Review article  Research Trends in Environmental Education of Korea: The Past, Present, and Future

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Accepted on April 26, 2017

Abstract
To describe the characteristics and development of EE research in Korea, this paper includes critical reviews of previous studies which discussed the trends in EE research. The range of studies reviewed includes journal articles, doctoral dissertations, and masters’ theses on themes of EE from the 1980s to 2016. This paper introduces the backgrounds and contexts of EE in Korea, interpreting the development of this field and the roles of academic journals. This paper also shows the expansion and diversification of EE research in Korea. In the processes, groups of researchers have conducted their studies in the emerging areas with specific target groups or topics such as early childhood EE and climate change education. By comparing research articles in the early 2000s and the early 2010s, the author suggests that the range of practices in EE has changed. Reviewing the past and present features of EE research, this study leads to discussions on traditions/currents of EE and roles of EE research for the future practices.

Keywords: environmental education (EE), research methodology, research trends, traditions/currents of EE

I. Introduction
1. Backgrounds: Some features of EE in Korea
As in many other countries in Asia, the Environmental Education (EE) in Korea has expanded with desire for the better environment since 1980’s and further developed after. The current features of EE in Korea are based on the dedicated school teachers, informal educators and researchers in related areas of EE such as conservation education, anti-pollution education, nature study, climate change education, and education for sustainable development (Sauvé 2005, Kim and Kim 2013).

Among many notable features of formal EE in Korea, the theme of the ‘environment’ has been incorporated into national curriculum as an independent subject at the secondary level since the 1990’s, while infused into related subjects at the elementary level. The subject ‘Environment’ has many implications for EE in Korea. Development of series of textbooks, research on curriculums, and launches of departments and graduate programs on EE are some derivatives of the subject establishment. Through the processes, a group of teachers has been seeking their identity as environment subject teachers, and the contents and philosophical directions of EE could be diversified. Now the subject includes not only environmental conservation but also the concepts of sustainability and social-ecological systems.

Enacted in 2008, the Environmental Education Promotion Act of Korea has provided legal and legislative instruments for EE in Korea afterward. Among the EE policies, the mandatory national/regional EE plans and the national/regional EE centers are also implemented.

2. Contexts: Academic journals on EE in Korea
In the course of development of a field of study, researchers and practitioners in the field gather to form academic associations and publish academic journals to exchange and communicate research and practice. The Korean Journal of Environmental Education (KJEE), the most representative journal on EE in Korea, was launched by the Korean Society for Environmental Education (KOSEE) in 1990 and has contributed to EE research. The topics of research cover EE policies, curriculum, teaching & learning methods, discussion on EE perspectives and so on.

As the field of EE evolves, other journals have also been started to embody specific subjects or themes. The Journal of Eco-Early Childhood Education (JEECE) launched in 2002 with a focus on early childhood. More recently, the Journal of Energy and Climate Change Education (JECCE) published its first issue in 2011, focusing on energy and climate change issues. The emergence of these journals also reflects academic needs in the field of EE.
To describe the characteristics and development of EE research in Korea, this paper includes critical reviews of previous studies which discussed the trends in EE research of the country. The range of studies reviewed includes masters’ theses, doctoral dissertations, and journal articles on themes of EE from the 1980s to 2016. A series of literature review in this paper mainly dealt with journals on EE but often included journals on science education or environmental studies, especially at early stages in the 1990s and before.

II. Overview of EE research in Korea

1. Previous studies on trends of EE research overall

The trends in EE research of Korea have been discussed by more than a dozen groups of authors for the last twenty years (Table 2). Among them, Noh et al. (1998) analyzed 188 articles published in the KJEE and a science education journal. Later Koh and Kim (2001) reviewed the articles in KJEE with a focus on research methodology and compared with the Journal of Environmental Education (JEE), and then followed by Shin and Lee (2009), and Hwang et al. (2012).

2. Early influences on EE

At the beginning of the 1990s or before, the studies on EE in Korea were mainly conducted by researchers with backgrounds in science education or environmental science/engineering. That’s why Noh et al. (1998) compared the research papers in the KJEE with ones in a science education journal. After the Korean Society for Environmental Education (KOSEE) and KJEE were launched in 1989 and 1990 respectively, research and discourses on EE could become to have own features in the academic community. According to the study (Noh et al. 1998), the main content areas in the articles reviewed were waste (27.7%), water quality (15.2%), and air quality (9.8%) followed by natural environment (5.4%), soil (4.4%), and energy (4.4%). It shows that the contents in EE had been influenced by the framework of environmental science/engineering, overall.

EE in Korea at its early stage was also influenced by the international EE discourses, especially from the UNESCO and other international conferences. Regarding research topics and methods, many EE research papers referred to articles in the JEE which was the most influential journal at that time. As the earliest, Lee and Kim (1994) reviewed 178 research articles in JEE from 1984 to 1992 in one of the first studies on EE research trends.

When Koh and Kim (2001) critically examined the research methodologies in EE of Korea, they compared the articles published in KJEE and JEE in the 1990s. In both journals, research methods of the survey and literature reviews were more frequently used (Table 3). The qualitative research methods such as participatory observations or phenomenology, which have been used in EE research of Korea since the 2000s, were rarely counted both in JEE and KJEE at that time.

<table>
<thead>
<tr>
<th>Academic Journals</th>
<th>First Issue</th>
<th>Issues / Year</th>
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<tbody>
<tr>
<td>The Korean Journal of Environmental Education (KJEE)</td>
<td>1990</td>
<td>4 issues/year (quarterly)</td>
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<tr>
<td>The Journal of Eco-Early Childhood Education (JEECE)</td>
<td>2002</td>
<td>4 issues/year (quarterly)</td>
</tr>
<tr>
<td>Journal of Energy and Climate Change Education (JECE)</td>
<td>2011</td>
<td>2 issues/year (bi-annual)</td>
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<table>
<thead>
<tr>
<th>Reviewers</th>
<th>Periods</th>
<th>Number of reviewed studies</th>
<th>Scope of review</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noh et al. (1998)</td>
<td>1987 – 1998</td>
<td>188 journal articles</td>
<td>EE in KJEE and a science education journal (JKASE)</td>
</tr>
<tr>
<td>Hwang et al. (2012)</td>
<td>1990 – 2011</td>
<td>383 articles</td>
<td>formal EE in KJEE</td>
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<tr>
<th>Research Methods</th>
<th>KJEE (%)</th>
<th>JEE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>literature reviews</td>
<td>81 (26.1)</td>
<td>46 (25.8)</td>
</tr>
<tr>
<td>content analyses</td>
<td>69 (22.2)</td>
<td>21 (11.8)</td>
</tr>
<tr>
<td>survey studies</td>
<td>74 (23.8)</td>
<td>76 (42.7)</td>
</tr>
<tr>
<td>interviews</td>
<td>17 (5.5)</td>
<td>17 (9.6)</td>
</tr>
<tr>
<td>experimental studies</td>
<td>17 (5.5)</td>
<td>2 (1.1)</td>
</tr>
<tr>
<td>case studies</td>
<td>45 (14.8)</td>
<td>9 (5.1)</td>
</tr>
<tr>
<td>participatory observations</td>
<td>4 (1.3)</td>
<td>2 (1.1)</td>
</tr>
<tr>
<td>others (action research, phenomenology)</td>
<td>4 (1.3)</td>
<td>5 (2.8)</td>
</tr>
<tr>
<td>Total</td>
<td>311 (100.0)</td>
<td>118 (100.0)</td>
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</table>
3. Expansion and Diversification of EE research in Korea

One of most comprehensive reviews on EE research was conducted by Kim (2006), based on the analytical framework including research topics, methods, subjects, and goals of EE pursued. Reviewing 261 theses/dissertations and 280 articles in KJEE, Kim (2006) showed that the number of research papers has been increasing (Table 4). Before 1997, there were much less than 10 theses/dissertations annually, but the number of theses/dissertations had been increased since 1998 and reached to more than 50 theses/dissertations in 2003. It was due to launches of the graduate programs on EE in Korea from 1996, in part.

As described above, the establishment of the ‘Environment’ subject in national curriculum and the establishment of EE departments in 1994–1996 also had impacts on the EE research communities. Kim (2006) showed that among the 541 papers reviewed, the articles with a focus on formal EE (85.6%) was dominant. Cho (2008) also showed that majority of articles in KJEE were related to EE in public school systems (mostly to the secondary level) while EE in communities were much less in the early 2000s. Studies on EE in diverse settings including school-community collaboration are found in the 2010s (Kim et al. 2014, Kwon et al. 2015). Regarding research topics, the studies on EE curriculum (63.4%) were dominated in numbers, followed by textbooks (14.8%), and philosophy of EE (4.6%).

Another diversification can be found in research methodology. In accordance with the international discourses on research methodology, the number of studies with qualitative research methods such as ethnography has increased since 2002 although quantitative research was still dominant by the late 2000s. In celebrating the 20th anniversary of KOSEE, Shin and Lee (2009) conducted a study to analyze 418 articles in KJEE and 393 in JEE from 1990 to 2008. In both journals, more studies were conducted by quantitative methods but the ratio of qualitative research have been increased since the mid-1990s for JEE and since mid-2000s for KJEE, respectively.

III. Emerging research areas with specific topics or target groups

1. Environmental Education and Ecological Education for early childhood

More recently, studies on research trends in EE has been conducted with specified target groups. For example, early childhood education researchers have analysed research trends on early childhood EE or early childhood education for sustainability which are rapidly expanding areas in the 2010s (Table 5).

Table 4. The Numbers of Journal Articles or Theses/Dissertations on EE in Korea (Kim 2006)

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Journal articles</td>
<td>0</td>
<td>17</td>
<td>9</td>
<td>18</td>
<td>20</td>
<td>23</td>
<td>8</td>
<td>6</td>
<td>22</td>
<td>19</td>
<td>41</td>
<td>21</td>
<td>23</td>
<td>16</td>
<td>13</td>
<td>24</td>
<td>280</td>
</tr>
<tr>
<td>Theses/Dissertations</td>
<td>17</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>7</td>
<td>8</td>
<td>3</td>
<td>14</td>
<td>13</td>
<td>22</td>
<td>23</td>
<td>46</td>
<td>52</td>
<td>42</td>
<td>261</td>
</tr>
<tr>
<td>Sum</td>
<td>17</td>
<td>18</td>
<td>10</td>
<td>23</td>
<td>22</td>
<td>28</td>
<td>15</td>
<td>14</td>
<td>25</td>
<td>33</td>
<td>54</td>
<td>43</td>
<td>46</td>
<td>62</td>
<td>65</td>
<td>66</td>
<td>541</td>
</tr>
</tbody>
</table>

Table 5. Review papers on early childhood EE research trends in Korea

<table>
<thead>
<tr>
<th>Reviewers</th>
<th>Periods</th>
<th>Number of reviewed studies</th>
<th>Scope of review</th>
</tr>
</thead>
</table>

In Korea, the environmental education or ecological education for early childhood considerably began in the 1990s. And the research in this field has boomed up since 2002 when the Journal of Eco-Early Childhood Education (JEECE) published its first issue. Before 2002, the target of kindergarten students was one of the school groups of less attention in EE research (Cho 2008, Son 2016).

During and after the UN DESD (2005–2014), the term ‘early childhood education for sustainability’ began to be used and the number of articles in this area have increased since 2012 (Seo and Cho 2015). The trend also reflects international trends in early childhood education. The 2010 World Conference of the Organisation Mondiale pour l’Education Préscolaire (OMEP), an international organization for early childhood education, addressed the “Early Childhood
Education and Sustainable Development” on its agenda (Seo and Cho 2015). Some of its outcomes were published in the International Journal of Early Childhood in 2009 and 2011. The launch of International Journal of Early Childhood Environmental Education (IJECCEE) in 2013 was considered to be influenced by such international trends.

Research on early childhood EE in Korea usually covers ecological education and nature education. Lee and Jang (2012) reviewed 233 masters’ theses and doctoral dissertations on ecological education for early childhood from 1997 to 2012. When the terminologies for this area were classified, the most frequently used terms in titles were ‘nature-friendly or nature education’ (28.3%), ‘eco-early childhood education’ (22.3%), followed by ‘eco-oriented or ecological education’ and ‘forest kindergarten.’ Regardless of the terms in titles, the terms such as ‘eco’ early childhood education, ‘nature-friendly’ education, and ‘eco-oriented’ education had been used with similar meanings.

The co-existence of ‘environmental education’ and ‘ecological education’ is still common in this area. Currently, the most common themes of early childhood EE are ‘nature experience in the forest’ and ‘forest kindergarten’ while including many other themes such as vegetable gardening, walking activities in nature, ecological arts, and animal farming (Hurh and Park 2016, Son 2016).

2. Energy Education and Climate Change Education

As the EE in Korea establishing linkages with related fields, the researchers have included the discourses of sustainability (Cho 2008, Seo and Cho 2015), climate change (Park et al. 2013), and energy (Jang and Shin 2013). Such research trends reflected the situations that the Education for Sustainable Development boomed in the period of DESD (2005–2014) in Korea and that Climate Change Education or Green Growth Education expanded in the socio-political contexts of Korea since the late 2000s.

Especially the “Low Carbon, Green Growth” strategy of the former Korean government (2008–2012) had influenced the EE practices. The concepts of sustainable development (or green growth) and the issue of climate change were substantially incorporated into textbooks of related subjects and the Environment subject through the revision of national curriculum in 2009. The enactment of the Act on Green Growth in 2010, the emergence of climate change education, and the launch of the Journal of Energy and Climate Change Education (JECCE) in 2011 all can be taken in this context.

When Kim (2011) analyzed 55 theses/dissertations from 1993 to 2011 with keywords of ‘global warming,’ ‘climate change’ and ‘education,’ the most common theme was ‘energy’ or education for energy conservation especially before 2007. The research on climate change has been increased since 2008 and markedly in 2010 (also in Jang and Shin 2013, Park et al. 2013). The terminology of “Climate Change Education” had also established in the period (Kim and Choi 2011). Recently, the themes of research have changed its focus from energy conservation to climate change, but more are on development and application of educational programs while less on climate literacy or how to address the issue as responsible citizens.

IV. Currents in EE of Korea and further discussions for the future

Every practice of EE has different characteristics and features based on its traditions. That’s why Lucie Sauvé (2005) suggested fifteen (15) currents of EE in understanding the broad range of concepts and practices in EE. The currents of EE include both more traditional ones such as the Naturalist and Conservationist currents, and more recently emerged ones such as Sustainability current and so on (Table 6).

<table>
<thead>
<tr>
<th>Naturalist</th>
<th>Conservationist/Resourcist</th>
<th>Problem-Solving</th>
<th>Systemic</th>
<th>Scientific</th>
<th>Humanist/Mesological</th>
<th>Value-centered</th>
<th>Holistic</th>
<th>Bio-regionalist</th>
<th>Praxic</th>
<th>Socially Critical</th>
<th>Feminist</th>
<th>Ethnographic</th>
<th>Eco-education</th>
<th>Sustainable Development/Sustainability</th>
</tr>
</thead>
</table>

By comparing research articles in KJEE published in the early 2000s and early 2010s, Kim and Kim (2013) argued that trends of EE research have changed (Table 7). The authors compared the EE currents from 40 articles published in 2000–2001 and 69 articles in 2010–2011, by analyzing the EE currents based on contents of the studies, concepts of the ‘environment’ and goals of EE pursued in the studies. For example, a study on the program of education ‘in’ the environment utilizing school outdoor environment was considered as one in the Naturalist current. The authors
did not categorize the Eco-education current, since “ecological education” or “eco-education” in Korea are usually interpreted under the naturalist current with different meanings from the ‘Eco-education current’ in Sauvé (2005).

In the early 2000s, research articles in the Problem-solving, and Conservationist currents were more frequently found in the KJEE, while the number of research articles in the Sustainability current had expanded in early 2010s. As mentioned above, the EE in Korea might start with the desire to solve environmental problems for the better environment in its beginning. But in the 2010s, the EE research included not only environmental protection but also the concept of sustainability. These changes mean that EE in Korea has included other representations of the environment. The descriptions of the environment as nature to preserve or the environment as the problems to solve are still common, but the considerations of the environment where we are living together to make a better world with critical perspectives have emerged (Sauvé 2005, Sauvé et al. 2007). There has also been changing understandings of EE, from that the problem-solving is the fundamental orientation of EE, to that EE can have more intrinsic goals for learners. Meanwhile, interpreting EE in the sustainability current may cause tensions with more traditional ways of EE (Ardoin et al. 2013). These tensions and further resolutions need to be studied in EE communities of Korea.

Attention paid to socially critical aspects of EE is another sign of meaningful changes. EE in Korea used to limit the scope of responsible citizenship to the level of individual action. It rarely highlighted viewing our social systems with socially critical perspectives or stressing collective actions. For example, many of energy education or climate change education materials had focused more on actions to reduce household energy consumption or individual greenhouse gas emission but less on reflection of mass production societies or unfairly low energy price for industries with critical perspectives. Studies with a focus on cultural traditions of Korea, and ones with eco-feministic or holistic perspectives, are also emerging but need more attention.

Regarding research methodology, quantitative studies are not dominant anymore. Many qualitative studies have delved into their research questions with the methods of ethnography, narratives, and phenomenology. However, there are limited studies with the mixed methodology in a systemic way. Thus, based on the reviews of past and present features of EE research, we may find hints for future practices in EE studies.

As seen above, there have been many studies on the past and current research in Korea. However, there is no study on future EE research needs in Korea yet. It is time to explore the future EE research themes with a prospective and retrospective. For more than 30 years, the EE communities in Korea has its efforts to make the field a more substantial and meaningful discipline. The structure of contents has been re-organized from the traditional framework of water, air quality, ecosystem, and soils to the reflection of the human-environment interactions in our social-ecological system in the 2015 revision of national curriculum. Such increased attention to social-ecological systems is also in line with what Ardoin et al. (2013) suggested as one of the future themes in EE: emphasis on the context of social-ecological communities and links between environmental quality and human well-being.

**Table 7. EE Currents in the articles of KJEE**

<table>
<thead>
<tr>
<th>Currents in EE</th>
<th>Number of articles in KJEE (%)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>2001-2002</td>
</tr>
<tr>
<td>Naturalist</td>
<td>6 (15.0)</td>
</tr>
<tr>
<td>Conservationist</td>
<td>11 (27.5)</td>
</tr>
<tr>
<td>Problem-solving</td>
<td>21 (52.5)</td>
</tr>
<tr>
<td>Scientific</td>
<td>3 (7.5)</td>
</tr>
<tr>
<td>Humanist</td>
<td>3 (7.5)</td>
</tr>
<tr>
<td>Value-centered</td>
<td>4 (10.0)</td>
</tr>
<tr>
<td>Holistic</td>
<td></td>
</tr>
<tr>
<td>Bio-regionalist</td>
<td>1 (2.5)</td>
</tr>
<tr>
<td>Praxic</td>
<td>10 (25.0)</td>
</tr>
<tr>
<td>Socially Critical</td>
<td>3 (7.5)</td>
</tr>
<tr>
<td>Feminist</td>
<td>1 (2.5)</td>
</tr>
<tr>
<td>Ethnographic</td>
<td>1 (2.5)</td>
</tr>
<tr>
<td>Sustainability</td>
<td>1 (2.5)</td>
</tr>
<tr>
<td>Others</td>
<td>6 (15.0)</td>
</tr>
<tr>
<td>Total</td>
<td>40 (100.0)</td>
</tr>
</tbody>
</table>

These changes mean that EE in Korea has included other representations of the environment. The descriptions of the environment as nature to preserve or the environment as the problems to solve are still common, but the considerations of the environment where we are living together to make a better world with critical perspectives have emerged (Sauvé 2005, Sauvé et al. 2007). There has also been changing understandings of EE, from that the problem-solving is the fundamental orientation of EE, to that EE can have more intrinsic goals for learners. Meanwhile, interpreting EE in the sustainability current may cause tensions with more traditional ways of EE (Ardoin et al. 2013). These tensions and further resolutions need to be studied in EE communities of Korea.

**About the author**

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and school-community EE collaboration guidebook. His research areas primarily sit at the intersection of environmental studies and education, including climate change education, energy education, education for sustainability, and EE policies.

References


