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The role of environmental education in the elementary school

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Abstract

The term "the environment" conjures up a parade of horribles. No reader of the newspaper needs to be told that we are plagued by pollution, erosion, species endangerment, and the dwindling of the resources on which industrial society depends. Each is inundated by the media with details--PCB spill, acid rain, increase of carbon dioxide, loss of estuaries and wetlands, the extinction of wildlife, dumping of toxic waste, and many more.

THE ROLE OF ENVIRONMENTAL EDUCATION IN THE ELEMENTARY SCHOOL

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CHAPTER 1

Introduction

The term "the environment" conjures up a parade of horribles. No reader of the newspaper needs to be told that we are plagued by pollution, erosion, species endangerment, and the dwindling of the resources on which industrial society depends. Each is inundated by the media with details--PCB spill, acid rain, increase of carbon dioxide, loss of estuaries and wetlands, the extinction of wildlife, dumping of toxic waste, and many more. Johnson (1983) enumerates grim realities facing our world today:

1) Extinction of as many as one fifth of all the earth's species is possible by the turn of the century projecting current rates of deforestation and urban development. This will certainly result in the alteration of global nutrient cycles which affects soil productivity.

2) A 1975 study indicated that tropical forests are being cut down at the rate of 42,000 acres per year around the globe. At this rate, half of these forests will be gone in over fifty years. The loss will also affect the weather pattern.

Added to these environmental shocks, Johnson (1983) cites that one third of the earth's cropland is losing

topsoil and that millions of acres have been changed to desert because of forestry practices. A report in Time magazine (Grosvenor, 1988) indicates this wanton exploitation of nature is causing the destruction of tropical forests at the rate of one football field a second eliminating the source of numerous medicines. Erased with them will be at least a million or more of which a handful have been tested for possible use by humankind. Although water covers most of the earth's surface, nearly two billion people lack safe drinking water and the number is speedily increasing.

Iowa is no alien to these environmental issues. Experts say that if petroleum is used at expected rates, by the year 2,000 ninety percent of the world's oil may be exhausted. Iowa imports ninety-eight percent of its oil and natural gas needs, and thousands of jobs depend upon these energy resources. Furthermore, there is frequent media coverage that Iowa's groundwater is muddied by fertilizers, pesticides and herbicides, and other toxic waste. These make water unsafe to drink, affect wildlife habitats, and are the cause of death for aquatic and animal life (Godfrey, 1979).

With the overwhelming reduction of the global environment, somehow there prevails a seeming complacency that things are actually getting better, that pollution of air, water and land are being regulated, and that

eventually solar energy will be the answer to energy problems. Authoritative sources claim that environmentalism often consists of sentimental concern over individual species and beauty spots. We need to wonder whether the barn owl, the coyote, the snail, the birch tree or the prairie grass are vital to human well-being. Session (1983) voices this same concern that most of the food species of fish are being harvested at levels beyond the yield their numbers can sustain and this "ecological crime and prevention should be the criterion for a plan or activity of any kind. How long this beautiful, fragile, and wondrous swirling ball that most of the astronauts have described can endure, and the quality of life it can support are the challenges that today's planetary citizens face. The solutions do not depend alone on the laws of physics (Sanction, 1989)." People have reached a point where they have the power to affect the present and future state of the planet.

In the twenty-first century, the greatest challenge will be economic and ecological access to food arising from inadequate purchasing power on the one hand and environmental degradation on the other. Global agriculture is at the crossroads, and we need to meet the new challenge (Grosvenor, 1988).

Major Concerns in the Field

"The environment" is a concept that is so broad as to be meaningless. When one speaks of protecting the environment, most often one means protecting one's own immediate surroundings. Education is about real and meaningful environments. According to Lutts (1985), nature and culture are at war. It is vital that children need to focus on the earth as our home, rather than simply as something apart from us. We are more likely to act to protect our home than we are to protect something less personal and precious. After all, if we harm our home, we harm ourselves. What is missing is a sense of depth and pervasiveness of the threats to ecological stability of "our home". It is important to make sure that we are talking about the same thing when we discuss "the environment" as an issue worthy of the school's attention.

The existence of environmental education in public school curricula can often be characterized by loose organization and little sense of direction (Hungerford, Peyton and Wilke, 1980). There is no research providing a comprehensive description of the environmental education program developed or implemented in the nation's elementary and secondary schools. It is largely intuitive in nature. A cohesive strategy is needed to guide program developers toward goals to a citizenry competent for future decision-

making and participation. This could result in a drastic modification of our environment. Knowledge of the patterns that connect us to the rest of the global environments should be central to any educational program. Educators, authors, and leaders in the field maintain that the paramount task of modern education is to prepare students to cope with these environmental problems. There is an urgency for better education about the immediate dangers to our environment. It is not a separate subject. It is an awesome task which may require generations to struggle with the issues. As Wetzel (1983) states, "environmental education is as old as the hills and as fresh as tomorrow's sunrise."

Environmental problems cannot be addressed merely through laws or political considerations. No educational system hoping to prepare its students for citizenship in the world could fail to treat "the environment" as an important subject. Future citizens must be given the tools to deal with the issues. Values, beliefs, and attitudes are established and fixed by the time students reach high school (Jaus, 1984). Instruction in environmental concerns then needs to take place in the elementary school. There is substantial evidence that only a few studies have involved elementary students. Authors also contend that the affective component is of more value than the cognitive aspect in the education of the young children. Pomerantz (1986) shares

this view that pre-adolescent attitudes toward the environment are formed during early childhood. These will govern their behavior throughout adult life. He cites a study of 17,000 elementary school students throughout the United States that showed the most pronounced changes in children's political attitudes between fourth and fifth grades. Although elementary school children participate in the observation of Earth Day, Arbor Day, and Conservation Week, environmental education appears to proceed slowly. Sessions (1983) aptly describes it as "letterhead pieties and convention oratory." Critics continue to view environmental education as lacking in depth, accountability, and involvement.

The patterns that connect us to the rest of the global environment should be central to any education program. The study of these patterns is supported by Macgregor (1984) where ecological consciousness redefines the "group" beyond the society at hand--all the interlocking systems that sustain life. She stresses the sense of history that builds an understanding of where we have been and moves toward a deep sense of responsibility for where life is headed for generations into the future. The prevalent view of growth and health of the economy are misinterpreted as the growth and health of society. Our 'sacred cows' have to do with material success and acquisition, competition, technology,

and the like. Macgregor (1984) proposes the need for ethical and moral values as a foundation to respect and protect the interests of the group as a whole. Several authors criticize society's perception of progress as the further development and expansion of the artificial environment when in fact is is a regression in the ecological perspective. Social responsibility through environmental education is being explored. Sessions (1983) claims that the problem with education is not that the values are being ignored but it is the teaching of global views and values of the technological and scientific society that are being ignored. Several studies also note that education is preparing young people for careers in a highly exploitive and ecologically disastrous technological society. Heath and Wiebe (1980) define the existing attempts by educators to revitalize citizenship education because of the increase in juvenile crime rate, especially among elementary school age pupils. There is a serious concern nationally about the school's ability to develop contributing citizens and environmental education can be a facet of values education.

There appears to be very little support coming from the public, school administrators, or others to develop coordinated and effective environmental education programs. There are other curriculum priorities and there appears to be a lack of an organized and convenient way to establish

accountability for an environmental education plan (Pettus and Teates, 1983). The "conservation ethic" that Brennan (1986) advocates has not been accepted by the public, and therefore, has not become an essential factor in shaping national and international policies nor in educational programs. This "conflict perspectives" points to the question of who decides environmental issues (Crowfoot and Bryant, 1980). Is it going to be left to the segments of society with dominant influence which are those who own the means of production? The non-owners are the victims because they do not have the economic or political power, nor the necessary consciousness to influence corporate and governmental decisions. Progress continues to exploit human labor, allows individual corporations to expand, compete and grow stronger while depleting the earth's natural resources. Brennan (1979) criticizes the exclusion of conservation in curriculum and other experts in the field support this view. Any mention of conservation, or nature study, in outdoor education means certain rejection of any proposal for funding under the Environmental Education Act. It is as if these uses of the environment as a laboratory to study the environment are not valid. Nations now spend over one billion dollars a day on defense (Brennan, 1986). Think of what could be accomplished with one billion a day for conservation of the environment! The need for greater

community participation and control at local and state levels for the development of some alternatives must be supported. Programs cannot be developed and decisions cannot be made when scientists, economists, engineers, politicians, or artists complete their education without an introduction to the environment. The nation, according to Brennan (1979), operates with total ignorance of environmental laws.

A survey of social issues assessed the extent to which respondents believed various societal issues should be included in the curricula. The two hundred and eighty-six responses, representing thirty-eight states, rated pollution of the earth's environment at the top of the list (Molnar, 1983). There appears to be an urgent demand for better education about the state of our environment. Critics and environmentalists emphasize the need for a study that will establish the role of education in the development of pupils' understanding of their environment. It is proposed that such a study will establish relationships among people and the environment as they were in the past, are now, and will potentially be in the future (Brennan, 1979). Who are these environmentalists? They are the individuals attempting to protect and reduce the exploitation of the natural environment to enhance health and well-being. They are the individuals who are involved in increasing

citizen participation in economic and political decisions so as to enhance environmental quality.

A concern for the land and its resources is basic to our survival, both as individuals and as a nation, for we cannot live apart from our planetary home. Environmental quality, human health and well-being are interdependent. Preoccupation with environmental issues and increased concern for environmental protection is more than a quality of life issue. It is also a matter of long-term global survival. There is an essential urgency to establish the role of education in the development of children's understanding of the environment. It is, therefore, instructive to reconsider our knowledge of human development with a specific focus on the processes whereby children construct a coherent image of their natural world. This image must affect their understanding, attitudes, and behavior towards the planet earth (Rejeski, 1982).

The eventual condition of life on this earth depends heavily on the future commitment and concern of today's children. There is a need to develop and implement opportunities in the most formative school years for students to experience and explore the interrelationships between people and things around them. It is critically important that children recognize their interdependence with their environment and with all life. It is vital for them to

recognize that the maintenance of a place fit for life and living is everyone's responsibility.

Statement of the Problem

The environmental education agenda confronting us is demanding. How can educators provide students with experiences which will lead to their active involvement in responsible environmental behavior? Can we teach our children the tenets of leadership and the principles that lead to caring for the environment? One choice that each can make is to seek and support existing quality education programs.

Educational goals and strategies must follow suit. The presence of environmental education in public school can often be characterized by loose organization and little sense of direction (Hungerford, Peyton and Wilke, 1980). According to a curriculum specialist, we are just where we were twenty years ago in the environmental education program (Brennan, 1979). It appears that teachers are not getting the types of preparation, assistance, support, and resources they need to provide effective instruction about the environment. A teacher survey revealed that the majority of them think preservice programs should require environmental education. A small number did not regard it as a critical need (Pettus and Teates, 1983). Teacher preparation programs in environmental education remain scarce and poorly developed here and around

the globe (Wilke, 1975). If teachers do not have the knowledge, skills, or commitment it is unlikely that environmentally literate students will be produced.

We are not passing through a period of biological, environmental, and cultural evolution unmatched in history (Brennan, 1986). Environments have been altered and human populations place many demands on limited resources. What kind of world do we want for our children and the children of future generations? What kind of culture must we develop? What kind of curriculum must we advance to develop responsible citizens?

In 1970 Congress passed Public Law 91-516-The Environmental Education Act. The law authorized the United States Commissioner of Education to "establish education programs to encourage understanding of policies, and support of activities, designed to enhance environmental quality and maintain ecological balance" (ICEC Agenda, 1989). The law provided for the development and support of new and improved environmental education curricula, the demonstration of model education programs, training for educational personnel and supply of curricular materials.

Although the 1970 federal law offered only minuscule funding, it did establish a national policy on behalf of environmental education. It sent to state departments of

education a clear message to begin developing and integrating environmental curricula into public school programs.

Environmental education is also a requirement in the elementary curriculum by the state of Iowa. Section 257-25 of the Code of Iowa provides curriculum requirements and standards for Iowa schools. The code states, in part, that "the following areas shall be taught in grades through sixth: science, including conservation of natural resources and environmental awareness..."(ICEC Agenda, 1989).

There appears to be renewed interest and concern with environmental education among national leaders and the public. It is evident that the eventual condition of life on this earth depends heavily on a future commitment and concern of today's children. Highlighting the problems is not the solution, nor terrifying students about ecological disasters the answer. It is essential that our educational system produce students who understand the global environment and that humankind is the dominant species in that environment. That is a more hopeful and less paralyzing view of the world and a more fascinating challenge to education.

Scope of the Review

The review of related literature on environmental education will encompass the study and discussion of: a) the rationale and definition; b) the goals, the objectives, and an integrative model for a curriculum plan; c) the main

components of an ideal program; d) teaching/learning experiences; e) resources; and f) the need for teacher advocacy.

It is the aim of the writer to help elementary teachers gain a better understanding of environmental education, not as a discrete discipline, but an integrative one to look at different approaches and strategies for infusion across many subject areas. Issues related to each area of concern are examined in an effort to provide educators with background information. While by no means definitive, these statements are starting points for understanding these complex issues. Educators today are faced with an even greater challenge of looking at the curriculum. They need to consider the disciplines as a system for an ongoing environmental education program. School systems are being asked to review their curricula, their teaching methods, and their materials. The components of a model environmental education program, guidelines for a curriculum plan, program structure and teaching responsibilities--all are necessary to help guide and encourage teachers in the process towards an effective, well-balanced, and meaningful environmental education program.

A basic knowledge of teaching/learning processes related to environmental education in the elementary school program are also presented. Various activities and projects will be

reviewed as to structure and procedures so that acquired skills and new understanding will ensure more productive and relevant experiences. Classroom activities are ways in which a teacher can address the instructional objectives. These experiences integrate key stages of cognitive and affective development. Instructional techniques are suggested that promote problem-solving, inquiry, values, and attitudes which are consistent with everyone's role as stewards of the earth.

The writer reviewed the ideal components of a sound environmental education curriculum so that effective planning and operation can be achieved. The literature search enabled the writer to examine the developmental design of environmental education studies not only to the logical progression of content and skills, but also to the mental, physical and emotional capabilities of the participating children. From this comprehensive overview, a teacher will be more skillful in alerting the children of the part they play in assuring continued survival on this planet and inspire others to aspire for excellence. The assessment and the evaluation of some readily available resources must be instituted in order to effectively plan for an interdisciplinary program in a school district. This clarifies the unique role of institutions, educational leaders, agencies, and learning centers and how they fit together in a joint effort to manage world resources.

The information contained in this paper was acquired from various sources. An Education Resource Information Center (ERIC) search was conducted and Current Index to Journals in Education (CIJE) was referred to. Textbook series, teacher' manuals, and various instructional materials on environmental education were examined at the University of Northern Iowa Library and Curriculum Laboratory in Cedar Falls, Iowa. The writer has completed Project WILD and IDEAS Workshop Program under Dr. Duane Toomsen, an environmental education consultant of the state of Iowa and the writer is also a current member of the Iowa Conservation Education Council. The knowledge, skills, and literature gained from the inservice and membership have been invaluable sources in the writing of this paper.

Limitations

The purpose of the literature search is to clarify the role of environmental education in the elementary school and to obtain an overview of an effective program for a curriculum plan that includes all the subject areas. The teaching of environmental education in the elementary school covers a broad field of study and it was the intention of the writer to focus only on the main components of a sound program.

There appears to be a vast number of resources and instructional materials that have been developed to motivate

teachers develop student skills and understanding about global environments. Various committees have created goals and objectives for developing conferences, workshops, and curricular materials. The following were examined and reviewed: curriculum models, content area skills and processes, curriculum strategies and guides, and textbook series with interdisciplinary emphasis.

A number of authors have commented that there is a lack of credible research in terms of theory, methodology, and application of environmental education. It seems reasonable to assume that the reasons behind this are due to other curricular priorities that take precedent over the development of district-wide programs and the lack of funding for implementation. According to a study (Childress, 1978), there is not enough public and administrative support, lack of time and expertise to coordinate an interdisciplinary curricula with the existing resources, and inadequate preservice and in-service training.

CHAPTER 2

Rationale

Successful continuation of a high quality of life for us all depends upon how well we conserve, manage, and utilize energy, and safeguard our natural resources. Our schools play a key role in the development of what amounts to an informed public environment ethic. The rationale for this integrative thrust lies in the fact that science, mathematics, language arts, social studies, math, art, and physical education are integrally interwoven in the real world outside the classroom. It follows that these subjects should be similarly treated in the classroom if we are to prepare our students for life in that world. They encompass the art of questioning, investigating, hypothesizing, and discovering. They are the means that provide clarity, objectivity, and understanding. The language arts provide the most powerful tools of communication. Many of the major contemporary issues involve societal issues stemming from advancements in science. The children need to develop awareness, attitudes, and competence related to global interdependence and to understand that we are all citizens of the world. It is time that educators apply a more holistic mode for transmitting knowledge to students.

There appears to be an abundant source of instructional materials and extensive educational opportunities to

integrate the study of the environment into the curriculum. The teachers are in the position to use these available resources. Many committed, knowledgeable, and skillful innovators of curriculum programs can transmit their expertise. The teacher must understand her role, possess the necessary knowledge and skills, search for appropriate materials and equipment, and truly be committed. The teacher, too, must ask crucial questions that point to a need for greater concern and solutions: How can we hope for good stewardship of this planet if we don't know how life interacts with life? How can we hope to live peacefully with our fellow man if we don't comprehend where or how he lives (Grosvenor, 1988)?

There are some truths, even fundamental ones, that are apt to elude people. The most basic truth regarding our Earth-home is that all living things in some manner, are related to each other. This fact, while mainly important as as a physical principle, has implications even of a spiritual nature (Storer, 1953). The basic principles governing the entire living community must be generally understood if human beings are to be successful in maintaining the productivity of the earth. Nature will not accept ignorance of her laws as an alibi.

Children, like adults, learn best when they're actively engaged in the learning process and feeling good about

themselves and each other. They must be involved in many kinds of experiences from pure aesthetic appreciation, role playing, observing, questioning, experimenting, using their senses, to researching in order to make learning meaningful and relevant in their lives. According to a number of authors, exploration is perhaps the children's most powerful form of motivation. The child learns because he/she must.

The children today are the decision-makers of tomorrow. That role, due to the increasing energy demands, the impact of technological elements on health and decreasing supplies, is why schools must provide a solid foundation for decision-making (Stephens, 1982). Is there still time to change our collective ways regarding lifestyles and the misuse of the global environment or are our efforts too little--or too late? Dr. Peters (1985) recommends that in order to solve our immediate pressing problems as well as future woes, it is important that educators possess not only knowledge, insight, and skills, but also the courage necessary to solve problems. They must also make a lasting commitment to action and stewardship of this planet. Several studies strongly support the contention that the only way that change and problem-solving can occur is to educate a generation of global citizens who willingly assume the responsibility on a twenty-four hours a day, three hundred and sixty five days a year basis. The only way that such

a determined vigilance can occur is for each and every individual to internally develop a sense of environmental stewardship.

The teacher interacts with a significant number of youngsters in the classroom each year. She can be a vital connection to restore the will of the young people to envision a future that is hopeful and that can be influenced by their efforts. The teacher must want to guide the students to ask the hard questions about the environment in order to find appropriate solutions. The teacher must also understand the importance of her role in the integration of environmental education within the curriculum. The premise for an environmental program in the elementary school is aptly summed up by Martha Munzer's note, "Insight: The Three R's of Ecology":

> ...It comes about that most people simply don't know how beautiful the world is and how much splendour is revealed in the smallest things, in a common flower, in a stone, in the bark of a tree or the leaf of a birch. Grown-up people who have occupations and cares and who worry themselves about mere trifles gradually lose the eye for these riches which children ...quickly notice and love with their whole heart (Rilke, 1989).

Definition

There is consensus that environmental education is a process which is applicable to everyone and directed to people of all ages. Its purpose is to produce an environmentally literate citizenry who will have the basic knowledge of and concern for the environment, awareness of the implications of issues, basic skills to cope with trends and initiate solutions as well as commitment to the measures of environmental management. A number of authors demonstrate that the school must be concerned with broad processes which involve the development of awareness, knowledge, skills, and attitudes which assist learners to understand the relationships between people and their surroundings. This process also includes the enhancement of concern for the well-being of the earth's inhabitants, making decisions, taking responsible action to improve the quality of life, and accepting both individual and group responsibility for environmental management. Environmental education should take a holistic approach and be developed within all the traditional subject areas of the school curriculum.

A number of authors and writers of curriculum plans strongly support the philosophy that education for the environment seeks to develop students' responsibility towards the environment with activities aimed at promoting values that will lead to the formation of a personal environmental

ethic. This will encompass the learning of ecology which is a study of the interrelationships of living things. Sound conservation practices are based upon a knowledge of the mutual relations between organisms and their environment (Storer, 1953). It means educating students so that their actions will benefit the environment. It seems reasonable to assume from the number of instructional materials consulted, that education about, from, and for the environment can take place within the classroom, around the school buildings, in the homes, the neighborhood, a pond, or anywhere 'in the wild'.

Environmental education remains "untaught" unless at least three things are achieved: attitudes, genuine personal action, and the transfer of knowledge and skills to new situations (Sourcebook, 1981). Goals will be met when it can be observed that learners have clarified concepts and learned skills. Environmental education is not a unit of study in a particular subject. It is not the same as outdoor education, a nature study, nor a field experience center; although these, like science or social studies and other elements of the school curriculum, can be part of environmental education (Jaus, 1984).

Most of the environmental issues of today are about cities, energy, land-air-water pollution, food production and conservation/management of natural resources. They involve a

reexamination of lifestyles and clarifying existing values in the light of a more informed understanding of the many facets of the environment. New courses added to the curriculum are not needed. Most existing subjects can be used to develop concepts about or attitudes towards environmental concerns. In the elementary grades, a teacher typically has the responsibility of one group of students for much of the school day and, therefore, has the flexibility to integrate an environmental program within subject areas.

There is considerable evidence that the environmental issues of greatest concern today are clearly interdisciplinary in nature. The issues pertain to all subject areas of the curriculum that develop the intellectual, physical, emotional, and social skills of each learner. In order to provide a well-balanced, holistic approach, it is necessary to utilize a wide range of learning environments which are accessible to the school and relevant to the particular learning objectives.

The core learning processes are closely related to environmental education (Sourcebook, 1981). Learning and thinking techniques such as problem-solving, inquiry, critical thinking, recording of data, drawing conclusions, and many other thinking skills are an important part of environmental education. The development of interpersonal and group relationships through projects and field trips,

practical performances, using a variety of forms of expression, developing reading-writing and other forms of communication skills, or clarifying values may be considered as the environmentalist's perspective across the curriculum.

CHAPTER 3

Goals and Objectives

The representatives at the 1977 Tbilisi Intergovernmental Conference on Environmental Education developed a set of general objectives for a sound environmental education program. These are: awareness, knowledge, attitudes, skills, and participation (Hungerford, Peyton, and Wilke, 1980). If environmental education is to be ultimately concerned with humanity, this must include an objective understanding of how children learn about their environment and how this learning process shapes their behavior. For the educator, this becomes an understanding of how children come to know their natural world which includes the ecological systems which sustain life as well as the cultural and technological forces which often prove necessary to biological existence. The teacher must consider the question of whether a framework for organizing knowledge about the environment can be coordinated with a developmental structure for understanding how the child's knowledge of the environment changes, grows, and is amended by experience.

The primary goal of environmental education is to develop citizens who are knowledgeable about the environment and, therefore, are involved in working toward a more livable future. Sly and Rose (1984) proposed a goal based on the following assumptions:

1) The environment is not only biophysical; it is also aesthetic, economic, social, and political.

2) Environmental education must promote an environmental ethic where people are not exploiters of the environment but are stewards concerned with the preservation of all life systems.

3) Environmental education must reflect a commitment to future generations, not merely perpetuate the values of the past.

4) Environmental education is not a subject, but a synthesis of concepts and skills from all disciplines that relate to the environment.

A thing is right when it preserves the integrity and the beauty of the biotic community. A thing is wrong when it tends to do otherwise. John Denver (1986), founder and president of Project WILD, stressed that the comprehensive goal should be: "to develop awareness, knowledge, skills, and commitment which will result in informed decisions, responsible behavior, and constructive actions... for wildlife, and the environment upon which all life depends."

The guidelines for objectives should also be consistent with the inquiry process. An ideal framework for objectives needs to provide experiences so that the children will:

1) develop concepts and generalizations which will assist in their understanding of diverse environments and societies;

2) use inquiry methods and develop skills in inquiry learning in order to: a) identify problems, pose questions, formulate hypotheses, b) find or generate data, c) analyze data and make and apply generalizations and, d) communicate the results of their inquiries to others;

3) develop group interaction skills through group discussion and group decision-making;

4) develop a commitment to maintaining and improving environmental quality (Sourcebook, 1984).

It is important that in planning for teaching/learning skills, the teacher consider global perspectives. General objectives for integration in a curriculum plan will allow the student to:

a) gain exposure to diverse global environments;

b) be introduced to basic concepts re: natural and social environments;

c) develop perceptions re: global environmental relationships;

d) develop geography skills;

e) develop critical thinking/decision making/research skills;

f) develop an understanding of how other human groups live;

g) develop an understanding of the relationship between their present lifespace environment and the world community (Peters, 1985).

Several curriculum guides have subdivided objective statements into the areas of: knowledge and understanding; skills, abilities, and processes; and values and attitudes. The knowledge and understandings are a synthesis of the concepts, facts, which could be taught in separate areas. The skills, abilities, and processes are either what the learner may be perceived to need in order to address the knowledge and understandings or those which appear well suited for practice and use during a study. Values and attitudes are descriptions of what it is hoped the students may internalize or come to feel as a result of the investigations in which they have been involved.

In utilizing the interdisciplinary approach, most programs involved virtually every subject that is taught as a part of the curriculum. The result is a complex network or weblike linkages which appear, at least initially, to be somewhat overwhelming and difficult to follow. However, with some practice and through the detailed procedures that most manuals provide, these concerns should be alleviated.

From this body of research it may be concluded that the essential goal of a meaningful environmental education program should be to produce individuals capable of making decisions concerning environmental quality. In order to achieve these objectives the teacher must address the development of three basic areas: a) an understanding of the environment in its totality; b) skills for examining and analyzing the environment; and c) a feeling of concern for the environment.

The goals and objectives for a holistic approach provide the basis for lesson/unit organization and execution. The various curriculum series that were consulted were designed to be infused with the existing and ongoing subjects of instruction in the elementary school. Skliar (1974) and many others have shown that curricula can influence the image of a school subject when a program emphasizes affective, cognitive, and aesthetic objectives.

A Model for a Curriculum Plan

The various environmental education programs examined have been designed to accomplish a number of tasks. The most important of these was to present the interdisciplinary approach in a logical and developmental framework. The end result is a curriculum model through which the relationships between concepts and ideas with an environmental focus are integrated in various subject areas.

The writer chose the Project WILD model as an ideal program. The biased choice was due to the following reasons: 1) The writer has attended the in-service workshop that provided some basic knowledge, skills, and understanding of environmental education. 2) The Project WILD manuals and activities are sequentially presented and the procedures are easy to follow. 3) The activities are highly adaptable to the school community where the writer teaches; and the learning experiences that have been utilized have proven to be stimulating, meaningful, and applicable to the needs and interests of the level of students she teaches.

The activities in Project WILD are organized into seven major sections corresponding to a conceptual framework. The concepts and generalizations outlined under each section provide the basis for setting up objectives in various subject areas. The consistent format allows the teacher to conveniently identify the conceptual development, sequence, and interrelatedness of a particular activity to the aims of environmental education. A summary of the format of each section is given below:

Section One: Awareness and Appreciation

Activities in this section are introductory and they are designed to establish a foundation for most of the activities that follow. The prevailing

concepts relate to the basic needs of humans and wildlife.

Section Two: Diversity of Wildlife Values

This section provides students an opportunity to consider the range of contributions by wildlife to people and the environment. They include aesthetic, ecological, scientific, political, commercial, economic, recreational, and intrinsic values.

Section Three: Ecological Principles

A foundation for understanding the characteristics of the environment, how they work, who and what inhabits them, and implications for understanding these principles as they affect wildlife are provided in this section.

Section Four: Management and Conservation

This section builds on the generalizations established from the preceding sections and provides an opportunity for more depth in understanding how wildlife and other natural resources can be managed and conserved.

Section Five: People, Culture, and Wildlife

The major emphasis of activities in this section is to examine the ways that human cultures affect

people's attitudes toward and treatment of wildlife and other natural resources.

Section Six: Trends, Issues, and Consequences

A range of difficult issues is addressed in the activities. Students are given opportunities to apply knowledge they have gained in earlier experiences by consideration of difficult issues and their consequences.

Section Seven: Responsible Human Actions

The activities are designed to serve as a way for students to recognize, evaluate, and make responsible choices in their own lives. They are given opportunities to consider and take constructive actions as thoughtful, informed, and responsible inhabitants of our shared home.

The Organization of Each Activity Based on the Model

Each activity has an information box that gives the teacher an idea as to the appropriateness of the activity to the age level, correlated subjects, skills to be developed, group size, duration, and reference to the conceptual framework. Each activity also includes a statement of the instructional objective; background information for the teacher; materials, procedures, and enrichment experiences; key vocabulary and recommendations for evaluations. There appears to be a balance of objectivity and technical value of

the materials which represent a wide range of views on wildlife and its management.

Other Models/Programs/Units

Some programs that were examined developed a curriculum plan model through which the relationships between concepts and ideas with an environmental focus originate within contributing disciplines. Other models centered on a particular areas of the environment in a thematic approach: clean air, groundwater, energy, outdoor education, animals or plants, careers, conservation and the like. Some dealt with children's literature and language arts activities for heightening students' awareness of their surroundings, whereas others emphasized the hands-on experimental strategies. Litchfield's (1978) curriculum series for the elementary school dealt with writing, listening, and speaking which appear to be most adaptable of the disciplines especially in elementary school.

Friedman's (1985) Self-Teaching Activity Book emphasizes interdisciplinary reading and activity programs. A caring little animal named Jelly Jam is used to help children understand pollution, how it affects their own lives and what they can do to help clean up the environment.

Water is the theme for some environmental programs. The activities are sequenced in an intricate web of relationships between the biological and the physical world. The topic of

water considers the importance of habitats, the water cycle, and the causes and effects of pollution. Godfrey (1979) developed numerous learning centers to help children understand their role and to take action on keeping water safe for all. The Science Teaching Center in Maryland initiated an interdisciplinary approach using a data bank which consists of topics related to Chesapeake Bay--a threatened and complex environment. Dr. David McCalley, Director of the Institute for Environmental Education at the University of Northern Iowa, with a select group of teachers, created a number of activities for Outlook: On Groundwater which is an educational project in three modules for teachers in the elementary, middle school, and senior high. The series is based on the premise that the quality of groundwater is becoming an apparent concern due to the abundant use of fertilizers and pesticides as well as past and present hazardous waste management procedures.

A number of programs and units are centered on energy conservation. Most are designed to help students become familiar with past, present, and alternative sources and forms of energy for consumption and economic uses.

From this body of instructional materials and models for curricular plan or infusion that were examined, the related activities followed a sequential approach based on conceptual schemes. It is up to the teacher to choose the

learning module that best reflects the community in which the school is located but not to the exclusion of the state, national, and global context. The broad goals and objectives can be mixed and matched whenever such fusions are appropriate. It is recommended that a teacher attend an in-service workshop of the particular model that she/he wishes to implement. Most of all, that the activities she/he selects are geared toward the interests, needs, and grade level of the students.

CHAPTER 4

The Conceptual Approach

Rejeski (1982) clarifies the types of activities that are relevant in the upper elementary grades. By fourth grade, children have reached a period in which common physical actions have become internalized as mental actions or logical operations. The first operational structure which affects their cognitive style is the ability to do groupings, to classify and systematically reduce the complexity of the world. At this age level their increased symbolic capabilities also allow them to incorporate both experiential and vicarious material into new cognitive schemes.

Wildlife, ecological systems, and responsible human actions are recommended topics to introduce. A curriculum framework organized around three major conceptual schemes may be appropriate with the upper elementary age-group: 1) Interaction--biological and cultural; 2) Interdependence in the global community; and 3) Change and its consequences brought upon by their actions and the action of others (Brennan, 1986). These conceptual schemes can be built upon one theme such as habitat, adaptation, food-getting, water or energy conservation (Cole and Gilfillan, 1981). The system of relationships and interrelationships in the environment is a conceptual scheme. In the process of conceptualizing, various levels and aspects of thinking skills are involved

and many varied activities begin to relate to an idea (Kuse and Kuse, 1986). There needs to be many experiences that relate to this one concept and in order that it is refined, a system of "many references and cross references are filed which relate" to it (Kuse and Kuse, 1986). Each step must promote the development of abstract concepts in children and in order to reduce gross redundancy, a teacher needs to plan the experiences and materials that will enable them to expand and refine the idea they have in mind. The concept broadens sequentially, based upon the activities provided and their research skills.

The lack of understanding of interrelationships and interdependence leads to irresponsibility resulting in the exploitation of the environment and waste of resources. The concept of ecosystems shows constant feedback within and among species; where everything that exists today as feature must have a reason, and that groupings which optimize the chances for each other's survival last the longest. The concept of "home" can be an effective theme (Lutts, 1985). Through the use of sensory, aesthetic involvement, and physical activity, children become familiar with their family of plants and animals, rocks, sunlight, etc. It becomes a personal and cultural family--an intimate and wonderful interactive patterns that join them together as one. The units based on conceptual schemes show three dimensions;

objectives, content, and learning situations. The activities promote a process of thinking and knowing--cognitive and affective. The conceptual approach in curriculum design is "as valid for the dinosaur as for people, the forest, for citizens of New York or the Melanesians of New Guinea" (Brennan, 1986). In teaching concept, each subject area is an entity made up of interconnections rather than an accumulation of discrete parts. A team approach to teaching the environmental concepts entails cooperation and planning. The procedure for the selection of concepts for the curriculum under each area of concern is found in Appendix A.

The Development of Concepts Through Skillful Questioning

Our complacent attitude about our environment and the many assumptions we have held are due to the fact that we have ceased to ask questions. For example; that advanced technology means the best technology--no questions asked. People remain unquestioning because they find scientific progress satisfying (Howard, 1983). In north Oregon's Seaside High School, students have been led forth year after year into the environment of Oregon's north coast. The students learned to ask questions--their own questions about the ecosystems that have surrounded them all their lives. They asked their own questions about the streams, the estuary, the shore, the spruce forests, and how they affect their own community. Their training in the disciplines came

as they learned how to pursue answers and communicated their knowledge. For two years, entirely on their own initiative, they wrote, edited, and distributed the "Student Oceanography Newsletter" which went out to schools in thirty-five states (Johnson, 1983). The students have produced slide shows on such subjects as forest fire management and the value of "snags" (standing dead trees). They took pictures of wildlife and habitats which were presented at public meetings. They studied about the salmon, one of the area's most valuable resources. They became so fascinated by the streams through which the salmon passed that, by following their own questions, they changed their focus from the individual creature to the entire ecosystem. The teacher was praised for teaching the students to ask their own questions and search for their own answers. Kuse and Kuse (1986) state that skillful questioning can and must be taught so students will learn how to ask questions that will help them acquire the information they want. This gives the students a sense of ownership and responsibility in finding their own answers but the teacher has to provide the setting to motivate the students to ask questions.

Values and Attitudes

Huxley is quoted from his novel Island stating the view that an understanding of ecology leads to an understanding of morality (Sessions, 1983). If the goal of environmental

education is to develop citizens to become caring stewards of the earth, it should involve learners in examining and thinking about the value conflicts inherent in their society. They must be taught the ability to make choices forced on them daily and to have the knowledge about these alternatives. At a personal level, the children should be encouraged to think about their own behavior as it influences the quality of their living and of those around them. The experiences must allow the learners to consider the options available in resolving conflicts of interest inherent in environmental improvement and protection. They must become aware of what must be given up in order to gain something else. While understanding about the environment is a prerequisite to action, the emphasis should be placed on changed behavior patterns. Attitudes can be "caught" rather than "taught" if the children are provided many experiences which will motivate them to inquire into, and consider issues involved in their own environment.

Several studies recommend that the teacher needs to encourage the students to ask each other questions regarding their code of ethics in a non-judgmental way. The purpose is for each one to evaluate his/her own priorities in a responsible consideration of day-to-day actions that affect the environment, and enhance their potential for decision-making (Crowfoot and Bryant, 1980). Numerous activities are

recommended to provide opportunities for children to clarify their values and a few examples are discussed in this section.

Journal writing encourages the students to use their beliefs or set of codes in keeping track of how easy or difficult it is to live by them. Progress reports may be a meaningful activity when done in the spirit of each person paying attention to his/her own action, and bearing responsibility for them. The use of role-playing and/or dramatics can place an individual into a situation in which an understanding of an underlying environmental topic can be developed. Through simulations, the process of weighing up conflicting evidence before drawing a conclusion can be transferred. Educating children to feel for the environment may also be a point of considerable importance in the curriculum areas where the development of empathy is a major objective. Writers of fiction consciously or unconsciously reflect the views and values of the societies in which they belong.

Other studies propose that the teacher constructs a number of focusing questions to introduce each topic. A number of skills and processes considered to be fundamental to inquiry learning must be identified. The process of clarifying values encourages children to consider alternatives but it is not the intent of any activity to

describe "right" and "wrong" answers for the students. One exception is in the area where information about laws is conveyed.

There are a few variations from state to state in laws affecting wildlife and the environment. There are federal, state, and local regulations that the teacher and the students need to know. Whether right or wrong, questions of law can be separated from questions of ethics. The individual choices as to what seems right or wrong for him or her in terms of values and behaviors may be described as a personal code of ethics. Hunting, for example, is controversial for some people from an ethical point of view. Others believe it is an ethical form of recreation, acquiring food or a form of population control. Others believe that it is not right to take the life of a wild animal. These differences in beliefs may be sincerely held. As students examine their own beliefs and values, they are provided with an opportunity to come to their own judgements about what they think are the most responsible and appropriate actions to take.

Dilemmas solved in cooperation group work have also been a prominent strategy in teaching values (Parker, 1984). Land use decisions affecting wildlife have become a familiar issue. Imaginary conflicts that correspond to some real life dilemmas should be discussed in small groups. This affords

the students experiences in having ideas examined by peers. It is not necessary and may not be desirable for the students to reach consensus because there are legitimately ranging views of the most appropriate and responsible actions to take in many situations. The purpose of each activity is to provide students with an opportunity to examine, express, clarify, and take responsibility for their own reasoning. The teacher must also create a stable atmosphere where there is caring, listening, and respect for one another's opinions. Values clarification is an approach which integrates knowledge, teachers, and learners so that the dynamic process that is environmental education can take place at the level of individual learners, groups of learners, and the whole school (Jaus, 1982).

Using the Learner's Senses

The advance of technology has not destroyed humanity's awe and wonder at the beauty of the earth. Many voiced the same tender feelings on seeing the first images of earth as viewed from the moon--a shimmering, luminescent ball. Edgar Mitchell who flew to the moon aboard Apollo 14 in 1971, described the planet as a "sparkling, blue-and-white-jewel... laced with slowly swirling veils of white... like a small pearl in a thick sea of black mystery" (Sancton, 1989). The children today, who are fascinated with robotic toys and push-button games can be enriched through many sensory

experiences in order to attain a deep feeling of appreciation and respect for the planet earth. Through the use of the senses, children construct a more coherent image of their natural world--an image which affects their understanding, attitudes, and behavior towards the environment (Skliar and La Mantia, 1974).

For the younger children, nature is a common property of people everywhere--the sun, the moon, the birds, trees or rivers. It is a world which is felt before it is labeled. In the upper elementary grades, the children begin to organize the world around them. They view nature as a defined space whether it is a lake, a mountain or park (Rejeski, 1982). Because of the children's initial limitations in understanding, it would be helpful to utilize simplified models to begin the development of a more articulated understanding of ecological systems. The children's interests lie in the immediate environment and they still lack the ability for conceiving themselves in other worlds removed from their physical surroundings. It may be more relevant and practical to focus a study on a certain limited area like a small pond, a tree, a weed patch, or an unmowed hill as an accessible microcosm reflecting many aspects of larger, more complex ecosystems.

The children are encouraged to use all of their senses and observe carefully in order to arrive at conclusions. The

teacher's role is to direct this inquiry, finding the "teachable moment." The multidisciplinary approach to learning incorporates many academic subjects. First hand sensory experiences are a fundamental focus for teaching and learning. The hands-on approach is also effective, exciting, and efficient. For example: children's sensory and scientific awareness can be extended through finding different species of plants on the weed patch; their language then must develop as they seek to describe that which they see; their mathematical skills may be reinforced as they estimate the number of different types of wildlife within that patch of land. Basic ecological concepts are learned through the children's own sensory experiences: the smell of a dandelion, the sound of the wildlife creatures, the texture of a milkweed pod, the diameter of a cattail, or the movements of shadows. Sensory learning is a factual course. These facts could begin to form a basis for the later development of attitudes towards the environment as a whole.

Shepherd and Speelman (1986) made a study of eight groups of campers which compared their responses to an attitude survey before and after the experiment. Posttests indicated that the children developed more positive conservation attitudes where less emphasis was placed upon the campers' learning of factual information and more emphasis was placed on the affective-sensory

aspects of nature. The development of sensitivity and awareness can only be met when the learner is exposed to the reality of the environment.

A total involvement with the outdoors offers a refreshing sensitivity to, and understanding of, the environment. Sensory learning is an avenue where a child can become a part of the natural world, watching it and wondering about it. It's where one can see tracks in the dust, hear a dragonfly's wings, or smell a honeysuckle. Curiosity, caring, discover, and sharing are experiences that happen to nurture an inquiring mind.

CHAPTER 5

Outdoor School

Most educators who use the outdoors as a medium for environmental education are enthusiastic about its impact in the cognitive and affective learning of the children. It requires a thorough preparation for a focus is much harder to maintain when the diversity of things to see, hear, feel, smell, or do, is suddenly expanded. The teacher needs to anticipate the problems of safety for the children and of the environment to be explored. Taking children outdoors can be a challenge. However, if specific tasks for the children are well planned, being outside with thirty young people is not only manageable, but fun. Several authors recommend the inclusion of participants in the planning. Parents can better support the outdoor efforts if they know what the teacher intends to do.

Experiential learning through outdoor education enhances the use of all senses and domains based upon interdisciplinary curriculum matter. If properly integrated, a successful, stimulating, and functional outdoor educational experience can be created (Priest, 1986). The skills for analyzing must be enhanced and a number of process skills need to be developed, namely: recording, classifying, inferring, hypothesizing, experimenting, and interpreting (Jaus, 1982). It is suggested that teachers concentrate on

specific topics with the information and activities clearly related to each other so the children will understand the focus. A teacher must be careful not to ruin the children's own discoveries by over-teaching and over-directing. It is a mixture of teaching process and philosophy as well as a portfolio of facts whereby outdoor experiences provide a kind of holistic understanding... a kind of learning that is "an ancient tradition" (Rumrill, 1980).

Miriam Wetzel (1983) supports the view that the best experience is direct participation in a setting that abounds in natural habitats. She remembers as a freckle-face third grader when her teacher took the class for a hike through the Pennsylvania hills. The teacher shared her knowledge of the local flora and fauna and even taught her class the Indian trick of moving through the forest leaving no sign that they have been there. And, after this time with Mrs. Van Omer, the author recalls that they "never again carelessly plucked a sprig of wild arbutus or uprooted a lady slipper." The author describes this as environmental education which is the appreciation of the aesthetics of the wilderness and the awesome splendors of nature. The teacher provided the setting for Wetzel and her classmates to learn the facts about interconnections of all life and about the values of maintaining environmental integrity.

The outdoors as a classroom is discussed in a different context by Ewert (1986) who justifies the construct of fear as an effective and ethical application in outdoor learning. He encourages participation in adventure activities that are fear-provoking claiming that while social institutions have sought to counteract fear, they can develop skills in decision-making, discipline, and personal awareness. Fear and stress that are created in rock climbing, wilderness camping, rope courses, and the like are utilized to help the participants develop outdoor skills but also experience personal involvement and opportunities for identifying and dealing with other fear items.

Plants and Animals at Outdoor School

Learning about animals at the outdoor school should bring students to the conclusion that all animals are involved in a variety of chains, webs, cycles, and pyramids. To understand the basic principles of ecology one must appreciate how animals "fit in" to these relationships. In an outdoor habitat, each animal occupies a niche and has a certain role in its own environment. Knowing what it eats and what may prey on the animal will help students visualize it in a food chain.

Students should understand in an outdoor school that the foundation of this food web is green plants. Energy from the sun used by green plants and then transferred to plants and

animals is a basic concept that needs to be learned in order to understand ecosystems. By providing activities for outdoors, the student will understand that even though human beings have the greatest ability of all to adapt, we are never independent of the same basic needs as animals. It appears that sooner or later humans must consider some trade-offs if they are to survive on a crowded planet. The natural laws that govern wildlife students see outdoors are the same ones that govern species around the world.

Perkinson and others (1989) produced an activity booklet dealing with fears based on the premise that truth is stronger than fiction. The activities centered on the misunderstood animals--snakes, bats, coyote, fox, ticks, rats, and the like. Fear of these animals with poor reputations is a learned behavior and the authors contend that children must be helped in dealing with these outdoor fears. If children are encouraged to ask questions and find their own answers, often their misconceptions are replaced with respect or even stronger positive emotions not only for the individual, but of the environmental resource as well.

The value of using plants and animals to develop a range of learning skills and an empathy with living things can be interdisciplinary and there appears to be as many resources as there are objectives. The teacher remains as the model for the behavior that she expects of her students. Animals

and plants offer a vast range of experiences which can be most effective in fostering positive attitudes and develop a personal responsibility for the common good.

Other Instruments for Learning About the Environment

Lutts (1985) discusses an interesting view of teaching tradition through environmental education as a powerful instrument of integrating experience and history. It is a unique way of using the concept of home that, however trivial and mundane to others, has specific descriptions of the environment built upon the foundations of familiarity. Each is a place, each environment has a past--a history out of which its present identity evolved and each has a selection of options open for its future. Lutts relates the story of his home from childhood associations of the old pear tree to the narrow trails, discovering his father's autobiography and recollections of his grandfather's stories--all were powerful events that shaped his reality. As educators, we must help our students understand and appreciate this sense of tradition and history. When we speak of a home, we are speaking of a place with special quality and with which we have a special kind of relationship. If the earth and our particular spot upon it are to truly feel like home to us, they must become something alive and vibrant and wonderful in our lives.

The zoos and aquariums provide a number of opportunities for the children to interact purposefully with things in nature. In 1978, an education survey was administered by the American Association of Zoological Parks and Aquariums throughout the United States and found that over 72% of the zoos and aquariums had educational programs conducted by volunteers called docents (Marshdoyle, Bowman and Mullins, 1982). In any form of field trip, however, the objectives must be set and the teacher will need to evaluate the effectiveness of pre- and post-trip planning if they meet existing approved curriculum objectives of the school. Studies in leisure behavior have pointed out that what children do in terms of leisure pursuits are often carried into adulthood (Marshdoyle and others, 1982). This means that the youth that visits the zoo and aquariums today has a positive, enjoyable experience and may be the voice of public support for the zoos and aquariums tomorrow.

Museums and schools can be excellent partners in the educational process. Museums can provide an excellent extension of environmental concepts. Careful planning by staff and the classroom teacher for activities and investigations are necessary whether it is a living history or science/technology museum.

Photography can be used as a tool in assessing student achievement of objectives in environmental education. The

camera is commonly found in almost all households and photography can record concepts, problems and solutions that can enhance higher levels of thinking (Janke, 1982). Photographically recording examples causes students to interact with real examples.

Magazines are sources of enrichment on environmental knowledge. Pomerantz (1986) reports the results of a study in Australia where the magazine is the primary source of educational diversion. The use of Ranger Rick magazine of 491 fifth graders in North Carolina over a three-month period showed an overwhelming increase in knowledge of ecological principles (Pomerantz, 1986).

There appears to be an abundant source of ideas and activities that can be used as effective tools for environmental education. "Conflict Perspectives" through fables, discussion groups, debates, or simulations (Howard, 1983) are examples of strategies for clarifying the interrelatedness of the concepts of environment and citizenship.

CHAPTER 6

Environmental Policies in the School

The informal or hidden curriculum in schools is something that must be considered if environmental policies are to be effective in promoting an environmental ethic in the school community. One facet of this curriculum is the influence of a school building on the behavior of both adults and students (Power and Kohlberg, 1986). A teacher must look at ways in which the functioning of a building can be used to reinforce the messages of the classroom as well as demonstrating positive attitudes. Considerable opportunities for modeling by adults for integration with the formal curriculum are implicit especially in the area of conservation. Children must become aware of the need to conserve and reuse. Activities can reinforce ecologically sound values by giving them opportunities to analyze paper, plastic, materials, or food waste; where they are discarded; and possibilities for recycling and conservation.

When people are involved in the creation of modifying their surroundings, they feel more comfortable and take better care of them. It is important and desirable that the users of a school should continue the design process by adapting, improving, and personalizing the facilities to make them more in tune with changing educational needs. Things such as turning the lights off when not in use, conserving

paper, recycling plastics, wise use of paper towels, etc. The students might generate a list of activities on their school grounds that have a negative impact on wildlife and practical experiences that can enhance an awareness, understanding, and empathy as well as reinforce skills in environmental management. The school surroundings can constitute a major focus for as many subject areas as possible.

A study was made in a farming community where thirteen year old students were exposed in an inquiry-type curriculum for a whole year. The control group was exposed to the traditional teaching of a course called "Let's Grow Plants". At the end of the year, the experimental group perceived the usefulness of the class in relation to leisure activities, beautifying their surroundings, reading about plants and their benefits instead of producing them mainly for economic gains (Blum, 1982).

A school landscape can be exciting if care is taken to provide a rich blend of visual stimuli. The children often reward their explorations with very personal and precious observations which can then become incorporated in language development. The teacher must have the flexibility to adapt, modify, and extend in ways that meet the needs of the students.

There are certain parameters that a teacher needs to be aware of in setting up activities. Most districts have supplemental insurance coverage designed to protect the students, staff, and volunteers that apply to certain unique teaching situations. The teacher must have some foresight to alleviate situations that might expose individuals to some element of risk.

Environmental Education in the Community

The students need to learn how to be contributors and not simply expect to be users. The community can become an extension of the school when there is cooperation and involvement in providing learning experiences. If students are given the opportunity to apply their skills, they can be willing and capable contributors towards a worthy endeavor. Responsible citizenship was exhibited by young students who worked toward the improvement of a local park--one of the projects created through a partnership with the local business community. The students also applied their communication skills, ingenuity, and talents to bring a greater public consciousness on societal issues. They conducted interviews, made surveys, planned, wrote scripts, produced, and directed them for local commercial stations. They gained not only an understanding of their responsibilities as citizens but also their self-worth was significantly improved (Aldridge, 1986).

An environmental education is concerned with cooperation. Improvement and management of the environment at all levels involve cooperation. Programs must help learners develop cooperative skills and attitudes. Single class groups may undertake a beautification or clean-up project, or the whole school may be engaged in studying, lobbying for, and/or rectifying an environmental problem in the community. The students might even conduct pollution studies and make a film/slide or video taped media "production". These projects can be screened in the classroom or, better yet, at community meetings or school assembly.

Finding solutions through experimentation and investigations are found to enhance the students perceptions of environmental education. They can: take pollution surveys of their locality; observe their sources; take an inventory of the non-biodegradable waste each day in their own homes and multiply that per month, per home, or per community; and they can find out alternatives to minimize pollution or ways to conserve energy. They can also help publicize facts through bulletin boards, posters, or displays. They may be encouraged to interview local farmers to understand their share towards a cleaner environment, health agencies, sanitation and planning commission personnel, the school custodian, and many more.

These are only a few examples among a list of many activities that can provide an operating framework for acquiring and developing skills based on real problems of concern to the students and their own community. They are in the position to be always for something and not against something. It gives them the responsibility for their own success. It gives them the tools so that success is virtually assured.

Resources for the Teaching of Environmental Education

It appears that the materials, ideas, facilities, and/or resources for the teaching and learning of environmental education are limitless, inexhaustible, and abundant. During the initial stage of planning for the environmental education program for the curriculum, the master lists of resources available should be obtained from the school, the district, and the Area Education Agency media specialists. A brief random list of readily accessible materials and resources is found in Appendix B. The Iowa Conservation Education Council (ICEC) provides invaluable information and resources for teachers. This non-profit organization publishes educational materials for educators, sponsors scholarship programs, and regularly supports conservation education workshops for teachers. The ICEC represents many conservation agencies and organizations as well as many schools that it sponsors through special projects. The ICEC coordinates current

events among institutions, agencies, outdoor learning centers, and special people who are interested in the preservation, reclamation, and protection of our planet home.

There are innumerable sources for learning experiences and a resourceful and creative teacher can add on, expand, and enrich her/his teaching form these. Even ordinary things that children bring to school (rocks, moldy pumpkin, shells, toys, or an 'unidentified object of the strange kind') can be talked about, researched about, written about, hypothesized about, or analyzed. Everyday things can provide a base for drama, poetry, writing, and speaking.

Many schoolgrounds contain areas which are not used either because they are remote, noisy, or just unattractive. Such unproductive areas can be turned into valuable teaching and recreational facilities useful both to students, staff, and community; appealing and aesthetically pleasing at the same time.

Evaluation

A central problem in the evaluation of any curriculum, especially when it claims to achieve effective objectives is how to differentiate between the contribution of the curriculum and those of the teachers. How can assessment be valid if the changes in the students were induced by the method on which the curriculum was based or by the teacher personality factors (Blum, 1982)? Teachers have preferences,

and in order to succeed, they must identify with what they do. A teacher needs time to adapt a new method and be able to internalize it with her/his teaching pattern. Therefore the design for the evaluation of a curriculum in environmental education should allow for suitable teacher training, for teachers' identification with prescribed methodology, and time to gain experience and self-assurance in the handling of a new curriculum plan (Blum, 1982).

Evaluating Students' Performance

Finally, in considering the curriculum, it is necessary to realize that evaluation of understanding or mastery of specific skills must be executed concurrently or immediately following the activities presented. This can be carried out in the form of observation of how an individual attacks a problem; evaluation of a project with respect to specific criteria; written or oral exams where recall or vocabulary is focused upon; checklists, particularly where work is conducted on an independent basis; or interviews where conceptual understanding, processes followed, procedures chosen, or conclusions arrived at are focused upon. Different evaluation forms will lend themselves to certain situations and frequency of evaluation should be determined by needs of the teacher and student as well as by the goals professed. However, above all else, it is most significant to recognize ways in which an individual is able to apply

what he/she has learned to other situations. In this way, learning is quite evident (Bohlmeyer and Burke, 1987).

Learning outcomes will continue to be measured by a variety of objective measures and consideration can be given to either process or product or both. Evaluation will be based on the objectives of the activity and a technique should be selected that includes the provision for process evaluation (Bohlmeyer and Burke, 1987). It may be concluded that it is easier to enhance students' cognitive achievements than induce an effective change in students' behavior. Evaluation becomes especially important when the program emphasizes affective objectives. Therefore when the curriculum is introduced it is necessary to assess, among other aspects, students' perception of the usefulness of an interdisciplinary environmental education program in achieving various goals.

Because of the integrative thrust, the following cognitive and affective outcomes need to be assessed in both objective and subjective measures: 1) Motivation is increased; 2) There is improved quality of learning and retention; and 3) The subjects in school have become more meaningful and useful (Wiebe, 1986). Parents and teachers can indicate on a check list the changes they notice in the children's interest, awareness, and attitude form their experiences. An evaluation of their process skills and

integrated curriculum skills could be plotted from high to low. If this were done with frequency and consistency, it would become clear whether or not the children were acquiring increased competence in the listed skills. To verify what basic natural concepts and facts, the children might self-evaluate by summarizing what they've learned. Have their skills in abstraction, imagination, and communication conveyed a deeper environmental understanding? Were the teaching/learning objectives accomplished after each activity? Parents might also be asked whether their children relay information of activities to them or their siblings. How much the children have learned and remembered is also indicated by the frequency with which they refer to the information from previous experience. In a school situation, a questionnaire might be used, although formal testing is anathema to the joy and excitement the teachers want the children to feel (Lingelback, 1986).

CHAPTER 7

Environmental Education and the Teacher

It would seem reasonable to conclude that each educator utilizes a preferred set of strategies and modes of instruction, and each possesses distinctly personal levels of interest and expertise in a particular area. Environmental education curriculum plans present virtually endless variety of teaching situations. In recognition of this diversity, a spectrum of possibilities and alternatives, thus attempt to offer a degree of flexibility consistent with such variety. The varied curriculum plans investigated were designed for all educators. Program developers recognize that not everyone is an avid environmentalist, nor should they be. They are aware that not everyone wishes to take students out of the school on field studies, camps, or tours. The program innovators for environmental studies recognize that funding and support from school administrators are sometimes not readily available. They recognize that not all classrooms, schools, communities, or situations are the same. there is considerable evidence in literature, however, that there are literally "tons" of instructional materials developed and an equally vast number of resources. The teachers in all the curriculum areas may pick and choose from a wide variety of activities that are suitable for their particular area of interest.

Today we see more children picking litter rather than scattering it about. All across the country, they are picking up and pitching in to keep America clean. Stephens (1981) gives a great deal of credit for the awareness to elementary school teachers who she claims have done an excellent job of alerting children to the problems our environment faces. Although true environmental awareness is more than just picking up garbage, a week's unit, or a day of outdoor school--any activity that contributes to the health of the environment helps. Everyone can contribute toward the attainment of the goals and objectives of environmental education in some way and the range of these contributions is considerable. And little by little, it is starting to show.

The Environmental Educator and the Learner

A number of studies clarify that there is no single teaching model to which all learners will respond favorably under all circumstances. Some learn best when the teacher is acting as a presenter of information. Others learn best when there is an atmosphere of teacher/learner interaction. Authors stress the importance of assessing the situation and the available personal skills and blend the two in an effort to achieve the best learning environment. Too often, classroom talk and discussion are dominated by the teacher. It is based on the premise that the teacher's main task is the transmission of knowledge--knowledge that has been

conceptualized from an adult point of view (Blum, 1982). A quick sketch of the classroom where the teacher dominates discussion may go something like this: the teacher talks, pupils listen; teacher asks questions, pupils attempt to guess the answer; teacher proposes an activity, pupils investigate matters the teacher knows all about; the pupils give the resultant information back to the teacher attempting to match the teacher's way of expressing things as closely as possible. Several studies have shown that in order to have real and effective learning in the classroom, the teacher must create situations where students are encouraged to: use their own language to explore, recall, predict, plan, analyze, report, create, and think aloud; work in an environment where change, modification, supposition, suggestion, and challenge can take place; where tentative and new ideas can be tried out in supportive, encouraging situations.

The importance of the teacher as a role model has been identified by most critics. If the example set or the impression conveyed to the students is not consistent with an environmental concern, then little of any consequence will result.

A compiled list of recommendations for the environmental educator that relates to outdoor school appears in Appendix C. The ideas were summarized and condensed from the various

curriculum manuals and journal articles that were consulted. Although there appears to be several concerns that are discussed in related literature, the writer chose to focus only on those that she deemed are the most common behavioral issues in matters of student/teacher interaction related to outdoor learning.

A wildlife spokesman, Frederic Leopold, maintained that the objective of environmental education is "to teach children to see the land, to understand what they see, and to enjoy what they understand" (Kaufman, 1989). Given that it is important for young people to learn that they "can do" for people, wildlife, and the environment, the teacher must select experiences that are realistic and projects that are relevant and possible. If not, the students may experience an activity that contributes to their thinking that they "can't do". With this view in mind, "A Teacher's Environmental Code of Ethics" by Zarella (ICEC, 1989) describes in a moving and inspiring way, what environmental education is all about. This is found in Appendix D.

Teacher Advocacy

Environmental education is in a state of crisis yet there is evidence of the many opportunities for growth. Teachers and school systems are being asked to examine their curricula, their teaching materials, and their methods. The quest begins with America's educators.

Dr. Hair (1989), President of the National Wildlife Federation, stated in a conference address: "We can of course, still change the course of the world... We can leave a rich legacy to our children. But we have to start now." He stressed the development and integration of environmental education curricula into public school programs with the teaching of facts, values, and ethics. He strongly emphasized that teachers must become activists by becoming involved in curriculum development and training programs, join in the evaluation and revision of materials, and, most of all, be a strong advocate for environmental education.

The first step is to participate in conservation activity programs, take in-service workshops and university courses that are directed by trained leaders and educational experts. Teachers can enhance their involvement, knowledge, and commitment as well as competency in assessing and developing environmental education programs. Participants in a six-day residential environmental education workshop showed that the awareness level in both environmental issues and action strategies were significantly higher (Jordan, Hungerford and Tomera, 1986). It is also necessary to form close alliances with colleagues by sharing events, classes, projects, publications, and resources so that together they can find alternatives and solutions to affect the processes for a sound environmental education curriculum. A summary

of the recommended steps for this collaborative work force follows:

1) Formulate a small working group

2) Identify organizations to lend their name and support--state directories are helpful

3) Know certification requirements and who the decision makers are in the system

4) Organize a study committee

5) Develop a survey and assess needs

6) Draft a proposal and enlist aid of study committee to evaluate (Wilke, 1985).

Not only are teachers recommended to take a variety of courses in theory and practice of societal trends, ecology, economics, and policy but also to stay being informed. They need to be aware of the prevailing information (or misinformation) contained in the media and to be vocal about one's point of view as well as gain public support. Waller (1989) for example, expressed the moral outrage of the wanton destruction of life and habitat as he watched a flock of geese (Canadas) who will "never again experience the overwhelming presence of the great unity in which we exist..." Another voiced her anger and sadness in a moving essay after the recent Exxon Valdez oil spill in April, 1989. She sensed the pathos of it all as she watched on television a helpless artic loon, so doomed made its last mournful

sigh--and tens and thousands more of the Alaskan wildlife perished before they even got a chance. There are a number of issues that are going on in one's own locality that require a cooperative effort to find alternatives and solutions. They range from the groundwater problem, the destruction of a beaver dam, cutting down of trees for so-called 'aesthetic reasons', extinction of rare Iowa butterflies, or toxic waste, to the use of chemicals on the farmland. Teachers should be able to use strategies which allow the receiver to recognize the role value in environmental decision making, clarify value positions, and understand the valuing process (Wilke, 1985). The teacher as an advocate must be a critical thinker as to the ecological soundness or accuracy of the big industries' communication arsenal--brochures, speeches, advertisement, press releases, and other forms of institutional advertising. It has been found that the role of accumulated information in forming attitudes and the amount of information received on an unfamiliar topic is more important than the quality or source of information (Bavec, Broom and Schoenfeld, 1980).

Teachers are encouraged to assist support group development, skills in research, mass communication, and lobbying on behalf of environmental education. Express support for state and local policies that benefit the health of the environment. Support the goals of environmental

agencies that coordinate statewide programs and help recognize the efforts of special leaders and dedicated workers. Environmental advocacy needs time, skill, support, and money. It is a necessary approach to increase power and effective influence, develop alternative values and societal restructuring (Crowfoot and Bryant, 1980).

"None goes his way alone. All that we send into the lives of others come back into our own" (Hair, 1989). Advocacy is like planting a seed in a fertile soil and holding up one's share of the sky.

CHAPTER 8

Summary and Conclusions

There is urgency for better education about the immediate dangers of the threats to the environment and it is an issue worthy of the school's attention. The paramount task of modern education is to prepare students to cope with these environmental problems. The presence of environmental education in public school curricula, however, is characterized by loose organization and little sense of direction. There is no research providing a comprehensive description of the program developed or implemented in the nation's elementary schools. Teacher preparation on environmental education remains scarce and poorly developed. Curriculum planning must be advanced and implemented in order to develop environmentally literate students and responsible citizenship.

It is of crucial importance that environmental education be taught at the elementary level. Values, attitudes, and beliefs are formed during early childhood and the most pronounced changes occur at the upper primary level. There is a serious concern that the teaching of global values of the scientific and technological society are being ignored. The school's ability to develop contributing citizens is being challenged and environmental education can be a facet for values education. Through values clarification, the

students are given opportunities to examine, express, clarify, and take responsibility for their own reasoning and actions. An interdisciplinary approach across the curriculum will require teamwork planning among teachers and administrative support in order to teach the environmental concepts effectively.

There is an essential need to establish the role of education in the children's understanding of the environment. Environmental quality, human health and well-being are interdependent. They need to be given opportunities for service to the community by actually helping to identify environmental problems, finding solutions or alternatives to local area concerns and be given support to communicate these to the public. Not only do practical and meaningful experiences enhance their self-concept but the children will also develop a more unified and relevant understanding of their environment as they explore interrelationships between people and things around them. It is extremely important that children develop the understanding in the most formative school years, that the maintenance of a place fit for life and living is everyone's responsibility.

It is evident that so many programs and instructional materials have been developed for environmental education. The process of finding solutions to environmental problems will not be complete until the learning activities reach a

significant number of youngsters in the classroom. The teacher is the key part who must take all these knowledge concepts and resources to the children. Environmental education is a special preparation which will give the children an objective sense of how the natural world functions as a whole and their responsibilities as part of the natural order. The goal should never be to diminish the child's sensible fascination with nature but to add other dimensions of knowing. The abundance of materials, resources, and ideas for inclusion into all the subjects of the curriculum in the elementary school will help students to understand the scientific, social, economic, and aesthetic alternatives that must be considered. The development of ethical thinking through values clarification will help them make their own meaning and introduce them to the processes by which they can make their own meaning of it.

The process skills enable children to seek and answer questions for themselves. These are necessary prerequisites to the development of individuals who are sensitized to the world in which they live. Much educational research emphasizes the need to provide direct, concrete, and relevant learning experiences in order to formulate abstract thinking. They learn concepts about interrelationships within the environment through a wide range of activities. Well established process skills provide the foundation for sound

decision making, creativity, and problem-solving. In a school's choice of a model, a conceptual design is recommended and activities are planned for educational soundness, balance, accuracy, and the application of these process skills. The destructive notion that each subject area is unrelated to others can be broken down so the learning is seen as a unified activity. The integration of language with environmental concepts must not be neglected. Several studies have shown that only through the study and mastery of the human expression can the student achieve a deeper understanding about the environment. This would take a whole school effort that would require the cooperation of the teaching staff, school workers, parents, and a supportive administrative personnel.

The user of any particular model of the curriculum plan is allowed flexibility to adapt the activities to the needs and interests of a particular group of children as well as to the school setting, teaching situation, and resources. There is considerable support in literature for the necessity of constructing the learning situations that would foster cognitive and affective development of each individual. Authors strongly recommend that skills taught must build upon one another and are interrelated through the subject areas. It seems evident that elementary school teachers are in a much stronger position to gear their

teaching to environmental concerns because of the length of time they spend with a certain group of children within a school day. It is necessary for teachers of all grade levels to be coordinated administratively to provide a set time for team planning so a sequential and holistic program could be developed.

For environmental education to really succeed, it is of paramount importance for all teachers to regard themselves as those concerned with environmental education. With the help of specialists and experts in the field, environmental organizations, education agencies, workshop consultants, and universities, teachers must seek guidance in methodology, location and use of materials, and resources which are pertinent to the level of students they teach. The teacher should be an advocate and she/he must use her/his efforts to foster the goals of environmental education. Teachers must be involved participants in supporting and assisting the prime movers of environmental education--people who care about children, about the land and its resources, and about the future. By applying the knowledge and understanding they have gained in the teaching of young students, teachers become a part of them.

Teachers must be the role models for their students in a consistent and honest way. They must aspire to develop ethical thinking in their students which Stefanich (1984)

calls the "environmental conscience". It is that feeling of discomfort if one participates in an activity that is destructive to the environment or to another person. The same uncomfortable feeling also occurs when one is an unwilling participant in an activity on behalf of the environment.

A number of authors also address the issue of evaluation. Learning outcomes will continue to be measured by a variety of objective and subjective means. The process of evaluating student performance, knowledge, level of input, and understanding will depend upon the objectives of the lesson. Evaluation measures must also aim to determine the quality and effectiveness of the activities for possible revisions, deletions, or expansions in line with the needs, abilities, and interests of the students. Evaluation methods can also serve as means to synthesize the knowledge and skills they have acquired and provide opportunities to consider and take constructive actions as thoughtful, informed, and responsible citizens of our shared home.

In this world, all are interdependent, and each one has a stake in what everyone else is doing. Humankind must begin to realize that it cannot survive on the face of the earth alone. It's everyone's responsibility to redefine priorities. Over the next decade, fifty million children

will pass through the doors of elementary schools (Hair, 1989). How are teachers preparing them for the future of a high technology society? The teaching of environmental concepts may be the answer in which they are led toward informed decisions, responsible behavior, constructive actions, and most of all, a true environmental conscience for a planet upon which all life depends.

Through a century of extinction citizens today prepare for a decade of attempted restoration and a warning to another endangered species: humans. Survival becomes as much a part of people as it is a part of a polar bear, coyote, a loon, a spider, or the prairie grass. Environmental educators can still help children appreciate the aesthetics of the wilderness or the meadows and the awesome splendors of nature. Although one senses the pathos of their vanishing world, flickering out, they can enlighten. We too are chained to their vanishing world--but there is hope. Teachers can guide the children to have a conceptual understanding of the human-altered and natural environment. We want to teach them how to ask the hard questions about environmental quality and together we can learn about the interconnections of life and about the values of maintaining environmental integrity.

And who knows, if more people try to preserve the world we live in, maybe one of those future generations will even

see a flight of Canada geese stopping on the wetlands they have learned to save as little children--for even the tiniest creatures that they have come to love with their whole heart.

The children we teach today will have the responsibility of teaching others towards the attainment of knowledge and responsible stewardship for the global environment--the goals of environmental education. The challenge and personal inspiration to aspire and achieve for these goals are aptly summed up in Ralph Waldo Emerson's poem, "Success":

> To leave the world a bit better, whether by
> a healthy child, a garden
> patch or a redeemed social condition;
>
> To know even one life has breathed
> easier because you have lived;
> This is to have succeeded.

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APPENDIX A

Team Teaching Environmental Concepts: Recommended Steps for Planning an Interdisciplinary Teaching of Environmental Concepts

The following is the writer's summary of the procedures implemented by a group of teachers in the San Diego, California schools (Cannon, 1978).

1. Reach an agreement of a working definition of environmental education.
2. The group leader asks each individual to jot down those learning activities that he/she has done, is doing, or plans to do with the students that relate to environmental education.
3. Place a newsprint on the wall and the leader asks individuals to call out their activities and identify the area of concern that each activity best fits. A recorder will list the responses.
4. After discussion and clarification, the leader asks the group to reconsider its curriculum and determine which of the areas of concern it would like to emphasize in the future. Facilitate the development of a common "Point-of-View" statement to use as a working definition.
5. Select concepts for the curriculum under each area of concern that will be infused in the curriculum. The

leader asks all teams to review concepts, objectives, and activity descriptions for all selected areas. Consider modifications or additions.

6. Select specific concepts to emphasize in the curriculum.
7. After discussion and advocacy period is over, the leader helps the group reach agreement on which concepts they will include in their curriculum.
8. The group is now ready to make personal commitments to implement related concepts.

APPENDIX B

Resources for the Environmental Educator in Iowa

This is a random list of possible resources for a curriculum plan on environmental education. It consists of some people who have expertise in the field who may be available for consultation and/or give direction to other materials, as well as institutions, agencies, and learning centers that may be contacted for guidance and instructional materials for developing a program about the environment.

1. Resource Persons

University of Northern Iowa, Cedar Falls, Iowa -

Dr. Greg Stefanich - Department of Curriculum and Instruction.

Dr. David McCalley - Institute of Environmental Education.

Dr. Marc Yoder - Man: A Course of Study (MACOS), K-8 program.

Science Department:

Dr. J. Konefes, Dr. C. Lee, and Dr. Ren Claussen.

Dr. Duane Toomsen - Bureau of Instruction and Curriculum, State Department of Education, Des Moines, Iowa.

Blackhawk County Personnel:

Bruce Bottorf - Director, Blackhawk Management Commission, Sewage Treatment Center.

Bryce Harthoorn - Supervisor, John Deere Environmental Services, Toxic Waste Consultant for Blackhawk County.

2. Other Resources

University of Northern Iowa, Cedar Falls, Iowa -

SPARKS - Monthly newsletter of educators K-6 (includes ideas, variety of activities, and program news).

OUTLOOK: Groundwater - Graduate in-service program/Dr. McCalley.

Education Center Curriculum Library.

Botanical Garden, Zoology Dept. & Museum - guided tours.

Blackhawk County Services (see phone book) -

Area Education Agency 7 - Online Bibliographic Search; Wanda Farrell, Field Representative, Media Center.

Blackhawk Dept. of Natural Resources.

Resource Recovery Advisory Committee.

Iowa Association of Business and Industry Environmental Committee.

John Deere Pollution Control Dept.

Hartman Reserve Outdoor Learning Center.

For instructional ideas, materials, current programs, and events -

Blackhawk Soil and Water Conservation Newsletter. Iowa Conservation Education Center, Guthrie Center, Iowa.

Iowa Conservation Education Council, Iowa State University, Ames, Iowa.

OAK - Quarterly newsletter of Blackhawk Conservation Board.

3. Additional Materials

Iowa Policy Council - Dept. of Public Instruction, Grimes State Office Bldg, Des Moines, Iowa.

Environmental Protectioin Agency (EPA) - Washington, D.C.

APPENDIX C

You as Environmental Educator

This is a compiled list of suggestions for the teacher in dealing with outdoor school activities. The ideas were obtained from various curriculum manuals and journal articles that discuss some of the more common concerns relating to outdoor experiences.

Be a role model - You are the leader and the children will follow your example. Your attitude toward the environment will register clearly with them as you carefully replace a log or pick up trash left by people before you. How you feel about nature should and will come through to the children--when you stop suddenly to listen to a bird song or pause to watch an ant laboring under a heavy load. Curiosity and caring are contagious.

Everyone is afraid of something - Most people "hate" or fear some things in nature. To lessen those fears by learning more about the object of them is a worthwhile effort, for our own sake and for the sake of the children we influence. Be honest. When the situation arises explain that you are afraid of snakes, spiders, or mice, and that you are trying to increase your knowledge about them so you will become less fearful. This admission may lead to a good discussion in which children can admit their fears and be encouraged to realize they need not be trapped forever by them. Many fears

can be dispelled by accurate information, simply explained. What a favor you will have done for a child if you can dispel a fear.

Sense of humor - Children learn best when they are having a pleasant time; your sense of humor will keep them on their toes. Use humor when things drag a bit. A witty remark can turn a mistake of a minor accident (like losing a shoe in the mud) into a comical situation. Laughter is good for the soul as well as the brain.

Running Wild - Exuberance and pent-up energy, especially for children can be channeled. Your plans may call for a sit-down discussion or a controlled scavenger hunt. When they have "calmed down" you can go over your behavior expectations. Children who egg each other on should be separated. Occassionally one may have to be sent indoors; the other children have the right not to be distracted or misled. Running wild evokes images of ponies galloping on the plains, manes and tails streaming behind them. Sometimes children, too, have the need to stretch out, try their speed, express their joy at being let loose. The trick is knowing when to let it happen.

Collecting - This is one of the hardest natural inclinations to regulate. Children love to pick, catch, keep what they find. The children might be helped to set some guidelines that will lead to their decision why it is best to leave the

species where they belong. If they need to be studied in a controlled situation, discuss with them the importance of releasing and respecting all creatures.

Cutting a story short - Sometimes a question is asked because a child is curious to know the answer but when they become lengthy stories and anecdotes, it may be necessary to cut a child's story short. Be sincere and let them know they have a chance to tell their stories during recess.

Silence - Children's lives frequently feel as hectic as the teacher's. If one can inject a little serenity into their time, the teacher will help them enjoy and understand both the natural world and themselves a little better. A noisy intrusion into a field brings a natural activity to a temporary halt as creatures freeze or scurry into hiding. Encourage the children to be silent and let the natural flow of life resume around them.

Expected behavior - Whether indoors or out, a respect for each other helps engender a respect for nature. We all have different tolerances for commotion, but none of us need to tolerate meanness or thoughtless infringement on the right of others. Most important is for you to be clear which behaviors are acceptable and which are not. Explain your expectations to the children. Encourage them to discuss their expectations with each other. Then when you have to discipline a child, you are reviewing behavior codes, not

initiating them. Reasonable behavior translates into a lot more fun for everyone.

Boundaries - Outdoor activites often erupt into a joyous explosion of energy and dispersal into the far reaches of an outdoor area. Before you give the children their final activity instructions or equipment and send them off, clearly define the boundaries beyond which they may not explore. It may be a specific limit like a fence or a more general area like within earshot or your whistle. Assign them with a partner or a group and agree on the time and place to re-congregate.

Children are usually more secure, and thus freer to concentrate on finding, looking, investigating when they know the boundaries.

APPENDIX D

I will teach only that which is life affirming: the preservation, reclamation, and protection of our planet home.

I will teach connections: the myriad of ways that plants, soil, rocks, trees, animals, and humans are dependent on and enriched by one another.

I will teach respects for the rights of all others to a peaceful and natural existence: plants, animals, people; regardless of national affiliation, political persuasion, economic condition, race, religion, or gender.

I will teach peace: with other people, with the flora and fauna, with the entire biotic organism.

I will teach tolerance of other views: knowing that there are many approaches to even the tallest mountain, but always the universal goal.

I will teach giving back: time, energy, matter; by recycling, working for environmental groups and causes, using biodegradable materials, planting trees, growing prairies.

I will teach appreciation for the wonder and beauty of our planet home: the shape of a cloud scudding across a summer sky, the autumn beauty of a phalanx of geese responding to an ancient call, the quiet solitude of a snowy wood at twilight, the joyful and raucous riot of color that is a spring meadow.

I will teach the job to be found outdoors:

I will take my students out of doors:

I will let the outdoors teach them... and me.

by Maureen A. Zarrella, 1988

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