improved children's social relationships and spirit of inquiry, sense of beauty and desire to take care of the environment, and understandings of the value of the environment. Describing the effective teaching methods of early childhood environmental education in the book *Environmental Education Program*, the Ministry of Environment (2006) indicated that "the experiences in the environment are, above all, important in early childhood environmental education…. Kindergarten teachers should

develop children's sensibilities about the beauty of the environment through the direct experiences to feel and touch the environment (p. 16)."

However, research participants believed that they should go field trips to places far from the schools for providing direct experiences to young children, because most kindergartens were surrounded by an artificial environment in Korea. Moreover, participants revealed a strong discomfort about going on a field trip because of following reasons:

> When we go on a field trip, it doesn't matter whether the places are distant or not. Because teachers have the partial responsibility in children's accident and missing happened during school activities, teachers are very nervous and tired from attending to the safety of the children. (Jungmin, September, 29, 2006)
>
> After an accident happened at summer camp to students of another school this year, principals and teachers of this city came to be more careful to plan and go on field trips. In order to go on a field trip, teachers should receive permission of the principal but it became complicated after that accident. (Yujin, September, 29, 2006)
>
> I enjoy going on field trips to indoor places, such as a museum, a botanical garden, and a gallery, but not outdoors. Especially, field trips to natural places make me so tired because it is hard to control the children who become more active in the environment. (Mihee, September, 29, 2006)

Research participants indicated the burden of attending to children's safety, complicated procedures to get permission from the principal, and children's characteristics to be more active in the environment as reasons to avoid going on a field trip to the environment. Most reasons were basically related to attend to children's safety. In the context of

Korean kindergartens, one Kindergarten teacher should take care of 15-20 children in the environment without the support or help of parents and community, except student teachers who were in the kindergarten for one month a year. Participants mentioned that even kindergarten teachers, who were interested in EE, tended to choose environmental topics and activities that could be implemented in the classroom. For example, although kindergarten teachers identified that the development of children's senses, attitudes, and awareness about the environment through direct experiences was an important objective of environmental education for young children, kindergarten teachers preferred to implement recycling and the frugality of water and electricity in the classrooms, rather to go on field trips to the environment.

Actions to Overcome the Barriers to Fully Implementing EE and Changes in Teachers, Children, and Educational Practices of EE

In order to fully implement environmental education in the Korean kindergarten context, research participants made decisions to plan and take actions to develop their awareness and understandings of EE, to improve the information about environmental activities and the implementation of EE in their classrooms, to change their attitudes toward the environment, and to involve parents in EE. This section details which actions participants chose and took to overcoming the barriers to fully implementing

environmental education, and how teachers and children were changed through this research inquiry on environmental education.

Improving the awareness and understandings of EE

Research participants considered the lack of knowledge and awareness of Korean kindergarten teachers as a barrier to initiating the implementation of EE and focused on enhancing their knowledge of environmental education. During the first few weeks participants sought to discover the objectives of early childhood environmental education, the potential topics and content appropriate for young children, and the topics and content included in the National Curriculum of Kindergarten. Research participants planned to acquire the above knowledge by reading about EE and asked me to provide some books describing the objectives, topics, and content of environmental education. In order to choose environmental books which included comprehensive and appropriate content to the Korean kindergarten context, I searched the Korean literature on early childhood environmental education, and provided excerpts from the various books by the request of research participants.

Environmental educators commonly have insisted on the establishment of awareness, attitude, behaviours, and senses of the environment as important objectives

for early childhood environmental education, as well as knowledge and skills (Hyun et al., 2003; The Ministry of Environment, 2006; Yun & Cho, 1993; Yun & Park, 1998). In the beginning of this research inquiry, research participants' understandings of these objectives were limited to establishing children's behaviors, to solving environmental problems, and to protecting the environment. However, understandings of research participants came to be improved by reading and reflection on the objectives of early childhood environmental education:

> I did not know that awareness of the value and the beauty of the environment is included into environmental education and especially emphasized in early childhood environmental education. I had never considered the improvement of children's value, awareness, and attitudes toward the environment as an important objective of EE. (Yujin, September, 22, 2006)

Yujin also identified that ECEE focused on developing children's awareness of value and beauty of the environment and establishing attitudes toward the environment:

> When I considered environmental education just in connection with the environmental problems, I thought it might be difficult and boring to young children. How can I explain water pollution, air pollution, and global warming to young children? However, I identified that EE focused on improving understanding of the beauty and the value of the environment and establishing attitudes toward the environment should be started from a young age. Moreover, EE focusing on the development of children's attitude and awareness of the environment is much more interesting to young children than EE emphasizing the environmental protection and the solutions to problems. (Jungmin, September, 22, 2006)

Jungmin also came to understand importance of the development of children's awareness and attitudes toward the environment in ECEE.

> I really agree with the points of books that the established attitudes and awareness are hard to be changed and influence on later learning in EE. Children could develop the skills and knowledge of the environment and environmental pollutions in the middle and high schools. However, the establishment of the attitudes and awareness might be prior to the acquisition of skills and knowledge. (Mihee, September, 22, 2006)

Mihee understood the necessity to establish attitudes and awareness from a young age because it would be hard to alter later. Mihee also recognized that the development of skills and knowledge regarding environmental pollution and protection needed to be focused on the middle and high school rather than in kindergartens.

When participants understood the development of awareness, attitudes, and sense of the environment as the important objectives of early childhood environmental education, the participants' discussion was extended to the practical difficulties to attain the above objectives in the Korean kindergarten context:

> In order to foster children's awareness of the value and the beauty of the environment and establish the various senses related to the environment, teachers may often provide chances to experience the beautiful and clean environment. Children, who often see the beautiful mountains and rivers through television or direct experience, represent the beauty of the mountain and river in drawing, making, and writing. However, it seems to be difficult to attain these objectives in the polluted environment of our country. Because many kindergartens are surrounded by the artificial environment, teachers and children should go on field trips to the environment far from the school. However, is it possible for teachers to often plan field trips to mountains and rivers within kindergarten educational practices? (Yujin, September, 22, 2006)

Research participants identified the necessity to provide children direct experience in the environment to attain the improvement of children's awareness and attitudes. However,

participants recognized the artificial and polluted environment near schools of Korea, and the difficulties going on a field trip. Research participants, identifying the difficulties in establishing and developing children's awareness, senses, and attitudes toward the environment in the surrounding environment and through field trips, discussed alternative ways to provide chances to experience and feel the environment. According to the research participants, teachers could provide young children direct experiences of the environment during school picnics. Teachers could also provide opportunities for children to directly experience the environment by encouraging parents to travel with children to the environment as often as possible.

After research participants discussed the objectives of early childhood environmental education, they made decisions to read and reflect on possible topics and content of EE described in the activity books. In order to compare and analyze the topics and content provided in various books, research participants prepared the following table through group discussion (Table 3). Through reflection on and discussion of these references, participants identified clean life, water, soil, air, food, animal, plant, the Earth, noise, waste, frugality, pollution, and protection as the potential topics of environmental education for young children. Moreover, research participants noted that each topic of EE consisted of the following content: value and importance of the environment, the

relationship of the environment to children's lives, sense of taking care of the environment, causes of pollution, ways and behaviours to reduce pollution, and attitudes for protecting the environment.

Table 3. The topics of early childhood environmental education

Reference	Activity Book of Early Childhood EE (Seoul Metropolitan Office of Education, 1993)	Activity Program of early childhood EE (Hyun et al., 2003)	The Practice of Early Childhood EE (Donga Kindergarten, 2006)
Topics	• Water • Air • Soil • Noise • Waste • Food • Frugality of resources • Protection of the nature	• Water • Air • Soil • Waste • Animal and plant	• Value of the environment • Soil • Water • Air • Energy
Reference	Program of Early childhood EE (The Ministry of Environment, 2006)	EE in Kindergartens (Yun & Cho, 1993)	Lesson Plan for EE (Sackdong Kindergarten, 2000)
Topics	• Clean life • Protection of pure water • Protection of fresh air • Protection of clean soil • Protection of plants • Protections of animals • Frugality of goods • Reduction of waste • Food • Reduction of noise • Frugality of energy	• The environment surrounding us • Pure water • Precious air • The basis of life, soil • The troubled noise • Waste we are dumping • The beautiful our community, our Earth	•Clean life •Animal and plant protection • Soil pollution • Food • Water pollution • Noise • Air pollution • Reduction of waste • Recycling resources • Frugality of energy • The Earth

While reflecting on and discussing the possible topics and content included in the above environmental books, many research participants identified possibilities for implementing environmental education in connections with children's daily lives and previous activities conducted in their classrooms. Sumi mentioned that "I come to understand that an activity to rinse the teeth using a cup after lunchtime can be related to water" (September, 27, 2006). Jungmin indicated that "a school picnic and field trip might be a wonderful chance for children to smell, touch, feel, and observe the environment because mountains and parks would include plants, animals, water, air, and soil" (September, 27, 2006). Moreover, Yujin described that "I gained the confidence to implement EE through interesting and fun activities in connection with children's daily lives in schools and at home" (September, 27, 2006).

After identifying the potential content and topics of EE through the above books, research participants also intended to reflect on the National Curriculum of Kindergarten. Whereas EE was limited to Inquiry among the five fields of the National Curriculum of Kindergarten in the first group communication, the understanding of research participants about topics and content included in the National Curriculum of Kindergarten were extended to various fields, such as Physical Health, Social Relationships, Expression, and Inquiry. These extensions were based on reviewing the

possible topics and content from the environmental books.

First of all, research participants chose possible topics and content, such as clean life, food, and pollution, from the Physical Health (See table 4).

Table 4. The possible topics and contents of EE selected by the research participants from the Physical Health of the National Curriculum of Kindergarten

Contents	Level I	Level II
<Health>		
7. Cleaning body	Cleaning hands and teeth	Having habits to clean hand and teeth
	Cleaning body	Having habits to clean body
10. Proper eating habits	Knowing the necessity for food	Knowing the relationship between food and nutrition
	Eating a balanced meal	Eating proper quantities of a balanced diet
	Valuing Food	
<Safety> 17. Preparing for pollution or disasters	Considering ways to live safely in a polluted environment	

(The Ministry of Education, 2000)

Many research participants seriously discussed whether cleaning body and food could be topics of EE or not. However, participants eventually included these as topics of EE because environmental educators and Ministry of Environment mentioned that these topics needed to implement in ECEE (Ministry of Environment, 2006; Sackdong Kindergarten, 2000; Seoul Metropolitan Office of Education, 1993). Participants also mentioned that cleaning body could be connected to the implementation of frugality of

water and reduction of using detergent and cleanser later. Moreover, proper eating habit might be related to the reduction of food waste, and valuing food could be connected to valuing the environment as resources of food. Participants mentioned that while emphasizing eating habits and balanced diets during lunchtime, they had never connected them to the value of food or mentioned the relationship between food and the environment.

In the Social Relationships, research participants selected the topics and content of frugality, beauty of the environment, and waste (see Table 5).

Table 5. The possible topics and content for EE selected by the research participants from the Social Relationships of National Curriculum of Kindergarten

Contents	Level I	Level II
<Basic living habits> 3. Living frugally	Keeping and using equipment frugally Using water and Electricity frugally	
<Social phenomena and environment> 15. Becoming interested in conservation of the environment	Knowing the value of a beautiful environment	
	Separating and disposing of trash in assigned areas	Knowing how to reduce trash and acting upon this knowledge Finding and recycling reusable items

(The Ministry of Education, 2000)

Participants were surprised at the inclusion of significant and direct topics and content

for EE in the Social Relationships. Research participants were especially impressed by the inclusion of the topic related to the beauty of the environment – not only in the Social Relationships but also in the Expression – in the National Curriculum of Kindergarten, and recognized the emphasis on this topic in early childhood environmental education again (see Table 6).

Table 6. The possible topics and contents of EE selected by the research participants from the Expression of the National Curriculum of Kindergarten

Contents	Level I	Level II
<Appreciation> 13. Appreciating objects, nature, and formative arts	Appreciating the beauty of objects and nature	

(The Ministry of Education, 2000)

Many participants then became concerned about how and what they would implement to foster children's awareness of the value and beauty of the environment. This concern led participants to implement environmental activities related to these topics later in this study.

Finally, research participants selected animals and plants, changes of natural phenomena, and Earth as potential topics and content for EE from the Inquiry (see Table 7). Although participants identified these topics should be implemented to kindergarten children by reviewing environmental books and the National Curriculum of

Kindergarten, they were still reluctant to implement activities regarding natural phenomena, such as changes of weather, changes of seasons, day and night, and sun and moon.

Table 7. The possible topics and contents of EE selected by the research participants from the Inquiry of the National Curriculum of Kindergarten

Contents	Level I	Level II
<Scientific inquiry> 2. Taking Interest in Living Things	Considering animals and plants	
	Observing animals and plants in their environment	Finding out the particular characteristics of animals and plants that are of special interest
		Rearing an animal or growing plants that are of special interest
3. Finding out about natural phenomena	Observing the changes according to the weather	
	Taking an interest in the change of seasons	Finding out about life patterns changed by the seasons
	Finding out the differences between day and night	Taking an interest in earth, moon, and sun

(The Ministry of Education, 2000)

Participants believed that understanding these natural phenomena seemed to be difficult for young children. Participants also admitted that they did not have enough knowledge of such phenomena. Moreover, some participants indicated that before reflecting on the National Curriculum of Kindergarten in this research inquiry, they did not recognize the

inclusion of these topics in the National Curriculum of Kindergarten. In short, content and topics selected by research participants in the beginning of this study were not very comprehensive or broad. However, the awareness and understanding of research participants about EE improved rapidly over the weeks through referring to environmental books, reflecting on the National Curriculum of Kindergarten, and sharing their ideas in group communication.

Developing the implementation of EE

After improving the understanding and awareness of environmental education by reflecting on some environmental books and the National Curriculum of Kindergarten, participants searched and implemented environmental activities in their classrooms for the development of knowledge and confidence to teach EE. At the request of participants, I provided a few environmental activities related to the next week's topic during group communication. Research participants individually read and reflected on the provided activities for a week and during the group communication collectively planned actions to conduct in their classrooms. Research participants chose and implemented activities appropriate to their situations and students, based on reflection on the provided activities during group communication. Research participants planned and implemented activities regarding weather and seasons, appreciating the beauty of nature, air, plants, and food in

this stud. The following are the results of their efforts in each area.

Weather. Many research participants already had plans to implement an activity about the weather and appropriate clothing to the weather. However, research participants had never considered this topic in connection with EE in spite of implementing it every season. Accordingly, before implementing weather and clothing, research participants desired to provide direct experiences of weather to children. Research participants encouraged children to feel the sky, wind, and sunshine of the fall on the playground of the schools, and discuss the weather of fall and changes in their daily lives associated with the changes of the weather. After implementing the activities of the weather and changes, research participants indicated that although children enjoyed feeling the fall weather on the playground, the responses of children were totally related to summer rather than fall because of the warmer weather. Most children mentioned that the weather, sunshine, and wind were very hot, and they should wear light and short clothes because the temperature of the daytime was over 25℃, which was 3-5℃ higher than the previous year.

Research participants were, at first, surprised at children's responses about the hot weather in the fall. However, research participants agreed with the children's responses and recognized the need to connect these activities with global warming.

Jungmin demonstrated her changed attitude and responses to children's questions through the improved knowledge and awareness of EE during the previous meetings of this research inquiry:

> I also thought that it was hotter than the previous year and complained about the hot weather. However, I did not consider the relation of the hotter weather to global warming and our daily lives. When I listened to children's responses about the hot weather in the fall, I was surprised and wanted to quickly complete this activity. However, I asked why it was so hot. Children and I could not find the exact answers but discussed global warming, such as the hotter Earth using previous knowledge heard from the media. (October, 12, 2006)

Research participants, being aware of the possibilities of connecting the hot weather in the fall with global warming, discussed and searched for potential activities about global warming for effective implementation of the weather. Participants identified the following activities during group communication: encouraging children to ask parents about the changing weather within the last few years, investigating the reasons for the hotter weather with children, and considering the hotter summer and warmer winter in connection with children's favorite things to do in each season. Participants discussed the implementation of activities related to global warming during the next week.

However, research participants made decisions to implement environmental activities of appreciating nature during the following two weeks because most schools went to a school picnic during these weeks. Moreover, participants believed that concepts regarding global warming would be difficult for kindergarten children. For

example, children, especially 3 and 4 years old children, could not understand the changing weather for several years and effects of hotter weather on their daily lives. Participants thought that it might be more appropriate for kindergarten children to feel the different weather and the relationship between current weather and clothing than to learn global warming.

Appreciating the beauty of nature. Korean kindergartens usually go on a school picnic in the spring and the fall. While participating in this study, research participants developed a plan to go on a school picnic to a mountain or a park. Research participants wanted to provide children the chance to appreciate and feel the beauty of the environment during the school picnic. Children listened to the sound of the environment, smelled, and touched the environment. Children described the various sounds of birds, winds, and trees they listened to in the environment with closing eyes, as follow;

- I heard the sound of birds.
- Rustling rustling, hissing hissing, whistling whistling, and crunching crunching.
- I listened to the sound of soft rustling and the sound of a chick.
- I heard the sound of raining.
- I heard the sound of pattering.
- It was so good to hear the sound of crisping crisping.

Although it is hard to perfectly translate children's responses in English, children vividly described various sounds of the environment. Children used their faces, arms, bodies to represent different sounds. Children also made the different voices to describe different

sounds. While representing various sounds, children revealed their appreciation of the environment felt through hearing in the mountain. Children were also interested in the smell of the mountain;

- It was sweet and cool.
- I could smell of trees.
- When I smelled the mountain, the inside of my nose was so cool.
- The smell of the mountain was different from that of the city, but I cannot say it.

Differing from various and vivid representation of sounds, children were hard to express their appreciation of the smell in the mountain. However, children really enjoyed smelling of the environment, and some children felt the different smell of the pure environment and polluted environment. Some research participants encouraged children to feel trees while closing their eyes. Children represented their feelings as follows;

- The tree I touched was rough-ey rough-ey.
- The tree was thick and rugged.
- It was smoothey smoothey and hard.
- The trunk was rugged and leaves were smooth.

Most children enjoyed hugging and touching the different parts of trees, such as the trunk, the branches, and leaves. Children represented different feelings of the trunk and leaves of trees. Research participants reflected that these activities were simple and easy, but children had a great time to feeling the environment with their various senses more than any other activity. Yujin mentioned “I cannot forget children’s interested and curious faces whenever touching, smelling, and listening to the environment. I was also

impressed with children's various and vivid representation of their feelings." (October, 26, 2006). Research participants identified the necessity and importance of providing children chances to feel the environment and to appreciate the beauty of the environment.

Plants. In order to develop children's awareness of the surrounding environment, participants planned to implement environmental activities using the trees at the school. Each child chose a tree as his/her own and observed, named, and took care of it for a week. According to the reflections of research participants, many children seemed to be embarrassed by the teacher's suggestion, because participants had rarely provided these types of activities to children. However, most children enjoyed observing, touching, and naming their own trees. Moreover, research participants were impressed by the changes in children's drawings after the close and concentrated observation of the trees. Before the implementation of these activities, most children had drawn trees using a similar pattern – regardless of the season or location (see Figure 2).

Figure 2

However, children involved in this activity represented specific characteristics of trees, acquired by the use of various senses, in drawing and naming of their own trees (see Figure 3).

Figure 3

According to the children who drew each picture, the first tree was named as the ‘tickling tree’ because this tree tickled her hands and face when she touched it (see Figure 3-A). The second tree was named the ‘beautifully glittering tree’ because the leaves were shining when the wind blew (see Figure 3-B). The last drew a picture of the ‘pencil scent tree’ because the scent of her tree was similar to the smell of a pencil (see Figure 3-C). In addition to the above pictures, other children gave various names to their trees. For example, one child called his tree ‘the insect tree’ because it had many insects, and other children named their trees based on the shapes, such as ‘the sharp tree’, ‘the basket tree’, ‘the longish tree’, and ‘oasis tree.’

Children selected, on their own, the following ways to take care of their own trees: hanging a name tag, hugging the tree, reading a book to the tree, singing a song for the tree, and giving water to their own trees. Children came to their own trees and did an activity during lunchtime or the break for a week. Participants reflected that while participating in these activities, children totally considered the trees as living lives and enjoyed taking care of a tree like a baby. Many research participants also recognized that the trees, just having been in the schools without receiving any attention from children and teachers, could be an interesting topic of environmental education to foster an awareness of the surrounding environment and to provide children the chance to directly observe, feel, and take care of plants.

Seasons. Research participants, who identified the possibilities for including the environment surrounding children and schools into EE, made a decision to implement these kinds of activities again. Because it was late fall and there were many fallen leaves in Korea, participants planned to gather and observe the fallen leaves from the playground of the schools, in an attempt to provide children the chance to feel the changes of trees by the changes of seasons. Participants had implemented activities to gather and make other products with the fallen leaves every fall, but had never focused on the fallen leaves, the changes of trees, and the changes of seasons. Accordingly,

research participants provided children enough time to observe, feel, and discuss the fallen leaves.

In addition to the activities naming my trees implemented in the previous week, the close observation and direct experience of the fallen leaves promoted children's awareness and attitudes toward the environment; as Sumi described,

> In order to compare a living leaf and a fallen leaf in the classroom, I asked children to pick a leaf from the trees. However, children strongly prevented picking a leaf and a child shouted, "No, if we pick a leaf, the tree will be in pain like pulling out our hair". Another child then said, "Probably, it will be painful like broken arms". I was so surprised at children's resolute manner to prevent picking a leaf and ashamed to think that it was okay to pick a leaf from trees for using as a teaching material. (November, 16, 2006)

During this research inquiry, children came to consider trees as a living thing. In addition to the above child, many children often described the fallen leaves and trees as being sick, dying, or being cold during the implementation of environmental education.

Some research participants also demonstrated children's improved awareness of the surrounding environment during the observation and direct experiences of the fallen leaves. According to one participant, children's drawings came to be more detailed after observing and feeling the leaves fallen in the playground (see Figure 4).

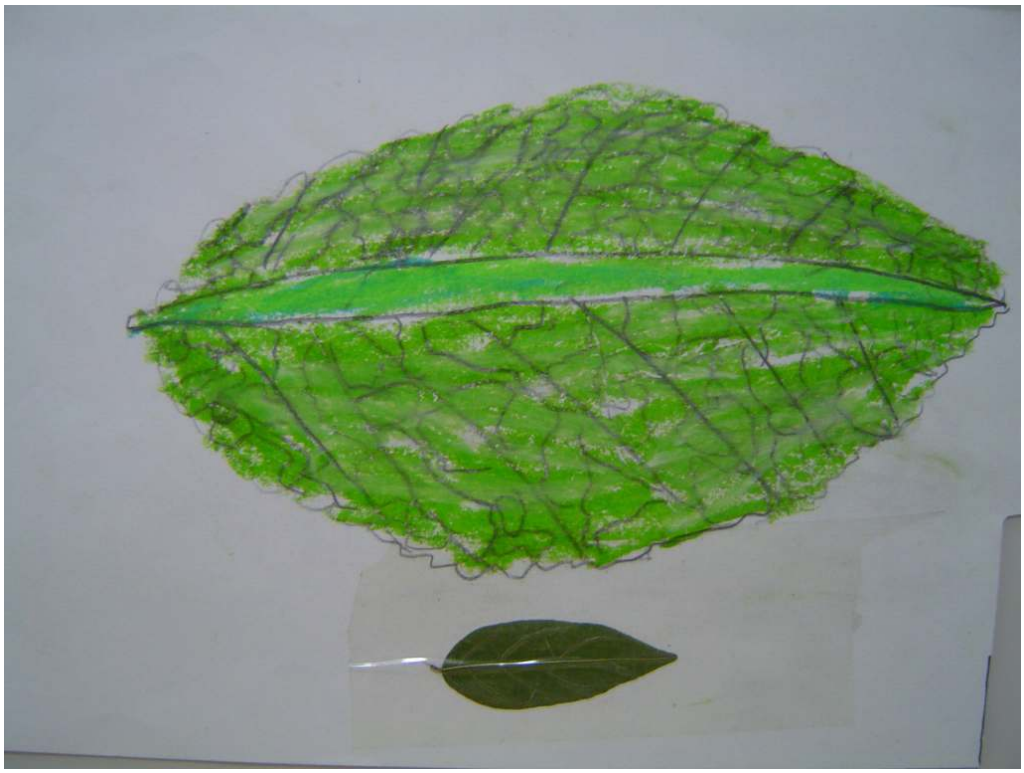

Figure 4

Most children had previously described the leaves in a simple and similar way. However, as described in Figure 4, children participating in the environmental activities depicted even the small parts of leaves in detail. Moreover, participants indicated that while observing and discussing the characteristics of fallen leaves, children identified the similarities and differences of fallen leaves seen in schools and in other places.

> When children gathered and observed the fallen leaves in the playground of the school, a child mentioned that “oh, here are all brown fallen leaves. I saw a lot of yellow fallen leaves when I went to mountain with my family.” The other child then said that “these fallen leaves are long and big, but I saw the fallen leaves in the shape of hands in the street. The hand fallen leaves were red and smaller than these leaves.” (Jungmin, November, 16, 2006)

> When I asked children about the feeling of fallen leaves, many children mentioned that these fallen leaves were rough because these leaves were very dry. A child then whispered that "the fallen leaves I gathered in my grandma's garden were soft and wet". (Yujin, November, 16, 2006)

Children's above mentions implied that children came to be aware of differences and similarities of the distant environment. It also implied that children could understand environmental education regarding the distant environment beyond the surrounding environment.

Children were also curious and asked about the differences between the deciduous trees and the pine trees standing next to each other in the playground of the school. Many research participants mentioned that they were perplexed by the children's questions about the different types of trees, deciduous trees and pine trees, because of their insufficient knowledge. However, participants recognized the necessity of seeking ways to deal with the above situations rather than avoiding implementing EE. Participants easily and simply explained what they knew, or admitted their insufficient knowledge and made the promise to find answers with children in the future.

After sufficiently observing and feeling the fallen leaves in the environment, children's products with the fallen leaves were more related to the environment they experienced (see Figure 5 & 6).

Figure 5

The child who created the image in Figure 5 indicated that he represented an ant, trees, and a butterfly with the fallen leaf. He mentioned that when he observed and gathered the fallen leaves, he saw ants crawling on the fallen leaves and butterflies sitting on the trees.

Figure 6

The child who created the image in Figure 6 described that he made the flower cosmos fully blooming in the playground of the school while observing and gathering the fallen leaves. The above representation of children demonstrated that environmental activities directly experienced in the playground improved children's awareness of the surrounding environment. According to participants, children and participants gathered the fallen leaves and made products every year, but children made products regardless of the environment, such as a sunglass, a knife, a house, or a bag. However, most children,

who sufficiently observed and experienced the fallen leaves, made products related to the environment what they observed in the environment.

Air pollution. Many research participants already had a plan to implement the fifth-day system of the car[14] in their classrooms as an activity of the topic, "transportation." When I encouraged research participants to think about the potential topics of environmental education associated with the fifth-day system of the car, research participants mentioned that they never considered the implementation of the fifth-day system of the car in relation to environmental education. In order to acquire some ideas of environmental topics regarding the fifth-day system of the car, research participants reviewed environmental activity books.

After reviewing environmental activity books, Jungmin indicated that "I think the most serious environmental pollution is air pollution in Korea…. From the environmental activity books, I understood that one way to protect air is the reduction of usage of cars" (November, 15, 2006). In addition to air pollution, research participants

[14] The fifth-day system of the car is operated to lessen the usage of cars in Korea. It prevents the usage of cars from Monday to Friday according to the last number of the car number. In other words, one whose last numbers of the car are 1 and 6 should avoid riding his/her car on Monday. Although this system does not have a strong legal effect, many people working in public buildings, schools, and some companies are encouraged to keep this system. The tenth-day system of the car is a similar system but prevents the use of cars on the day with the same last number of the car from Monday to Sunday.

identified the frugality of energy and noise as potential environmental topics for the fifth-day system of the car because the decrease of energy usage, noise, and air pollution might be reasons for operating the fifth-day system of the car in Korea. Research participants decided to implement the fifth-day system of the car in connection with the topic of air pollution. Most activities about air, included in the environmental activity books, were related to the value of air, causes of air pollution, and ways to solve problems associated with air pollution. Research participants planned to support the fifth-day system of the car as a way to decrease air pollution.

According to the reflections of research participants during group communication after taking actions in their classrooms, the topic of air pollution and the fifth-day system of the car was difficult for 3-4 years old children. Research participants, teaching 3-4 years old children, explained the fifth-day system of the car to students by observing the notice board about the fifth-day system of the car at the front gates of schools, and discussed air pollution with pictures illustrating that many cars polluted air by fuming out exhaust. However, 3-4 years old children rarely understood the concept of the fifth-day system of the car and air pollution because of children's insufficient understanding of numbers and the causes and effects of air pollution. Accordingly, many research participants teaching younger children completed this action by explaining the

fifth-day system of the car, the causes of air pollution, and ways to decrease it.

On the other hand, 5 years old children actively involved in discussions and activities about the fifth-day system of the car because most 5 years old children had knowledge of air pollution and a basic understanding of numbers. For example, although research participants added one or two causes of air pollution, children mentioned smoke from burning waste, the exhaust gas of factories and cars, and yellow sand phenomena[15] as significant sources of air pollution. While reflecting on children's responses to causes of air pollution, participants agreed that yellow sand phenomena caused air pollution. When I asked whether yellow sand phenomena caused air pollution or not, participants began to reconsider it. After group communication, research participants teaching 5 years old children informed that yellow sand phenomena was a natural phenomena and was not a cause of air pollution.

Children also identified recycling and reduction of waste, following the fifth-day system, and planting trees as the ways to protect the air through discussion and environmental activities. Research participants encouraged children to write poems related to the fifth-day system of the car, to make webs of promises to decrease air

[15] It is phenomena that small sand, yellow sand, and dust blow from the desert and yellow earth of the Continent of Asia to distant areas. It is usually observed in Korea between March and May every year. It is a natural phenomenon but children think it is a cause of air pollution because it seems to make the air impure.

pollution, or to draw posters informing others about the fifth-day system of the car.

While implementing the above activities in their classrooms, participants recognized the possibilities and the importance of connecting children's previous knowledge with environmental education, the differences between 3-4 and 5 years old children, and the improved knowledge and confidence of teachers. At first, many research participants indicated that children remembered the previous implementation and discussion more than teachers thought:

> Emphasizing the reduction of waste and paper usage a few months ago, I had explained that black smoke, produced by burning wastes, polluted the clean air, and that dumping out the wastes into the soil contaminated the soil because of non-biodegradable garbage. When children and I discussed the causes of air pollution last week, I had forgotten it but many children remembered and mentioned the previous explanation. (Yujin, November, 22, 2006)

> While discussing the ways to protect pure air, I asked children the question, "Why should we plant trees?" Sooner or later, children remembered the discussion, shared on Arbor Day[16], about planting trees to keep the pure air and connected planting trees with the ways to decrease air pollution. (Mihee, November, 22, 2006)

Research participants were surprised at children's remembrance of previous implementation and interested in possibilities to introduce new information in connection with previous knowledge. This previous knowledge was useful for children

[16] The Arbor Day is the day to plant trees. Although it was a holiday in Korea, it was excluded from the official list of holidays several years ago. There are various school and family event to plant trees on Arbor Day.

to understand and involve in EE because many topics of EE were related to children's surroundings and daily lives. For example, when children remembered that they planted trees on Arbor Day to keep the pure air, children more easily understood this way to protect pure air than other ways.

Research participants teaching 3-4 years old children were dissatisfied with their implementation and were apologetic to me. However, I emphasized that this research inquiry was not intended to satisfy my purposes, but to improve participants' understandings and educational practices regarding EE. I then asked a question about what they had learnt while implementing it in their classrooms. Participants mentioned that in light of the different responses of children to the implementation of environmental activities, children's understandings and attitudes towards the environment were established and improved very quickly between the ages of 3 and 5. Moreover, participants discussed the necessity for selecting different topics and content of EE according to the age of children. For example, "teachers can implement causes and ways to reduce air pollution to 5-year-old children. However, the value of air and the appreciation of air may be more appropriate to younger children than air pollution" (Jungmin, November, 22, 2006).

Finally, research participants noted that the review of provided activities was

very helpful for implementing EE because they could acquire more exact and varied knowledge of environmental pollution, as well as information about environmental activities. Sumi stated that “actually, I did not know clearly the causes of air pollution and the ways to solve it before I looked over the activities. While preparing and implementing activities related to air pollution, I acquired a lot of knowledge” (November, 22, 2006). Participants also mentioned that improved and exact knowledge of the environment made them feel comfortable and confident in implementing environmental activities and involving children in the discussion.

Food. Many research participants were already implementing activities related to the topic of food during lunchtime. However, these activities were focused on eating all of the school lunch. While reflecting on the possible topics and content of EE for young children during the first several weeks, research participants were interested in the topic of food included as a topic of EE in many environmental activity books (Sackdong Kindergarten, 2000; Seoul Metropolitan Office of Education, 1993; The Ministry of Environment, 2006). In these books, the topic of food was related to the value of food, eating habit, the relationship between the food and the environment, and food waste.

After reviewing the above books, research participants firstly recognized the food as a part of environmental education:

> I repeatedly talked to children to have all of the meal provided in lunchtime. I did not discuss with children about the value of having balanced meal…. I never considered the relation between food and the environment. I came to know that a lot of food being good for our health comes from the environment such as plants and animals of sea, mountain, and river. (Yujin, December, 2, 2006)

> If children understand that food is important for their growth and health, they may have all food without avoiding the reluctant food. And if children know that the valuable food for our health comes from the environment, they would have mind and behaviours to protect the environment. (Sumi, December, 2, 2006)

Although Yujin and Sumi had difficulties to understand food as a topic of EE in the beginning of this research inquiry, they came to identify the necessity to implementing the value of food and the relationship between food and the environment in kindergartens. Participants recognized that if children understood the value of food for our physical health, children would recognize the value of the environment because most food came from the environment.

In order to foster children's awareness of the value of the food, research participants teaching 3-4 years old children asked, "if we do not take food, what will happen to you?" Children discussed about the results of having insufficient and unbalanced food in relation to their health and growth (see Figure 7).

Figure 7

Children in Figure 7 commented that they would go to hospital, be hungry, die, be tired, be skinny, catch a cold and feel a headache, and be hard to study and run well. Children's worry about being healthy so that they cannot study, among the above comments, implies the expectation of Korean parents towards education, even for 3-4 year-old children. Some parents might often mention the necessity of having sufficient and balanced meals to these children for being healthy and studying well. 5 years old children identified more detailed and comprehensive information about the relationship between food and nutrition. For example, according to the discussion of 5 years old children, fish strengthened the bone, oranges and pears helped us overcome a cold

because they have a lot of vitamins, apples made the skin beautiful, and meat helped us grow up strong.

Through the above discussion about the value of the food, children recognized the importance of every food for their health and growth and understood the necessity of balanced diets.

> My mom always says that I should eat a lot of vegetable. However, I don't like vegetable. Especially, I hate the taste of carrots and onions. During the discussion about food, I know that I should eat various foods including carrots and onions to be a healthy adult like my mom. (Ayoung, December, 2, 2006)

As Ayoung commented, most children mentioned vegetables, such as mushrooms, cucumbers, peppers, onions, and carrots, as their reluctant food to eat. Participants and children discussed about their reluctant food to eat and made a promise to eat every food including their reluctant food at lunchtime in the school and at home. According to the research participants, although children already acquired various knowledge of the food from the community, their parents, and teachers, children did not recognize the importance of a balanced diet because of the insufficient understanding of the value of food and nutrition.

In order to inform the relationship between food and the environment, research participants asked, "What did you [children] eat in lunchtime?" "Where does lunch food come from?" Many children mentioned that food came from the market. For example,

Jiyoung mentioned that “I had the vegetable soup, meatballs, egg rolls, and milk in lunchtime. My mom went to a big market and bought vegetable, meat, and milk everyday” (December, 2, 2006). However, some children indicated that food came from the farm and the sea. According to Minsu, “vegetables come from the farm. My father often says that farmers work so hard to grow rice and vegetables. So, we don’t have to leave food and should eat every food” (December, 2, 2006). Juyoung commented that “Fish comes from river and ocean. My family often goes to fishing. If my father catches big fish, mom makes the fish stew with this” (December, 2, 2006). Some children and participants also shared their experiences of gathering wild vegetables in the mountain, fishing in the sea and river, gathering fruits and mushroom in the farm, and observing the cultivation of seafood. The above discussions were connected with the protection of the environment, such as sea, farm, mountain, and river, providing valuable food for our health.

Changing attitudes toward the environment

Participants of this research inquiry identified their negative attitudes toward the environment as a barrier to fully implementing EE in their classrooms. Participants believed that teachers who had negative attitudes toward the environment were not competent to teach environmental education. In order to change and overcome their own

negative attitudes toward the environment, participants planned to participate in touching, smelling, and feeling of the environment. Research participants intended, first of all, to feel and touch the plants, because most of them had more negative attitudes toward insects and animals than plants. Participants actively involved themselves in touching, smelling, closely observing the trees, listening to the sounds of the environment with closed eyes, and feeling the wind and sunshine while implementing environmental activities with their students.

Research participants enjoyed participating in the above activities and shared their feelings to touch, listen, smell, and observe the environment in group communication. Mihee tried to experience a tree in her school:

> When I touched a pine tree in the playground of the school, the trunk was hard and rough, but the leaves were soft and smooth. When I approached the tree to touch it, I also could smell the pine resin and leaves. I sometimes had smelled the pine resin when I had passed by the pine trees. However, it was the first time to enjoy the smell of the pine tree for a while and feel it so good. (Mihee, November, 8, 2006)

Mihee usually ignored trees in the playground of the school. However, direct experiences to touch and smell a pine tree prompted her appreciation of the surrounding environment. Jungmin indicated her feeling to touch the trees in the mountain:

> While touching the trunk of the trees in the mountain during the school picnic, I recognized that the shapes of the bark of trees were various. I considered that the bark of trees were rough, but never thought that it would be different from each other. Moreover, the feeling to touch was different by the shapes of bark of each

> tree. It was so interesting to touch the trees with my hands. (Jungmin, October, 19, 2006)

Jungmin experienced different feelings of different trees by touching the trunk of various trees in the mountain. This experience was a wonder to Jungmin and encouraged her interest in direct experience of the environment. Yujin focused on listening to the sound of the environment in the park:

> It was new experience to listen to the sound of the environment with closed eyes. When my eyes are open, I might rarely listen to the sounds of the environment because I might focus on the sight more than sounds. However, I could listen to the sounds of birds, wind, and the movement of trees with closed eyes. Through the sharing with children I identified that each person listened differently to the same sound of the environment, and each person caught the different sounds from the same places. (Yujin, October, 25, 2006)

Listening to the sound of the environment could be hard to do in the surrounding environment in Korean kindergartens because of the noise of cars and people. During the school picnic in the park, Yujin intended to listen to the sound of the environment with closed eyes. She was surprised at listening to the various sounds that were hard to recognize with open eyes. Yujin also experienced the wonder of the environment because she and children could differently listen to the same sound and caught the different sounds from the same environment. Sumi also involved in the close observation of a spider's web in the mountain;

> When closely observing the tree, I saw a spider's web. Before I participated in this research inquiry, I ran away from the spider's web because I believed that the spider's web existed in dirty and messy places. Moreover, I hated to see

> spiders. However, thinking about the spider's web and the spider as the parts of the environment, I endured and closely looked at it for a while. I was then surprised at the marvelous support power of the fine silk of the spider's web. Moreover, the spider's web shining by the sunshine was even beautiful. (Sumi, November, 8, 2006)

During the close observation, Sumi felt the beauty of the spider's web shining by the sunshine in the mountain. This experience and improved awareness of the environment changed her previous attitudes toward the spider's web considering as the messy and dirty environment to a part of the beautiful environment.

Research participants agreed that it would be difficult to quickly change their attitudes, but identified the changes in themselves towards the environment through the participation in directly touching and feeling it. Participants mentioned that improved interests and changed attitudes, in spite of still being somewhat insufficient, provided them the confidence that they could implement EE. In addition, participants indicated that although some teachers had negative attitudes toward the environment, teachers could have chances to change their attitudes and awareness of the environment through the implementation of EE in their classrooms.

Involving parents in EE

While implementing EE in their classrooms, participants came to recognize the necessity of involving parents in EE for young children. However, participants also identified the inactive participation of parents and the insufficient efforts of teachers to

involve parents in environmental education implemented in the kindergarten. Research participants discussed the following potential ways to foster parents' interest and involvement in EE based on the environmental books during group communication: the provision to parents of the weekly plan describing environmental activities, the request to bring materials that are needed for environmental activities from home, the provision of some environmental activities that require students to work with parents, the invitation to parents to attend a small exhibition of the children's productions related to EE, the invitation to parents to be a daily teacher for EE, the invitation to parents to participate in a yard sale at the school, the encouragement to go on a family picnic to the environment, and the provision of information on environmental campaigns, workshops, and activities provided by Korean environmental associations.

In order to encourage interests and cooperative support of parents in EE, research participants planned to send home children's products (see Figure 8 & 9).

Figure 8

The child who created Figure 8 wrote a poem about the fifth-day system of the car to their parents. The poem was “today is Wednesday. Today is 20th. So, do not move the cars whose last number is 0. Mommy and daddy, please keep the rules!”

Figure 9

The child who created Figure 9 made posters describing the last number of the car that should keep the fifth-day system of the car from the Monday to Friday. Children's products in Figure 8 and 9 revealed that children also recognized the necessity for parents to involve in environmental activities, such as the fifth-day system of the car. When participants asked children to draw anything related to the fifth-day system of the car, most children produced posters and poems to send to their parents. In addition, children and participants promised to check the dates which parents should keep the fifth-day or tenth-day system on the calendar at home if parents might break the rules of the fifth day system..

Children's products and discussions about environmental activities, such as Figure 8 and 9, stimulated parents' awareness and interest in the environment. During group communication, research participants indicated the effects of children's products and mentions on improving parents' interests in environmental activities:

> After I sent children's poems and poster of fifth-day system of the cars to parents, some mothers mentioned that they knew the fifth-day system but did not follow it because it was uncomfortable. However, mothers said that when they received children's products and children asked to follow the fifth-day system of the cars, they were surprised and ashamed to their child. And some mothers mentioned that they tried to follow the fifth-day system as much as possible. (Jungmin, December, 10, 2006)

Mothers of the above quotation mentioned that through children's products and mentions they could understand environmental activities conducted in kindergartens. Mothers also pointed that children's products awakened them to keep the fifth-day or tenth-day system of cars, because they forgot the fact that they should keep this system. These findings are supported by mentions of Ballantyne, Fien, and Packer (2001) "young children can influence everyday household practices such as walking or riding a bike to school, taking shorter showers, turning off taps and lights, and purchasing environmentally friendly cleaning products" through sharing their learnings and attitudes with their parents (p. 14). Research participants also made decisions to send the pictures of trees with name tags, made and hung by children on their own trees, to the parents at the end of term with other pictures. Participants believed that parents might be more interested in

EE through the children's products and mention of environmental activities than through teachers' emphasis on the importance and necessity of environmental education.

Moreover, Ballantyne, Fien, and Packer (2001) indicated that "programs can be designed to involve parents in activities such as homework assignments, research activities, and class presentations. These activities stimulate intergenerational communication that is potentially educative for parents and students" (p. 14). Vaughan, Gack, Solorazano, and Ray (2003) also elucidated that collaborative learning through "the use of coloring books and homework was important to effectively transfer informal knowledge from teachers to children to parents" (p 16). In order to encourage intergenerational communication and collective learning of parents and children in EE, participants of this research inquiry also provided simple and easy activities to parents being in the environmental education situation. For example, participants encouraged parents, who participated in the school picnic, to be involved in the environmental activities of touching, smelling, and listening to the environment with children at the mountain. Research participants described that many parents did not participate in the school picnic and were reluctant to become involved in environmental activities in the beginning. However, parents involved in environmental activities were interested in the different feelings in the environment and enjoyed directly experiencing the environment

during the school picnic. Although research participants could not take various actions to involve parents in environmental education because of parents' busy schedule and expectations to other subjects, research participants identified the possibility to improving parents' involvement in EE by continuous efforts to send children's products, to encourage children's mentions of EE at home, and to provide simple and easy collaborative learning experience to parents being in the EE situation.

In summary, the participants' understandings and awareness of EE were related to the protection of the environment and the solution of environmental problems in the beginning of this study. Moreover, EE was implementing about the specific topic, through a few activities, and for a short time. During group communication, research participants identified the following barriers preventing the full implementation of EE in their classrooms: a lack of knowledge, negative attitudes toward the environment, the lack of parents' involvement, teachers' excessive reliance on the activity books, and the burden of going on a field trip.

In this research inquiry, research participants mainly improved their knowledge of EE and the implementation of EE by reviewing environmental books and taking activities in their classroom. Participants also tried to change their negative attitudes toward the environment by involving in direct experiences of the environment with

children. Participants encouraged parents' interests and involvement in EE by sending children's products regarding the environment and providing easy and simple activities to parents being in the environmental education practices. In addition, participants identified children's changing attitudes toward the environment, improving understandings, and developing abilities while participating in environmental education. Some parents also revealed their improved awareness and interests in environmental education implemented in kindergartens.

Chapter 6

Implications

This chapter includes the discussion about the results of this research inquiry and provides suggestions for future research regarding environmental education in the context of Korean kindergartens. I discuss, at first, about adaptation of critical action research to the Korean kindergarten context. Next, I emphasize the necessity and importance of early childhood environmental education on the basis of the results of this research inquiry. Finally, I describe the professional development of Korean kindergarten teachers in early childhood education. I close the description of this research inquiry with recommendations and implications for future research of environmental education.

Adaptation of Critical Action Research to the Korean Context

Critical action research was initiated and developed in several Western countries, and this cultural context has created difficulties using action research with Korean kindergarten teachers. For example, most processes of critical action research are conducted through collective communication (Carr & Kemmis, 1986; Kemmis & McTaggart, 1988; Kemmis & Wilkinson, 1998). However, Korean kindergarten teachers

are very uncomfortable in group discussions; this was especially an issue at the beginning of this research inquiry. This discomfort may be due to the cultural differences between Western countries and Korea.

Korean communicative culture tends to be based on emotion, authoritarianism, and written language (Choi, 2002; Park, 2003). During communication, Koreans typically first consider their emotions and degree of intimacy with whom they are speaking, rather than trying to be objective and rational (Park, 2003). This tendency means that most Koreans communicate personal issues only with close acquaintances. Koreans who are adapted to this communicative culture often feel uncomfortable becoming involved in discussions requiring them to rationally and objectively analyze issues and solve problems (Park, 2003). At the start of this research inquiry, research participants also displayed this tendency. Participants were not familiar with collective communications involving rational reflection and decision-making. Instead, participants were most comfortable chatting and having individual discussion with their close friends.

The next characteristic of the Korean communicative culture is that communication is related to authoritarianism by position, age, and gender in the job, school, and family (Park, 2003). Koreans have learnt for a long time that the younger people, women, and people in lower positions should follow the advice and direction of

the elders, and of those in higher positions. This idea influences every aspect of Korean communication. For example, if someone always expresses their ideas sufficiently and seeks to discuss ideas seriously with older people and people in higher positions, people consider this person to be rude and stubborn.

This communicative culture is also applied to the relationships between men and women in the job and family, and between teachers and students in schools. Women have more difficulty achieving the higher positions than men because of the distinction of gender in the work place. Women are also forced to obey their husbands and fathers at home (Choi, 2002). Students are mostly expected to listen to lessons and follow the rules and directions of teachers in schools. Research participants of this research inquiry were women in families, were students from elementary school to university, and were in a lower position than principals in the job. Accordingly, participants did not have the various experiences to sufficiently express their ideas and to actively participate in group communication. In their role as kindergarten teachers, these women were unlikely to even develop the skills of group communication.

The Korean communicative culture also relies more on written language than on spoken language (Park, 2003). This characteristic of Korean communication is caused by the educational system of Korea. Students represent their ideas and knowledge through

homework and reports in school. Students' improved knowledge and understandings are evaluated by written exams. Presentation and group discussion during the class do not have significant value to teachers and parents. Research participants of this research inquiry were also educated in the above educational practices, and intended to represent their ideas and opinions by written language. In a word, research participants in this study were unfamiliar with how to collectively reflect, analyze, and solve the issues that occur in schools, at home, and in jobs. Participants were, rather, more accustomed to answering questions, listening to the advice and explanation of others, and sharing ideas individually.

Research participants also felt difficulties in participating in the group communication because of our communicative culture. Nevertheless, critical action research by group communication was valuable in the Korean kindergarten context in that it provided more practical research applicable to the educational practices and improved the confidence and pedagogical knowledge of Korean kindergarten teachers. Research participants identified that previous educational research in Korean kindergartens was mainly done under the direction of university-based researchers, not through a partnership between teachers and researchers. According to Sumi,

> I did not think that academic research was conducted *with* the university-based researcher. It was always regarded as the work *by* the researcher. Teachers just

> provide some time, places, and information researchers needed to collect data for academic research. Therefore, we do not need to discuss with the researcher for a long time about implementation, problems, and educational context….Because many teachers also believe the excellent capacity of university-based researchers in doing research, teachers do not want to provide their opinions of research to researchers. We believe that it is researcher's work. (October, 19, 2006)

Sumi's comments considering research as researcher's work imply that the authority between the university–based researcher and teachers is clearly separated into doing research and teaching children, although these two works are conducted in the same educational practice. During participation in academic educational research, teachers usually implement some activities designed by the researcher, follow the requests of researchers, answer some questions, and involve in the surveys. Researchers also avoid observing teachers' teaching or discussing anything unrelated to their research. Accordingly, the results of previous research conducted under the above context were often not applicable to kindergarten practices.

In addition to the communicative culture, this separation of authority between the researcher and teachers provoked participants to feel strong discomfort towards participating in group communication with the academic researcher, and this initially hindered the authentic involvement of participants in this research inquiry. Although this critical action research inquiry could not absolutely overcome the difficulties caused by Korean communicative culture and the separation of authority, this research inquiry

provided research participants a chance to participate in group communication to reflecting on individual and educational situation, making decisions about possible activities, and planning actions. This research also offered the opportunity to foster teachers' interests and partnerships in educational research and to provide research results appropriate to kindergarten practices.

Critical action research by group communication also encouraged empowerment and confidence to research participants in this research inquiry (Carr & Kemmis, 1986). Research participants indicated that through group communication they could collectively discuss, reflect, and solve the educational problems that they would not have attempted on their own (Carr & Kemmis, 1986; Stringer, 1996). Because these issues were related to social demands and parents' expectations on academic development, teachers previously left these problems to the care of government experts. For example, Yujin mentioned that "how a teacher can change parents' expectation of improving cognitive development and academic skills caused by the excessive competition of university entrance exam in Korea" (October, 27, 2006). In addition, "if the Ministry of Education asks kindergarten teachers to do some activities and works, such as the sheets of activity outcomes, teachers should do it in spite of having a lot of complaints" (October, 27, 2006). However, through the agreement and encouragement of other

teachers in group communication, participants acquired the passion and confidence to approach these issues. Research participants of this research inquiry then planned actions collectively and implemented some actions in their classrooms. Participants recognized that although educational problems related to social and parents' demands were hard to change in a short time and with an individual action, reflection on these problems and the implementation of actions to solve them through critical action research would be a small step for future changes in Korean kindergarten practice. The pride that research participants acquired from this approach to educational problems and actions provided them ownership of their teaching, educational practices, and educational issues.

Another merit of using critical action research in this research inquiry was the promotion of participants' knowledge for better pedagogy of environmental education. Jungmin provided an example how group communication improved participants' knowledge of EE:

> Because I had taught 3-4 years old children for a few years, I knew the differences between younger and older children in kindergarten. I also believed I understood proper approaches to the different age group. However, during group meetings, I recognized that children's understandings and background about environmental education were much more different according to the age than I thought. As I involved into group communication, I acquired a lot of information, such as topics, activities, and resources of EE, appropriate to different age group. (November, 22, 2006)

Although Jungmin believed that she had sufficient knowledge about different age group,

she faced difficulties in implementing EE to young children. Through group communication, Jungmin could listen to teachers' advices and information for the implementation of EE to different age group. Moreover, while planning for and reflecting on actions and activities to be implemented in their classrooms during group communication, participants could share various information and ideas related to teaching and learning environmental education. As Jungmin and other participants described, the improved knowledge from colleagues through group communication promoted better pedagogy of environmental education in kindergartens.

Participants in this research inquiry also indicated that they could acquire various teaching methods through critical action research. For example, participants learned ways to select and plan activities appropriate to their situations and children, to respond to children's questions, to introduce a new and difficult knowledge easily to children, and to acquire materials and resources. Some issues were not discussed directly, but many teachers indicated the influences of group communication on the improvement of their knowledge regarding teaching methods. In a word, critical action research by group communication provided the chance to share information about different age groups, teaching methods, and resources and materials; thus playing a significant role in the development of better pedagogy, not only of EE but also overall in the education of

kindergarten children.

Critical action research, including the above considerable merits, may be adapted to the Korean context through partnerships with university-based researchers and the deliberate selection of participants. In this research inquiry, a partnership with a university-based researcher was necessary in the Korean kindergarten context since participants were not equipped to initiate and conduct critical action research. Although most critical action researchers insist that research should be initiated by an insider researcher (Carr & Kemmis, 1986; Kemmis & McTaggart, 1988), it seems to be impossible with Korean kindergarten teachers, since they do not have sufficient ideas about critical action research and environmental education. As a university-based researcher, I played a significant role in forming the research group, informing group members about the procedures and characteristics of action research, and encouraging participants' critique (Grundy, 1998; Hanrahan, 1998; Hopkins, 1987; Kemmis, 1987; McTaggart, 1997).

In the beginning of this research inquiry, research participants often sought my confirmation when making decisions, rather than actively participating in reflection, planning, and actions. However, I sought to help participants' involvement in group communication by changing their stereotype to mention correct and useful answers and

by shifting their discomfort to group communication. Moreover, I continuously explained the significance of sharing ideas with other teachers, described the importance of teachers' knowledge on children and educational practices, and offered individual conversations to give advice and to answer the participants' questions. As a result, research participants came to honestly share their ideas, confidently implement actions, and actively make decisions with confidence on their professional practice. In summary, through the partnership with the university-based researcher, critical action research by group communication can be adapted in the Korean kindergarten context beyond cultural differences.

Moreover, critical action research by group communication can be adapted in the Korean kindergarten context through the deliberate selection of participants. Yujin mentioned how acquaintanceship among participants helped them involve in group communication:

> When we began group communication, it was so hard to actively involve in it in the first few weeks. However, many participants had already met in workshops and conferences, and we had had similar working experiences. While we were individually sharing our problems occurred in schools, we came to be close each other soon. Once we came to be close to each other, we shared ideas more easily and honestly. (Yujin, November, 9, 2006)

Research participants of this research inquiry were randomly selected but already knew each other because they worked in national kindergartens of the same city over 10 years.

Yujin indicated that the acquaintanceship helped them establish intimacy among participants and overcome discomfort in group communication. Rapport among participants promoted the active and honest participation amongst individuals during group communication activities (Freire, 2000; Habermas, 1973). Accordingly, the selection of participants who have similar educational backgrounds, age, and working experiences might be essential to encourage group communication of kindergarten teachers, at least in the Korean context.

Forming a research group among teachers working in the same kindergarten would be a helpful way to promote participation of teachers in group discussion. Teachers working in the same school are already intimate and can easily have group meetings. In practice, research participants working in the different schools found it difficult to decide the date and time for group meetings because of the different schedules regarding the weekly plan and school events. In some cases, although some participants wanted to extend group discussion, others had to leave on time and were hard to meet each other before the next meeting. If a research group is formed within a school, teachers can plan group communication and feel free to determine the length of the meeting.

The results of critical action research conducted by the deliberate selection of

participants might be hard to generalize to other educational practices. However, it is certain that the deliberate selection of participants will be useful to adapt critical action research through group communication to the Korean kindergarten context. If some schools recognize that other schools accomplish professional and practical development through critical action research, the former may come to be interested in critical action research and seek to adapt critical action research to their educational practices. Moreover, if participants of critical action research work in different schools, these teachers might inform and initiate critical action research in their schools.

The Necessity and Importance of Early Childhood Environmental Education

The results of this research inquiry demonstrated the necessity and importance of starting environmental education from a young age. This study revealed that EE contributed to the development of the whole child and that young children already had sophisticated abilities to understanding and learning EE. Many early childhood environmental educators point to the significant effects of environmental education, starting from a young age, on developing children's attitudes, wonder, sense of respect, and responsibility for caring the environment (Kemple & Johnson, 2002; Russo, 2001; Wilson et al., 1996). The main point of the above environmental educators is that

established attitudes and senses related to the environment are hard to alter later. In fact, some of the children who participated in this inquiry already had negative attitudes toward the environment.

However, through direct experience in the environment as a part of this research inquiry young children changed these attitudes and acquired a sense of respect and responsibility for caring the environment (Neal & Palmer, 1990; Oltman, 2002; Wilson, 1995). For example, children, who avoided approaching the environment because of parents' and media's indications about harmful and polluted environments, came to appreciate the beauty of the environment by touching and smelling trees and by feeling the wind and sky of fall in the playground of the school. Many of these children then revealed changed attitudes toward the environment by actively smelling and listening to the sound of the environment, by laying and sitting on the ground, and by touching and closely observing wildlife in the mountain during the school picnic. In addition, while taking care of his/her own tree and discussing about breaking off the branch of a tree, children of this inquiry came to acquire a sense of respect and responsibility for taking care of trees. In light of the possibilities to change children's negative attitudes toward the environment and to establish environmentally appropriate attitudes, senses of respect, and responsibilities, this research inquiry supported that environmental education should

be started from a young age (Jalongo & Stamp, 1997; Kemple & Johnson, 2002; Wilson, 1995; Wilson, 1996).

Environmental educators also insist that EE may improve children's various skills and abilities for other subjects (Bartosh, 2003; Lieberman & Hoody, 1998; Pringle et al., 2003; Wilson, 1995, 1996). Bartosh (2003) indicated that in statistical research schools implementing EE programs for at least three years revealed the positive impact on children's achievement in math, reading, writing, and listening. Lieberman and Hoody (1998) also demonstrated the benefits of environment-based education in eight key areas: general educational benefits, language arts, math, science, social studies, thinking skills, interpersonal abilities, and revitalized teaching. Through environment-based education, for instance, children acquired improved language skills and more success in communicating with others and with public and private agencies in language art. Children increased understandings and knowledge of science content, concepts, processes, and principles, and demonstrated better ability to apply science to real-world situations. Children developed ability to think creatively and achieved proficiency in solving problems and thinking strategically (Liberman & Hoody, 1998).

Children participating in this research inquiry also showed changes in drawing after direct experiences with the environment. These children became more expressive

as they shared their various impressions felt in environments. These children also sympathized with plants broken by human beings and understood the relationship between the value of food and their physical health. For instance, most children had drawn trees with similar patterns before participating in this inquiry. However, after involvement in environmental education, children drew trees in various ways emphasizing the characteristics of trees. Children tried to use various adjectives to more exactly express the sounds and smells they felt in mountains and understood broken trees in connection with their experiences of physical hurt. Children also recognized that nutrition of food correlated with our health and that the environment provided a lot of food for human beings. In a word, because children can acquire the various skills and abilities for art, science, physical health, social relationships, and language through EE, environmental education should be implemented in kindergartens (Essa & Young, 2003; Feeney et al., 2001; Hendrick & Chandler, 1996; Ministry of Education, 1999; Violato, 1996).

Whereas many environmental educators insist upon the importance and necessity of EE starting from a young age, some environmental educators argue that young children would have difficulty understanding natural phenomena and concepts regarding environmental issues (Bunting & Cousins, 1985; Chung, 1999; Cohen &

Trostle, 1990). However, the results of this research inquiry demonstrated the possibilities of early childhood environmental education in that children were very sophisticated in their views and understandings of the environment by the age of 5. Children of this inquiry showed sophistication in drawing and naming of trees, such as “tickling tree”, “beautifully glittering tree”, “insect tree”, and “pencil scent tree”. These representations came from the sound, the touch, and the smell of trees, as well as the shape of it. Moreover, because most Korean children can write, read, and count by the age of 5, they can understand the concepts and explanation associated with environmental education and represent their knowledge and impression through spoken and written language. Although 3-4 years old children participating in this inquiry sometimes did not understand totally environmental education, 5 years old children had already begun to acquire attitudes, behaviours, and knowledge of the environment from their parents, media, books and direct experiences. 5 years old children also understood the cause and effects required to understand environmental pollutions, the distant environment, and relationship between the environment and human beings.

In light of the effects of environmental education on the development of children’s attitudes, senses of respect, and responsibilities for taking care of it, the improvement of essential skills and abilities for other subject, and children’s

sophisticated abilities and understandings, environmental education should begin at a younger age with the topics and activities suited to their levels of knowledge and understanding before children completely establish the attitudes and behaviours related to the environment.

The Professional Development of Korean Kindergarten Teachers in EE

Kindergarten teachers of this research inquiry initially found the natural world threatening and creepy because of the lack of various direct experiences and information about the environment. For instance, many research participants believed that most plants, flower, animals, and insects were harmful and dangerous to them and avoided touching even pets. These attitudes and erroneous information prevented participants' active involvement in environmental activities in the environment and weakened their confidence and interests to learn and teach environmental education.

I also had similar experiences regarding personal attitudes toward the environment. Before studying environmental education in Canada, I also had negative attitudes toward the environment. Although I came to be interested in EE, I could not enjoy being close to the environment and came to consider seriously my competence to teach EE with the above attitudes toward the environment. In short, it was hard for me to

have professional confidence and development as an environmental educator. However, various direct experiences of the environment by touching, smelling, and listening during the classes of EE provided me opportunities to appreciate the beauty of the environment. According to the research participants in this inquiry, the strong impression they felt from the environment also made them consider the environment as beautiful and precious. In addition to such direct experiences, comprehensive information about wildlife helped me recognize that all wildlife is not harmful and dangerous. I then began to change my own negative attitudes toward the environment, and be active and confident in learning and teaching environmental education. In short, direct experiences in the environment and the development of knowledge about the environment might be significant routes to establish environmentally appropriate attitudes towards the environment and to improve the confidence and the professional development of Korean kindergarten teachers.

In addition to change their attitudes toward the environment, participants in this research inquiry also improved their knowledge and understandings of EE, their backgrounds for the better implementation of environmental activities in their classrooms, and parents' involvement in EE. Participants considered the changes and improvement of the awareness and attitudes of kindergarten teachers as the most urgent

need for the effective implementation and generalization of early childhood environmental education in the current Korean kindergarten context. In a word, because environmental education might be an unfamiliar subject to Korean kindergarten teachers, teachers' professional development would be necessary to the development and generalization of environmental education for young children in schools (Choi, 2003; Lee, 2005; Lim & Kim, 2000).

While research participants reflected and improved their understandings and implementation of EE, the most remarkable changes were the transformed interests and awareness of research participants about environmental education. Previous awareness of EE, limited to education about environmental pollution and protection, caused research participants to consider EE to be a subject that children and teachers should understand scientific knowledge related to environmental pollution and ways to solve such issues. However, when identifying the possibilities of teaching EE in connection with the activities currently implemented in their classrooms, topics and contents related to children's daily lives, and the surrounding environment, participants recognized the topics and content of EE as appropriate to young children and found fun and interesting ways to approach EE with their students. Wilson (1996) mentioned that "the best place to start is in an environment that is similar to what they (children) already know (p. 3)"

and recommended focusing on a single tree in a backyard or playground as one way to develop and implement an environmental education program for preschool children. These comments support participants' understandings and awareness of early childhood environmental education acquired by involving in this research inquiry.

Moreover, the implementation of environmental activities in this research inquiry changed teachers' beliefs about teaching environmental education. Research participants came to understand that the environment could provide various chances for children to feel and observe the beauty of the environment and to take care of it. Teachers' considerations of the environment were also shifted from distant wildlife and nature to the plants and animals of their surrounding area. In addition, the understandings and awareness of research participates about early childhood environmental education not only improved, but also changed from focusing on environmental pollution to developing awareness, attitudes, and senses of children toward the environment. The above changes in participants also influenced their decisions to choose and implement environmental activities in their classrooms during this inquiry.

The improvement of knowledge, awareness, and confidence regarding environmental education made research participants overcome their fundamental fears of implementing EE. Research participants initially indicated a strong discomfort

implementing a new subject, including EE, and felt guilty avoiding answering children's questions because they felt a lack of knowledge. However, while participating in this research inquiry, research participants came to seek a way to deal with this situation rather than be surprised at it. This result is supported by the mention of Carr and Kemmis (1986) that educational action research encourages the development of the confidence and authority of teachers, as well as the improvement of knowledge and awareness of individuals and the transformation of the educational situations. In summary, critical action research helped these Korean teachers, who were not equipped to teach environmental education, significantly and comprehensively develop their knowledge, awareness, attitudes, and practices of EE through the partnership with other teachers and university-based researcher.

Environmental issues are serious in Korea and all over the world. Many people, such as governors, environmentalists, economists, and the public, are interested in taking actions to protect the environment and to solve environmental problems. Korean governmental institutes, such as KEDI, the Ministry of Education, and the Ministry of Environment, intend to develop environmental education in the context of schools (Choi et al., 2002; Lee, 2002; Nam, 1995; Park et al., 2003). Korean social and private associations provide various environmental programs to make the public be aware of

environmental issues and establish environmentally appropriate attitudes, values, and behaviours (Choi, 1994; Chung, 1993;Kim, 1996; Kim, 1997; Lee, 1993; Noh, 1994). With the worldwide emphasis of the sustainable development, environmentalists and economists try to fulfill human needs while maintaining the quality of the environment (Hammond, 1998; Jickling, 1992; Orr, 1992).

I believe that EE starting from a young age is a hopeful way to protect the future environment. Children learning environmental education from kindergarten will grow up recognizing the beauty of the environment, establishing environmentally appropriate behaviours, and understanding the relationship between human beings and the environment. The society and environment experienced by these children in the future might be different from now. Accordingly, teachers should start to educate children from a young age to know the beauty and importance of the environment in school. As our children grow up appreciating the beauty of the environment and considering the importance of the environment, they can learn to live in harmony with the environment and develop an eco-friendly and environmentally appropriate society.

Recommendations for EE in the Korean kindergarten

Critical action research focusing on EE significantly awakened Korean kindergarten teachers to the importance of early childhood environmental education, as well as improved their knowledge and capacity to implement EE in their classrooms. In this section, in order to generalize and develop environmental education in the Korean kindergarten cont*ext, I suggest some recommendations. For a summary of the recommendations* that follow, please consult Appendix F.

Developing EE through critical action research

This study revealed that one way to more fully implement EE in kindergarten could be through critical action research. In the beginning of this research inquiry, most participants' knowledge and understandings was limited to environmental pollution and protection. In addition, environmental education was rarely implemented in kindergartens (Lee, 2005; Lim & Kim, 2000; Yun & Cho, 1993). However, while participating in critical action research through group communication, participants improved their knowledge of EE, the awareness of the importance and necessity of EE starting from a young age, and the implementation of EE in their classrooms. It implies that critical action research leads the development of individual background and educational practices regarding environmental education. There is some worldwide

research to develop environmental education through action research (Apanomeritaki, 1995; Bitso, 2006; Day, 2004; Gayford, 2002; Stapp, 1996). However, the above research including this study was limited to the partnership with teachers or children.

Given the need for supports from the government, private institutes, and universities, critical action research in partnership with administrators, environmental experts, and professors could be an appropriate method for more comprehensive and rapid development of environmental education. Although it was not conducted by action research, Lim and Kim (2000) recognized the necessity of partnership with various fields in EE and investigated the awareness of professors of early childhood education, principals, and kindergarten teachers in Korea. On the basis of the results of Lim and Kim's research, if critical action research through the partnership is extended to include administrators and environmental experts, environmental education would have more comprehensive and rapid development in the Korean kindergarten context. University-based researchers might also play a significant role to initiate and support the partnership among administrators, environmental experts, professors, and kindergarten teachers (Brooker et al., 1998; Grundy, 1998; Hanrahan, 1998; Kemmis, 1991; McTaggart, 1997).

Supporting teachers to be experts in EE

Research participants of this study often mentioned that they acquired a lot of information about EE from other teachers during group communication. If a teacher working in the same school becomes an expert of environmental education, this teacher would introduce EE and give advice regarding EE to other teachers in schools. Recently, some Korean researchers try to improve teachers as environmental educators through teacher training programs (Kang, 2003; Koo, 2001; Korean Environmental Education Association, 2005; Lee, Jung, Na, Lee, & Nam, 2001; Yun, 2006). Korean Environmental Education Association (2005) offered the guideline of teacher training programs for teachers' professional development in EE. Yun (2006) analyzed and evaluated teacher training programs for EE. Moreover, Kang (2003) searched the effects of the implementation of environmental education by teachers involved in teacher training programs of environmental education. However, the numbers of above programs and research are still slight and focused on elementary, middle, and high school. Accordingly, the Korean government and universities should support kindergarten teachers, who are working in schools and interested in EE, to become an expert in EE through the provision of various teacher training programs for EE (Lee, 2005; Lim & Kim, 2000).

Moreover, I suggest that government and university should offer regular visits of environmental experts and student teachers majoring environmental education to kindergartens for the professional development of Korean kindergarten teachers in the long run. Student teachers and environmental experts might provide various resources, materials, and information about the environment and environmental education as a mentor.

Emphasizing EE in the national curriculum and environmental literacy

In the first meeting with the participants of this inquiry and in interviews during the pilot study, many kindergarten teachers did not have any ideas about what environmental education was. Moreover, some teachers had never heard of it although various topics and contents of EE were included in the National Curriculum of Kindergarten (the Ministry of Education, 1999). This implies that the emphasis on EE in the National Curriculum of Kindergarten is not sufficient and that EE is not comprehensively introduced to kindergarten teachers. As research participants mentioned in this research inquiry, the National Curriculum of Kindergarten is too vague to apply to Korean kindergarten practices. In addition, the objectives and content regarding environmental education are integrated with various fields of the National Curriculum of Kindergarten (Hyun et al., 2003; Korean Institute of Childcare

Information, 1998; Seoul Metropolitan Office of Education, 1993; Yun & Cho, 1993; Yun & Park, 1998). Accordingly, it seems to be hard for Korean kindergarten teachers, who do not have knowledge about EE, to identify the potential content and topics of EE and to implement these practices in their teaching. Moreover, because Korean kindergarten teachers mainly refer to other activity books to plan and prepare the teaching in their classrooms, these teachers also do not recognize the content and topics recently included in the National Curriculum of Kindergarten.

However, according to some Korean environmental educators, the continuous inclusion and emphasis of environmental education in the national curriculum significantly improved the development and generalization of environmental education in the context of middle and high schools (Choi et al., 2002; Kim & Han, 1993; Park et al., 2003). Therefore, the Ministry of Education should more strongly emphasize and introduce EE in the National Curriculum of Kindergarten for Korean kindergarten teacher to identify the necessity and importance of EE in early childhood education.

Research participants of this study fostered their knowledge of objectives and potential topics of environmental education for young children by referring to environmental literacy. In order to understand teaching methods and activities appropriate to kindergarten children for the implementation of EE in their classrooms,

participants of this study also reviewed the Guideline of National Curriculum of Kindergarten and environmental activity books. In short, Korean kindergarten teachers of this study acquired the professional development by referring to the National Curriculum and environmental literacy. The teaching resources including activity books, guidelines, and materials are required for the better implementation of EE in the kindergarten classrooms (Choi, 2003; Lee, 2005; Lim &Kim, 2000). Therefore, the detailed explanation of EE in the Guideline of National Curriculum of Kindergarten and the various provisions of the activity books may also help Korean kindergarten teachers understand and implement environmental education.

Including EE as an essential subject in the exam of higher education

In this research inquiry environmental education was identified as a clearly marginal academic subject in Korean early childhood education. According to research participants, Korean parents' expectations on the improvement of children's cognitive and academic skills hindered the implementation of EE in schools (Choi, 2003; Lim & Kim, 2000; Yun & Cho, 1993). Parents' these expectations lead parents to ignore academic subjects given less or no weight on entrance into the university (Lim & Kim, 2000). In research analyzing environmental education practices, Yun and Cho (1993) identified that the awareness of environmental education was very low because of the

entrance examination-oriented educational system in the context of Korean school. In other words, many parents consider that children do not need to study subjects not required to enter university, including environmental education. Because these parents' expectations and educational system are unlikely to change, the Ministry of Education should emphasize and inform the importance and necessity of studying EE to teachers and parents by including environmental education as an essential subject in the university entrance exam.

Including EE into the curriculum of department of early childhood education

The Korean Ministry of Education should encourage the Department of Early Childhood Education in universities to include EE into their curriculum, because participants of this study found it hard to recognize and teach a subject they never learned at university. Some research in other countries presented the effects of including environmental courses and programs in the curriculum of teacher education in universities (Ekborg, 2003; Firth & Winter, 2007; Magntorn & Hellden, 2005; Van Petegem, Blieck, & Pauw, 2007). In Korea, since the Seoul National University first opened the graduate school of the environment in 1973, the graduate school and the department related to the environment and environmental education were established in other universities (Park et al., 2003). Recently, few Korean universities, such as National

University of Education, Educational University of Gongju, Soonchun University, and Daegu University, have created departments of environmental education (Choi, 2002). However, these universities educate the teachers of environmental education for secondary education. There are no kindergarten teachers learning environmental education at university (Lim & Kim, 2000). Consequently, environmental education should be included as well in the curriculum of the Department of Early Childhood Education at universities.

Introducing EE in workshops and seminars of early childhood education

The Korean government has supported the Korean Educational Development Institute to inform the importance and necessity of environmental education to the public through workshops and seminars since 1970s (Park et al., 2003). Although these seminars and workshops are insufficient and limited to secondary education, these play the significant role to introduce environmental education to teachers and the public. The world vision of education and sustainable development was also widespread through the authoritative conferences and seminar, such as 1992 Earth Summit, 1997 Environment and Society: Education and Public Awareness for Sustainability, and 2002 Johannesburg Summit (Hammond, 1998; Jickling, 1992; Orr, 1992; UNESCO, 2002). It may be hard to improve teachers' understandings through a single workshop and seminar. However, if

environmental education is introduced in the authoritative workshop and seminar of early childhood education, it would be very helpful to inform ECEE to Korean kindergarten teachers. Accordingly, the Ministry of Education and Ministry of Environment should encourage the awareness of Koran kindergarten teachers about EE through workshops and seminars.

Supporting environmental camps for kindergarten teachers

Through the direct experiences of the environment research participants of this study transformed their negative attitudes toward the environment and acquired the professional development of EE. However, in the context of Korean kindergarten, teachers are hard to often plan field trips to an environment for direct experiences of the environment, because of limited budgets, busy schedules, and negative attitudes (Choi, 2003; Lee, 2005). Accordingly, I suggest that field trips just for teachers should be supported by government, environmental experts, and universities. The Korean government, at first, needs to provide funds to private institutes for the provision of environmental camps for teachers. Many Korean private institutes already provide intensive and professional environmental camps in the environment with environmental experts during weekends and vacation (Lee, 2002; Park et al., 2003). However, these camps mainly target children and parents (Choi, 1994; Chung, 1993; Kim, 1996; Kim,

1997; Lee, 1993; Noh, 1994). In cases of offering camps for teachers, the Korean kindergarten teachers miss these programs because of a lack of information and financial support. Therefore, the government should provide private institutes funds to operate and advertise environmental camps just for teachers and encourage teachers to participate in these programs. In addition, if the government provides funds to the private institutes to offer child care programs during camps, it would increase the participation of Korean kindergarten teachers.

In order to provide high-quality environmental education, teachers should have environmental literacy, foundations of environmental education, environmental responsibilities, abilities to planning and implementing EE programs, competences to fostering children's learning, and assessment and evaluation (NAAEE, 2000). In short, teachers should be qualified as environmental experts and educational experts (Choi, Lee, & Jin, 2003; Lee et al., 2001; Yun, 2006). Environmental camps for teachers conducted by environmental experts might be insufficient to improve the above competences as environmental educators. The environmental experts have a lot of knowledge of the environment but may not have experience in education. Accordingly, educators need to join in providing camps and programs. The cooperation between environmental experts and educators would be helpful for the professional development of Korean teachers

appropriate to the educational context. For instance, educators can help teachers apply experiences and knowledge acquired in the camps to the implementation of EE in their classrooms. Educators also can emphasize the importance and effects of direct experiences in the environment to kindergarten teachers.

Implications for Future Research

This study suggests that teachers' improved background and pro-environmental behaviours and attitudes toward the environment encourage their confidence to implement environmental education in their classrooms. However, in Korea, most research is limited to revealing kindergarten teachers' awareness about environmental education (Choi, 2003; Lim & Kim, 2000; Lee, 2005). Accordingly, further research needs to focus on development of kindergarten teachers' awareness and understandings about EE. Further research also should invest and transform attitudes toward the environment and environmental education among Korean kindergarten teachers.

This study discovered difficulties teachers face in environmental education practices and sought to overcome those difficulties for better implementation of environmental education. Kindergarten teachers in this study intend to transform teachers' negative attitudes toward the environment, teachers' burden of going on a field

trip, and parents' insufficient involvement. However, kindergarten teachers in this study mainly focused on the improvement of teachers' insufficient awareness about EE and knowledge to implement EE in their classrooms. Further research on EE needs to invest in and take actions to overcome more barriers to fully implement EE in the Korean kindergarten context. Further critical action research may suggest more practical actions to overcome the barriers to fully implement EE through teachers' critical reflection on their practices and group communication.

Although not targeting young children, this study demonstrated children's sophisticated abilities to understand the concepts and phenomena regarding the environment and environmental issues (Cohen & Horm-Wingerd, 1993; Palmer, 1995; Palmer & Suggate, 2004; Pringle et al., 2003). This study also revealed the possibilities to develop children's understandings and to establish environmentally appropriate behaviours and attitudes toward the environment through environmental education (Apanomeritaki, 1995; Basile & White, 2000; Palmer, 1995; Pringle et al., 2003). However, there is rarely research about environmental education for young children in Korea. In addition to research for the development of teachers, further research on EE targeting young children need to reveal children's understandings, behaviours, and attitudes toward the environment and environmental issues. Further research also should

focus on the effects of EE on development of children's understandings and establishment of behaviours and attitudes toward the environment. Through implementation of various environmental activities, further research will suggest information regarding potential topics and teaching methods of EE appropriate to kindergarten children.

While teachers are implementing environmental activities in the classrooms, young children in this study often mentioned environmentally inappropriate behaviours of their parents. Young children learn through direct experiences and the modeling of behaviours of others (Chaille & Britain, 2003; Oltman, 2002). Accordingly, further research needs to discover the relationship in the establishment of environmental behaviours and attitudes between young children and adults (Ballantyne et al., 2001; Vaughan et al., 2003). If there is a significant and positive relationship, further research also need to investigate and develop environmentally appropriate behaviours and attitudes toward the environment among young children's parents and teachers in Korea. The effects of Korean parents and teachers on children's behaviours and attitudes also need to be searched by longitudinal studies.

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Appendix A.
Environmental Contents in the 6th Korean Kindergarten National Curriculum

<table>
<tr><th>Field</th><th>Contents</th><th>Level I</th><th>Level II</th></tr>
<tr><td rowspan="3">Social Relationships</td><td><Social phenomena and environment>
Becoming interested in conservation of the environment</td><td colspan="2"></td></tr>
<tr><td colspan="2">Knowing the value of a beautiful environment</td></tr>
<tr><td>Separating and disposing of trash in assigned areas</td><td>Knowing how to reduce trash and acting upon this knowledge
Finding and recycling reusable items</td></tr>
<tr><td rowspan="4">Expression</td><td><Exploration>
Exploring Sound</td><td colspan="2">Becoming interested in the sounds of nature and surrounding environment</td></tr>
<tr><td></td><td>Listening to and distinguishing the sounds of nature and surrounding environment</td></tr>
<tr><td>Exploring Movements</td><td colspan="2">Becoming interested in and watching movements that can be seen in nature and the surrounding environment</td></tr>
<tr><td></td><td>Watching and distinguishing the movements that can be seen in nature and surrounding environment</td></tr>
</table>

Field	Contents	Level I	Level II
Inquiry	<Appreciation> Appreciating objects, nature, and formative arts	Appreciating the beauty of objects and nature	
	Taking Interest in Living Things	Considering animals and plants	
		Observing animals and plants in their environment	Finding out the particular characteristics of animals and plants that are of special interest Rearing an animal or growing plants that are of special interest
	Finding out about natural phenomena	Observing the changes according to the weather	
		Taking an interest in the change of seasons	Finding out about life patterns changed by the seasons
		Finding out the differences between day and night	Taking an interest in earth, moon, and sun

Appendix B.
Interview Protocol of Pilot Study

Background information
Name of teacher: _____
Pseudonym: _____
How long have you been teaching in public schools? _____ years.

1. Awareness of environmental education

Q. What does the term, "environmental education" mean to you?
If hesitant, then:

a. What does the word, "environment" mean to you?
b. Do you teach students about the environment in your kindergarten class?

2. Connection of environmental education with current teaching

Q1. Are you doing any environmental education activities in your class?
Q2. If so, what are you doing?

3. Awareness of the environmental education in the kindergarten curriculum

Q1. What parts of the kindergarten curriculum are related to environmental education?
Q2. Which topics do you believe should be part of the environment education of kindergarten children?

4. Obstacles of environmental education in schools

Q. What difficulties, if any, do you face when teaching environmental education in kindergarten?

5. Elements for the effective environmental education

Q. What do kindergarten teachers need to teach environmental education?

6. Awareness of importance/necessity of environmental education

Q. How important is environmental education for children in kindergarten?

7. Awareness of environmental issues

Q. What do you consider to be the most serious environmental issues?

8. Awareness of issues and lifestyle

Q. In your opinion, how would someone live an environmentally responsible life?

Appendix C.

Twelve principles for the development of international environmental education in Action Plan for international Environmental Education

- Consider the environment in its totality-natural, built, technological and social (economic, political, cultural-historical, moral, aesthetic);
- Be a continuous, lifelong process, beginning at the preschool level and continuing through all formal and non-formal stages;
- Be interdisciplinary in its approach, drawing on the specific content of each discipline in making possible a holistic and balanced perspective;
- Examine major environmental issues from local, national, regional, and international points of views so that students receive insights into environmental conditions in other geographic areas;
- Focus on current and potential environmental situations, while taking into account the historical perspective;
- Promote the value and necessity of local, national, and international cooperation in the prevention and solution of environmental problems;
- Explicitly consider environmental aspects in plans for development and growth;
- Enable learners to have a role in planning their learning experiences and provide an opportunity for making decisions and accepting their consequences;
- Relate environmental sensitivity, knowledge, problem solving skills and values clarification to every age, but with special emphasis on environmental sensitivity to the learner's own community in early years;
- Help learners discover the symptoms and real causes to environmental problems;
- Emphasize the complexity of environmental problems and thus the need to develop critical thinking and problem solving skills;
- Utilize diverse learning environments and a broad array of educational approaches to teaching/learning about and from the environment with due stress on practical activities and first hand experience. (UNESCO, 1978)

Appendix D.
Letter of consent for participants

You are being invited to participate in a study entitled, "development of environmental education in the Korean kindergarten context" that is being conducted by Keum Ho Shin. I am a Graduate student in the Department of Curriculum and Instruction at the University of Victoria, British Columbia, Canada. You may contact me if you have further questions by calling my home at 1-778-881-4282 or via email (keumho74@hotmail.com). As a graduate student, I am required to conduct research as part of the requirements for a PhD in Education. This research is being conducted under the supervision of Dr. David Blades. You may contact him for further information at 1-250-721-6570 or via email (dblades@uvic.ca).

The purpose of this research project is to research how Korean kindergarten teachers fully implement environmental education by investigating and overcoming the barriers through the reflection and change on understandings, practices, and situations of environmental education. This research is important because this study can help provide information about barriers to fully implement environmental education in Korean kindergartens. This information will be useful in providing direction of curriculum development, policy decisions, and the practical improvement of environmental education for young children in Korea.

You are being asked to participate in this study because you are a Korean kindergarten teacher. If you agree to voluntarily participate in this research, I would ask you to be available for group communications and for implementation of actions for 12-16 weeks. The group communication will be opened once every week approximately for 45 to 60 minutes. This communication will be focused on the discussion to reflect barriers of environmental education and to plan actions to fully implement environmental education in your classes. During the communication and actions I will do the videotape recordings and take notes, with your permission. I also want to let you know that participating in this study is not a part of the regular requirements of teachers so your participation is entirely voluntary. I certainly recognize and appreciate the personal commitment and the time expenditure you will be making to this study if you agree to participate.

The potential benefits of your participation in this research include a chance to share your ideas on the topic, to contribute to the research on environmental education, and to aid the development of the educational system and society as a whole.

Your participation in this research must be completely voluntary. If you do decide to participate,

you may withdraw at any time without any consequences or any explanation. If you do withdraw from the study your data will be destroyed immediately by a paper shredding machine and will not be included in the study. To make sure that you continue to consent to participate in this research, I will be asking you at numerous intervals during the study.

In terms of protecting your anonymity, participants and the researcher will be aware of your true identity, as this is necessary to regularly meet and contact you. However, in the case of all written documentation and videotape recordings, your name will be replaced with a pseudonym. Pseudonyms and real names will be kept on a coding sheet that will only be accessible to the researcher, as it will be in a locked file cabinet that only the researcher has a key.

Your confidentiality and the confidentiality of the data will be protected by keeping the transcripts and videotape recordings in a locked file for a period of five years after the completion of the study. The records of this study will be kept private. The translator will have access to the participants' records at the time of data analysis, but your confidentiality and anonymity will be ensured by the use of the pseudonyms and by the removal of any identifying information prior to the translator seeing the materials. If we include quotes from the participants, no identifying information about the participants or the study's location will be included. The videotape recordings will be destroyed immediately after they are transcribed. After a five-year period, the field materials and data analysis materials will also be destroyed.

It is anticipated that the results of this study will be shared with others by the publication of the dissertation in University of Victoria, Canada. In addition, the results will be provided to all interested parties and participants. In addition to being able to contact the researcher and the supervisor at the above phone numbers, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Associate Vice-President, Research at the University of Victoria (250-472-4362).

Thank you for considering this request to participate in this research study. If you are willing to volunteer to this study, please fill out the form on the next page and send it to me in the attached, self-addressed envelope. Everyone who volunteers will be contacted, however.

Thank you for considering this request,

Ms. Keum ho Shin

Dear Participant:

Thank you for volunteering to be part of the study called, Development of Environmental Education in the Korean Kindergarten Context.

Your signature below indicates that you understand the conditions of participation in this study explained in the previous letter and that you consent to being taped by the researcher.

Name of Participant	*Signature*	*Date*

If selected for the study, we will contact you to arrange the first meeting. To help us arrange the group meeting, please provide the following information (this information will be kept strictly confidential):

Home telephone number: _____

Home address: _____

Please send this consent form to the researchers in the envelope provided. The next page is a copy for your records.

Thank you for volunteering to be part of this study. We will notify you as soon as possible.

Ms. Keum ho Shin

Appendix E.
Description of action research and roles of participants in this critical action research

This research project is critical action research. Action research is usually distinguished into “technical”, “practical”, and “critical” by its main aims and the relationship between practitioners and the researcher (Carson, 1989, pp. iii-iv). Technical action research pursues to improve effectiveness of educational practices, and practical action research aims to improve practitioners’ understanding and professionalism. However, critical action research aims “not only at technical and practical improvement and the participants’ better understandings, along with transformation and change within the existing boundaries and conditions, but also at changing the system itself or those conditions which impede desired improvement in the system/organization” (Zuber-Skerritt, 1996, p. 5). In a word, critical action research in the educational context focuses on reflecting the problematic practices and changing it.

Technical action research is conducted by co-option and dependence on the researcher, and the researcher of practical action research intends to cooperate and encourage practitioners’ deliberation and self-reflection. However, all participants of critical action research, including the researcher and practitioners, equally involve into all procedures of research with the responsibility, because critical action research is a democratic form of social research. In other words, participants of critical action research play an active role whereas those of the technical and practical action research are relatively passive.

It seems to be ideal for all participants to participate *equally* with responsibilities. However, participants can become equally responsible in the climate of mutual trust. Because the climate of mutual trust is attained by the interaction in time, “whether the other side is in truth or honestly participating or is only pretending to engage in communicative action and is in fact behaving strategically” (Habermas, 1973, p. 18), participants of this research project seek to establish the climate of the mutual trust through actively and responsibly involving in all procedures of research. In addition, communicative action in this research project “cannot be reduced to the act of one person’s depositing ideas in another, nor can it become a simple exchange of ideas to be consumed by the discussants” (Freire, 2000, p. 89). In a word, no participant’s point of view is taken as the final authority and considered with greater credibility than others in this research project (Winter, 1996).

Participants will also actively, dialectically, and critically participate in a self-reflective spiral of cycle to reflect on the practices, understandings, and social structures which constrain the complete implementation of environmental education in their classrooms. This self-reflective spiral basically consists of a series of steps of planning, acting, observing, and reflecting. However, this process is not a mechanical sequence of steps but "is likely to be more fluid, open, and responsive" (Kemmis & Wilkinson, 1998, p. 21). Korean kindergarten teachers who participate in this action research project will not end at a single loop of the cycle but continue to develop the extended loop of the cycle including revised planning, acting, observing, and reflecting.

The researcher of this research project will serve as a "critical friend" and play the following roles:

- initiate action research and form action research group to participate in this research project
- introduce action research process
- motivate and stimulate action research group to critically reflect the practices of environmental education of Korean kindergarten
- encourage teachers to participate in the research with responsibility
- support participants' critique, suggest theoretical perspectives relevant to participants' work and action, and offer advice on materials
- observe and record participants' group communication in the meeting and action in the classroom
- gather data and analyze it

The researcher only initiates this research project and supports teachers' critical reflection on the problematic practices of environmental education. Participants in critical action research are expected to actively participate in group communication, reflection, planning action, and implementation of action with ownership, authenticity, and responsibility for future development of environmental education in the Korean kindergarten contexts.

Appendix F.
Summary of Recommendations

1. Korean kindergarten teachers should be invited to participate in critical action research in partnership with administrators, environmental experts, and professors for comprehensive and rapid development of EE.
2. The Ministry of Education and the Ministry of Environment can support kindergarten teachers to be experts in EE and to give advice about EE to other teachers in the kindergarten context.
3. The government and universities should offer regular visits of environmental experts and student teachers majoring EE for the longitude professional development of Korean kindergarten teachers
4. The Ministry of Education should strongly state the necessity and importance of early childhood environmental education in the National Curriculum of Kindergarten.
5. The Ministry of Education should provide a detailed explanation of EE in the Guideline of National Curriculum of Kindergarten and in the environmental activity books.
6. The Ministry of Education should emphasize the necessity of studying EE by including EE as an essential subject in the exam of higher education.
7. Universities need to include EE into the curriculum of the department of Early Childhood Education.
8. EE should be chosen and introduced as the main topic of authoritative workshops and seminars of early childhood education.
9. The Korean government needs to provide funds to private environmental institutes for the provision of environmental camps just for kindergarten teachers.
10. During environmental camps for teachers, cooperation between the environmental experts and educators is necessary for the professional development of Korean kindergarten teachers appropriate to the educational context.

Appendix G.
Summary of proposal

The need and the importance of early childhood environmental education (ECEE) in public education were included in *the National Curriculum of kindergartens* from 1999 in Korea. Although there is no designated subject for environmental education in the *National Curriculum of Kindergartens*, the Korean Ministry of Education (1999) emphasizes implementing EE in kindergarten through integration into some fields of the national curriculum (Chea et al., 2002; Choi et al., 2002; Hyun et al., 2003; Kim, 2003; Korean Ministry of Education, 1999;Yang, 2001). In addition to emphasis in the curriculum, early childhood environmental education in public education was supported by the Ministry of Environment, educational organizations, and the Educational Law in Korea (Choi et al., 2002; Korean Ministry of Education, 1999; Nam, 1995).

However, despite above emphases and efforts, the statistical report of the Ministry of Environment and the pilot study show the insufficient implementation of environmental education in kindergarten. Most kindergartens do not actually implement the environmental education curriculum, but "only exemplary schools decided and funded by the Ministry of Education and the Ministry of Environment implement EE" (Hyun et al., 2003, p.24). However, even the number of exemplary schools implementing environmental education was slight in case of kindergarten (Choi et al., 2002; Hyun et al., 2003).

The insufficient implementation of environmental education in kindergarten is also identified in a pilot study. Some kindergarten teachers of the pilot study had never heard the term environmental education. Most of the teachers may have the very limited view of environmental education for young children, such as protecting the environment and solving the environmental problems. In addition, environmental activities commonly implemented in kindergarten were limited to recycling, raising small animals and plants, or going on field trips to the zoo. Teachers of the pilot study also indicated the following barriers to implementing environmental education in the Korean kindergarten context: lack of teachers' knowledge and awareness, lack of materials and resources, lack of support from community and parents, and the urbanized environment of kindergarten. In short, the barriers to fully implementing environmental education in Korean kindergartens are related not only to the insufficient awareness and knowledge of the individual but also to the unsatisfactory support of the educational systems and general society.

Many environmental educators in Korea and in other countries insist on starting EE from a young age by describing the following reasons and possibilities of early childhood environmental education: early childhood is the critical period to develop various senses that are required for later learning (Brown, 1991; Tilbury, 1994; Wilson, 1995; Wilson, 1996; Wilson et al., 1996), the theories and philosophies of early childhood education fit well with environmental education (Bower, 1998; Bredekamp, 1987; Oltman, 2002; Pringle et al., 2003; Wilson, 1996), and young children can understand environmental phenomena and improve their knowledge and attitude related to the environment and environmental issues through EE (Apanomeritaki, 1995; Basile & White, 2000; Palmer & Suggate, 2004).

However, Korean kindergarten teachers are insufficiently equipped to implement environmental education in their classrooms because of individual and social barriers. Therefore, this study aims to research how Korean kindergarten teachers fully implement environmental education by investigating and overcoming the barriers through the reflection and change on understandings, practices, and situations of EE. The research questions of this study are as follows:

How can Korean kindergarten teachers fully implement the environmental education curriculum in their practices?

a. What barriers do Korean kindergarten teachers identify to implementing environmental education included in the National Curriculum of Kindergarten?
b. What do they believe to be the most significant barrier?
c. What possibilities exist for dealing with the barrier teachers indicate in question "b"?
d. To what extent are teacher support/planning groups useful for addressing this barrier and for encouraging individual teachers to take action?
e. What types of actions do teachers take when reflecting about how to implement EE in their classrooms?

Research Methodology:

This action research project is committed to the qualitative orientation to deeply and critically understand Korean kindergarten teachers and practices of EE connected with the individual and social context. In addition, in order to be aware of and transform the problematic practices of environmental education, Korean kindergarten teachers in this research project may identify individual and social barriers to implementing environmental education by reflecting on their understandings, practices, and situations, and seek to overcome these barriers by taking action. Consequently, action research informed by the critical orientation fits with this research project aimed at encouraging Korean kindergarten teachers to fully implement environmental education

through reflection and actions for future development.

In this research project, Korean kindergarten teachers will dialectically and critically participate in a self-reflective spiral of cycle to reflect on the practices, understandings, and social structures which constrain the complete implementation of environmental education in their classrooms. This self-reflective spiral basically consists of a series of steps of planning, acting, observing, and reflecting. However, Korean kindergarten teachers who participate in this action research project will not end at a single loop of the cycle but continue to develop the extended loop of the cycle including revised planning, acting, observing, and reflecting.

The Korean kindergarten teachers in this research project will participate in the collective self-reflection through the group communication, since the problematic practices of environmental education are experienced by individuals working in social situations. These teachers also experience social barriers to the implementation of environmental education. If educational practices are constituted in a social context, changing practices also need to be done through a social process (Kemmis & Wilkinson, 1998).

This research project as critical educational action research aligns to the claim of "action research as a democratic form of social research", and "conditions for investigating the truth of knowledge-claims are also the conditions for democratic participation in critical discussion" (Carr & Kemmis, 1986, pp. 199-200). In order to be democratic, all participants of this research project seek to participate *equally* with responsibilities in group communication, as well as in all phases of planning, acting, observing, and reflection. However, participants can involve equally into communication and research only in the climate of mutual trust attained by communicative action, such as dialogue or discourse, in the interaction with others (Habermas, 1973; Freire, 2000). Accordingly, communicative action "cannot be reduced to the act of one person's depositing ideas in another, nor can it become a simple exchange of ideas to be consumed by the discussants" (Freire, 2000, p. 89).

Early critical action researchers believe that practitioners only can study praxis because practitioners can access understandings and commitments informing actions. Early critical action researchers, on the basis of the above explanation, insisted strongly on being a researcher among practitioners instead of an outside researcher (Carr & Kemmis, 1986; Kemmis & McTaggart, 1988). However, the current focus related to collaboration in critical action research is not who is included and excluded but how different groups collaborate with each other (McTaggart, 1997). The relationship between the researcher and participants in this research project is also modified

from that of traditional critical action research. The researcher, in spite of being an outsider, will serve to initiate this critical action research project and to stimulate teachers to reflect on the problematic practices of environmental education, serving as a “critical friend” (Carr & Kemmis, 1986, p.161; Harahan, 1998, p. 316).

Research Design:

In order to closely observe and intensely encourage the participation of teachers in all procedures, the researcher of this research project will select 6 kindergarten teachers from a southern city of Korea. This city is urbanized, but is close to rural areas and natural places. Kindergarten teachers working in this city may face the difficulties in implementing environmental education under the urbanized environment. However, teachers can often plan environmental education in nature, because they can reach various natural places within one hour by car. In addition, this city is middle size in Korea. If participants of this research project choose the close place to each other, they can arrive at the meeting place within 30 minutes by car. The size of the city is important to teachers who will participate in the group communication once a week for 12-16 weeks.

The selection of participants will be based on the following traits among teachers sending a permission form:

- teachers who are not confident, but desire to implement environmental education in their practices;
- teachers who are willing to share and discuss their ideas with other teachers;
- teachers who have between five and fifteen years working experiences as a full time teacher in public kindergarten

The participants’ similar working experience and age will have the effect of establishing a close rapport. The professional and personal rapport will play an important role in encouraging participants to share and discuss their ideas during the action research project. The researcher will choose teachers having 5-15 years working experience as participants of this research project. In this way, the age and educational background of these participants will also be close to those of the researcher.

This research project will take place for 12-16 weeks. In the first meeting, the researcher and participants will introduce each other, and discuss action research based on participants’ questions of the brief paper provided to participants ahead of the first meeting. This paper includes about action research, the differences between action research and other research methods teachers are accustomed to, and the roles of the researcher and participants in this

research project (see Appendix E). Participants then involve in decision-making of the duration, frequency, and location for future meetings and to reflect the practices of environmental education in the Korea kindergarten context.

In the second meeting, participants will choose a barrier to fully implementing environmental education and plan actions to take before the next meeting. The researcher will make appointments with teachers to visit their classes. While visiting classes during the weeks, the researcher will observe and record the actions of teachers and changes. At each meeting from the third meeting, participants will reflect on the previous implementation of action, choose another barrier to discuss, and plan action to take. After the meeting, participants will implement planned actions in their practices for a week before the next meeting. Barriers for subsequent meetings will be determined according to the needs and interests of participants. A similar procedure will be repeated during the remainder of this research project.

In order to establish reliability and validity of this research project, the researcher will use the method referred as *triangulation* collecting various types of data, using different data sources, collecting data at several times, and analyzing data from diverse perspectives (Anderson & Arsenault, 2001; Goodwin & Goodwin, 1996; Johnson, 2002). The researcher of this research project will collect written and recorded data from the group communication, the implementation of action, and the individual conversation to demonstrate the reflection and changes of Korean kindergarten teachers.

The internal validity of qualitative research is enhanced by *audit trail* "keeping meticulous records of all sources of information used, using detailed transcripts, and taking field notes of all communications and reflective thinking activities during the research process" (Anderson & Arsenault, 2001, p. 134). The researcher of this research project will keep writing a research journal to describe emerged patterns and interpretations of changes.

The researcher will do the videotape recording of the group communication. The videotape recordings facilitate the analysis of the group communication reflecting and changing the problematic understandings, practices, and situations of environmental education. In order to enhance the internal or data-collection reliability, the researcher reviews the recordings to identify themes of the group communication and provides themes to participants in advance of the next meeting. Participants will verify the accuracy of themes before starting the group communication of a new theme.

Although this study does not focus on children, children's products may be indirect data to demonstrate how teachers and practices of environmental education are changed through this research project. Participants may bring children's products related to environmental education and produced during this research project, and share it in the group communication. If participants decide to include any child's product as a data of this study, the researcher will send a consent letter to the parents of the child. In case of receiving parents' consent, children's products will be used as a data of this research project.

Whenever the researcher requires understanding the participants' discussion and action more precisely, the researcher will do informal and individual conversations with teachers. The researcher will also plan a conversation when participants have some questions and want to discuss ideas in more depth with the researcher. The agreement between the researcher and participants on the meaning or interpretation of what is observed through these conversations is significant to enhance the internal reliability and validity (Anderson & Arsenault, 2001; Goodwin & Goodwin, 1996). The form of the conversation, such as duration, location, and frequency, will be different according to the situation.

As the data collection initiates, the data analysis will begin by the inductive way (Gall et al., 1996; Goodwin & Goodwin, 2001; Johnson, 2002; Kemmis & McTaggart, 1988). The results directly pertain to the discovery and are found as the data collection begins. In order to do inductive analysis, the researcher will keep writing, reviewing data, and being flexible (Kemmis & McTaggart, 1988). Once the researcher recognizes recurred items, themes, or patterns, these will be coded into meaningful categories. After coding the data, the researcher will describe how participants reflect and change understandings, practices, and situations of environmental education in the Korean kindergarten context.

After an analysis is completed, the researcher will review the initial results with participants to ensure the reliability of the information. Once data analysis has been done, a translator will translate the final document from Korean to English. The findings of this qualitative action research project will be helpful to understand particular situations and inform similar situation rather than be generalized to other situations and communities (Johnson, 2002).

Appendix H.
Proposed Timeline for Completion of the Dissertation

- Preparation for Study:
  - May 1, 2006 – August 30, 2006 (18 weeks)
  - Related activities and tasks:
    - Candidacy exam
    - Ethics Review
    - Preparation for the first meeting of the action research participants
    - Selection of participants
    - Signing of the letters of consent

- Research study:
  - September 5, 2006- December 12, 2006 (14 weeks)
  - Ongoing related activities and tasks include:
    - Coordinate approximately 14 group sessions, once every week:
      - Phase One – Initial group session: September
        - brief summary of the proposed research
        - description of the expectations for participants in the context of action research
        - discussion based on the participants' reading of the research proposal and description of action research
        - discussion as to procedures of future sessions, including frequency, length, location, and topics

      - Phase Two – Action research spiral: September-December
        - reflecting on previous implementations of action in their classrooms
        - choosing a topic to discuss (if participants want to choose new topic)
        - planning action
        - implementing action planned in the group session

      - Phase Three – Closing group sessions: December
        - transcribe recordings of group sessions and implementation of action
        - review and revision of transcripts
        - initial analysis and interpretation of data

- Initial Draft of the Dissertation:
    - January 1, 2007 – October 15, 2007 (40 weeks)

- Revisions to Draft Dissertation:
    - December 1, 2007 – March 1, 2008 (12 weeks)

- Preparation Dissertation Defense:
    - March 1, 2008 – April 10, 2008 (5 weeks)

- Defense of Dissertation:
    - April 11, 2008