

The Status of Education for Sustainable Development in Taiwan

Huey-Jen Su, Tzu-chau Chang

I. Introduction

Beginning with the report, OUR COMMON FUTURE, issued by World Commission on Environment and Development (WCED) in 1987, and action strategies of “AGENDA 21” proposed by the United Nations’ Earth Summit in 1992, the core concepts of striving for sustainability have been adopted as a guiding principle for development in the 21st century. In Taiwan, the Council for National Sustainable Development (<http://ivy2.epa.gov.tw/nsdn/>) was first established in 1997 under the charge of assigned Minister at Large in Executive Yuan, the highest administrative office in Central Government. The Council has gone through many re-organizations since then, and is now among the few committees having the Premier of Taiwan as its chairman. With an ambitious “Action Plan” announced in 2002, the Council is monitoring the progress of national development in sustainability through 8 working groups, including the Working Group for “Sustainable Vision, Water and Land Resources, Resources and Industries, Biodiversity, Life and Production, International Environmental Protection, Health Risks, and Sustainable Education”. It is this Council’s vision that through the proposed plan, we are jointly to “*create a safe, healthy, comfortable, beautiful, and sustainable living environment; build a pluralistic, harmonious, flourishing, vital and vigorous society, and be a responsible citizen of the global village*”.

II. Overview of ESD

1. Brief description on the national (regional) educational system

There are currently more than 4,000 schools in Taiwan’s formal educational system, including elementary, junior- and senior-high schools, colleges, and universities; both private and public ones available in every level mentioned. The compulsory education system of 9 years, elementary of 6 years and junior-high of 3 years by average, has been implemented since 1968, and every city/county government has the direct charge in this level of education while the Central Government is still responsible for the ultimate policy-setting and significant percentage of budgetary support. Students can now enter the senior-high schools either through application, interview, or taking regional entrance examination. Except for those in Taipei and Kaohsiung City, most public senior-high schools, including some vocational ones, are directly reporting to, and supervised by the Dept of Secondary Education in the Ministry of Education. The Ministry views the Colleges and Universities as some independent entities who should be able to identify their own values and themes in

the School's administration and development, although the Ministry has various systems in granting out financial support, regulating their operations, and auditing their performance.

2. *Government policy on ESD*

The concept of "sustainable development" has many interpretations, and the most frequently quoted definitions are that *human's consumption of natural resources should not exceed the carry capacity of the earth and human's pursuing of their life quality should not decrease future generations' capacity to pursue their own life quality*. With that appreciation, the Division of Environmental Protection Education at the Ministry, established in 1990 as a mission-oriented unit, has long recognized the importance of education in promoting sustainable development, and proposed a master plan, entitled "*Stepping into 21 century – an action strategy for sustainable development education of MOE*" in 1999. Three goals were highlighted in this document: 1. abide the country's "***Fundamental Education Law***" to practice sustainable development education for environmental protection, ecological conservation, and resources management; 2. educate the citizens to be aware of environmental problems, understanding and caring about the mutual relationships between resources and living quality, and taking actions to maintain ecological balance and environmental quality; 3. culture the citizens to be with environmental literacy and ethics, knowledge, attitudes, skills, and values of environmental conservation.

3. *Present status of ESD-related activities in both formal and non-formal education*

As described earlier in "INTRODUCTION", "Education for Sustainability" is currently among the 8 working groups reporting to Taiwan's Premier for its progress in this subject matter, and the Ministry of Education (MOE) is the responsible agency to ensure that the "Action Plan" is properly conducted, and to coordinate activities among other governmental departments in the regard. The 3 main objectives and their key elements are as following:

- (1). Introduce and incorporate the concept of sustainable development into the school education and citizen's daily life
 - Clarifying the definition and contents of the concept of education for sustainable development
 - Passing the laws and setting up the institutions for implementing education for sustainable development
 - Infusing the visions and principles of sustainable development into school's curriculum

- Conducting sustainable development education workshop for in-service teachers
 - Encouraging research for sustainable development education
- (2). Coordinating the resources of governmental agencies, private sectors, business, and schools to implement education for sustainable development
- Establishing learning centers for education for sustainable development
 - Encouraging related governmental and non-governmental institutions to execute activities of education for sustainable development
 - Empowering all groups (women, children, aboriginal people...) to participate in the education for sustainable development
 - Training governmental employees to ensure their policy making and implementation will be in agreement with the principles of sustainable development
- (3). International cooperation of education for sustainable development
- Inviting related international organizations to share the experiences of sustainable development education
 - Holding international conference and symposium of education for sustainable development
 - Encouraging scholars and graduate students to participate in international activities for sustainable development education
 - Supporting exchange visits and programs between academic institutions

4. *Challenges, constraints and opportunities*

Despite of its high goals highlighted in this effort of promoting education for sustainable development, one of the critical challenges and constraints to the speedy progressions will be the lack of qualified, well-trained, and enthusiastic personnel to be positioned in the right settings, either in public, governmental, or private sectors. It is probably the key to future development when we can have more professional of all levels to collaborate in this topic throughout different parts of the country.

III. Regional centers of excellence on ESD (RCEs)

The concept similar to what the RCEs are defined in this short review was adopted even in the early phase of Taiwan MOE's efforts in promoting Environmental Education in early 1990's. About 10 Environmental Education Centers were established throughout Taiwan, based mainly on the difference of geographic distributions and related educational resources. Each center at that time often comprised of educators from Universities/Colleges with primary background or interest in environmental education, and teachers from primary and secondary schools.

Most of the learning materials and curriculum were developed through a joint effort and interaction with students of all levels. When the need of promoting “Education for Sustainable Development” was highlighted, the focal points for every aspect of missions undertaken by these 10 RCEs were also adjusted to address the rising interest. In addition, innovative approaches were developed to accommodate the fundamental characteristics of multi-disciplines required in formulating a comprehensive framework for conducting programs of “Education for Sustainable Development”. In brief, they can be described in the following categories:

1. Developing instructional materials for “Education for Sustainable Development”

A specific and unique Program Project was orchestrated by Taiwan’s MOE to review, organize, and develop teaching and learning materials for the theme of “sustainable development”. This project, starting in 1999, began with roundtable forums to discuss the most appropriate concepts, knowledge, and core values to be delivered in the classrooms of “general education” in undergraduate curriculum for the topic of “sustainable development”. Renowned and experienced faculty members across country and from different disciplines were then invited to participate in the 10 working groups to develop specific teaching modules to address a wide range of concerns expected in the “education for sustainable development”. After some satisfactory level of consensus were reached, the curriculum framework and contents for “sustainable development” were developed to be taught to college students of all backgrounds in the setting of “general education”. The outline of general consensus in this regard includes:

(1).Goals for college sustainable development education

- Educating students to be aware of and care about local and world environmental, social, and developmental issues.
- Offering learning opportunities for students to learn awareness, knowledge, values, skills, and action experiences for sustainable development.
- Developing a sustainable development behavior model for individuals and society.

(2).Core concepts of college sustainable development education

- Environmental ethic: the meaning of sustainable development, the development of the concepts of environmental conservation and sustainable development, the relationships between people and environment, the relationships among environment, society, and economics under sustainable development.
- Sustainable environment: environmental changes, local and world

environmental problems, the influences of environmental issues on human daily life, the development of local and world environmental conservation.

- Sustainable economics: the changes and development of economical structures, the limitation of natural resources, the energy utilization and economical development, the economical development and life quality.
- Sustainable society: the changes and development of societal structures, social issues such as poverty, gender, education, aboriginal people..., the development of city and rural areas, world responsibility.

With rigors discussion and interaction with colleagues from NGOs (Non-governmental organization) and other groups of interest, 30 teaching modules were developed between 2000 and 2002. The titles are listed as following:

- Aboriginal people and sustainable development
- Human right and gender issues and sustainable development
- Community development and sustainable development
- Biodiversity and sustainable development
- Greening building and sustainable development
- Ocean conservation and sustainable development
- Eco-tourism and sustainable development
- NGO(Non-governmental organization) and sustainable development
- Bio-technology and sustainable development
- Sustainable development issues investigating and analyzing through internet
- Environmental Hazards and sustainable development
- Human arts and sustainable development
- Public hazards and sustainable development
- Educational reform and sustainable development
- Environmental education and sustainable development
- Wetland conservation and sustainable development
- Knowledge-based economy and sustainable development
- Environmental ethics and sustainable development
- Land and water conservation and sustainable development
- Natural conservation and sustainable development
- Environmental issues investigation and sustainable development
- Environmental actions and sustainable development
- Environmental health and sustainable development
- Natural resources and environmental hazards
- International responsibilities and participation

- Environmental conservation and economical development
- Population and environment
- Justice and sustainable development
- Community development and sustainable society
- Agriculture and sustainable development

2. *Holding international conference of sustainable development education*

To promote exchanging experiences of sustainable development education, and to review the teaching modules in the process of being developed, an international conference of sustainable development education was held on November 30, 2001. Scholars from Canada (Dr. Charles Hopkins), Australia (Ms. Jo-Anne Ferreira), Hong Kong (Chi-kin John Lee), and Mainland China (Min Wang) were invited to share their experiences of sustainable development education.

The goals of the international conference are as follows:

- Introduce the most recent ideas of sustainable development education and related instruction materials;
- Understand the trend of practice and research of international sustainable development education;
- Introduce Taiwan efforts on the practice and research of sustainable development education;
- Improve college teachers' profession on sustainable development education;
- Strengthen international communication of sustainable development education.

3. *Conducting teacher workshops for sustainable development education*

To ensure that educational materials developed can be delivered to the audiences of interest in a most effective and correct form, different types of workshops have been held regularly to fulfill the goals. To name a few:

(1). Education for sustainable development training workshop for college teachers

The purpose of this workshop was to offer an opportunity for the college teachers and teacher trainers to learn and share experiences of college sustainable development education. This workshop used "Teaching for a Sustainable World" as text, which was developed by Griffith University and supported by UNESCO. Ms. Jo-Anne Ferreira, a member of John Fien's team to develop "Teaching for a Sustainable Development" in Griffith University, was invited to conduct this workshop. The workshop focused on introducing the contents of "Teaching for a Sustainable World", and teaching strategies. Collaborative learning for practicing and designing teaching modules was also

the major task in this workshop with emphasis on interactive learning, participation, and practicing.

(2). Education for sustainable development training workshop for primary and high school teachers

Since 2002, the Environmental Protection Administration (EPA) in Taiwan has sponsored workshops every year for primary and high school teachers, about 200 each year, emphasizing on how to implement education for sustainable development in different level of schools. This training program for in-service teachers has been quite different from other conventional workshops that often lasts for almost 6 months. Attendees were asked, one-day workshop, to implement a sustainable development educational project which consists of developing an instructional plan, designing teaching modules, teaching in the classrooms, evaluating students' learning effectiveness, and recording teachers' reflections. At the end, selected projects of remarked quality were rewarded and collected for publications as references to be distributed by governmental agencies.

4. *Taiwan Greenschool Partnership Program*

The Taiwan Greenschool Partnership Program is a system designed to assist the development of "greenschools" in Taiwan providing concepts, action plans, instructional materials, and government and private resources for developing Greenschools. Once an individual from any school registering as a partner, the Greenschool Program Center will issue Leaves of Hope, after review by managing committee, as encouragement and incentive to participate in future forums for exchanging experiences and accomplishments in developing his/her school to become a Greenschool.

In brief, Greenschool emphasizes core development of ecological thought, humanistic concern and active learning in the following four domains:

(1) Administration:

Ideally, Greenschool leaders would pledge environmental commitments, and work toward departmental integration, environmental evaluation as well as implementing environmental improvement projects and encouraging spontaneous environmental actions in school.

(2) Facilities:

An ideal Greenschool should have architectural design and environmental management in agreement with demand for low pollution, ecological friendliness, and educational functions. Facilities should also be designed to

take the local environmental conditions into account, and to provide opportunities for students, teachers, and even the parental groups to participate in the process of planning and maintenance afterwards.

(3) Curriculum:

A Greenschool plans and designs its own educational contents highlighting life, land and active education as well as encouraging outdoor hands-on learning programs. Education on environmental issues is implemented by integrating and exploring a wide array of studies and values.

(4) School Life:

Teachers and students learn to appreciate and adopt lifestyles that are more in tune with nature, as well as foster responsible behaviors to protect the environment, including energy conservation, pollution prevention, and efficient use of resources to benefit society, so as to create an atmosphere of mutual support for environmental conservation.

5. *Taiwan Sustainable Campus Program*

If the “Taiwan Greenschool Partnership Program” is considered the “software” renovation project for conducting “Education for Sustainable Development” in Taiwan, the parallel revolution in school’s hardware, including the physical construction and utility operation, is called the “Taiwan Sustainable Campus Program”, now officially a component project in Taiwan Government’s “Challenge 2008-National Development Plan”.

Taiwan encountered the famous, historical earthquake that hit hard mostly on Central Taiwan in September 21, 1999. More than 1500 schools, mostly elementary and secondary, were in complete ruptures. A nation-wide survey and examination on the sturdiness of the school’s buildings and facilities were conducted. As the reconstruction process took place, the ideal functions that a school, especially the elementary and junior-high schools that are practically present in every district of the 319 administrative units in Taiwan, could and should offer were also re-considered. In addition, the core value of “sustainable development” was adopted as the guiding principle as how the ruined area was to be rebuilt. Reflecting such a demand and recognition, the MOE therefore planned a first-ever national project to renovate all the campuses under its charge, the “Taiwan Sustainable Campus Program”. In essence, the future campus, regardless of the scales in size, should, at least, be one that:

- can be participated by all members of interest during the design, construction, and future operation
- has ecological concerns during the construction and operation afterwards

- can respond to the changing needs in future curriculum consisting a wide array of activities
- can serve as a community center for life-long learning, culture-preservation, and shelters during emergency

A in-depth and detailed proposal-review mechanism, executed by a Central Advisory Committee at MOE, including experts for architecture design, community development, energy and water conservation, and environmental education, was established to ensure the selected proposals could truly grasped the spirit of “sustainable campus” where discussion forums had been formed, natures of individual’s campus had been reviewed, and a study module/program had been developed for every renovation item proposed, etc. During the past few years, the Program has successfully revitalized the interest of studying the land and life closest to our hearts in almost every corner of the country. People from within and outside of the campus, basically the adjacent community, has come together to work directly on the land that is right underneath their feet, and to bind with the people that are their dearest neighbors whom may have been strangers before the program took place. More than 160 schools have been supported in the first phase of endeavor, and now the Program has further identified the goal to encourage joint project by collaborating with schools from nearby or other towns to create a sense of larger community in a rapidly globalized era.

Although approaches described above may have come from different orientations, they are, nonetheless, relatively apparent to have served, to certain extent, some functions defined for RCEs to be discussed in this Conference.

They are:

“RCEs could serve to:

- *Promote exchange of information and experience, and facilitate cooperation among organizations providing different levels of education and other organizations relevant to ESD;*
- *Assist in developing and implementing sustainable development curricula for schools, universities, professional training etc.;*
- *Facilitate effective management of resources, including expertise and knowledge; and*
- *Raise awareness on importance of educators and education for sustainable development.”*

IV. Sustainable production and consumption

As many aspects seem to have been addressed in various programs described above, this specific topic is undoubtedly one area that has not been adequately attended to. Periodically, teaching and learning modules have been developed with support from various governmental sectors. The Taiwan Green Partnership Program has also emphasized that “green-consumption” and “green-purchasing” should be the part of school’s environmental policy. In addition, schools with the capacity for teaching or research in the area of “green production”, such as the vocational schools, technical colleges, and the universities, have been encouraged and funded to undertake endeavors in this subject matter. Above all, the Government has enforced the “green-purchasing” policy for all public sectors with the goal that specific and increasing percentage of all purchasing should be made accordingly. As much as it is ambitious, it is also admirable, and fruitful results are expected as the support and interest for the topic is increasing more than ever in the country and worldwide alike.

V. Summary

As the Education for sustainable development attracting increasing interest throughout the country, and gaining significant support from Taiwan’s MOE and EPA, both in terms of administrative approached and financial arrangements during the past several years, substantial changes, resulting in phenomenal progress, have been put it into effect particularly on formal educational settings, such as:

- Offering undergraduate courses on sustainable development.
- Developing teaching materials for sustainable development at K-9 level.
- Conducting education for sustainable development in-service teaching training for elementary and secondary teachers.
- Networking with local NGOs on issues and activities related to sustainable development.
- Establishing educational facilities for demonstration of energy and water conservation, wastewater treatment by man-made wetland, and organic farming on rooftop, among others, for students and community.
- Implementing and advising Green School system on campus environmental management, curriculum development, instruction development, and teacher’s professional development.

We are optimistic that whatever minute we change in every campus and however few people we may influence through the educational programs, both in formal and informal settings, will all be an important step that we contribute to a better and more sustainable world we share together tomorrow.

References

1. Blueprint For A Green Campus: The Campus Earth Summit Initiatives For Higher Education. (1995).
2. Chameau, Jean-Lou. (1999). Changing a Mind-Set, Not Just a Problem-Set: Sustainable Development in Colleges of Engineering. Presented at 1999 Engineering Deans Institute, American Society for Engineering Education: "Ethics in Technology and Social Responsibilities", March 21-24, Maui, Hawaii.
3. Educating for a Sustainable Future: A Transdisciplinary Vision for Concerted Action. (1997). International Conference – "Environment And Society: Education And Public Awareness for Sustainability". UNESCO.
4. Engleson, D.C. (1994). A Guide to Curriculum Planning in Environmental Education. Wisconsin: Wisconsin Department of Instruction.
5. Fien, J. (1995) Teaching for a Sustainable World: The Environment and Development Education Project for Teacher Education, Environmental Education Research.
6. Hungerford, H. R. & Peyton, R. B. (1986). Procedure for Developing an Environmental Education Curriculum. UNESCO: Paris.
7. Hungerford, H. R. & Peyton, R. B. & Wilke, R. J. (1979). Goals for Curriculum Development in Environmental Education. Journal of Environmental Education, 11(3).
8. Kosko, B (1994) Fuzzy Thinking, Flamingo, London.
9. Learning for a Sustainable Future (1993) Developing a Co-operative Framework for Sustainable Development Education, Learning for a Sustainable Future, Ottawa.
10. Milbrath, L.(1989) Envision s Sustainable Society: Learning Our Way Out, State University of New York Press, Albany.
11. Orr, David. (1998). Transformation or Irrelevance: The Challenge of Academic Planning for Environmental Education in the 21st Century. Presented at North American Association for Environmental Education, Florida Gulf Coast University, March 4-8, 1998.
12. President's Council on Sustainable Development. (1996). Education for Sustainability: An Agenda for Action.
13. President's Council on Sustainable Development. (1997). From Classroom to Community And Beyond: Educating for a Sustainable Future.
14. Sterling, S (1996). 'Education in Change' in H John & S Sterling (Des) Education for Sustainability, Earthscan Publications Ltd, London.
15. The Class of 2000 Report Summary of Recommendations. (1999). Expand Environmental Education At Colleges And Universities With A Focus On

Increasing Environmental Literacy.

16. The Essex Report: Workshop on the Principles of Sustainability in Higher Education—Second nature.
17. Trainer, T. (1990) Towards an Ecological Philosophy of education, *Discourse*, 10(2),92-117.
18. UNCED (1992) Promoting Education and Public Awareness and Training, Agenda 21, United Nations Conference on Environment and Development, *conches*.
19. United Nations, Agenda 21: Chapter 36 – Promoting Education, Public Awareness And Training.