

The Essence of EE

Who Does EE?

According to the National Environmental Education Advisory Council (1996), EE in the United States takes place in two main sectors:

- ❖ **Formal** EE takes place in elementary and secondary schools, colleges, universities and technical institutions.
- ❖ **Nonformal** EE takes place in businesses, nonprofit organizations, the media and other institutions that are not considered part of the formal education system.

Thus, EE is carried out by:

- Federal, state, local and tribal governments
- Nongovernmental organizations
- Universities, colleges, schools and technical training institutes
- Business, industry and the media
- Private and public foundations

For more information on the current status of EE at the national level, see the report, *Assessing Environmental Education in the United States and the Implementation of the National Environmental Education Act of 1990* -<http://www.epa.gov/enviroed/pdf/needa.pdf>.

Guiding Principles of EE

The Tbilisi Conference set forth a set of guiding principles for the practice of EE (Disinger & Monroe 1994). These guidelines speak to the development of a process that reaches to a broad audience that includes formal K-12 educators, citizens, adults, and environmental professionals (UNESCO/UNEP 1978).

- 1. Consider the environment in its totality** - natural and built, technological and social (economic, political, cultural, historical, moral, aesthetic).
- 2. Be a continuous lifelong process**, beginning at the preschool level and continuing through all formal and nonformal stages.
- 3. Be interdisciplinary** in its approach, drawing on the specific content of each discipline in making possible a holistic and balanced perspective.
- 4. Examine major environmental issues from local, national, regional and international points of view** so that students receive insights into environmental conditions in other geographical areas.
- 5. Focus on current and potential environmental situations**, while taking into account the historical perspective.
- 6. Promote the value and necessity of local, national and international cooperation** in the prevention and solution of environmental problems.
- 7. Explicitly consider environmental aspects in plans for development and growth.**
- 8. Enable learners to have a role in planning their learning experiences** and provide an opportunity for making decisions and accepting their consequences.
- 9. Relate environmental sensitivity, knowledge, problem-solving skills, and values clarification to every age**, but with special emphasis on environmental sensitivity to the learner's own community in early years.
- 10. Help learners discover the symptoms and real causes of environmental problems.**
- 11. Emphasize the complexity of environmental problems** and thus the need to develop critical thinking and problem-solving skills.
- 12. Utilize diverse learning environments and a broad array of educational approaches** to teaching/ learning about and from the environment, with due stress on practical activities and firsthand experience (UNESCO 1978).

- How can environmental educators involve the EE guiding principles in their work?

Examples might include:

- ❖ Taking an interdisciplinary approach by including material from a variety of subject matter areas.
- ❖ Taking a balanced approach by including a variety of viewpoints regarding environmental issues.
- ❖ Including activities that foster critical thinking and problem-solving skills.
- ❖ Including a wide variety of learning environments and activities, especially hands-on activities.

How We Practice EE in the United States

EE is a unique way of teaching. It is different from environmental science, since it is concerned with the human dimensions of social and economic factors and values and skills. Disinger and Monroe (1994) capture this uniqueness in their description of the way EE is practiced in the United States.

- ❖ **EE includes a human component.** Environmental solutions are not only scientific, but also include historical, political, economic and cultural perspectives.
- ❖ **EE is based on a foundation of knowledge about social and ecological systems.** Such knowledge is important for analyzing, resolving and preventing environmental problems.
- ❖ **EE includes the affective domain.** The EE process makes it clear that differing values exist with respect to environmental issues, and helps learners clarify their own values as a basis for attitudes and commitments necessary to build a sustainable society.
- ❖ **EE provides opportunities to build skills,** such as problem-solving, communication, investigation and group process skills.

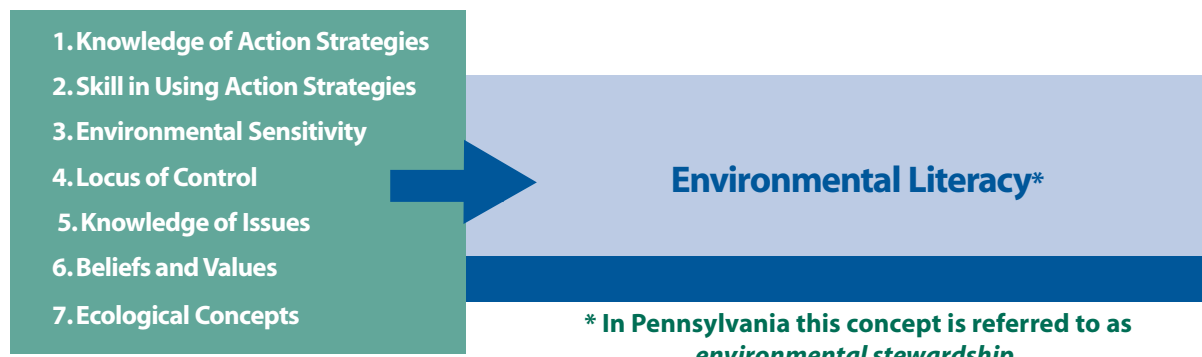
- See Activities 2, 3 and 4

Environmental Literacy

Environmental literacy may be defined as the understanding and awareness of a person's relation to their environment and the capacity to take appropriate action to maintain, restore, or improve the relative health of the environmental system.

Variables Associated with Environmental Literacy

Hungerford et al. (1996) have developed a system of seven environmental literacy variables and associated educational strategies. These variables interact with each other and with the life experiences of individual learners, to encompass the "environmental education process." The seven variables are identified in the following figure.



- See Activity 5

Teaching Strategies for Environmental Literacy

Variables 1 & 2: Knowledge of and Skills in Using Action Strategies

William Hammond (1994) identified the following skills as being related to environmental action:

- Identifying, researching and investigating a selected environmental issue or problem
- Organizing, leading and participating in groups
- Making effective presentations
- Managing conflict

- Determining support and opposition to a solution, selecting appropriate methods and tactics for implementing the solution
- Understanding and evaluating alternative strategies
- Developing the capacity for project sustainability and continuity

Example: An EE program available in Pennsylvania that utilizes many of these techniques is *Earth Force*. For more information and a list of Pa. sponsors, see their Web site at <http://www.earthforce.org>.

Variable 3: Environmental Sensitivity

Current research indicates that environmental sensitivity develops over time, and is the result of the individual having positive experiences with aspects of the natural world. What constitutes a positive experience is often influenced by the individual's culture. A crucial element that many environmentally sensitive individuals report is association with role models. Role models demonstrated a high degree of sensitivity that was emulated and often were members of an individual's family or were teachers.

Variable 4: Locus of Control

Locus of control is a factor associated with an individual's perception of whether or not a particular behavior will result in an anticipated outcome or reinforcement for repeating the act. This perception is called **expectancy of reinforcement**. People who have a high degree of belief that they are in control of situations that demand action are said to possess "internal locus of control." Internal individuals tend to take action on an issue because they believe that their actions would in some way be effective, i.e. help solve the problem.

Example: One possible resource for inspiring ideas and providing models for conducting effective environmental action projects is the book, *Taking Action*, available from Project Wild and developed in coordination with the World Wildlife Fund. It includes samples of more than 30 projects from around the country that provide a glimpse of how groups of students have seen a need in their community and successfully worked together to implement change. To find out more, visit the Project Wild Web site at <http://www.projectwild.org>, and click on the "Materials" icon at the top of the page.

Variable 5: Knowledge of Issues

Knowledge alone is insufficient to promote environmental stewardship. However, an in-depth investigation of an issue may promote changes in human values and lead to overt action with some individuals. Through a thorough and fairly exhaustive investigation, a person can develop ownership of the issue. This ownership becomes a motivator for action. It is important to note that an individual's perception of an issue is shaped by much more than just knowledge; it also depends heavily upon his or her beliefs and values related to the issue.

Variable 6: Beliefs and Values

Beliefs and values are complex and closely interrelated. A person's perception about a discrete environmental issue arises from an integration of his or her belief and value systems.

A **belief** is an idea that an individual holds to be true. In many individuals, it need not be substantiated by rational or physical evidence. Beliefs are shaped by facts, information, and experiences.

Example of a belief: "Organic agriculture has less negative impact on the environment."

A **value** is the relative worth an individual places on something. Values are a person's overarching priorities and principles. It appears that values grow out of an individual's personal experiences and background. For any given resource, there may be associated ecological, ethical, economic, recreational, aesthetic, social and utilitarian values.

Example of a value: "Organically grown produce is better for the environment than non-organically grown produce."

An individual's behavior is influenced by their beliefs and values. However, they do not always absolutely dictate the behavior. Individuals hold many beliefs and values and they can contradict and mitigate each other.

Example of interaction between values and behavior: A person may value organically grown produce, but if it is very expensive, they may not purchase it because paying the high price conflicts with spending their money on other valued items.

It should be kept in mind that EE is a process that facilitates learners developing critical thinking skills. As educators, it is our job to teach students how to think, not what to think. Indoctrinating students with certain “correct” values is not only unethical; it is likely to be counterproductive. Educators in a culturally diverse democratic society must acknowledge the rights of individuals to formulate and adhere to personally chosen values. Individuals can be encouraged to consider their values in relation to the ecological and societal implications of acting on those values. Educators can work for the development of individuals who are skilled investigators and problem solvers. Environmental educators must trust that with the acquisition of these skills, individuals will be able to sort through their own values and identify a position of integrity. This is often referred to as **organization of values**—the ability to determine which values in the system are most important and develop criteria by which certain things are valued.

Variable 7: Ecological Foundations

Hungerford et al. (1996) identified specific ecological concepts as being crucial to making ecologically sound decisions. They included:

- individual organisms
- succession
- population dynamics
- man as an ecological variable
- interaction
- energy transfer
- homeostasis
- limiting factors
- biogeochemical cycling
- interdependence
- communities

The North American Association for Environmental Education’s project for excellence in environmental education has identified these ecological concepts in their k-12 guidelines for learning:

- processes that shape the earth
- changes in matter
- flow of matter and energy
- heredity and evolution
- systems and connections
- energy
- resources and resource
- organisms, populations, and distribution
- communities

The Pennsylvania Department of Education has identified these content areas in their Academic Standards for Environment and Ecology:

- Watersheds and Wetlands
- Renewable and Nonrenewable resources
- Environmental Health
- Agriculture and Society
- Integrated Pest Management
- Ecosystems and their Interactions
- Threatened, Endangered and Extinct Species
- Humans and the Environment
- Environmental Laws and Regulations

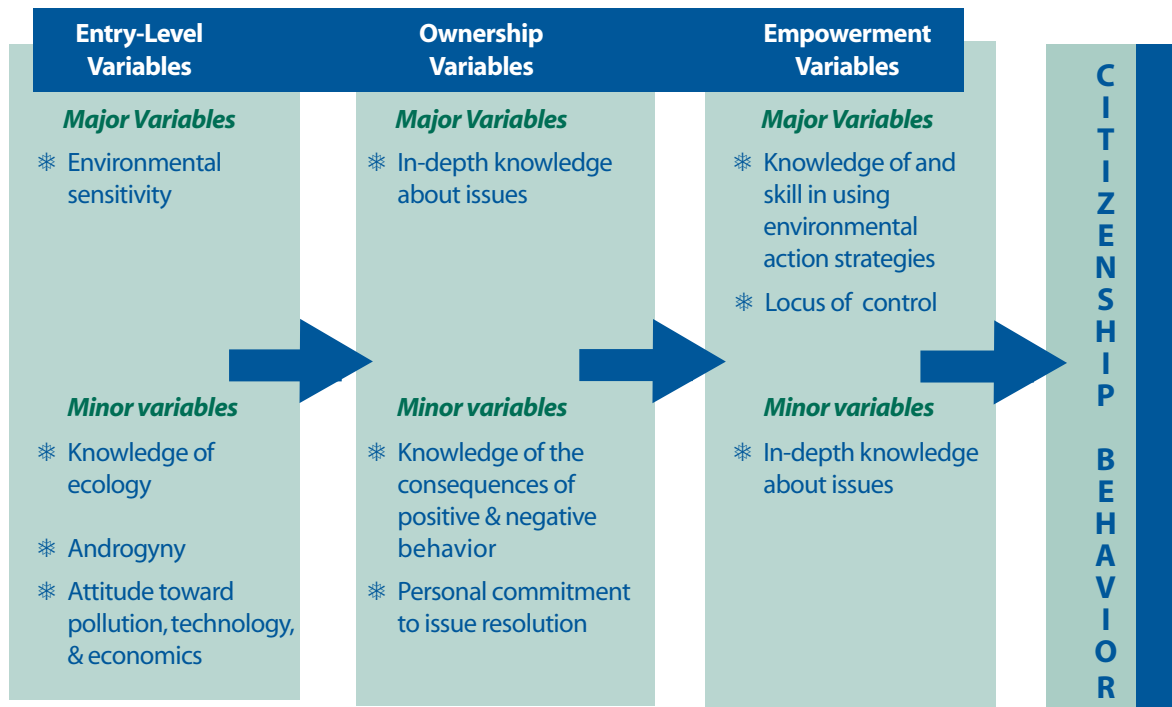
■ See Activity 6

The First Pennsylvania *Environmental Readiness for the 21st Century Survey Report*

The *First Pennsylvania Environmental Readiness for the 21st Century Survey Report* is the first of its kind in the nation. **It addresses the environmental literacy recommendations in the Report of the Pennsylvania 21st Century Environment Commission.** Findings show that Pennsylvanians personally take primary responsibility for solving the state’s environmental problems and have positive attitudes toward the environment. However, they, like the nation as a whole, currently have a poor grasp of both environmental knowledge and environmental issues. A copy of the report may be found on the Pennsylvania Center for Environmental Education’s (PCEE) Web site at: www.pcee.org. For information on the 21st Century Environment Commission, visit their Web site at: www.21stcentury.state.pa.us.

Citizen Action and Responsible Environmental Behavior

EE focuses on developing citizens who will make informed and responsible decisions regarding their actions related to the environment. Traditional thinking has been that by providing learners with more knowledge about the environment, behavior could be changed. However, research into environmental behavior does not appear to support traditional models (Hungerford and Volk 1990). Hungerford and Volk (1990) undertook an extensive study in which they examined the research literature in EE, and identified three categories of variables that seem to lead to responsible environmental citizen action. The variables identified in the **Hungerford and Volk model** are:



- ❖ **Entry-level variables:** These are the prerequisites of responsible environmental behavior. They do not guarantee that a learner will engage in responsible citizenship action, but they seem to be necessary for such action to occur. They include:
 - *environmental sensitivity* and
 - *knowledge of basic ecological principles*
- ❖ **Ownership variables:** These are the variables that make environmental issues personal for learners. They include:
 - *in-depth knowledge of issues* and
 - *personal commitment*
- ❖ **Empowerment variables:** These variables enable learners to feel that they are capable of making a difference in solving environmental problems. They include:
 - *knowledge of and skills in using environmental action strategies* and
 - *locus of control*

- What EE teaching methods and approaches are suggested by the Hungerford and Volk model of citizen action and environmental responsible behavior?

Examples might include:

- ❖ Include activities that foster environmental awareness and sensitivity.
- ❖ Include foundations in basic ecology.
- ❖ Include activities and approaches that help learners explore, investigate, and analyze issues.
- ❖ Allow learners to choose the issues they want to investigate, when possible.
- ❖ Include activities that develop skills in taking environmental action.