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ERIC Development Team

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Environmental Education that Makes a Difference--Knowledge to Behavior Changes. ERIC/SMEAC Environmental Education Digest No. 4, 1988.

Goals and objectives of many state and local environmental education programs have included developing students with knowledge, skills, positive attitudes and motivation to take action, to prevent and to resolve environmental problems. This digest describes variables involved in developing responsible environmental behavior and some teaching approaches and materials that have been effective in achieving this goal.

WHAT DO WE KNOW?

Individuals who exhibit responsible environmental behavior on a broad range of problems have:
(1) Knowledge of relevant environmental concepts;

(2) Knowledge of environmental problems and issues;

(3) Concern for the quality of the environment;

(4) Knowledge of action strategies that may be used for

resolving an issue;

(5) Belief that their action can make a difference.

(6) Commitment to take action; and

(7) Experience in action based activities.

Data indicate that a good knowledge of environmental concepts is not sufficient; knowledge of environmental issues, issue skill analysis, and attitudes and values related to taking action are also necessary for the individual to take action and to act responsibly.

Some states, such as Wisconsin (Engelson, 1985), have developed state curriculum guides that recognize the need to provide for these variables in school programs,

beginning early in the school program and continuing the emphasis throughout the school program. The Wisconsin program supports a hierarchical approach and that (1) concepts, attitudes and skills develop over time, (2) effective programs involve both cognitive and affective emphases, (3) effective programs require issue analysis, and (4) experiences should be provided that help the individual develop the feeling that their efforts and actions can make a difference with real issues and problems.

Environmental curriculum developers have been working to develop and test materials to help students to exhibit more responsible environmental behavior. Three sets of materials that have been found to have a significant impact on student learning and behavior are summarized in this digest. Other materials are available through the National Diffusion Network and listed in the ERIC database.

WHAT ARE SOME ENVIRONMENTAL EDUCATION APPROACHES THAT MAKE A

DIFFERENCE IN DEVELOPING RESPONSIBLE ENVIRONMENTAL BEHAVIOR?

CONSERVATION FOR CHILDRENConservation for Children (NDN, 1988) is a program for use in grades 1-6 designed to increase (1) conservation awareness, (2) understanding of basic scientific environmental, and conservation concepts, and (3) conservation action. The program includes a variety of basic skill activities in the areas of language arts, mathematics, social studies and science with conservation concepts and conservation action.

The infusion approach used in the program provides a conservation emphasis throughout the curriculum. The program also provides a continuing emphasis on conservation concepts and behaviors over time by providing materials for six years.

Materials can be used to replace or to supplement current materials so relatively little additional class time is needed. Six grade-level curriculum guides and one all-level guide (activities, resources) are available. Data indicate most pupils who use the materials on a regular basis learn over 80 percent of the concepts and implement conservation practices at home.

INVESTIGATING AND EVALUATING ENVIRONMENTAL ISSUES AND

ACTIONS: SKILL DEVELOPMENT MODULESHungerford and his associates have analyzed research on variables related to the development and demonstration of environmentally responsible behavior and have designed and tested a set of instructional materials based on this research (Hungerford, 1985). The materials stress

a hierarchical-approach involving four levels of activities (Hungerford p28-29 in Disinger, 1987).

1. Ecological Concepts: This goal level attempts to provide the learner with the ecological knowledge that will permit him/her to make ecologically sound decisions with respect to environmental issues. This knowledge would include (but not be limited to) such concepts as individuals and populations, interaction, limiting factors, biogeochemical cycling, abiotic influences, homeostasis, succession, etc.

2. Conceptual Awareness: This goal level attempts to develop a conceptual awareness (i.e., knowledge) of how individual and collective behaviors influence the relationship between quality of life and the quality of the environment, as well as how human behaviors result in issues which must be resolved through investigation, evaluation, decision-making, and citizenship action.

3. Issue Investigation and Evaluation: This goal level attempts to develop the knowledge and skills needed to permit learners to investigate environmental issues and evaluate alternative solutions for remediating these issues. It also provides opportunities for students to actually investigate and evaluate issues.

4. Environmental Action Skills: Training and Application: This goal level attempts to develop those skills needed for learners to take positive environmental action for the purpose of resolving or helping resolve environmentally-related issues.It also involves the development of action plans by the students and provides them with the opportunity to implement those plans if they desire.

Research data indicates that behavior change usually will not occur if students are exposed only to Goals 1 and 2. The data also indicates that behavior will change if students are thoroughly exposed to Goals 3 and 4 in addition to 1 and 2. The quality of the students environmental actions also tends to improve when they have used issue analysis and investigation.

The materials Hungerford and his associates have developed include six modules: (1) Environmental Problem Solving; (2) Issue Investigation (Basics); (3) How to Gather Information; (4) Interpreting Data; (5) Investigation of Issues; and (6) Environmental Action Strategies. (Hungerford, 1988).

Studies report that effective use of the modules has usually required about 18 weeks of instruction and activities, but alternative approaches have been suggested in the literature. The modules have been tested primarily at the middle school and junior high school level, but could probably be adapted to grade levels as low as four and certainly could be used with older students in secondary schools and postsecondary institutions.

DECISIONS FOR TODAY AND TOMORROW:

ISSUES IN

SCIENCE-TECHNOLOGY-SOCIETYThese materials by Iozzi and Others (1987) were developed to supplement secondary school programs in the areas of science and social studies. The materials stress developing a knowledge base, problem solving, critical thinking, and thoughtful action.

The materials include a student guide with 12 chapters related to science-technology-society and the environment. There are two teacher guides that provide background material for the teachers, lesson plans, handouts, and worksheets. The guides provide suggestions on effective teaching approaches and activities to use.

SUMMARY

Research has identified several variables that are important in developing students who exhibit responsible environmental behavior. Programs and materials that include experiences with issue analysis, issue investigation, and working on real environmental issues and problems have been more successful than those that have not included these experiences. Programs that have included an emphasis on environmental knowledge and problems over several months to several years have also been more successful than brief activities. School staff and non- formal program developers concerned with effective environmental education programs should consider including such experiences in their programs.

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