Environmental Education in Higher Education Institutes in Asia

- Overview of Experiences in South Korea, Malaysia, and Japan -

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Abstract

This paper provides an overview of the development and status of environmental education (EE) at higher education institutes (HEIs) in three Asian countries: South Korea, Malaysia, and Japan. EE is one of the major educational fields oriented toward sustainability, and a mutual understanding of EE in HEIs among different Asian countries is considered to be crucial for successful international collaboration toward sustainability. The paper, based on a review of existing documents and data, presents an overview of EE at HEIs in these countries, particularly at universities and teacher-training institutes, according to a four-category framework, and recommends topics that should be further explored in the interest of successful international collaboration toward a sustainable future.

Keywords: Asia, Environmental education, higher education, university

I. Introduction

The international community has regarded higher education institutes (HEIs)¹⁾ as major actors in the resolution of environmental problems since the United Nations Conference on the Human Environment highlighted their importance in 1972 (Tilbury 2012). As interest in environmental and sustainability issues gradually intensified during the 1980s, expectations regarding the roles that HEIs would play also grew, accompanied by discussion of how HEIs can and should contribute to sustainable development. Since the 1990s, several international declarations, partnerships, and networks of HEIs for sustainability have emerged, including the Association of University Leaders for a Sustainable Future, the Global Higher Education for Sustainability Partnership, the Global Universities Partnership on Environment for Sustainability, the Promotion of Sustainability in Postgraduate Education and Research, and the Higher Education Sustainability Initiative (Wright 2004, Nomura and Abe 2010).

According to a study by Wals and Blewitt (2010), a review of the papers published in the International Journal of Sustainability in Higher Education between 2001 and 2010 revealed that earlier studies focused on environmental management by institutes, including energy saving and waste reduction, while the focus shifted toward education and teaching in later publications. As Figure 1 illustrates, HEIs are expected to contribute to sustainability through education, campus management, support for community development, research, and international networking. While international networking and collaboration are crucial in allowing HEIs to fulfill their roles, a mutual international understanding of the actual practices, issues, and potential of HEIs with respect to

Figure 1 Roles of Higher Education Institutes for Sustainability (Higher Education Sustainability Initiative n.d.)

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sustainability must be fostered. Several publications have provided resources aimed at promoting this international understanding (Corcoran and Wals 2004, Jones et al. 2010, Global University Network for Innovation 2012), including some focusing on the Asia-Pacific region (Ryan et al. 2010, Nomura and Abe 2010, 2012). However, resources of this nature remain limited, particularly for the Asian region, due in large part to the language barrier.

This paper provides an overview of the development and status of environmental education (EE) at HEIs in three Asian countries: South Korea, Malaysia, and Japan. EE is one of the major educational fields oriented toward sustainability, and mutual understanding of EE in HEIs among different Asian countries is indispensable for successful international collaboration toward sustainability. This paper, based on a review of existing documents and data, illustrates the current status of EE in these countries' universities and teacher-training institutes in particular, and synthesizes the findings under four categories: teacher training, environmental professional education, general education, and extra-curricular activities. The paper concludes by highlighting issues that merit further exploration for successful international collaboration in EE toward a sustainable future.

II. EE in South Korean HEIs

In South Korea, EE teacher training forms the core of EE at the higher education level. While EE in South Korea can be divided into two major categories—school EE and social EE (Jang and Ju 2017)—South Korean universities only offer degree programs for school EE teacher training²⁾. An EE Major program for pre-service teachers was initiated at five universities in 1996 (currently four universities: Korea National University of Education, Kongju National University, Sunchon National University, and Mokpo National University), following the launch of “Environment” (at middle-school level) and “Environmental Science” (at high-school level) as independent subjects in 1992, in accordance the national curriculum (Choi 2006). These programs essentially combine pedagogy, environmental engineering, and science, and emphasis on philosophies, concepts, and methods specific to EE is limited. This may be partly due to a lack of faculty members who have specialized in EE from a pedagogical perspective. According to Choi et al. (2016), among the 17 faculty members that supervise EE teacher training at the four universities mentioned above, only 3 majored in EE as part of their doctoral studies. In 1998, a master's program for EE was approved for national universities of education.

South Korean universities also offer both general and specialized courses and programs that pertain to the environmental field. According to a survey of 92 universities in 2017, 16 universities (17.4%) offer environment-related subjects as general education courses (Choi et al. 2018). The authors analyzed the courses that were on offer in 2016, as listed in the online syllabi of Seoul National University (SNU) and Pusan National University (PNU), which are both considered to be representative of South Korea's national universities. The analysis revealed that, among the 6,682 general and specialized courses offered at SNU, 81 (1.21%) included the word ‘environment’ in the course title³⁾. The courses were targeted at students of various majors, including geography, construction engineering, and forestry. Similarly, of the 7,807 courses at PNU, 79 (1.01%) had the word ‘environment’ in the title⁴⁾. Additionally, 2,161 (approximately 13.51%) of the 16,000 undergraduate students in SNU (SNU 2018) and 2,768 (approximately 16.28%) of the 17,000 undergraduate students in PNU took these courses (PNU 2018). This indicates that, while the courses are relatively few in number, a significant percentage of students actually take them. The figures from both of these major universities provide a limited perspective but, nonetheless, a glimpse of the status of EE.

As for specialized programs, SNU launched its Graduate School of Environmental Studies in 1973 (Choi 2006). Other universities followed this example in the 1980s: the College of Natural Sciences of Kangwon National University established a Department of Environmental Studies, the Industrial College of Kyung Hee University launched its Department of Environmental Conservation, and the College of Engineering of the University of Seoul, Konkuk University and others⁵⁾ established the Department of Environmental Engineering (Roh 1983). During the late 1990s, graduate programs in EE emerged, with SNU launching its master's and doctoral programs in 1999.

The Korean Association for Green Campus Initiative (KAGCI) has played a significant role in facilitating EE at various universities since its establishment in 2008. The Green Campus Initiative fosters environmental literacy and environmentally responsible citizenship among students (ULSF 1990). KAGCI began implementing the initiative by introducing good practices and facilitating research, and there are currently 51 green campuses nationwide.

However, its guidelines have not been standardized to encompass the holistic concept of a green campus. More recently, new initiatives have been launched under the auspices of KAGCI, since the passage of the Paris Climate Change Accord in 2015 and the implementation of the United Nations Sustainable Development Goals (SDGs) in 2016. More South Korean universities have begun to focus on sustainability and environmental literacy in their educational offerings, regarding SDGs as practical tools with which global difficulties may be resolved. As part of this shift, more universities are acknowledging university social responsibility (USR), establishing internal social contribution organizations, and launching various programs for local communities. However, the practical activities undertaken by university students' environmental clubs remain inadequate (Sung and Jeong 2017).

III. EE in Malaysian HEIs

The development of EE in Malaysian HEIs has its origins in the earliest teacher training curriculum: "Nature Study" was included in the teacher preparation program offered by the Women Teachers Training College in 1935 (Wong and Chang 1975). The introduction of EE to the national education system in the 1990s ramified throughout the schools and HEIs, including teacher training institutes and universities. In 1991, EE was formally integrated into the national education system (Aminrad et al. 2012). The subject "Man and the Environment" was introduced in elementary schools, marking Malaysia's signatory to the Earth Summit in 1992. Eventually, EE came to permeate all subjects across the primary and secondary curricula, including geography, integrated science, biology, chemistry, and the humanities (Aminrad et al. 2012). This institutionalization of EE as part of the school curriculum required targeted teacher training, and EE was included as a subject in pre-service teacher training at HEIs from 2001 (Ho 2007), with the aim of equipping teachers with the knowledge, skills, and values required for effective implementation of EE in schools (Ho and Azizi 2009).

Second, almost all of Malaysia's 20 public and 45 private universities (as of November 2015) include departments related to the environment or natural resources, although most have adopted a traditionally sectoral, rather than an integrated, approach to teaching and research in these fields. Two public universities are particularly well known for their established faculties in environmental studies. The Faculty of Science and Environmental Studies at the Universiti Putra Malaysia (UPM) was established in 1976, and later became a stand-alone faculty in 2004. The Institute for Environment and Development at the Universiti Kebangsaan Malaysia was established in 1994. Other universities also offer environment-related courses, mainly in faculties of engineering, science, medicine and public health sciences. In recent years, there has been a trend toward increasing the number of environment-related courses at the undergraduate and postgraduate levels. The Malaysian-Danish collaboration from 1994 to 2010 assisted Malaysian universities in upgrading their environment-related courses, using insights and techniques that had been developed in Denmark with a particular focus on the application of problem-oriented and inter-disciplinary approaches (DANCED 2001 and DANIDA 2016). Regarding general education, the Faculty of Environmental Studies at UPM offers "Man and Environment" as an elective course, for example.

Furthermore, Green Campuses are also on the increase in Malaysia. In 2015, eight Malaysian HEIs were listed as Green Campuses in the Universitas Indonesia GreenMetric Ranking of World Universities (Universitas Indonesia 2015). In 2018, this number grew to 18, with UPM in the lead, being ranked number 27 in the world (Aris and Ponrahono 2018). UPM's Green Campus initiatives are primarily institution-led, driven by the Green Sustainability Steering Committee whose mission is to cultivate "green activities" in teaching, learning, and professional services (Aris and Ponrahono 2018). Among the initiatives are a reduction of in-campus bus services and ban on driving on campus among freshmen, in favor of cycling and walking. The university gives a RM300 rebate to new students toward the purchase of a bicycle, and facilities such as bicycle lanes, bicycle stands, and roofed walkways have been constructed. Campus buses are gradually converting to natural gas vehicle (NGV) fuel. A campus-wide no-polystyrene policy has also been instituted. Student-led activities include recycling projects, tree-planting, and awareness campaigns, such as Earth Hour. Most EE activities of this nature are carried out by student clubs.

IV. EE in Japanese HEIs

In Japan, the first teacher training program that included the word "environment" in its title was launched in 1988

(Uchiyama 2011), while environment-related courses were already on offer (Yamaishi et al. 1993) across several programs. Subsequently, teacher training for EE in Japan formally developed from the 1990s onward, while teacher training universities founded institutes and facilities for the promotion of EE practices and research. For example, Tokyo Gakugei University restructured its Field Studies Institute to establish the Field Studies Institute for EE in 1994, and Miyagi University of Education founded the EE Center in 1997. However, EE has never formed part of mainstream teacher training in Japan, and the government has not institutionalized EE as an independent subject in schools⁶⁾ (Science Council of Japan 2008a). The Science Council of Japan (2008b) has argued for the necessity of making EE courses compulsory in the teacher training and foundation/liberal arts curriculums, toward the development of basic literacy and competencies for a sustainable future; however, this has not yet come to pass.

EE formed part of professional education in other fields prior to its inclusion in teacher training, and was developed in three stages, according to the Vision for Environmental Leadership Initiatives for Asian Sustainability in Higher Education (ICVELIAS 2008). The first stage began by training professionals to tackle the growing issues of pollution and environmental destruction in the scientific and technological fields, such as public health engineering and agricultural science, by the mid-1970s. In 1973, Tokyo University of Agriculture and Technology established the Department of Environmental Protection, the first environment-specialized department in Japan. The second stage saw the launch of faculties and departments bearing the word “environment” in their titles, in the fields of science and engineering in the late 1970s and in the social sciences in the 1990s, under the influence of the change of university establishment standards in 1991 and the Earth Summit in 1992. The third stage began in the 1990s, as more inter-disciplinary faculties and departments bearing the word “environment” emerged. Following the launch of the United Nations Decade of Education for Sustainable Development (DESD) in 2005, the Japanese government implemented several projects aimed at subsidizing HEIs to develop innovative EE programs, such as the Support Program for Contemporary Educational Needs – Promotion of Environmental Education for Sustainable Society (Ministry of Education, Culture, Sports, Science and Technology (MEXT): 2006-2007), the Environmental Leadership Initiatives for Asian Sustainability (Ministry of the Environment: 2008-2009), and the International Environment Leaders Training Program (MEXT: 2008-2010). In response to these initiatives, several universities established environmental courses to expand existing curricula, or programs that are environmental in focus, bridging different disciplines including the sciences and the humanities (Ninomiya-Lim 2014).

Regarding the status of EE in general education, a 2007 survey showed that approximately 60% of Japanese universities offer foundation courses related to the environmental field (VELIAS 2008).

EE as extra-curricular activities has also played an important role. Some institutes, faculties, and individual lecturers organize internships and volunteer service programs in the environmental field, in addition to seminars and workshops on environment-related topics for interested students. Students themselves have also organized similar activities with financial, material, and/or personnel support from HEIs. A SEED JAPAN and Eco-League are two major student networks that are engaged in environmental activities in Japan. The former was launched as a national hub for students wishing to join the Earth Summit in 1992 and actively operates as a major environmental advocacy organization in Japan (A SEED JAPAN n.d.). The latter was established in 1994 as an association to connect the various youth organizations founded following this summit, and has organized discussion and training events targeted primarily at college students (Eco-League 2014).

V. Conclusion – Synthesis and Prospects for Further Study

Based on the above overviews of EE at HEIs in three Asian countries, four categories of EE can be distinguished: teacher training for EE, environmental professional education, EE in general education, and EE through extra-curricular activities (Table 1). This section lists the issues that merit further exploration in accordance with the above categorization.

First, teacher training for EE has formed one of the major pillars of EE at HEIs in South Korea, Malaysia and Japan since the 1990s and 2000s, simultaneous with the rising global interest in sustainable development during this period. The content and approaches of EE teacher training programs in all three countries, and where these programs are significantly linked to the content and approaches of EE in schools, should be explored further to identify

commonalities and differences among them.

Another major pillar of EE at HEIs in all three countries is nurturing professionals in “environment-related” fields, including geography, construction engineering, and forestry, as listed in the South Korean overview; natural resource management, engineering, science, and medical and public health sciences, as mentioned in the Malaysian overview; and public health engineering and agricultural science, as listed in the Japanese overview. Further study of these lists of major “environment-related” fields in each country is required, in relation to their local contexts. The development of inter-disciplinary “environment” programs since the 1990s was reported in the Japanese overview. While the Malaysian overview points out that EE in Malaysia’s HEIs remains largely sectoral, the status of inter-/multi-disciplinary EE in HEIs in these countries requires further exploration.

Third, general or foundation courses relating to the environment form another important pillar of EE at HEIs in these countries. Further study is necessary to identify and examine these courses in greater detail, and to acquire more data to compare the status of EE among the countries, including in terms of the contents of environmental courses, and the percentages of students registered to them.

Fourth, extra-curricular activities with an environmental focus also emerged as an important aspect of EE. The Green Campus initiatives mentioned in the South Korean and Malaysian overviews are key examples. The Japanese overview offered examples of internship/volunteer service programs, seminars, and workshops pertaining

Table 1 Categories of EE at Colleges and Universities in Japan, South Korea, and Malaysia

Type	Category	Japan	Korea	Malaysia
Curricular	Professional Education	EE Teacher Training: programs and courses to develop teaching knowledge and skills in EE 1980s and before: Environment-related courses offered by some programs 1988: The first program with the word “environment” in its title launched 1990s: Institutes and facilities to promote EE practices and research established at teacher training universities	1996: EE-specific programs launched at five (now four) universities following the introduction of “Environment” (at middle schools) and “Environmental Science (at high schools)” as independent subjects in accordance with the national curriculum in 1992 1998: Master’s EE programs authorized for national universities of education	1935: “Nature Study” offered in the teacher preparation program of the Women Teachers Training College 1991: Integration of EE into the national education system followed by training for teachers 2001: EE introduced as a subject in teacher training
	Professional Education in the Environment-related Field: programs and courses with a focus on the environment	1973: Dept. of Environmental Protection at Tokyo University of Agriculture and Technology launched: professional education to tackle growing issues of pollution and environmental destruction in the scientific and technological fields developed by the mid-1970s Late 1970s: Faculties and departments bearing the word “environment” launched in the fields of science and engineering 1990s: emergence of such faculties and departments in social science and inter-disciplinary fields	1973: the Graduate School of Environmental Studies at Seoul National University launched 1980s: environment-related departments in the fields of natural sciences and engineering emerged 1999: Master’s and doctoral programs launched at Seoul National University	1976: Faculty of Science and Environmental Studies, Universiti Putra Malaysia established 1994: The Institute for Environment and Development, Universiti Kebangsaan Malaysia established. 1994-2010: Improvement of environmental-related courses supported by Denmark – problem-orientated and inter-disciplinary approaches introduced
	Liberal Arts/General Ed	“Environment” Courses as Part of General Education: for students of various disciplines 60% of Japanese universities offer foundation courses related to the environmental field according to the 2007 survey (VELIAS 2008).	16 out of 92 universities (17.4%) offer general education courses related to the environmental field, according to a 2017 survey (Choi et al. 2018).	No data. The Fac. of Env. Studies, UPM, offers “Man and Environment” as an elective course
Extra-curricular	Extra-curricular Activities with an Environmental Focus	Early 1990s: The launch of two major networks of students involved in environmental activities; A SEED JAPAN and Eco-League Internships and volunteer service programs in the environmental field, including environmental management and EE in campuses, and communities/seminars and workshops for environment-related topics.	2008: Korean Association for Green Campus Initiative launched. The practical activities of environmental clubs for university students at the national level remain inadequate (Sung and Jeong 2017)	Green Campus Initiatives: 18 universities in UI GreenMetric World University Ranking 2018 Faculty-based student clubs carry out environmental projects at most universities

to environment-related fields and topics. Extra-curricular EE initiatives at HEIs in these countries also require further exploration.

Notes

- 1) Higher education is defined as “all types of studies, training or training for research at the post-secondary level, provided by universities or other educational establishments that are approved as institutions of higher education by the competent State authorities” according to the World Declaration on Higher Education for the Twenty-First Century. This paper focuses on universities and teacher education institutes, as clarified later.
- 2) The Social Environmental Educator Training Course is being implemented by the Ministry of Environment in South Korea, not as a degree program but rather as a certificate program. The participant can obtain a certificate, depending on the program level, from first to third class.
- 3) Analysis of Market Environment includes “environment” in the subject title, but was excluded.
- 4) The Clothing Environment course was also excluded.
- 5) Chonbuk National University, Chosun University, Inha University, Ajou University, Dong-a University
- 6) Among the subjects taught in Japanese schools, “Life Environmental Studies”, launched in 1992 to combine and substitute for conventional Social Studies and Science for young students in the first and second grades, contains the word “environment” in its title, but its Japanese title “Seikatsu-ka” actually translates simply as “Life Subject”. For students of the third grade and above up to high school, a “Period for Integrated Studies” is offered for interdisciplinary learning, including but not limited to EE (Kodama 2016).

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