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ENVIRONMENTAL EDUCATION LEARNING PROGRAMS: TAIWAN AND US PERSPECTIVES

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BACKGROUND

Relative to the US, Environmental Education (E.E.) started late in Taiwan. The US Environmental Education Act was passed in 1970. Taiwan passed an Environmental Education Act in 2010. In Taiwan, beginning in 2011, every Taiwan citizen is required to have 4 hours of E.E. classes per year. Agencies responsible for environmental protection will have to set up 'environmental education funds' to advance environmental education and provide training.

Taiwan is heavily urbanized. Many people rarely have an opportunity to interact with nature and until recently, education curriculums didn't offer chances to observe or study nature. Lately, E.E. has become very popular in Taiwan. Schools are starting to use many E.E. activities. Also, E.E. became an important issue for Grade 1-9 curriculum in 2008.

During this period of E.E. development, it has become apparent that many people, including educators, and government administrators have heard about E.E. but do not really know what E.E. is. For instance, teachers think E.E. is primarily focused on recycling. The Taiwan government wants to use E.E. to promote environmental protection and nature ecology conservation, however because of a lack of E.E. background, volunteers or staff needed to promote E.E. have been rejected and resultantly in many cases E.E. efforts have failed due to a lack of trained educators. Advancing E.E. is a big challenge in Taiwan.

NATURAL RESOURCES IN TAIWAN

The island of Taiwan sits over an active and intense plate tectonic movement area in the east Pacific ocean. Powerful earthquakes and seasonal typhoons frequently batter Taiwan with destabilizing tremors and torrential rainfall. There are over 293 mountains over 3,000 m(9,842 ft) in elevation. The highest mountain is the 3,952 m (12,966 ft) tall Mt. Yushan, located in the mid west area of the island.

Taiwan is bisected by the Tropic of Cancer and the main forest types are tropical and subtropical. Taiwan has a very high biodiversity level. In all, over 100 species of mammals, 456 species of birds, 98 species of reptiles, 2,869 species of fish and 5,738 species of plants can be found on Taiwan.



Yushan mountain



Brood-tail fwallowtail butterfly



Formosan black bear

Taiwan's mountains are very steep and frequented by landslides and debris flows. Currently there is little to no logging on the island. 99% of timber is imported. 72% of forests are managed as biodiversity conservation natural forests using an ecological integrity maintenance method. 20% of forests are managed as plantation forests with the goal of wood productivity and sustainability maintenance for future harvest of lumber resources. These forests are also managed for carbon offsets and water and soil conservation. 8% of forests are bamboo forests.

In terms of geology, landscapes, forests, and forest management goals, Taiwan is an extremely diverse place. In order to maintain improve forest management in Taiwan, E.E. programs will be very important.

EDUCATION PROGRAMS AT THE TFRI

Weekend Activities

At the Taipei Botanical Garden, the subject of weekend activities is changed every month but related to a theme that is chosen every year. For example, this year of 2010, the annual theme is "The Wonderland of Colorful Plants" and the January activity subject was 'Life Emergence - Seed Germination', February was 'The Power Source of Plants - Roots'. We design activity study sheets and use volunteers to run the activities. There is no cost to attend the activities and family and adults usually participate. Weekend activities usually include interpretation, hands-on lessons, scientific exploration and games.



Nature education workshops, grasslands exploration and trap set up.

Nature Education Workshops

Workshops are designed for adults. Typical attendees are teachers and volunteers who serve as E.E. educators in Taiwan. Goals of the workshops include: teaching nature investigative skills, how to enjoy learning in the outdoors, and advanced E.E. program design. Specific activities include pond dipping, forest investigation, grassland exploration, trap set up, tranquil observation, outdoor safety assessment, accident response and ecosystem games. Team work and hands-on activities are also emphasized.



Weekend activities and study sheets

Interpretative Signage

At the Taipei Botanical Garden, signage design is specific to the vegetation or signage theme. Many signage materials and styles have been applied.



Interpretative signage in Taipei Botanical Garden



Outdoor interpretative signage

WHAT I HAVE LEARNED

Environmental Education and Interpretation Publications

Multiple publishers produce E.E. publications. North American Association for Environmental Education (NAAEE) is a major publisher and many E.E. themed books can be found at bookstores such as the Acorn Naturalists book store.



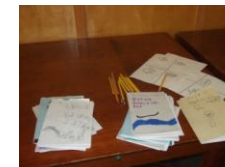
Summer Camp

Cooperation is Important

Children summer camps often use high school students as paid assistants. Education programs like the Rediscovery Forest Education Programs at Oregon Garden and Project Learning Tree are designed by teams comprised of scientists, educators, government and non-governmental organizations. Cooperation between professionals of different fields permits a more fully faceted, complete E.E. program design.

Creative Opportunity

In the US, programs often focus on giving more freedom and creative opportunities to kids. Under the guidance of an E.E. instructor, kids are allowed to design their own journal and independently interact with nature, permitting more personal, original experiences and lessons.



Kids create their own journal

Emphasis on Consumer Driven Programs

Discovery Museum, Oregon Garden and Lan Su Chinese Garden use pre-visit visitor surveys, monthly questionnaires, and visitor experience coordinators to help understand visitor needs and interests. Programs are designed with the goal of attracting new visitors and convincing old visitors to continue visiting.



Discovery Museum



Discovering nature

Fee and Increased Professionalization

In the US, E.E. programs often charge a student fee. Resultantly, programs are designed to provide high quality, professional lessons valued by the students.



Interpretative Signage - Outdoor and Indoor

In the US, outdoor signage is often trapezoidal in shape and designed to be visible and easily understood using concise, clear language and large fonts. Signage is placed at heights suitable to the student.

Indoor signage is often more interactive than outdoor signage. Simple language, pictures, and actual objects are combined and constructed using durable materials to allow student interaction and clear understanding.



Indoor interpretative signage

CONCLUSION AND RECOMMENDATIONS

Develop Partnerships

Development of Taiwan environmental education will require team work. Partnerships between the TFRI, Chinese Society of Environmental Education, Forestry Bureau, and local schools should be forged or at least the feasibility of such partnerships investigated.

Develop More E.E. Publishing

Availability of E.E. themed books and texts will help promote E.E. goals. Through cooperation with the Chinese Society of Environmental Education and the TFRI, publishing and promotion of E.E. should be increased in Taiwan.

Respect the Visitor Experience

More visitor surveys and investigations should be completed before designing programs and interpretative signage for our Botanical Gardens. Our botanical gardens are open to everyone. We want visitors to enjoy their experience and return to the garden.

Add More Hands-on Activities

Create more hands-on activities where students can controlling how they interact with lesson material. Give more freedom and creative opportunity to the participants.