

ENVIRONMENTAL EDUCATION IN THE UNITED STATES A STATUS REPORT—1974^{1, 2}

ROBERT E. ROTH

*Division of Environmental Education, School of Natural Resources, Ohio State University,
Columbus, Ohio 43210*

ABSTRACT

Environmental education grew significantly in the U.S. during the decade 1964–1974. It would seem that the citizens of “Spaceship Earth” are becoming aware of their environmental responsibilities, and are actively seeking the institutional arrangements, educational programs, and behaviors essential to securing a quality environment and life style. The problems and opportunities that remain before us are enormous, but the challenge is clear as Leopold (1972) reminds us: “Ours is not a job of building roads into lovely countryside, but of making inroads into the still unlovely human mind.”

The status of environmental education in the United States improved over the past decade (1964–1974). Programs and projects funded by Title III of the Elementary and Secondary Education Act (E.S.E.A.) emphasizing outdoor education were the first major emphases in American education. The recent set of guidelines from the U.S. Office of Environmental Education (OEE) (1974) highlights development of research, demonstration and pilot programs based upon the impact of scientific and technological findings, human settlements, food production, energy production, and population dynamics, as well as air, water, and land use and related life support resources, for purposes of educating various targeted audiences. As the area of environmental education becomes more precisely defined there appear to be three major foci that emerge. Lucas (1972) identified the referents as “. . . education *in* the environment, education *about* the environment and education *for* the environment.” A conceptual base concerning education “for” the environment which is consistent with the Lucas referent was developed by this writer previously (Roth *et al.*, 1970) to provide a foundation for further work. The 1974 OEE Guidelines are also clearly founded on the conceptual base, the referent of education *for* the environment.

Environmental education, while developing rapidly in the past few years, contributed greatly towards the shaping of necessary new approaches concerned with meaning in life rather than the routine, narrowly specialized disciplines that are often dictated by present educational and training programs.

Environmental education stresses interrelations and linkages and the role of man in managing properly the natural resources at local, national, regional and global levels. It is essentially interdisciplinary, and covers the social as well as the natural sciences.

This approach to education involves development of understanding: how the environment functions, how it is interrelated with man, how man affects his environment, and especially what are the short- and long-term consequences of his actions. It also involves the development of attitudes and ethics: the maintaining and enhancing of diversity, and keeping open options for future choice, leading to formulation of guidelines for behavior and action in relation to issues concerning environmental quality and ultimately contributing to better decision-making based on sound ecological principles (IUCN, 1972). Specifically, environmental education is concerned with developing a citizenry that is:

1. knowledgeable about the biophysical and sociocultural environments of which man is a part;

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2. aware of environmental problems and management alternatives of use in solving those problems; and
3. motivated to act responsibly in developing diverse environments that are optimum for living a Quality Life.

(Roth, 1973)

Thus it can be seen that environmental education is concerned with knowledge of the universe, society, and the individual, in that it not only attempts to provide the individual with environmental understandings, but also views him as a potential creative being and encourages him to accept the responsibility of decision-making which is his by virtue of being human.

National Assessment. Perkes (1972) and Bohl (1974) conducted studies designed to acquire baseline data about 10th and 12th grade students' environmental knowledge and attitudes and to study the relationship of attitudes and knowledge to variables that would be of interest in evaluative measures.

The staff of the ERIC Clearinghouse for Science, Mathematics, and Environmental Education (ERIC/SMEAC) and selected consultants developed three forms of an inventory which contained items requiring knowledge of specific facts and general concepts of the environment. Also, several items elicited students' attitudes about certain aspects of the environment.

The inventory was administered to a maximum of 30 tenth grade students and 30 twelfth grade students from 199 schools which were randomly selected from the Great Lakes states of Illinois, Indiana, Michigan, Ohio, and Wisconsin; and the Far West states of Alaska, California, Hawaii, Nevada, Oregon, and Washington.

It was found that males scored significantly higher than females on items requiring knowledge of facts, but not on items dealing with general environmental concepts. Twelfth graders scored significantly higher than tenth graders on the environmental concept items. But not on the items requiring knowledge of environmental facts.

In regard to attitudes, differences were found based on sex and grade level. However, the calculation of a chi square statistic using proportions instead of the total number of cases indicated that proportional differences were slight.

The size of the community where respondents lived and went to school was not significantly related to knowledge of environmental facts and concepts, but was related to items requesting the respondent to identify what he thought to be the major environmental concern of the community. Using a forced choice technique, there was a positive relationship between the size of community and the selection of pollution as the major community problem. However, this trend was reversed in cities over 100,000 population and concerns seemed to change toward sociological, crime and/or health related topics.

State of residence was also related to what was considered to be the major environmental concern in the community. California respondents selected air pollution; Wisconsin respondents were more concerned with water pollution; and respondents from Hawaii considered land-use to be of major importance.

Due to the large student sample used in this study (10,264), few significant relationships should have gone undetected. Also, where no relationships were found, it is highly probable that replication would produce similar results. Bohl's results parallel that of Perkes utilizing a different array of states, in fact the variation in data is less than 2 percent. It can be concluded that the youth of the United States have a positive attitude toward environmental management, but have little idea as to how or where things can be changed to achieve a satisfying quality environment.

Colleges and Universities. A study presently being concluded at ERIC/SMEAC inventoried 2800 two- and four-year undergraduate programs in the

United States (1974) to determine the extent of environmental education programs and courses being offered. An 85% response was received providing 70% useable instruments. Based upon preliminary analysis, four conclusions can be stated at this point:

1. Extensive change has occurred from 1969-1972 in the number of new environmental courses being offered. Care must be taken to differentiate between new courses, and old courses that have simply been subjected to name changes;
2. Emphasis has been placed on establishing college, institute, school, and cross disciplinary environmental programs. As of August 1973, about 255 institutions of higher education have followed such a pattern;
3. The variety of course offerings increases as the size of the institution increases. Notable exceptions occur only in such specialized situations like Evergreen and Univ. of Wisconsin, Green Bay;
4. Many small institutions are offering some kind of course or program. However, technical and/or vocational education programs are not always available where needed. Individuals attending such institutions don't go too far from home and as such may not have access to courses or programs that are needed. One preliminary recommendation that follows would seem to be that a needs assessment in each state, and especially in urban areas, should be conducted for a determination of the kinds and arrangement of courses and programs needed. Such a function could be part of the state plan for environmental education (Rocchio and Lee, 1973).

Teacher Education. Through ERIC/SMEAC (1974) a questionnaire was sent to 900 four-year teacher education institutions to inventory the extent of environmental education programs and courses. The survey had a 79% response providing 65% useable returns.

Of the 580 returns processed, about 100 institutions indicated they had a course or program in environmental education. Of those indicating such a course or program it seems likely that 25-30% could be categorized as offering only a course. Similarly it should be pointed out that "outdoor education" was not specified by some that had such a course, but this kind of omission is double checked by examination of catalogs from each institution.

It can be concluded from this brief, and as yet incomplete, status survey that there are few programs in environmental education aimed specifically at pre-service teacher education. About 100 institutions do have a minor program consisting of 24-30 hours of course work. Few institutions have a certification program and most prefer a minor area of concentration. A survey recently conducted by Dr. Sigmund Abeles of Connecticut State Department of Education (1973) inventoried certification in 47 states and found that one state, Wisconsin, has secondary certification in environmental education and none has it at the elementary level. In addition, seven states favor certification while 23 oppose it, with 17 giving "no response" to the question. Three states indicate a separate course in environmental education or ecology as a requirement for elementary teachers: Montana, Oregon, and Wisconsin. Two indicate a course requirement at the secondary level and those are Wisconsin and Oregon. Five states indicate interest in developing a course requirement as "supplemental" or "minor area" certification: Washington, Nebraska, Oklahoma, Maine, and Illinois.

State EE Coordinators. A communication network is maintained with the state environmental educators by ERIC/SMEAC. There is at least one designated for such responsibility in each of the 50 states, Washington, D.C. and Guam. The range of assigned time devoted to environmental education varies from 100% to 0% with most on half-time, combining the function with supervision in science education. Information on new materials, products, and research is disseminated

to the state coordinators and they in turn provide a great deal of information to the ERIC Center in return. A recent product using this system was the five volume set of "State Books" (Disinger and Lee, 1973b) that describes exemplary program models, state planning activity, and personnel involved in environmental education.

Exemplary Program Models. In a study conducted by Helgeson and Helburn *et al.* (1971), existing environmental education programs in public schools were analyzed. Results of the investigation indicated that there were relatively few operational programs in the United States compared to either the number of school districts, or more significantly to the number of school buildings. Programs designed for grades K-12 were few in number while more programs existed at either the elementary or secondary level.

Disinger and Lee (1973a) describe 296 projects and programs in the second edition of the ERIC/SMEAC directory of environmental education programs at the elementary and secondary levels. Examples included that are noteworthy as models by type are as follows:

1. State Plan: The New Jersey Council for Environmental Education under the direction of Dr. Edward Ambry has developed a statewide approach to environmental education, consisting of K-12 curriculum development, college and university curriculum development, involvement of citizen action and business and industry groups, teacher in-service and pre-service education, materials production, and evaluation.
2. Title III E.S.E.A.: The Maine Environmental Education Project under direction of Dr. Dean Bennett is patterned after Stapp's (1965) environment encounter program but applied to four K-12 demonstration projects covering a wide geographic area;
3. Public Law 91-516: A National Demonstration Project for Self Learning and Community Involvement under direction of Dr. Don Stotler, Portland, Oregon was developed to serve as a stimulus in helping people of all ages to know about environmental problems, alternative solutions and to motivate action to solve these problems. Few materials are produced with major emphasis on personal involvement and consultation;
4. Local Project: The Worthington, Ohio City Schools under direction of Mr. Dean Freund introduces environmental and outdoor education philosophy, methods, and materials to area teachers via a locally funded center and resident environmental education program.

Many other models exist and are worthy of mention, but I commend Disinger's publication to your attention for further information and detail.

Materials. Materials produced in relation to environmental education are extensive in amount, are available in both print and non-print form, and are improving in quality. Most, however, do not appear to be interdisciplinary and often lack concepts related to the social sciences or humanities. Similarly, urban oriented materials are few in number and most city schools have not developed materials oriented to their milieu.

New products developed by ERIC/SMEAC in response to demands from users, state coordinators, various professional organizations, practitioners, and researchers that might be of interest are as follows:

1. Modules I and III: A set of 80 slides and tape entitled "The Earth and Nothing More," designed to define environmental education and present the scope of the topics involved and a related set of 100 activities that are keyed by concept, subject matter, and grade level.
2. *A Review of Research Related to Environmental Education* by Roth and Helgeson (1972) that reviews 94 existing research studies and identifies areas for further investigation.

3. Nine bibliographies dealing with abstracted, annotated, and cited print, and non-print materials by topic for educational use, e.g. *Air Pollution*, *Water Pollution*, *Land Use*, *Population*, etc.
4. Targeted information sheets to audiences like elementary and secondary teachers and administrators, college and university teachers and administrators, librarians, community action groups, and professional societies; and
5. Compilations and related micro libraries of microfiche studies contained in the ERIC system.

Summary. Environmental education has undergone extensive change in refinement of definition and application in the United States. As can be detected from the foregoing report, several statements can be made that characterize its present status.

1. Environmental education has become closely identified with the referent: "education for the environment".
2. As determined by the *National Assessment*, the youth of the United States have a positive attitude toward environmental matters, are oriented toward regional problems and related knowledge areas, but have little understanding as to the means for effecting change.
3. Colleges and universities are developing courses and programs to meet the environmental challenge, but further needs assessment in this regard by state would seem to be useful.
4. Teacher education has developed few degree certification programs in environmental education and most teacher-education institutions prefer a minor area approach.
5. All 50 states, Washington, D.C., and Guam have designated environmental education coordinators usually devoting about half-time to the area.
6. Many program models exist and are presently operating under funding from federal to local sources. Materials of both a print and non-print nature abound.

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Toward a Political Sociology of Science. *Stuart S. Blume.* Free Press, New York. 1974. iv+288 p. \$9.95.

Here we are, thirty five years old (or forty five, or sixty, it makes little matter) practicing scientists and feeling a shade out of it. Some of our colleagues and acquaintances got their Nobel laureateships, but we didn't; we can count on one hand the number of national boards and committees on which we sit; postage for our reprint mailing list would not bankrupt anyone, and to us the *Citation Index* entry under our name seems astonishingly brief. Not too long ago we were clear-eyed Arrowsmiths or Mme. Curies about to turn the scientific world upside down, but a funny thing seems to be happening to us as we wend our way to Medicare. We have had almost no warning that the fuse might sputter; with only a few sparks and an occasional disappointing fizzle; no textbook hinted at the possibility, for textbooks deal only in important discoveries; no senior professor prepared us for this state of affairs.

How to account for it—this dim niche in which we find ourselves? Obviously there must be more to science and research than the confrontation of nature, for in that art we are rigorously adept. To be sure as we look at our colleagues we know that the race went to the swift, but the rewards do not seem to have been parcelled out equally. With time some of the swift got a little swifter; we hit a plateau or approached an asymptote below the level of our adolescent dreams. "How does the system work?" is the question of the middle aged scientist, and we may be a little bewildered because we had to ask. The beginning of the answer comes not from scientists but from sociologists, from psychologists and from political scientists, a state of affairs we might find hard to take. We have been trained to think that to be a sociologist is at least an indiscretion, to concentrate on the sociology of science, a misdemeanor, and to extend our attention to include both the politics and the sociology of science is to have committed a felony. But the position we take at our peril, for it is from sociologists and political scientists that we get some understanding of how the scientific community works; our reward is consolation, perhaps, and the understanding which staves off bitterness.

The major theme of Blume's book is "that the social structure of modern science is highly dependent upon the social, economic, and political organization of society, and [it is] extremely sensitive to changes in this environment. . . . Being a scientist places the individual within a network of relationships to the economic and political systems, with the exact position in part a function of the development of his professional career." The opening chapter reviews the development of the sociology of science and the political science of science. In subsequent chapters sociological issues within the scientific community are discussed from a political point of view. Does the scientific community interact with the mass media? How? Can the interaction be made effective and beneficial to the scientific community and to non-scientists alike? What happens when scientists (and other professional groups as well) unionize? What is the fate of scientific groups labelled politically "radical?" All these questions and many others Blume deals with sanely. The book is highly recommended to practicing scientists who wish to know where they are, and to understand why. Historians of science will learn much here, too, about scientists and their institutions.

J. Z. FULLMER