Review article Environmental Education Research in Japan
—A Fragmented Field of Inquiry—

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Accepted on March 3, 2017

Abstract
This article reviews the history of environmental education research (EER) in Japan, casting a critical view on its fragmented nature, and proposes a future agenda for its development. Pollution (kogai) education research (KER) and nature conservation education research were initiated and developed by people from different backgrounds in the 1960s and 70s, which was followed by “EE” research in the 1970s. The establishment of the Japanese Society of Environmental Education (JSOEE) in 1990 could have linked them up under the banner of EE, yet KE was rather neglected within the JSOEE in the 1990s and 2000s, unlike nature conservation education. This is possibly because many key KE researchers did not join nor become active members of JSOEE, and the then Environmental Agency downplayed KE in the formulation of its EE policy. This KER-EER disconnect may account for the weak critical and social scientific perspectives in JSOEE and a “technocratic rationality” prevailing among its members who tend to regard EE as an instrument to achieve policy objectives. Existing studies also show other disconnects embedded in JSOEE—between research in Japan and abroad and between research in the present and the past, the former hardly drawing on the latter in each case. These disconnects may be due to the emphasis on a street-level pragmatism and a lack of theoretical discussion within JSOEE. After pointing out several features of Japanese EER in the 2010s, this article concludes by suggesting several agendas to address the patchwork condition and existing disconnects for the future of EER in Japan.

Keywords: characteristics, history, nature conservation education, pollution education, review

I. Introduction
This is a review article of the existing studies (mainly in Japanese) on the historical development of environmental education research (EER) in Japan. This article, although it provides a limited amount of original empirical data, should be of value to both Japanese as well as non-Japanese readers, as the genealogy of EER in Japan is a rather neglected topic in the Japanese EE society itself. In fact, existing research is limited not only in number, but also in terms of the period and the kinds of EE they covered. Accordingly, this article draws much on Nomura (2015), which has a relatively large scope of time, targeting the research in the first 20 years of the Japanese Society of Environmental Education (JSOEE). It is complemented by the materials describing the EER before and after this period, as well as the EER outside of JSOEE.(1)

This article divides the history of EER in Japan into three phases. The first phase, until the end of the 1980s, is reviewed in Section II. Section III reviews the second phase, the first 20 years of JSOEE (1990s and 2000s), which is the core of this article. Section IV points out several features of EER in the third phase (2010s). The author suggests that the division between the first two phases is not as controversial as that between the second and the third. In fact, it is not very clear how significant the third phase is in the history of EER in Japan. Having said that, this article deals with this phase independently from the previous two, partly because of the requests from the editors to mention developments in the post-UNDESD (UN Decade of Education for Sustainable Development) period, which may in fact help us think about the future of EER in Japan.

This article casts a critical view on the fragmented nature of EER in Japan and proposes a future agenda for its development. Before such a claim is made, it is first necessary to delineate the slippery concept of EE here. This article uses the term “EER” to refer not only to the research that explicitly regards its subject as “EE” but also to the research on kogai (or pollution) education and nature conservation education, both of which are often considered as...
precursors to the Japanese EE. Research works on ESD or its synonyms (such as sustainability education) are also within the scope of this article as long as they are associated with the discussion on EE.

II. Pre-JSOEE Period: –1980s

It is debatable when EER in Japan started, but existing literature suggests that pollution (or kogai) education research (KER) started in the 1960s. KER meetings among elementary and junior high school teachers in Tokyo and Yokkaichi city began in the mid-1960s (the former developed into a nation-wide meeting in 1967). Local institutions such as the Yokkaichi City Education Research Institute started KER during this period. Since then, KER has underpinned KE in practice, which is a precursor and a key component of EE in Japan.

KER in the 1970s was pushed forward by the KE sectional meeting at the annual education research meetings of the Japan Teachers’ Union (Nikkyoso) from 1971, and an independent research group was made up of the meeting members (Ando 2015, Fukushima 1993). Key members of the group also joined the Environment and Education Research Group at the Nation’s Education Research Institute (Kokumin Kyoiku Kenkyujo) established by the Japan Teachers’ Union, which also led KER in the 1970s and 80s. The work by these KE researchers and their subsequent associates—or the KER school—in this period is illustrated by the Environment and Education Research Group at the Nation’s Education Research Institute (1985) and Fukushima (1985; particularly Fujioka’s chapter).

One of the characteristics of this KER school is its emphasis on the dialogue at teachers’ meetings, as well as publication of books and educational materials instead of presentations and publications at academic professional conferences. In other words, this school emphasized KER’s role in the anti-kogai movement by sharing knowledge through case studies, and it did not seem to give equal weight to generalized theoretical discussion among academics. Another characteristic is that KER, embedded in the anti-kogai movement, has cast a critical view on the power of the state and businesses that led the rapid economic growth at the sacrifice of the environment.

It is unclear when nature conservation education research began in Japan, but it must have started by the late 1960s–early 1970s when reviews of related literature and practices were made in the Journal of Biological Education of the Japanese Society of Biological Education (Ito and Ogawa 2008). The practice of nature conservation education started in the late 1950s as a part of the nature conservation movement (e.g., in the Miura Peninsula), following the traditional outdoor nature observation and biological education. Like KE, the research on nature conservation education seems to have made the movement the centerpiece of its roots, emphasizing knowledge sharing instead of theory building.

Thus, research on these headwaters of Japanese EE practices–KE and nature conservation education–can also be considered as the precursors of EER in Japan. One of their common features is the emphasis of their roles in social movements. One key difference is that many of the KE researchers taught social studies, while the researchers of nature conservation education tended to have a background in natural sciences.

However, when it comes to “research” and not practice, one may want to add another stream to these two precursors. It involves diverse types of EER and is difficult to label them, and it is debatable to even put them in the same basket–so let us just call it the “third school.” This school prefers to use the term EE instead of KE, or nature conservation education. In fact, it does not refer much to KER and nature conservation education research, while it often draws on the international development of EE. People in the third school do not overlap much with KE or the nature conservation researchers.

The research projects that first included the title “EE” emerged in the 1970s. The database of KAKEN (Grants-in-aid for Scientific Research), the largest source of funding for academic research in Japan, shows that KAKEN-funded EE projects also emerged in the early 1970s.21

Among others, there are two notable researchers who made significant contributions to EER in Japan with several KAKEN projects, and who represent the third school: Makoto Numata, a scientist of ecology who worked on EE curriculum research with KAKEN, and Kazuhiko Nakayama, a researcher of science education and educational technology who worked on the material development, documentation, and review of international trends of EE.

Unlike KER and nature conservation education research, this third school is not rooted in the social movements of previous decades, although it too has emphasized its relationship with practitioners and supports EE activities.
nationwide. Some of the people in this school are active in holding and attending international meetings, and many are involved in science education (kagaku kyoiku). Numata (1982, 1987) are among the key publications of the school in this period, of which ecology and nature conservation are the core themes. Accordingly, this school has a closer relationship with the people engaged in nature conservation education research than with KE researchers.

In the 1980s, organizations related to the government (then Ministry of Education and Environmental Agency) started EER, which is exemplified by a report commissioned by Japan Environment Association to the National Institute for Educational Research (see its published version Environmental Education Research Group at the National Institute for Educational Research, 1981). While their research projects use the term EER, they did not pay attention to the existing KER in Japan (Fukushima 1993, pp.97-98), while referring frequently to the international developments of EE. Because of this sense of detachment from KER and nature conservation education research, they can be considered as a part of the third school.

III. First Two Decades of JSOEE: 1990s & 2000s

1) EER in General

Although the KE movement withered considerably in the 1990s(3), KER remained an independent school throughout the 1990s, and its leading figures such as Tatsuo Fukushima and Sadahiko Fujioka issued important monographs (Fukushima 1993, Fujioka 1998). Ando (2009, p.94) points out that there are also notable KER projects outside of JSOEE in the 2000s.

In contrast, the rapid development of “EE” research, or research that explicitly calls its subject as EE, was witnessed in the 1990s and 2000s. The key event was the establishment of JSOEE in 1990. It can be said, at the risk of oversimplification, that it was established mainly by the people in the “third school” mentioned above, with the involvement of people from various backgrounds—many practitioners as well as academics—but not the KE and nature conservation education researchers. Numata became the first president of the JSOEE and Osamu Abe, a student of Nakayama, became the second and the third secretary general after serving as a major member of its preparatory committee, thus suggesting an influence of the third school. Since many of them are engaged in nature-focused education (such as nature experience activities), people in nature conservation education in the 1970s and 1980s seem to have gradually joined in on JSOEE.

In parallel with the development of EER, EE-related publications also increased during this period. In the early 1990s, for example, Kokudosha Publishing issued 4 volumes, and Tokai University Press published 5 volumes of EE book series (they are mostly introductory volumes, involving essays instead of research results). Textbooks for students of EE also emerged in the 2000s.

It is also worthwhile mentioning the increase in EE policy research in Japan in the late 1990s, which is one of the more popular topics at JSOEE (Nomura 2015). For example, the Institute for Global Environmental Strategies, funded by the then Environment Agency of Japan, started EE policy research in 1998 (EER members of this institute largely overlapped with JSOEE members).

In the 2000s, there was an increase in the number of graduate schools in Japan offering courses in EE. The doctoral dissertation database in Japan, CiNii Dissertations, shows that PhD dissertations on EE started to appear in 1994, and there were 13 dissertations throughout the 1990s; this number increased to 38 in the 2000s.

As we have seen, EER in Japan developed rapidly in the 1990s and 2000s, and JSOEE played a leading role. Now, let us turn to the distinctive features of EER at JSOEE during this period.

2) Distinctive Features of Research within JSOEE

Nomura (2015)’s bibliometric study reviews the articles published in the Japanese Journal of EE (Kankyo Kyoiku; hereafter the “Japanese Journal”) in the first twenty years since the inaugural issue in 1991, with reference to similar studies about the Australian Journal of Environmental Education (Stevenson and Evans 2011) and Environmental Education Research (Reid and Scott 2006) for a comparative purpose. It covers 107 original articles and review articles in total. As the Japanese Journal does not generally accept papers from outside of the society, the study portrays the characteristics of the research in the JSOEE.
Nomura (2015) highlights three distinctive features regarding the research published in the Japanese Journal. One is the neglect of KE within the JSOEE—only 2% of the articles targeted KE. This data supports the remarks by Asaoka (2009) and Ando (2009) about the low interest in KE of the JSOEE members.

This is partly because many KE researchers did not join nor become active members of JSOEE, although many JSOEE members regarded KE as a major element of EE at the time of establishment, which Furihata (2010, pp.85-86) calls a "disconnect problem" between KE and EE.

Ando (2015) provides an institutional explanation for the weak representation of KE in JSOEE or the shift from KE to EE in Japan in general. In short, it is partly because the government, particularly the then Environmental Agency, downplayed KE when it promoted EE. It is reflected in key government EE documents, such as the EE Conversazione Report in 1988, the Basic Environment Law (1993; EE is mentioned in Article 25), and the Central Environment Council Report on EE (1998).

The Japanese experience mentioned here suggests the power of institutionalization that can shape EER. In the case of Japan, it sidelined the traditional KER and nature conservation education research, both of which could have linked with EER when the JSOEE was established. People involved in KER and nature conservation education research had ties with social movements, which were (and still are, to some extent, especially when it comes to KE researchers) not necessarily cooperative with the government, while people at JSOEE did (and do) not have such socially critical views and went along well with the government in promoting EE. This difference could have been a stumbling block for connecting EER with the former two—particularly KER.

In fact, the weak critical and social scientific perspectives in EE is the second characteristic of the research within JSOEE. The articles that addressed the social/cultural dimension of the environment represent only 7% of the total in the Japanese Journal (Nomura 2015), while they occupy 44% of the articles in the Australian Journal of EE (Stevenson and Evans 2011, p.38). Articles about political and economic dimensions of the environment also occupy little in the Japanese Journal—2% altogether.

The above-mentioned KER-EER disconnect may account for this characteristic. KE emphasizes a critical view on the socio-political structure underlying pollution problems (Harako 1997). For example, Asaoka (2009, pp.83-87) understands kogai in the context of political and economic structure, as social disaster owing much to the profit-oriented corporations and the negligent government, in which the socially weak are the major victims. While nature conservation education can have a social and critical perspective, it began in Japan with the very optimistic premise that “the more that people know nature, the more people become environmentally-friendly” (Ito and Ogawa 2008, p.38), a premise that prevented it from joining with KE. This apolitical attitude of nature conservation education may be another reason for the disconnect between KE and EE (Ito and Ogawa 2008).

The third distinctive feature, which is related to the second, is the low interest in the paradigmatic discussion—or the domination of positivism—at JSOEE. There is no article in the Japanese Journal discussing paradigms framing EE (Nomura 2015). This illustrates a distinction from the Australian Journal of EE, in which 45% of the articles examine EE through a socially critical, phenomenologic, feminist or post-structuralist paradigms lens (Stevenson and Evans 2011, pp.34-35).

This can be understood as another disconnect embedded in Japanese EER—isolation from the international trend of an epistemological pluralization based on the rise of new paradigms such as critical realism and interpretivism in various disciplines of social sciences, including EE (as for EE, see Palmer 1998, Hart and Nolan 1999, Gough 2013, Stevenson et al. 2013, for example). Nomura (2015) suggested that this monolithic epistemology in JSOEE is due to the dominance of members with a natural science background, while social scientists such as human geographers played an important role in the Australian and some other western EE societies. Interestingly, this disconnect between Japan and abroad can be seen only in relation to theories—in fact, Japanese researchers have shown interest in introducing policies and practices abroad (Nomura 2015).

The dominance of positivism is also reflected in the popularity of quantitative analysis. Among the empirical studies included in the Japanese Journal, 68% of them draw on quantitative analysis (Nomura 2015), which overwhelms the 41% in the Australian Journal of EE and 34% in Environmental Education Research. In fact, including articles using mixed methods (quantitative and qualitative), as much as 78% of the empirical studies in the Japanese Journal.
involve quantitative data. Moreover, 59% of the articles that applied quantitative analysis use bi- or multi-variate methods, while the “vast majority of quantitative studies” in the Australian Journal “used only descriptive statistics” (Stevenson and Evans 2011, p.34).

Nomura (2015) also shows the positivist tendencies of the Japanese EER with different data such as the emphasis on the causal relationship between educational input and output by measuring the latter in a quantitative and psychological manner. In other words, the popular approaches of the Japanese EER are behavioral and applied sciences. Also, 16% of the articles of the Japanese Journal are about government policies (they occupy only 5% in the Australian Journal); however, they tend to only introduce and interpret the policies without critical analysis, which also suggests the weak critical perspective and social scientific approaches (for the tendency to accept the government policies among the JSOEE members, see also Japanese Journal of Environmental Education Editorial Committee 2009, p.54).

Then, has the positivist EER at JSOEE developed without problems? Two points are worth noting here. One, mentioned by a leading figure of JSOEE, is that JSOEE members tend to pay insufficient attention to existing research (Japanese Journal of Environmental Education Editorial Committee 2009, p.54). Here one can see another disconnect embedded in JSOEE—between research in the present and the past.

Second, there is a lack of interest in methodology in JSOEE, which may show its orientation towards pragmatic information-sharing instead of academic discussion. There have been no articles in the Japanese Journal discussing research design, methods or methodology of EE (Nomura 2015). There is particularly little interest in qualitative research—one can see less description of methods in the articles using qualitative methods than in the articles applying quantitative methods. This tendency of paying insufficient attention to past research and methodology should have been a significant obstacle to achieving high quality research.

This strong positivist tendency seems related to what Harako (2010) calls the “technocratic rationality” that prevails JSOEE. Harako points out that the Japanese researchers tend to perceive EE as an instrument to solve environmental problems or as a means for strengthening environmental management of the government; accordingly, objective and “scientific” empirical research, particularly on the impact of policy/educational intervention, is valued. This tendency may be due to the lack of the critical views that are embedded in KE or overseas discussion. This may also account for the strong support of JSOEE in the government-led ESD movement in Japan (discussed later).

IV. DESD and Beyond: 2010s

While the preceding section covered two decades to identify the features of EER in Japan, it is currently too early to consider any new trends of EER in the 2010s through the same kind of bibliometric study. Accordingly, this section introduces three signs of development that the author finds noteworthy.

One sign of development is that some efforts are found at JSOEE to address the KER-EER disconnect. In 2015, the Japanese Journal issued a special edition on KE (Vol. 25, Issue 1), and a few KE articles on other issues have also emerged.

Another is the increase in ESD-related efforts, including the ones after UNDESD. Articles on ESD in the Japanese Journal increased in the 2000s—9 out of 10 ESD articles were published in the 2000s (Nomura 2015). The Journal seems to follow this trend in the 2010s as well by issuing a special edition on ESD in the post-UNDESD period in 2015 (Vol. 24, Issue 3). The special edition on EE and development education in 2012 (Vol. 21, Issue 2) can also be understood in this context.

Also, one cannot discount the impact of 2011 Tohoku Earthquake and the ensuing Fukushima nuclear accident. The Japanese Journal issued a special edition on the disaster in 2013 (Vol. 22, Issue 2), and JSOEE issued a monograph in 2013 entitled “EE after Tohoku Earthquake” (Higashi Nihon Daishinsai go no Kankyo Kyoiku).

These efforts overlap in some sense. For one, they all emphasize local activities. For another, nuclear issues have always been within the scope of KE. Also, natural disasters and nature conservation (education) cannot be separated. Asaoka (2009, p.89), who regards community (local) development as the key to ESD, has shown a somewhat too optimistic view that KE and EE are leading to ESD, believing that KE, EE, and other types of related educational activities will be integrated under the banner of ESD.
However, one cannot jump to such a conclusion, as the overlap in the target issues of educational activities will not automatically overcome the KE-EE disconnect at the academic level. Importantly, like EER, ESD research in Japan lacks a critical perspective that is embedded in KER, although ESD is essentially a political concept developed at the international level and whose application to the local context needs careful examination (Nomura 2009, Nomura and Abe 2009, Nomura 2015). In other words, as Harako (2010) puts it, technocratic rationality is also found in ESD research in Japan, which tends to find instrumental value in ESD to achieve policy objectives. The author of this article would argue that, because of such an epistemological difference, the KE-EE disconnect cannot be addressed substantially, even when they begin to tackle the same issues.

V. Conclusion

This article mentioned three distinctive features of EER at JSOEE: the lack of KER; the lack of a social/critical perspective; and the lack of epistemological or paradigmatic discussion, resulting in the domination of positivism. Also, this article showed at least three disconnects embedded in JSOEE: that between KER and EER; between research in Japan and abroad (especially at the theoretical level); and between research in the past and the present. These features and disconnects are related to each other; the disconnect between KE and EE can account for the weak social and critical perspectives. It can also be understood as related to the disconnect between research in Japan and abroad, which led to the lack of epistemological or paradigmatic discussion popular among Western EE communities.

The author is not entirely critical of these features and disconnects, as they might have contributed to creating a pragmatic (i.e., not academic) environment, which may have widely promoted interaction between researchers and practitioners and encouraged EE activities. However, it seems about time for JSOEE to move to engage in the development of EE as an academic discipline.

The development of theoretical discussion in normative, empirical, and methodological terms is the key to the future of EER in Japan, because it can serve as a bridge or glue in this currently fragmented field of inquiry with the existing disconnects mentioned above. As for the KE-EE disconnect, a street-level pragmatism embedded in KER, EER, and nature conservation education research may hinder them from linking up. However, some kind of generalization or theorization can help connect them. This does not necessarily mean nomothetic or statistical generalizations. For example, KER that emphasizes learning from actual cases of pollution problems may seek naturalistic generalization (e.g., Stake 1978, Stake and Trumbull 1982) with “thick description.” In other words, generalized knowledge will help researchers of KE, nature conservation education, and EE learn from each other.

The development of normative and empirical theories cannot be made without referring to international discussion and past literature. In this context, a positive sign within JSOEE is the increase in EE theory textbooks (e.g., Imamura 2016), which shows that there is an increasing interest in this regard. Also, there is growing interest in the history of EER in Japan; further study of it will help identify how Japanese researchers should address this issue.

When it comes to methodology (including data collection methods, research designs, and epistemological discussions), a voluntary session on the topic has been held at the last several JSOEE annual meetings. This is a positive sign in the encouragement of the discussion on methodology, which has been rather neglected in the JSOEE and arguably an obstacle of Japanese EER.

These signs will hopefully lead to the future development of EER in Japan, including the strengthening of a social/critical perspective. It will help in the study of major issues of EE in Japan, such as the issue of institutionalization that has powerfully shaped Japanese EE and EER as mentioned above. More specifically, it will help reveal the technocratic rationality underlying the institutionalization of EE (Harako 1998, p.27) and contribute to the sound development of EE in Japan.

Notes

(1) In addition to general literature review, two bibliographical databases were searched for EER projects in Japan for this article: KAKEN (grants-in-aid for scientific research) database and CiNii Dissertations database <http://ci.nii.ac.jp/d/>. For the former, see Note 2 below for details.
(2) The database <https://kaken.nii.ac.jp/index> covers the KAKEN-funded projects since 1965, which intends to cover the whole history of EER in Japan. Many of the KAKEN-funded EE projects in the 1970s were pragmatic research by incumbent teachers of primary and secondary schools and staff members of local boards of education, with Numata and Nakayama notable exceptions.

(3) For example, research meetings affiliated with the annual education research meetings of the Japan Teachers’ Union stopped being held in the 1990s, and there have not been any large scale KER meetings since then.

(4) There is a remark that the people involved in nature conservation education did not join JSOEE at first (Furihata 2010, p.85); however, they seem to have joined JSOEE later on, at least to some extent, as can be seen from their activities at JSOEE.

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