



Geep GLOBAL ENVIRONMENTAL EDUCATION PARTNERSHIP

Sharing ideas to create a more just and sustainable future through the power of environmental education

CASE STUDY

Infusing Environmental Education into National Curriculum Framework in Taiwan

CONTRIBUTOR

[Tzuchau Chang, Professor, Graduate Institute of Environmental Education, National Taiwan Normal University](#)

GEEP is a partnership of the U.S. Environmental Protection Agency, the Environmental Protection Administration of Taiwan, and the North American Association for Environmental Education.



Infusing Environmental Education into National Curriculum Framework in Taiwan



GOALS KEY

[United Nations Sustainable Development Goals](#) addressed

Overview

Environmental education has long been a national priority in Taiwan. This case study shares lessons learned during the ongoing process of further integrating environmental education as a key component of the formal education system in 2018, and how environmental education is becoming a main component of Taiwan’s formal education system.

Since 2001, Taiwan has integrated environmental education into its national school system from grades 1 through 9. In 2016, and as the result of a new curriculum reform, environmental education is again required to be integrated into the national curriculum framework, and will be extended through grades 12. Even more, environmental education will become one of four priority educational issues (the others include human rights, gender equality, and ocean education). This reform will take two years to finalize, and will be implemented in 2018.

This case study illustrates how:

- The process of developing this new reform will continue to clarify the national goals and content areas of environmental education in Taiwan.
- The development of this new curriculum was made possible through strong partnerships within and outside the government sector.

The content areas of this environmental education curricula still need further development to be able to promote sustainable development and to respond to the challenge posed by climate change.





Background

Since the 1980s, Taiwan has placed value on the importance of environmental education by integrating discrete activities into their national school curriculum. In 2001, the importance of environmental education was further solidified through a reform effort that integrated environmental education activities into a formalized curriculum for grades 1 through 9. This was a huge victory for environmental education scholars and practitioners, who had long supported a more formalized integration.

However, in comparison to other learning fields, environmental education is a relatively new subject whose goals, content, and pedagogies need to be developed. The Ministry of Education, the Environmental Protection Administration of Taiwan, and several NGOs have helped researchers and practitioners to further develop environmental education as a national priority. For example, the Chinese Society for Environmental Education in Taiwan has participated in the research, development, and promotion environmental education since it was formed in 1993.

At this point, the goals and concepts for the 2018 revision have been developed. However, there is more work to be done around teaching pedagogy and implementation. The approach to this revision will include addressing five agreed-upon environmental education themes including environmental ethics, sustainable development, climate change, disaster preparedness, and sustainable use of resources and energy. In addition, this revision will encourage schools to develop their own customized school-based approaches.

Approach

Although environmental education has been required to be integrated into learning fields in year 1 - 9 curriculum framework since year 2001, the goals and contents of environmental education still need to be elaborated to respond to the global development of climate change and sustainable development. The development of environmental education for the infusing into the national grade 1 through 12 curriculum framework has taken the following steps:

1. Joining the committee of national curriculum framework development of grade 1-12

One representative from the environmental education field has joined the advisory board for issue education. This board was formed as a response to public concern around topics including disaster prevention education, life education, gender education, and others. The representative will collaborate with other issue education representatives to plan issue infusion education.

2. Forming an environmental education team to develop the goals, contents and instructions of environmental education for grade 1- 12

To develop the goals and contents of environmental education to be infused into learning fields, the Ministry of Education funded the establishment of a group of researchers and practitioners of environmental education. The group has proposed a set of goals and contents consisting of five themes of environmental education (listed above) after the process of focus group discussions.

3. Holding public hearing of infusing issues into school curriculum framework.

The committee of national curriculum framework development has held four public hearings to collect public opinions about the curriculum framework for the year 2018. Issues education has been one of the themes of the public hearings. The hearings were designed to collect viewpoints of parents and NGOs on the environmental education issues identified by researchers and environmental education practitioners.

4. Developing teaching plans and materials

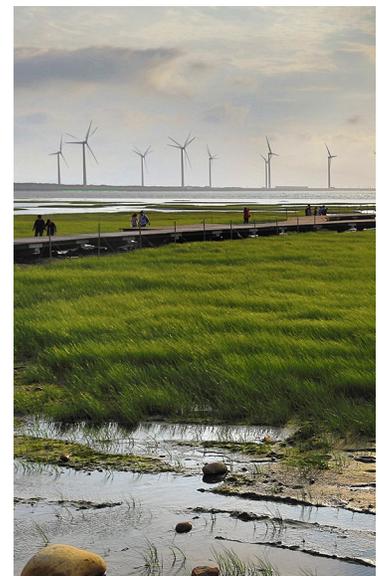
While learning fields such as mathematics, English, and the sciences have well developed teaching plans and materials, environmental education is relatively new to textbook developers. As a result, developing teaching plans and materials are crucial to the success of this revision.

Outcomes/ Results

The outcomes of the project to infuse environmental education into national curriculum framework are the same as its overall goals, which are widely accepted. As a result of this curriculum revision, students will:

- Understand the issues and challenges of sustainability, such as climate change, global warming, social justice, and generational justice
- Reflect on the purposes of personal, community-level, and national pursuit of sustainable development
- Practice green consumerism, advocacy, and lead sustainable life styles

As mentioned before, the five environmental themes include environmental ethics, sustainable development, climate change, disaster preparedness, and sustainable use of resources and energy.



The five themes and related concepts are shown on the following table.

Themes	Concepts for Grade 1-6	Concepts for Grade 7-9	Concepts for Grade 10-12
Environmental Ethics	<ul style="list-style-type: none"> Experiencing nature Recognizing the importance of ecological balance, beauty, diversity 	<ul style="list-style-type: none"> Understanding of animal welfare & rights Respecting different lives Recognizing the values of bio-diversity 	<ul style="list-style-type: none"> Recognizing the values of social, environmental, and generational justice
Sustainable Development	<ul style="list-style-type: none"> Awareness of the impact of human life style on nature environment, eco-system, & future generations Awareness of the issues of hunger and poverty. 	<ul style="list-style-type: none"> Understanding of the meaning of sustainable development & the trend of UN's implementing SD Understanding of the issues of population growth, food, nutrition, and sustainability 	<ul style="list-style-type: none"> Recognizing the values of quality of life and sustainability Adopting sustainable consumption & simple life styles
Climate Change	<ul style="list-style-type: none"> Awareness of the impact of climate change on living, social and nature environment Awareness of human responsibility to climate change 	<ul style="list-style-type: none"> Understanding of green-house effect & climate change, vulnerability & resilience, mitigation & adaptation Understanding of the vulnerability & resilience of Taiwan 	<ul style="list-style-type: none"> Analyzing the trend of energy consumption and carbon emission Developing mitigation & adaptation strategies and taking actions
Disaster Preparedness	<ul style="list-style-type: none"> Knowing serious natural disasters happened in Taiwan Awareness of increasing frequencies and impacts of disasters 	<ul style="list-style-type: none"> Understanding of the impacts of natural disasters on people's life, living, and social development Understanding of appropriate disaster preventive strategies Participating in disaster drills 	<ul style="list-style-type: none"> Analyzing and investigating the trend and impacts of natural disasters Applying mapping technologies to make disaster & evacuation maps Planning and practicing disaster drills
Sustainable Use of Energy & Resources	<ul style="list-style-type: none"> Awareness of the importance of sustainable use of material and energy Awareness that pollution and depletion are caused by over-consumption of materials and energy Practicing recycle in daily life 	<ul style="list-style-type: none"> Understanding of the relations among energy flow, matter cycles, and eco-system Understanding life cycle assessment, eco-footprint, water footprint, and carbon footprint Understanding of alternative energy, clean energy, and green energy. 	<ul style="list-style-type: none"> Understanding of environmental cost, polluter-pays principle, green design, and clean development mechanism Understanding of international conventions on energy policy Practicing green consumption and environmental friendly life styles

Evaluation plan

Since 2001, graduate students have conducted evaluations on the outcomes of infusing environmental education into the national curriculum framework. Generally speaking, the outcomes are very positive. The goals of environmental education – promoting environmental awareness, knowledge, values, skills, and actions—are being addressed. However, topics that promote environmental awareness and knowledge have been more frequently integrated than those promoting environmental values, skills, and actions. As a result, the themes planned for 2018 are working to address this.



Topics that promote environmental awareness and knowledge have been more frequently integrated than those promoting environmental values, skills, and actions. As a result, the themes planned for 2018 are working to address this.

The following evaluation plans are suggested to assess the impacts of infusing environmental education into grade 1-12 curriculum framework:

- **Evaluating the teacher understanding of infusing environmental education**
Before the new curriculum framework is implemented, teacher understanding of environmental education will be evaluated based on both the impact of the 2001 revision and their preparedness to infuse environmental education into the 2018 curriculum.
- **Evaluating student understanding of environmental education**
The evaluation of student understanding of environmental education will examine the effects of infusing environmental education into the curriculum framework since 2001, and build a base for comparison with the new curriculum framework of 2018.
- **Interviewing teachers to understand their instructional strategies of environmental education**
In addition to the contents of environmental education, teacher understanding of instructions on environmental education (including the infusion of environmental education into learning fields) is very important for implementing environmental education. How grade 1 through 12 teachers apply instructional strategies for environmental education will be a critical topic for researching.
- **Content analysis of the quality and quantity of environmental education infused in text books**
Text books have been developing recently and are supposed to be finished by the end of 2017. The evaluation of quantity and quality of environmental education infused in text books will examine if the curriculum framework of 2018 is well executed to integrate environmental education.

Lessons Learned:

More work is needed to promote pro-environmental values, skill-building, and action.

The goals of environmental education include promoting awareness and sensitivity; building knowledge, attitudes and values; and developing skills and actions. While all are addressed, they are not yet addressed equally. A huge challenge and opportunity for the 2018 revision will be to better include material that fosters pro-environmental values, skill building and action. This is a challenge because textbooks are subject matter oriented. Thus, while they can inspire curiosity and improve understanding, they are not as strong at promoting action.

More work is needed to promote project-based learning and issue investigation. Related to the lesson learned above, one key strategy in promoting pro-environmental values, skill-building, and action will be to promote project-based learning and issue investigation. To this end, ensuring teachers' pedagogical competences are important in adopting these instructional strategies. In order to implement environmental education effectively, teacher training for applying suitable instructional strategies for curricula is necessary.

Environmental education is multi-faceted and difficult to define, which presents both challenges and opportunities. The contents of environmental education are difficult to define. They include both natural sciences, such as ecology, earth sciences, chemistry, and social factors, such as social justice, poverty, equality (among many others). While this can be viewed as a challenge, it is also an opportunity. Environmental education can be infused into both natural sciences and social studies, and should be encouraged to be treated as cross disciplinary subject matters.

Environmental education is a widely accepted topic area of great importance in Taiwan.

While some countries struggle to gain buy-in for the importance of environmental education, the Taiwanese government is wholly supportive of it. This is also an indication of strong public support.

Resources

For more information:

- Curriculum Framework of 2018, please refer to NAER (National Academy for Educational Research) Web site (<http://www.naer.edu.tw/files/11-1000-639.php>)
- Curriculum Framework of 2001, please refer to K-12 Education Administration, Ministry of Education Web site (http://www.k12ea.gov.tw/ap/sid17_law.aspx)

Contact:

Tzuchau Chang, Professor, Graduate Institute of Environmental Education,
National Taiwan Normal University

tcchang@gapps.ntnu.edu.tw

