AN ASSESSMENT OF AN ENVIRONMENTAL EDUCATION CURRICULUM SUPPLEMENT: THE SPIRIT OF THE LAST GREAT PLACES

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CHAPTER 1

INTRODUCTION

Educational systems generally have the attainment of knowledge and skills as their major objective since they are necessary pre-conditions of thoughtful behavior and action. No where is this more evident than in environmental education (Disinger, 1993; Horton & Hanes, 1993). The Tbilisi Declaration, adopted at the world's first intergovernmental conference on environmental education, outlined five categories of objectives for environmental education:

1) awareness and sensitivity to the environment and environmental challenges,
2) knowledge and understanding of the environment and environmental challenges,
3) attitudes of concern for the environment and a motivation to improve or maintain environmental quality,
4) skills to identify and help resolve environmental challenges, and
5) participation in activities that lead to the resolution of environmental challenges. (NEEAC, 1996).

Educators must consider an individual's personal reality in relationship to the world in which he or she functions as a component of knowledge acquisition. Beliefs held about people, the world, and one's self, lead to the development of a personal perspective that must be addressed by an educational system (Roth, 1992). The intent of environmental education is to help individuals become capable of responsible judgments

about environmental issues that will have long-term applications (Horton & Hanes, 1993; Roth, 1992, NEEAC, 1996).

In a democratic society such as the United States, the primary task of education is to prepare students to be citizens and function effectively in today's and tomorrow's society. Students as consumers, potential voters and members of the workforce must be taught how to make informed decisions and take responsible action. Preparation of this scope does not happen overnight. It must begin early and progress throughout a lifetime.

Some present behaviors toward the natural world are in conflict with the ecological balance necessary to maintain the health and well being of the Earth. As protecting the environment depends increasingly upon the activities of individual citizens, the need for emphasis on environmental education curricula and instruction increases. Responsible environmental behavior is the ultimate goal of environmental education. In order to realize this goal, curricula must be developed and educators given appropriate training in its use and implementation (Hungerford & Peyton, 1980; NEECA, 1996; Roth, 1992; Sia, 1985; Wilke, 1993).

Teachers often indicate that they feel they should address environmental issues in the classroom; but many feel unprepared to do so. Very little time is spent on environmental issues unless the teacher is particularly interested in them (Chen, 1992; Heimlich, 1992; Lorson, 1993). The amount and kind of environmental education curricula integrated into the regular classroom curriculum most often varies according to teacher interest and the grade level taught (Chen, 1992; Smith, 1988). Teachers who integrate environmental education curricula into their regular curricula are enthusiastic and supportive of their use. Many organizations and institutions, from government

agencies to environmental nonprofit organizations and businesses, have developed environmental education curriculum supplements covering a wide range of topics. Attendance at environmental education workshops increases each year (Cantrell, 1988; Smith, 1988; Wilke, 1993). Unfortunately, the quality of the materials and workshops available varies greatly. It is left to educators to pick and choose those workshops and materials worthy of implementation.

The Spirit of the Last Great Places (Spirit) is an interdisciplinary environmental education curriculum supplement developed by the Oklahoma State University College of Education Center for Environmental Education through a grant from the Oklahoma Chapter of The Nature Conservancy. In the fall of 1994, the first workshop offering training in the use of the Spirit materials was held at Oklahoma State University (OSU). From fall of 1994 to fall of 1996, five workshops were conducted through OSU. Staff development workshops have also been conducted for Broken Arrow Public Schools, Tulsa Public Schools, and Union Public Schools. One hundred six individuals participated in these Spirit workshops.

Purpose of the Study

The curricula of a school are designed to provide structure for the teaching and learning process. To achieve the accompanying goals and objectives of this structure, curriculum must be chosen and implemented (Doll, 1989). Curriculum implementation is a means to achieve outcomes, and refers to actions taken to put into effect educational programs, policies, and/or practices that already exist, but are new to the people attempting to use them (Cantrell, 1987).

Do environmental education curriculum supplements such as The Spirit of the Last Great Places have a place within this curricular structure? Are supplemental materials such as the Spirit materials being used in the classroom or in other settings? How many of the people who attend workshops and receive training actually use these materials? If the materials are used, how are they used? Are they used as a basis for a unit of study? Are individual activities selected for use with an already existing unit of study? Are these curriculum materials used in settings other than the traditional classroom setting? Why do educators use these materials? Who uses the materials and who does not? Are educators using the videotape portion of the Spirit curriculum? Are educators enthusiastic enough about the Spirit materials to share them with others and continue to use them in the future? Do instructors spend more time on environmental issues as a result of using the Spirit materials?

Spirit is an interdisciplinary, environmental education curriculum supplement consisting of a printed curriculum guide and videotape. The Spirit materials were developed by the College of Education, Center for Environmental Education at Oklahoma State University through a grant from the Oklahoma Chapter of The Nature Conservancy. Information for this study was obtained from surveys of the participants of eight Spirit workshops. The study will examine the implementation of the Spirit materials with reference to the following: the frequency of use of the curriculum materials, how the materials are being integrated into the overall curricula, the effectiveness of the curriculum as seen by educator evaluation, whether or not educators share their Spirit materials with others, what factors are used to make decisions regarding

the use of this curriculum supplement, and whether or not there is a profile of the user and/or nonuser of these materials.

Justification of the Study

To ensure a quality environment on a long-term basis, it is imperative that young people have the necessary skills to make informed decisions. To provide young people with these skills, an educational system must use effective educational materials and methods (Braus & Lyons, 1993; Charles, 1986; Howe & Disinger, 1988; NEEAC, 1996, Sia, 1985). If conserving and protecting the environment for future generations is valuable, citizens must be actively prepared for this responsibility. A real and growing need exists to assess current environmental education programs to ascertain whether or not students are being prepared to be responsible environmental citizens. It is not enough to develop and make environmental education curricula available to educators. These curricula must be implemented on a widespread basis to have an impact on educational outcomes. Educational outcomes, in turn, should have an impact on society. Implementation occurs when a curriculum project is translated into practice. The curriculum project can be said to be fully implemented when it loses its "special" status and is a routine part of the behavior of the local educational agency (Cantrell, 1988; Price, 1982).

The purpose of the Spirit materials is to provide instructional activities to assist teachers in instructing their students about the ecology and beauty of natural systems within the state of Oklahoma. This instruction serves as a means to create an environmentally concerned and informed public. A better understanding of how the

Spirit curriculum materials are being used and implemented in educational settings will help to establish their acceptability among educators. Results of this study will be used by the developers of the Spirit curriculum to make revisions and improvements in materials and instructional design of workshops. It is also hoped that the results of this study will encourage other environmental organizations to develop quality environmental education curricula.

Research Objectives

The research objectives of this study were developed after review of the literature, discussion of the Spirit materials with educators and discussion of the Spirit materials with the instructors who facilitate the Spirit workshops. The objectives of this study are:

Research Objective 1: To determine how and why participants in the Spirit workshops are using the Spirit materials. Specifically:

a. To determine how many of the respondents have used the Spirit materials.
b. To determine why the respondents use the Spirit materials.
c. To determine if the Spirit materials are being used as a basis for a separate unit of study, incorporated into already existing curriculum unit, used as reference materials, or used in informal educational settings.
d. To determine how many Spirit activities are being used.
e. To determine which activities are being used and their frequency of use.
f. To determine whether or not the videotape portion of the Spirit materials is being used.
g. To determine why the videotape is being used.

h. To determine to what extent respondents share the Spirit materials with others.

Research Objective 2: To determine the results of Spirit instruction as exemplified by educator perceptions of student achievement following the use of the Spirit materials.

Research Objective 3: To determine educator goals for use of the Spirit materials with students and the extent to which educators achieve these goals.

Research Objective 4: To identify the differences existing between the respondents who used the Spirit materials and the respondents who did not use the Spirit materials.

Research Objective 5: To identify reported reasons for nonuse of the Spirit materials.

Research Objective 6: To determine to what extent use of the Spirit materials affected the amount of time spent on environmental issues in the classroom.

Research Objective 7: To determine respondent plans for future use of the Spirit materials.

Research Objective 8: To identify respondent comments or suggestions for improvement of the Spirit materials or workshops.

Definition of Terms

For the purposes of this study the definitions of the following terms are:

Biodiversity refers to the variety and complexity of species present and interacting in an ecosystem and the relative abundance of each (Spirit, 1994).

Curricula refer to courses of study in an educational setting (Doll, 1993).

Curriculum implementation refers to actions undertaken to put into effect educational programs, policies, and/or practices that already exist, but are new to the people attempting to or expected to use them. This term does not include curriculum development (Cantrell, 1988).

Curriculum supplement refers to any instructional materials that can be used to augment established or required curriculum (Wilke, 1993).

Ecosystem refers to a natural unit that includes living and non-living parts interacting to produce a stable system (Spirit, 1994).

Educators refers to teachers and others employed in public and private schools, college students, volunteers, parents, employees of public and private organizations and any other persons who seek to educate students in any setting where learning may take place (Wilke, 1993).

Environmental education refers to a learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address these challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible actions (NEEAC, 1996).

Facilitator refers to the individuals who were responsible for participant instruction and training at the Spirit workshops (McIntyre, 1995).

The Nature Conservancy is a nonprofit environmental organization whose mission is to preserve the biodiversity of plant and animal species by protecting their natural habitats (McIntyre, 1995).

Nonuser refers to any participant in the Spirit workshops who for any reason either chose not to or was unable to utilize the Spirit materials in the classroom, an informal setting, or as resource materials.

Survey refers to the instrument used to collect data from the population of this study (Isaac, 1993).

User refers to any participant in the Spirit workshops who did utilize the Spirit materials in the classroom, an informal setting, or as resource materials.

Major Assumptions

For the purposes of this study the following assumptions are made:

1. Respondents to the self-administered survey instrument will follow proper procedures.

2. Respondents will answer honestly, without feelings of pressure or personal threat.

3. Missing survey responses will occur at random and will not represent a particular segment of the population.

Limitations

Inaccurate addresses or a change in residence for some of the participants of the Spirit workshops are possible reasons for non-response to the survey. This is especially likely for this survey since there were participants in the OSU workshops who were students in residence in Stillwater while taking the Spirit workshops offered through Education Extension. There are no readily acceptable means of easily identifying how

many of these students have completed their course of study and/or moved to another location or how many of the participants of the OSU workshops fall into this category.

Names and addresses of the participants of the staff development workshops held at Broken Arrow and Union Public Schools were not made available to the researcher. The Science Coordinator in each of the districts addressed the surveys and cards. They were sent to the participants through school mail. This method of sending the surveys may affect survey response due to peer pressure or allegiance to a superior.

Due to the vacation of the Science Coordinator for Broken Arrow Public Schools and delays in obtaining names and addresses from the OSU College of Education, Office of Extension, 63 of the surveys were mailed to educators a week later than the other 43 surveys. This difference in mailing times may have an affect on survey response by reducing response time for some respondents.

The workshops held through OSU were available for tuition-based college credit and completion of an outside assignment was necessary to receive credit. The workshops were held at different locations and had different schedules. Presence of an outside assignment, the location of the workshop, the fact that the workshop was available for credit or the times the workshop was presented could affect participant response to the survey.

The Spirit workshops held through OSU were required to meet a total of 16 hours. The staff development workshops held for Broken Arrow, Tulsa and Union Public Schools were four to six hours in duration. The difference in the length of the workshops could affect participant response to the survey.

Mary McIntyre, Education and Outreach Coordinator for the Oklahoma Chapter of The Nature Conservancy, and Dr. Ted Mills, Director of the Center for Environmental Education at OSU, have acted as facilitators for the Spirit workshops. Ms. McIntyre has been present at all eight workshops, while Dr. Mills has participated in the five workshops held through OSU. Dr. Mills and Ms. McIntyre worked closely together in the development of the Spirit materials and both are very knowledgeable concerning the Spirit materials. Dr. Mills and Ms. McIntyre are both skilled and experienced instructors who make every effort to present a consistent workshop experience for all participants. However, the workshop facilitators may affect participant survey response.

An alpha of .05 was established for decisions on research hypotheses. Small sample size or low response limit the generalizability of the results.

Some members of the population did not receive a copy of the videotape at the workshop.

Simple refusal to complete and/or return the survey are possible reasons for non-response to the survey.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

The review of literature done for this study was conducted at Oklahoma State University, the University Center at Tulsa (now Rogers University), the University of Tulsa libraries and the Internet. The dissertation for Diane Cantrell was obtained through interlibrary loan services from Ohio State University. The literature reviewed included books, dissertations, theses, environmental education curriculum guides, journal articles, government reports, ERIC documents, Dissertation Abstracts, and Internet Web Pages. Personal copies of references and materials to review were also obtained from other graduate students, OSU faculty members and the Center for Environmental Education at OSU. The descriptors used in the search for relevant information were environmental education, ecology education, environmental education research, curriculum implementation, and curriculum assessment. The literature reviewed included environmental education efforts in the United States and to a limited extent, globally.

After reviewing the literature, it was apparent that the literature could be divided into the following sections for discussion: history of environmental education, the development of environmental education curriculum, development of the Spirit curriculum, and implementation of environmental education curriculum.

History of Environmental Education

Humanity has always depended on nature for its existence. The degree to which humans saw themselves as masters of the environment rather than an integral part of the environment changed for many as society became more developed. Humans began to develop new and varied products and processes to make use of the abundance of nature. What constituted the "basic" necessities of life changed. The natural world began to be viewed as something that could be exploited as humankind saw fit. That there might be a limit to the abundance of nature was unthinkable. This was especially true for many of the first settlers of the United States who saw before them, as far as they were concerned, a wide, virtually untapped wilderness to be explored, tamed and used. (Simpson, 1986; Wilke, 1993).

The nineteenth century and the early twentieth century brought many changes. These were years of great industrial growth in the United States. In response to this growth, several authors, such as Ralph Waldo Emerson and Henry David Thoreau, sought to encourage a return to a more basic relationship with nature and stressed the need to conserve natural resources. During this time the federal government established the National Park Service, the National Conservation Commission and the Forest Service that would later become part of the United States Department of Agriculture. The establishment of these agencies was a result of an increased awareness and belief in the need for preservation of natural resources that had been dramatically demonstrated by natural disasters such as timber fires, dust storms and flooding that occurred during this

time. The extent of these natural calamities had been increased in some instances by the ineffective manner in which the land had been managed (Simpson, 1986; Wilke, 1993)

The early twentieth century saw the development of three educational movements that were to be the roots of modern environmental education. These were the nature study movement, outdoor education movement, and the conservation movement. The first of these, the modern nature study movement, was popular from the 1890's through the 1930's. Wilbur Jackman's Nature Study in the Common Schools published in 1891, is often credited with the start of the nature study movement. The movement gained further momentum in 1896 when Cornell University established a program to promote nature study in rural schools. At this same time, Cornell University began a series of nature study publications. The establishment of the American Nature Study Society in 1908 served to further establish this educational movement. Nature education focused on increasing the student's awareness and appreciation of nature and emphasized the use of discovery learning (Simpson, 1986; Wilke, 1993)

Following on the heels of the nature study movement was the conservation education movement. The Civilian Conservation Corps (CCC) was established in response to the depression and the soil erosion and flooding disasters of the 1930's. The underlying purpose of the CPC was to provide work for many of the persons who were unemployed as a result of the depression. The people who worked for the CPC were given opportunities to learn the value of forests and woodlands and the interactions and interrelationships between living and nonliving things. During this time conservation agencies were established to publish educational materials for the conservation of forests, wildlife and soil (Simpson, 1986; Wilke, 1993).

When the National Conservation Commission was established in 1908 it had appointed a Conservation Commission in most of the states. (Oklahoma was the first state to have all of its land divided into conservation districts.) Before the conservation movement became an active one, these Commissions had done little or no real conservation education. In 1937, John W. Studebaker, U.S. Commissioner of Education, hosted the first nation-wide conference on education. As a result of this conference, there was a renewed emphasis on conservation education, especially in the high school curricula. Although a formal policy was not firmly established, many of the Conservation Commissions across the country began to implement conservation education at this time (Hungerford & Peyton, 1986; Simpson, 1990)

Another education movement that served as a foundation for current environmental education programs is the outdoor education movement. The outdoor education movement experienced tremendous growth in the years after the Second World War. With the returning soldiers came an accompanying baby boom and increased movement from rural to urban areas. This change brought with it an increased concern that the children of these former rural dwellers were not having the kind of contact with nature and the environment that their parents had enjoyed as children. The outdoor education of this time was not a specific area of study; rather it was an approach to teaching. The main emphasis was teaching various subjects outdoors where the students could have the opportunity to experience the environment (Hungerford & Peyton, 1986; Simpson, 1990, Wilke, 1993).

After World War II, technological advances in practically every field of knowledge began to increase. Application of these advances has often resulted in drastic

transformation of the environment. Nuclear power brought with it the need to dispose of radioactive waste. Advances in agricultural production due to increased use of fertilizers and pesticides brought with them the possibility of groundwater pollution. Medical science advances decreased the mortality rate of disease and increased life expectancy. With this increase in medical know-how came an increase in population and increased demands on the environment. The list goes on. These changes caused many people to reassess their view of nature and the environment and their place in it. (Simpson, 1990).

The environmental movement gained impetus during the turbulent 1960s and 1970s when many individuals were beginning to reevaluate their relationship with the earth. Many environmental books were published during this time. However, Rachel Carson's book, Silent Spring which was published in 1962, is often mentioned as a catalyst for renewed interest in the environment. The environmental movement of this age differed from the earlier conservation movements because it was far more widespread (NEEAC, 1996). The term environmental education was first used at a 1964 address to the American Association for the Advancement of Science. By the early 1970s, environmental education had come to mean education in, about, and for the environment (Lorson, 1993). The United States Congress gave credence to environmental education in 1970 when it approved Public Law 95-516, the Environmental Education Act (91st Congress, 1970). In this legislation environmental education was defined as:

> The education process dealing with man's relationship to his natural and man-made surroundings, and includes the relation of population, pollution, resource allocation and depletion, conservation, transportation, technology and urban and rural planning, to the total human environment.

Although Congress chose to give formal recognition of environmental education with this new Act and create an Office of Environmental Education within the US Office of

Education, the act was limited in scope. The Environmental Education Act never received more than a fraction of its authorized funds and lost its separate identity with the creation of Chapter 2 of the Educational Consolidation and Improvement Act of 1981 (Hungerford & Peyton, 1986; Lewis, 1990).

Other countries were also becoming more environmentally aware during this time. In June of 1972, the first United Nations conference on the environment was conducted in Stockholm. Attended by 113 countries, the conference discussed the various environmental problems facing the world, adopted the Declaration on the Human Environment, and approved a wide-ranging action plan. An upsurge of activity in environmental education followed the Stockholm Conference. One recommendation resulted in the formation of a special agency, the United Nations Environmental Programme (UNEP). The goal of this organization was to further international environmental education. As a result, the International Programme in Environmental Education (IEEP) was started by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) and the UNEP in January of 1975 (Hungerford & Peyton, 1986; NEEAC, 1996, Wilke, 1993).

Much of the development in the field of environmental education during this time was due to the constant effort of the IEEP. In 1975, a questionnaire was distributed to 136 members of UNESCO. The purpose of this questionnaire was to provide individuals working in the field of environmental education a valid base of information on which future decisions for action could be based. The results of the study generally indicated a lack of sufficient programs to address environmental education. Those that did exist were often not based on real environmental problems and therefore, lacked problem-

solving approaches. Others tended to teach aspects of the environment only from a naturalist view, leaving out considerations of the social significance of environmental issues (Hungerford & Peyton, 1986, Simpson, 1990).

One job of the IEEP was to organize conferences and seminars to address environmental education concerns. One such conference was the Tbilisi Conference of 1975. The major finding of this conference was that there existed an overwhelming need for environmental education to actively involve citizens in all aspects of working toward resolving environmental problems. Such a citizenry must possess the knowledge, skills, attitudes and commitments necessary to protect and improve the environment. Providing citizens with the necessary knowledge and skills to take responsibility for and participate in environmental problem solving should be goals of environmental education (NEEAC, 1996; Hungerford & Peyton, 1986; Simpson, 1990).

In 1978 following the Tbilisi conference, a National Leadership Conference was conducted in Washington, DC, where a national strategy for implementing the recommendations made at the Tbilisi conference was proposed. Federal, state, corporate, and nongovernmental organizations were involved in work groups to address the major needs and responsibilities of the United States. As a result of this conference, the Federal Interagency Committee on Education (FICE) was established to provide a formal network of environmental educators from various agencies. This committee was disbanded after the passage of the 1990 Environmental Education Act. At any rate, the committee did not accomplish much. Most of the proposed strategies were never implemented (Lewis, 1990; Simpson, 1990, Wilke, 1993).

In 1980, the World Conservation Strategy was drawn up by the International Union for Conservation of Nature and Natural Resources, UNEP and the World Wildlife Fund in collaboration with UNESCO. It was launched simultaneously in thirty countries. The strategy was the culmination of intensive efforts involving 450 government agencies and more than 700 eminent experts from 100 countries. The document dealt with environmental problems such as deforestation, desertification, depletion of fisheries, soil erosion, misuse of croplands, and genetic diversity. The Strategy included priorities for international action and stressed the necessity of training, research, global participation and education (Simpson, 1990).

In the United States, the National Environmental Education Act of 1990 (P.L. 101-619) restated the need for education to improve the quality of the human environment. Under the leadership of the Environmental Protection Agency (EPA), the Act directs the federal government to play a strong role in increasing the public's environmental literacy by focusing on educating the young and training individuals for environmental careers. The Act encourages partnerships among Federal agencies, local educational institutions, State agencies, nonprofit organizations and the private sector. Some of the broad provisions of the Act include:

1) establishing an Environmental Education Division (EED) within EPA
2) creating an Environmental Education and Training Program
3) awarding environmental education grants
4) providing for environmental internships
5) initiating a national environmental education recognition program
6) forming communication networks between EED and environmental educators nationwide
7) establishing a National environmental education and Training Foundation.

This Act represents a Congressional mandate for the EPA to strengthen and expand environmental education as an integral part of its mission to protect the environment (NEEAC, 1996; EPA, 1994).

Under the 1990 Environmental Education Act, the National Environmental Educational Advisory Council was charged with reporting on the status of environmental education in the United States. This Council is an eleven-member body from across the country with a wide range of public and private experience in environmental education. The Council did not instigate a new research project to fulfill its mission; rather it chose to use previous studies, surveys and reviews, as well as interviews with many professionals in the environmental education field as the source of information. In the Executive Summary of the Council's Report to Congress, the Council recommends that more be done. Specifically they state: "Environmental education needs increased support, participation, and collaboration for all stakeholders. The Council believes that all Americans must be educated to see themselves as stakeholders who have the knowledge, skills, and motivation to make informed decisions and to take responsible actions in a world of complex environmental challenges" (NEEAC, 1996).

Development of Environmental Education Curriculum

It is generally accepted that the impetus for renewed interest in environmental education in the late 1960s was increased concern for environmental quality - fear of severe deterioration of human health and quality of human life caused by dramatic declines in environmental quality. New approaches to environmental education sought to

refine and redirect the goals of the earlier nature study, outdoor education and conservation education programs in an attempt to fill the educational void of inattention to the interactive relationships between humans and their environment.

During this time many different agencies and organizations became active stakeholders in the future of environmental education. Environmental advocacy organizations such as the National Wildlife Federation, National Audubon Society, Sierra Club, The Nature Conservancy and others continued to champion understanding of environmental concerns and problems. Their outreach efforts focused on promoting increased awareness of the need to preserve and conserve natural resources and on current environmental concerns. Many of the publications published by these organizations could be used as supplemental material for school programs as well as to provide information for the general public.

Federal and state governmental agencies also became stakeholders in environmental education. These agencies often used environmental education as a tool to accomplish their mission for natural resource management and/or environmental protection. Environmental education programs presented by such agencies were often actually advocacy education, teaching for the promotion of utilitarian natural resource and environmental management. There is a certain logic in this approach. An educated public is more likely to be amenable to wise management of resources and more highly motivated to support efforts directed toward maintenance and enhancement of environmental quality.

Business and industry must also be considered stakeholders in environmental education. These businesses and industries range from the large energy-producing

company trying to maintain a positive image to the small businessman who is trying to run his office or plant in both an Earth-friendly and profitable manner. To ensure that their involvement in environmental activities and their side of environmental issues is known, many industries and corporations began to fund the development of innovative materials and programs. These programs and materials are often done in collaboration with federal, state, and local agencies, as well as with universities. The quality of these materials is not consistent. Some businesses and industries produce materials that are in fact only cleverly disguised advertisements for their products (Satchell, 1996; Wilke, 1993).

Because the student population is often viewed as a ready-made, captive audience, the formal education system is sometimes considered a conveniently accessible subset of the public. Even though this specific audience is generally somewhat removed from current participation in the major decision-making processes, this will not always be the case. In many instances, their daily actions have a large impact of many aspects of society. All of the stakeholders described, governmental agencies, non-governmental organizations, environmental groups, business and industries, attempt, with varying degrees of success, to influence school curricula (Simpson, 1990).

The best-known, most widely used supplementary environmental education teaching materials in the US were developed under the sponsorship of groups outside the formal education sector. In 1970, the Western Regional Environmental Education Council (WREEC), a non-profit organization, was established by a grant from the United States Department of Education, Office of Environmental Education. The stated purpose of the WREEC was to improve the quality of education available to young people and

their instructors. Their basic underlying goal was to assist young people with the acquisition of awareness, knowledge, attitudes and skills that would make decision-making involving natural resources possible. To achieve this goal, WREEC was to develop a curriculum that could be easily and inexpensively taken to educators who would use the materials and ideas with students. The materials were designed to encompass K-12 curricula and be interdisciplinary and supplementary in nature; so educators would be able to use them separately or combined with a unit of study (Charles, 1986; PLT, 1993; Smith, 1988; Wilke, 1993).

The result of this curriculum project was Project Learning Tree (PLT) which was developed as a joint effort by the WREEC, the American Forestry Council and other environmental organizations. PLT was presented for the first time in 1976. Activities presented in PLT focused primarily on the interdependence of society and nature with the forest ecosystem or habitat (Charles, 1986; Project Learning Tree, 1993; Smith, 1988; Wilke, 1993). In 1979, the WREEC began to work with the Western Association of Fish and Wildlife Agencies to develop Project Wild. Project Wild was developed to present additional activities concerned with the animal components of an ecosystem that were not covered in PLT. Project Wild was ready for use in 1981 (Project Wild, 1992; Smith, 1988; Wilke, 1993). In 1987, the Project Wild Aquatic Education Activity Guide was written to help educators explore and understand the world of water and the aquatic habitats it supports (Aquatic Project Wild, 1992; Wilke, 1993).

In 1990, WREEC became a cosponsor of another quality environmental education program, Project WET. The original Project WET was established in 1984 by the North Dakota State Water Commission. In 1989, with funding from the US Department of the

Interior, Bureau of Reclamation, the program was duplicated in Montana, Idaho, and later, Arizona. This success of this pilot program lead to a decision to develop a national Project WET program. This was when the WREEC became involved with Project WET. The Project WET curriculum guide was published in 1995 (Project WET, 1995; Wilke, 1993).

PLT, Project Wild and Project WET represent well-researched and well-written environmental education curriculum supplements that have been presented to thousands of educators across the nation. In 1993, it was estimated that more than 380,000 teachers had participated in the Project Wild training sessions and more than 25 million elementary and secondary school students had been exposed to the Project Wild materials since 1983 (Wilke, 1993). Response to the PLT, Project Wild and Project WET curriculum supplements has been positive and enrollment in workshops generally reaches capacity (Cantrell, 1988; PLT, 1993; Project Wild, 1992; Smith, 1988; Wilke, 1993). Many other quality environmental education curricula are available; however, the three supplements published by the WREEC are considered some of the best available to educators today. PLT and Project Wild are both award-winning programs and as such were excellent models for the development of the Spirit materials. (McIntyre, 1995; PLT, 1992; Project Wild, 1992; Wilke, 1993).

Development of the Spirit Curriculum

The Nature Conservancy, a nonprofit organization, was incorporated in 1951 in the District of Columbia for scientific and educational purposes. The mission of The Nature Conservancy is to preserve animal and plant species and the unique natural

communities in which they live. As a part of this mission, The Nature Conservancy views learning as a priority and teaching as an obligation. In 1993 with the assistance of The Nature Conservancy, KOTV-Channel 6 in Tulsa produced an award winning documentary entitled "The Last Great Places in Oklahoma." The goal of this program was to better inform the public about the existence of Nature Conservancy preserves, the biodiversity of Oklahoma represented by the individual preserves and the need to protect the ecosystems represented by these preserves. This television program served as the basis and catalyst for development of the Spirit curriculum. Development of the curriculum began in 1994, as a project of the College of Education, Center for Environmental Education at Oklahoma State University through a grant from the Oklahoma chapter of The Nature Conservancy.

During development of the Spirit curriculum, many quality environmental education curriculum guides and programs were reviewed. Project Learning Tree and Project Wild, two very successful environmental education curriculum supplements, served as models for the Spirit curriculum guide and the Spirit workshop. Several of the activities in the Spirit guide were adapted with permission from PLT and Project Wild.

The Spirit curriculum, designed primarily for grades 4-8, is comprised of printed materials and accompanying videotape. The printed materials are divided into ten topic units. Each individual topic unit is divided into three sections: two activity sections and a Nature Conservancy Highlight. The first section of each unit contains an introductory activity and supporting background information. The second section includes an activity that relates the introductory activity to a specific Nature Conservancy location and

additional supporting background information. The third section, TNC Highlight, describes the basic ecology of a related Oklahoma Nature Conservancy Preserve.

The videotape is designed to support the printed materials. The beginning segment of the video is an introduction to The Nature Conservancy by Brita Cantrell, executive director of the Oklahoma Chapter of The Nature Conservancy. The rest of the tape is divided into 10 segments that correspond with the topic units in the printed guide. Most topic segments are from four to seven minutes in length. However, the Tallgrass Prairie Section (Units 5-8) is nearly twenty minutes in length, as it covers four complete topic units. Scenes in the video that have no narration feature background music. The video was designed as a means of introducing the unit and generating interest in the unit topic. It can also be used as a review or reinforcement activity.

Topic One is designed to assist the student in developing a holistic view of the earth. Topics Two through Nine are designed to focus on specific environmental ideas and concepts. Topics Five through Eight focus on components of the Tallgrass Prairie. Topic Ten serves as a concluding unit designed to encourage the students to review what they have studied and examine their own environmental views and priorities. The specific Topic Units and the subjects covered in these units are listed in Table 1. Although, the units and activities work well on an individual basis, used as a whole this curriculum can be a unit or course of study (McIntyre, 1995; Spirit, 1994).

The Spirit curriculum is presented to educators in several ways. Workshops offered through the College of Education, Education Extension Office at Oklahoma State University and conducted by the Center for Environmental Education provide an intensive introduction to the Spirit materials. These workshops which can be taken for

one hour of graduate credit are conducted over a period of two days for a total of 16 hours of training plus an outside assignment. Workshops conducted by Nature Conservancy personnel have also been held across the state. These workshops vary in length from professional staff development in-service workshops to shorter informational sessions held at schools, conferences, and organization meetings. Following review by the State Department of Education curriculum staff, the Spirit curriculum was published and made available for order from the State Department of Education at a nominal fee. These varied presentation approaches provide widespread access to the Spirit materials for educators currently working in the field, as well as, future educators in Oklahoma (McIntyre, 1995).

TABLE 1

SPIRIT CURRICULUM TOPICS

Name of Topic Unit	Topic Subject
Topic One: This Great Place Where We Live	Ecosystems
Topic Two: That Special Great Place	Habitat and Niche
Topic Three: A Great Liquid	Water
Topic Four: A Great Substance	Soil
Topic Five: One Great Biome	Tallgrass Prairie
Topic Six: The Great "Web" of the Prairie	Food Chains and Webs
Topic Seven: A Great Prairie Species	The American Bison and Extinction
Topic Eight: Humanity and this Last Great Place	Prairie Ecology
Topic Nine: Other Last Great Places	Migratory Birds of Oklahoma
Topic Ten: The Spirit of the Last Great Places	Making Environmental Decisions

Implementation of Environmental Education Curriculum

There are various methods used to initiate implementation of new curriculum in schools. For example, they may take the form of a state mandate for three years of English in high school, a school district's adoption of a new reading series, new curriculum presented at either required or optional workshops, or the simple purchase of a new skills workbook by an instructor. However, adoption of a curriculum by a school district, purchase of a curriculum by an educator, or attendance at a curriculum workshop does not guarantee use of this curriculum (Cantrell, 1988; Chen, 1992; Lorson, 1993; Price, 1982; Roth, 1982; Smith, 1988). It does not matter how good a curriculum is if it is not implemented. Curriculum implementation cannot be separated from educational change.

There can be little doubt classroom teachers and other educators who work directly with learners largely determine the details of their curriculum. Regardless of the curriculum plan, it is the insight and skill of teachers that determines the quality of the learner's experience. The personal commitment of educators to a curriculum project depends on the degree to which they accept project ideas, the compatibility of the project with their own ways of working, and their estimation of the project's efficiency in their own classrooms (Doll, 1989; Gress & Purpel, 1988). Key factors in an instructor's acceptance of a new curriculum program or project are the quality and practicality of the innovation. Educators want programs that are "tangible, relevant, complete, well-organized, comprehensive, detailed, 'how-to' oriented, tested and readily usable" (Howe & Disinger, 1988). The purpose of any educational change is to help educators accomplish

their goals more effectively by replacing some programs or practices with better ones (Doll, 1989).

Currently in Oklahoma, there is no legislative mandate that requires environmental education be taught in the public schools (NEEAC, 1996; Wilke, 1993). However, nationally there is an increasing demand by many parents for more material in the classroom that present environmental subject matter (Charles, 1996; NEEAC, 1996; Sia, 1985). In a 1994 survey of parents in Minnesota, researchers found that more than 60 percent of the parents surveyed considered the environment to be a very important skill area for high school graduates. This compared to 58 percent for science, 54 percent for government, 43 percent for geography, 43 percent for history, and 19 percent for fine arts.

In a 1994 survey conducted for the National Environmental Education and Training Foundation, students were asked to rank "problems they are most concerned about and want to improve." Students from nondisadvantaged socioeconomic areas ranked concern about the environment second (51 percent) after concern about AIDS (64 percent). Students from disadvantaged areas cited less concern for the environment (43 percent) behind AIDS, kidnapping, guns, neighborhood crime and violence and the economy. In another survey conducted for World Wildlife Fund, teens ranked the environment as "one of the most serious problems that society will face in the year 2000." The data from these and other surveys also indicated that environmental education programs have an important role to play in the development of sound and effective environmental practices (NEEAC, 1996).

In a 1993 survey of 2000 science and social studies educators and non-formal educators working in zoos, museums, nature centers, and aquariums, more than 90 percent indicated that environmental education should be a priority in schools and non-formal institutions. They also indicated a need for more materials, training and institutional commitment for environmental education (NEEAC, 1996). Many teachers have also expressed the need for use of curriculum materials that cause conceptual change in their students (Cantrell, 1988; Chen, 1992; Sia, 1985; Smith, 1988; Wilke, 1993).

In 1996, the National Research Council of the National Academy of Science published the National Science Education Standards. The Standards are designed to establish a high level of scientific literacy in the United States. Scientific literacy is defined as " the knowledge and understanding of scientific concepts and processes required for personal decision making, participation in civic and cultural affairs, and economic productivity" (National Academy of Sciences, 1996). Although the acquisition of scientific facts and knowledge is a part of developing scientific literacy, the use of inquiry skills to understand of these facts and their interrelationships is also essential. The Standards also stresses the importance of emphasizing the interdisciplinary nature of science (National Academy of Sciences; 1996).

Not all parents and educators are enthusiastic about environmental education in the nation's schools. Many view environmental texts as representing opinion as fact, citing government bodies as scientific authorities and being anti-business and industry. In Arizona, the legislature has overturned a 1990 law requiring environmental education in public schools (Satchell, 1996). The curriculum guide has been withdrawn and

funding for classroom projects has been slashed. Some Christian groups see the commune-with-nature aspects of environmental programs as anti-Christian and pagan. Critics focus on what they consider attempts to indoctrinate students rather than educate them (Bolch & Lyons, 1993; Satchell, 1996).

Many environmental educators are concerned. While they do acknowledge that biased material is sometimes presented by teachers who do not know the subject well enough to ensure a balance and that some activist teachers push "ecoagendas" on malleable students, leading environmental educators say that these attacks are motivated by ideology rather than reason. As quoted by Satchell (1996), Ed McCrea of the North American Association of Environmental Educators states "Parents are often uncomfortable with teachers doing more than just imparting knowledge. They are uncomfortable with teachers encouraging students to question accepted ideas and make decisions which are often in conflict with their parents."

Implementation of environmental education into the standard curriculum is often not an easy task. It is undefinable in terms that "fit" existing school organizational patterns. It is not a discrete discipline. It cannot be properly subsumed by science or social studies. Although it has inherent moral and ethical aspects, it is not itself a humanity. This leaves the interdisciplinary approach, the idea that environmental education should be infused in all content areas (Braus & Wood, 1994; Disinger, 1987; Wilke, 1993). This is in fact the characteristic method of including environmental education in US school curricula, according to a survey summarized by Disinger (1987).

Infusion is a practical approach to finding room for environmental education in a crowded curriculum. Curriculum overload is a serious problem in the nation's schools.

Infusion runs into problems posed in part by an oversaturation of potential topics to be covered in the overall curriculum. Because environmental education does not conveniently fit into any school subject, and because its specific components are identifiable as elements of several of the defined disciples, educators must decide how to deal with "something that includes everything" (Heimlich, 1992; Wilke, 1993).

How do educators deal with this? Framing learning for environmental education requires moving beyond traditional methods of classroom teachers. One approach is to use supplementary curricular guides that, for at least a few periods, transforms the learning process into an environmental focus rather than a discipline-based and separated structure. There is no uniformity on how to best introduce and use environmental issues in the teaching and learning exchange. Each educator must use the method that is consistent with personal beliefs about learning and teaching. Forcing an educator to incorporate fundamental principles of environmental education through means that are uncomfortable to the individual will not work (Heimlich, 1992, Gress & Purpel, 1988; Wilke, 1993). It is the educator who usually decides whether or not to use a supplemental curriculum and which one to use. It is what educators do in classrooms as well as other instructional settings and what students experience that define the educational process (Heimlich, 1992; Hungerford & Peyton, 1980; Price, 1982; Roth, 1992, Wilke, 1993).

It is the choices and actions made by educators concerning curriculum implementation, specifically supplemental environmental education curriculum in the form of The Spirit of the Last Great Places that is the focus of this study.

CHAPTER III

DESIGN AND METHODOLOGY

Introduction

In 1994, the curriculum supplement, The Spirit of the Last Great Places, was developed for use by educators in Oklahoma through a grant from the Oklahoma Chapter of The Nature Conservancy to the Oklahoma State University College of Education Center for Environmental Education. In 1995, the material was published by the Oklahoma State Department of Education and made available for educators to order. Since fall of 1994, eight workshops have been held to introduce the Spirit materials to educators and provide an opportunity for in-depth investigation of these materials.

The purpose of this study is to examine the implementation of the Spirit materials by the 106 participants of five Spirit workshops conducted by the Oklahoma State University College of Education Office of Education Extension and the three staff development workshops held for Broken Arrow Public Schools, Tulsa Public Schools, and Union Public Schools. The study is also concerned with assessment of the Spirit materials by the respondents who have used the materials and reasons for nonuse of the materials.

This section will address the selection of the subjects to be used in the study, procedures for selection and development of the survey instrument, procedures for administering the survey instrument and proposed methods of data analysis.

Description of the Population

The population for this study is the 106 participants of eight Spirit workshops. Five of these workshops were held through the Education Extension Department at Oklahoma State University. There were 53 participants in the five workshops held through OSU. One workshop was held for each of the following school districts: Broken Arrow Public Schools, Tulsa Public Schools, and Union Public Schools. There were ten participants in the staff development workshop held for Broken Arrow Public Schools, thirteen participants in the staff development workshop held for Union Public Schools, and twenty participants in the staff development workshop held for Tulsa Public Schools. There were a total of 53 participants in these three staff development workshops.

Those individuals who have received the Spirit materials by ordering the text directly from the State Department of Education or by other means were not included in this study because they could not be identified.

Instrument Selection and Development

A mail questionnaire was chosen as the survey instrument to be used in this study for several reasons. It is a less costly and more efficient way to obtain data than personal interviews or telephone surveys. Respondents often provide more honest answers in mail questionnaires due to the anonymity of participant response (Gay, 1996, Isaac, 1995). Personality interactions between the interviewer and the interviewee can have both favorable and unfavorable effects on participant response when telephone surveys or other personal interview techniques are used. With the mail questionnaires, these

interactions are not a concern (Gay, 1996; Isaac, 1995). Mail questionnaires were used in other related studies (Cantrell, 1987; Smith, 1988).

Names and addresses of the participants in the Broken Arrow and Union Public Schools staff development workshops were not made available to the researcher. It is a matter of school policy in both of these districts not to release the names and addresses of their teachers to individuals not employed by the district. Therefore, the mail-back questionnaire was the most feasible way of obtaining input from these participants. In both instances, the Science Coordinator responsible for the administration of the Spirit workshop in the district, addressed and mailed the surveys and reminder cards to the workshop participants through the school mail system.

The survey instrument developed for the study of the Spirit materials was a modification of two previously existing surveys that had been successfully used by Cantrell (1987) and Smith (1988) to assess the Project Wild environmental education supplement. Both questionnaires used in these studies were modifications of a National Project Wild questionnaire and were very similar in nature. In these studies, extensive pilot studies and field tests were done to assess the validity and reliability of the questionnaires used (Cantrell, 1987; Smith, 1988).

After reading the two studies and comparing their research objectives to the research objectives for this study, it was evident that the questionnaires used by Cantrell (1987) and Smith (1988) could provide the basic format and examples of questions to use in the development of the questionnaire for this study of the Spirit materials. Neither of the surveys could be used without modification. After carefully rewording selected questions, deleting others, and creating new ones to address objectives unique to this

study, a questionnaire was completed that could be used to assess the use of the Spirit materials. The resulting survey (Appendix 1) is a self-administered mail-back questionnaire that was sent to the participants of the Spirit workshops.

After initial development of the Spirit materials questionnaire, it was distributed to thesis committee members and other educators for review. One aspect for review was the content validity of the questionnaire. Content validity is the degree to which an instrument measures an intended content area. It requires both item validity and sampling validity. Item validity is concerned with whether the items on the instrument represent measurement in the intended content area. Sampling validity is concerned with how well the test samples the total area to be measured. Content validity is determined by expert judgment. Content validity for the Spirit questionnaire was established by submitting it to the group of educators mentioned earlier. This group of educators included the author and editor of the Spirit curriculum, several professors experienced in working with surveys, as well as other educators who were familiar with curriculum supplement use (Appendix A).

Personal interviews were arranged to discuss the questionnaire. The following aspects of the questionnaire were discussed:

1. Were the directions clear and simple?
2. Were the statements and questions ambiguous or threatening?
3. Was there consistency in the format?
4. Was the sequential order of the questions appropriate?
5. Was there adequate white space?
6. Was the type size easily read?

7. How long did it take to complete the survey?

Reviewers were very helpful in recommending modifications, changes in word choice, type of question, and items that should be added or deleted. Modifications were made and the questionnaire was resubmitted to thesis committee members for final approval. At this time, a final check was made to ensure that the modified questions on the survey corresponded with specific research objectives and questions of the study.

The research proposal for the study was approved by the Institutional Review Board.

Data Collection

Responses to the survey were solicited through two mailings. The initial mailing included a cover letter (Appendix B), the questionnaire (Appendix B), and an addressed prepaid envelope for return of the survey. The purpose of the cover letter was to elicit a maximum number of returned questionnaires. Gay (1996) and Isaac (1995) recommend that a cover letter must provide the subjects with a good reason to respond to the survey, the purpose and significance of the study, assurance of the importance of the subject's response, as well as an assurance of the anonymity and confidentiality of subject responses. All of these components were included in the cover letter. Directions for completion of the survey, the deadline for returning the survey and an offer to share the results of the survey with those interested were also included in the letter. Before mailing, the cover letter was submitted to thesis committee members and associates for review to ensure that it was clear, concise and written in a manner to encourage response to the survey.

Respondents were asked to return the survey ASAP. The letter also indicated a final date two weeks after receipt of the survey as the date tabulation of the results would begin. The cover letter was printed on stationary of the Center for Environmental Education at Oklahoma State University and signed by Dr. Ted Mills and Vicki Carpenter, the principal investigators in this study.

A thank you/reminder postcard (Appendix C) was sent out to the entire population of the study ten days after the surveys were mailed in an effort to prompt those who had not yet filled out and returned the survey to do so.

Data Analysis

The data from the questionnaire were recorded, tabulated and analyzed using descriptive statistical analysis measures of central tendency, variability and relative position for each individual research question. The principal statistical procedure used to analyze the differences in the demographic data was the chi-square statistic. Chi square is a nonparametric test of goodness of fit appropriate when the data are in the form of frequency counts or percentages occurring in two or more mutually exclusive categories. The chi square statistic is appropriate when the data represent a nominal scale, and the categories may be true categories such as the user and nonuser categories of this study (Gay, 1995). Chi-square yields a value that represents the disparity between expected and observed frequencies falling into each data category. As greater disparity occurs, the chi-square value increases until it becomes statistically significant. The rejection or acceptance of null hypotheses was set at an alpha level of 5 percent (.05).

Research Questions and Hypotheses Statements

The research objectives identified in Chapter I were analyzed as the research questions and null hypotheses presented in Table 2.

TABLE 2

RESEARCH QUESTIONS AND HYPOTHESIS STATEMENTS

Research Question 1.1: How many of the respondents have used the Spirit materials?
Research Question 1.2: Why do educators use the Spirit materials?
Research Question 1.3: Are the Spirit materials being used as a basis for a separate unit of study, incorporated into already existing curricula, used as reference materials, or used in informal educational settings?
Research Question 1.4: How many Spirit activities were used with students?
Research Question 1.5: Which Spirit activities are/are not being used?
Research Question 1.6: What is the frequency of use of the Spirit materials?
Research Question 1.7: Do educators use the videotape segment of the Spirit materials?
Research Question 1.8: Why do educators use the videotape?
Research Question 1.9: What are the reasons for nonuse of the videotape?
Research Question 1.10: With how many others do educators share their Spirit materials?
Research Question 2: What do educators believe their students have learned from their experience with the Spirit materials?
Research Question 3: What were the educator goals for use of the Spirit materials?

Research Question 4: What were the differences existing between the group of respondents who did use the Spirit materials and the group of respondents who did not use the Spirit materials?

H_o1: There is no significant difference between users and nonusers of the Spirit materials for the variable of job description.

H_o2: There is no significant difference between users and nonusers of the Spirit materials for the variable of number of years of teaching experience.

H_o3: There is no significant difference between users and nonusers of the Spirit materials for the variable of grade level taught.

H_o4: There is no significant difference between users and nonusers of the Spirit materials for the variable of subject area taught.

H_o5: There is no significant difference between users and nonusers of the Spirit materials for the variable of length of Spirit training workshop attended.

H_o6: There is no significant difference between users and nonusers of the Spirit materials for the variable of amount of time they have had their Spirit materials.

Research Question 5: What are the reasons for nonuse of the Spirit materials as a curriculum?

Research Question 6: To what extent was the amount of time spent on environmental issues affected by use of the Spirit materials?

Research Question 7: How do respondents plan to use the Spirit materials in the future?

Research Question 8: What comments or suggestions for improvement did respondent make concerning the Spirit materials or workshops?

CHAPTER IV

RESULTS OF THE STUDY

Introduction

Surveys were mailed to the entire population of this study for a total of 106 surveys. Two surveys were returned by respondents who indicated that they had never received the Spirit materials. Since the list of addresses from OSU included everyone enrolled in the Spirit workshops, these participants may have enrolled in a workshop and been unable to attend. In this event, their names and addresses would have remained on the class rolls. These two respondents were not considered a part of the population for this study. Therefore, the population of the study is adjusted to 104 individuals.

Of the 104 surveys mailed, 54 were returned for a response rate of 52 percent. Many studies have been conducted on attrition rates in mail surveys. Return rates for mail-back surveys have varied from lows of about 20 percent to highs of more than 90 percent. One review of 183 mail surveys revealed that the average return rate was 48 percent. Others have found that the average return rate is closer to 30 percent (Ellis, 1994; Bulmer, 1979). The response rates for two Project Wild research projects using a survey similar to the one used in this study were 17 percent for the Cantrell (1987) study and 38 percent for the Smith (1988) study. The response rate for this study was therefore deemed acceptable.

The findings of the study are organized around the individual Research Objectives and generally represent descriptive information. For Research Objective 4, inferential information concerning differences between users and nonusers for the variables of job

description, grade level taught, subject area taught, number of years of teaching experience, length of workshop attended and length of time the respondents had the Spirit materials were also examined.

Findings

How Spirit Materials Are Used

Research Objective 1 was to determine how and why educators in Oklahoma used the Spirit materials. Research Question 1.1 dealt with the most fundamental question of this study, how many respondents have used the Spirit materials? After examining responses to Survey Question 7 (Table 3), it was determined that 70 percent of the 54 respondents to the study have used the Spirit materials.

TABLE 3

HOW MANY RESPONDENTS HAVE USED THE SPIRIT MATERIALS?

Response Options	Number	Percentage
Have used the Spirit materials	38	70.37
Have not used the Spirit materials	16	29.63
TOTAL	54	100

Research Question 1.2 dealt with the reasons respondents use the Spirit materials. The responses to Survey Question 11 summarized in Table 4 show that the most frequent reasons chosen for use were 1) "to provide opportunities for students to learn about their

environment", 2) "to provide interesting supplemental activities", and 3) "to provide students with opportunities to learn about Oklahoma ecosystems.

TABLE 4

WHY DO EDUCATORS USE THE SPIRIT MATERIALS?

Response Options	Number	Percentage
1. Provide opportunities for students to learn about their environment.	28	80
2. Provide interesting supplemental activities	27	77
3. Provide opportunities for students to learn about Oklahoma ecosystems.	25	71
4. Meet science requirements.	11	31
5. Meet social studies requirements.	6	17
6. Meet language arts requirements.	2	6
7. Meet math requirements.	0	0
8. Other - Prepare students for field trip to a Nature Conservancy Preserve.	2	6

Description of Respondent Use of Spirit Materials

To answer Research Question 1.3, how respondents are using the Spirit materials, responses to Survey Question 7 were examined. As shown in Table 5, most respondents select individual Spirit activities or units to include in existing curriculum, while few use the materials as a basis for a unit of study.

TABLE 5

HOW ARE THE SPIRIT MATERIALS BEING USED?

Response Options	Selected as Only Option	Total Number of Selections
1. Select individual Spirit activities/units to include in existing curriculum.	14	26
2. Use as reference materials	7	13
3. Use Spirit materials in informal setting.	2	8
4. Use as a basis for a unit of study.	0	4
Multiple Option Responses	14	
TOTAL	38	

Activity Use by Respondents

Research Questions 1.4, 1.5 and 1.6 deal with specific uses of the individual Spirit activities. These were answered by examining the responses to Survey Question 8. Table 6 summarizes overall respondent use of individual Spirit activities. Table 7 shows respondent use by grade level. In Table 8 information concerning the number of activities used by individual respondents is given.

TABLE 6

USE OF SPIRIT MATERIALS BY RESPONDENTS

Name of Activity	Number of Repetitions*	Total Number of Respondents
1A Activity Webs	32	19
1B Oklahoma Ecosystems	21	18
2A Go Bats!	41	20
2B What's Your Niche?	25	12
3A Water Moves	12	8
3B Water/Wetland Investigations	22	15
4A Exploring Soil	18	13
4B Looking at Erosion	7	7
5A Rainfall on the Prairie	15	11
5B Make a Grass	17	11
6A "On Some Other Prairie"	8	8
6B Prairie Food Web	28	20
7A Bison Tic-Tac-Toe	13	5
7B How Many Whatsits	6	5
8A Fire!	14	9
8B Prairie Hi-Lo	5	5
9A Migration Station	18	14
9B A View From the Sky	5	4
10A A Land-Use Case Study	4	3
10B Personal Views & Action	4	4

* Number of Repetitions refers to the total number of times the activity was used by all of the respondents.

TABLE 7

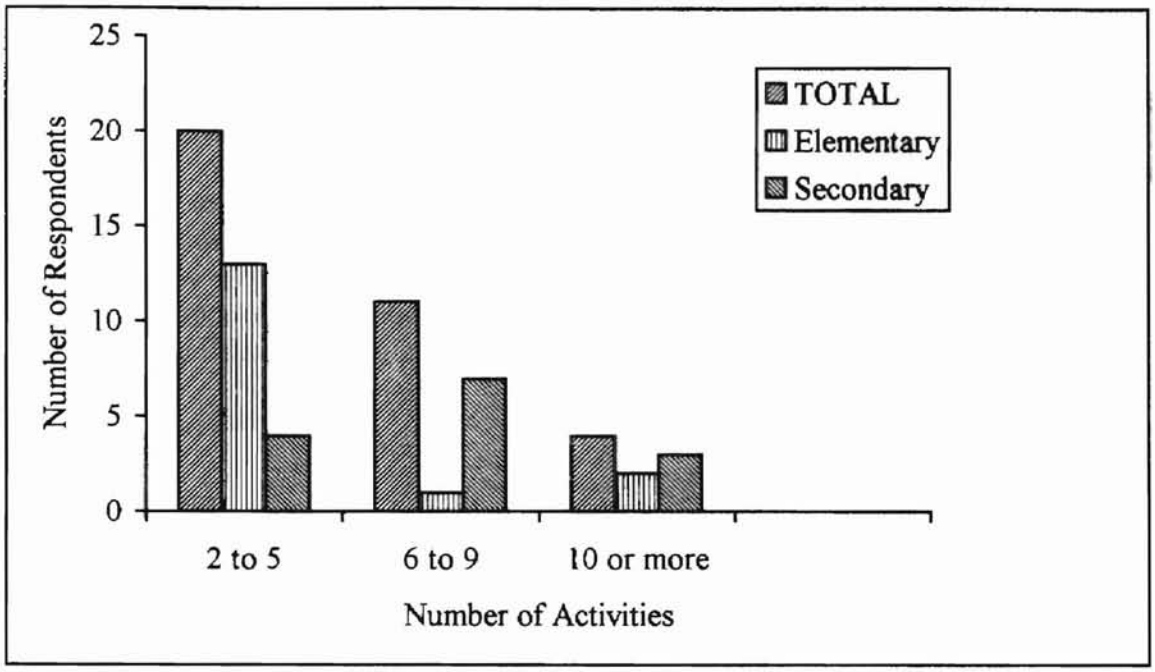
COMPARISON OF SPIRIT ACTIVITY USE BY GRADE LEVEL

Name of Activity	Elementary Respondents	Secondary Respondents
1A Activity Webs	9	7
1B Oklahoma Ecosystems	5	10
2A Go Bats!	10	7
2B What's Your Niche?	7	2
3A Water Moves	4	3
3B Water/Wetland Investigations	7	5
4A Exploring Soil	5	6
4B Looking at Erosion	1	4
5A Rainfall on the Prairie	4	6
5B Make a Grass	4	6
6A "On Some Other Prairie"	0	8
6B Prairie Food Web	8	9
7A Bison Tic-Tac-Toe	3	5
7B How Many Whatzits	1	3
8A Fire!	4	4
8B Prairie Hi-Lo!	1	3
9A Migration Station	6	6
9B A View From the Sky	2	1
10A A Land-Use Case Study	1	1
10B Personal View & Action	1	1

NOTE: There were 17 elementary respondents and 13 secondary respondents.

TABLE 8

NUMBER OF ACTIVITIES USED BY RESPONDENTS



Videotape Use

Responses to Survey Question 9 were examined to determine how many of the respondents use the videotape along with the printed materials, Research Question 1.7; how the videotape is used, Research Question 1.8; and reasons for nonuse of the videotape, Research Question 1.9. The majority of respondents used the videotape in conjunction with the printed materials, usually as a means to introduce the Spirit Topic unit. The most frequent reason for not using the tape was that the individual did not have a copy of the tape. Table 9 summarizes the use and nonuse of the videotape.

TABLE 9

RESPONDENT USE OF THE SPIRIT VIDEOTAPE

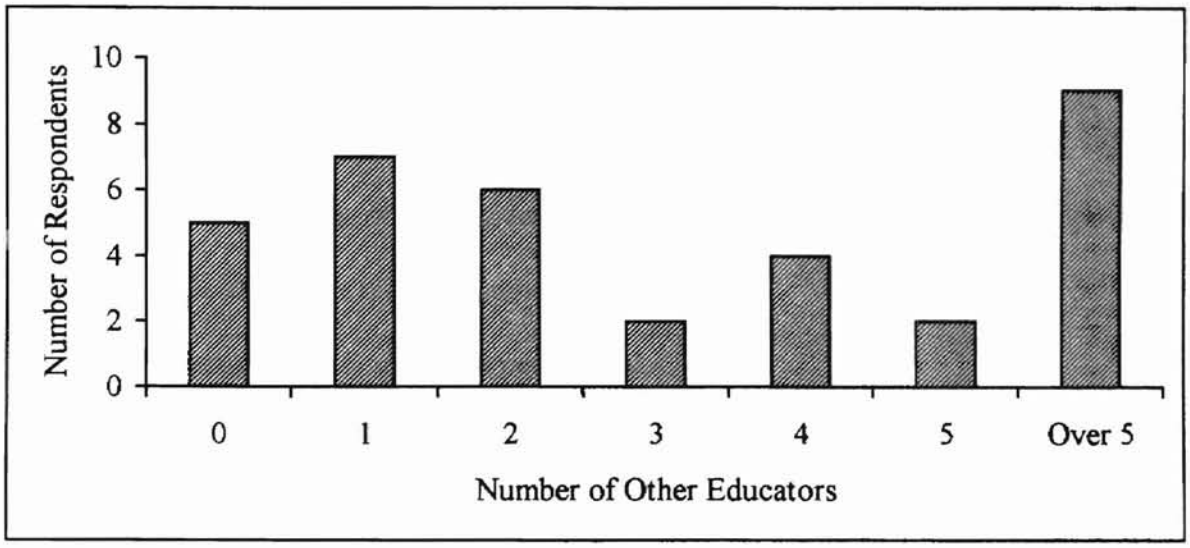
Response Options	Selected as Only Option	Total Number of Selections
"YES" RESPONSE OPTIONS:		
1. Useful way to introduce the unit.	8	18
2. Good stimulus for discussion.	4	14
3. Good review of the unit.	1	6
4. Other - To show bat behavior.	1	1
5. Other - As a reference for a paper.	0	1
Multiple Option Responses	10	
Subtotal	24	
"NO" RESPONSE OPTIONS:		
1. No copy of tape - would use if possible.	5	6
2. Too time consuming.	1	2
3. Added little to the instruction.	1	2
4. No access to VCR - would use if possible.	1	2
Subtotal	11	
TOTAL RESPONSES	38	

Sharing Spirit Materials

The number of individuals with whom the respondents have shared their Spirit materials was the focus of Research Question 1.10. This question was answered by examining the responses to Survey Question 10. Only 5 respondents indicated that they had not shared their Spirit materials with other educators. Table 10 shows the response patterns.

TABLE 10

NUMBER OF INDIVIDUALS WITH WHOM SPIRIT EDUCATORS HAVE SHARED THEIR SPIRIT MATERIALS



Results of Spirit Use

Research Objective 2 was to identify the results of Spirit instruction as exemplified by educator perception of student achievement. Research Question 2 was answered by examining responses to Survey Question 13. Table 11 outlines what educators believe their students have learned as a result of Spirit instruction.

To provide additional input into educator perception of student achievement as a result of Spirit use, responses to Survey Question 14 were examined to see to what extent educators believed their students had increased their environmental awareness, knowledge, inquiry skills and social skills. Most educators perceived that all or most of their students had shown an increase in all areas. Results are shown in Table 12.

TABLE 11

WHAT DO EDUCATORS BELIEVE THEIR STUDENTS HAVE LEARNED AS A RESULT OF SPIRIT INSTRUCTION?

Response Options	Number	Percentage
1. Overall importance of wildlife and their habitats.	24	63
2. Diversity and composition of Oklahoma ecosystems.	23	61
3. Necessary components of healthy ecosystems.	22	58
4. How people can affect the environment.	21	55
5. Varying perspectives from which people make environmental decisions.	8	21
6. Importance of making responsible environmental decisions.	3	8

TABLE 12

RESPONDENT PERCEPTION OF INCREASED STUDENT UNDERSTANDING AS A RESULT OF USE OF THE SPIRIT MATERIALS

Components	All	Most	Some	Few	None	Total
Greater Environmental Awareness	18	12	1	0	0	31
Knowledge	14	13	2	0	1	30
Inquiry Skills	11	10	6	0	3	30
Social Skills	11	9	9	0	1	30

Respondent Goals for Use of Spirit Materials

Research Objective 3 was to determine educator goals for the use of Spirit materials. Research Question 3 was answered by examining response options to Survey Question 12. Respondent goal responses are shown in Table 13. Research Question 3.2 sought to ascertain to what extent educators perceived that Spirit instruction helped them reach these teaching goals. Responses to Survey Question 15 are shown in Table 14.

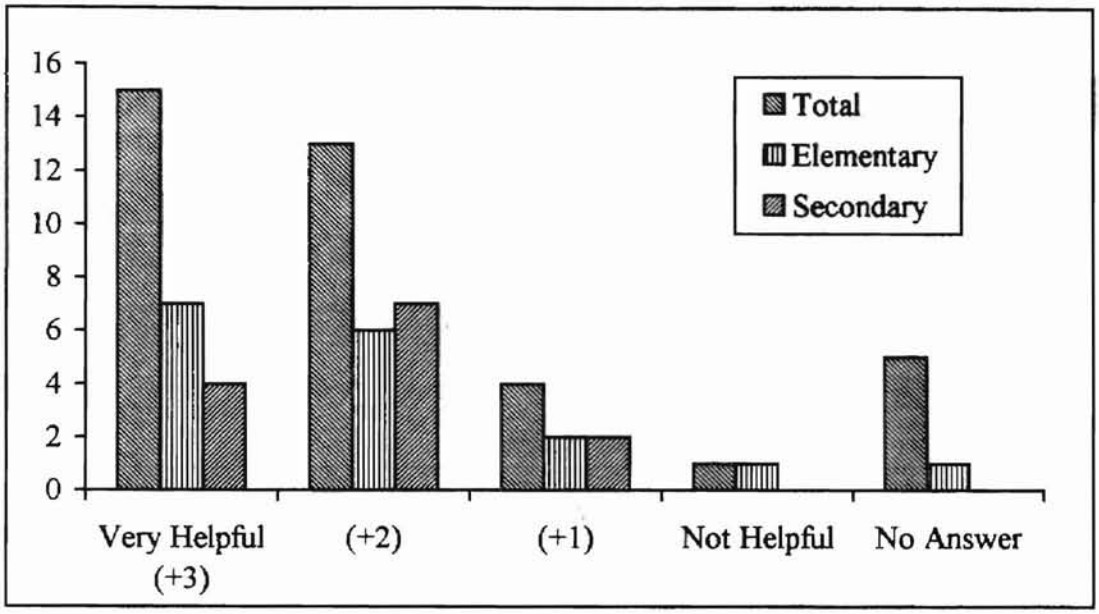
TABLE 13

RESPONDENT GOALS FOR USE OF THE SPIRIT MATERIALS

Response Options	Number	Percentage
1. To help students acquire an appreciation of their environment.	32	84
2. To help students acquire a greater understanding of the environment.	32	84
3. To foster an understanding of environmental relationships.	28	74
4. To help students acquire a greater understanding of their environmental role.	27	71
5. To provide students with increased knowledge and skills.	26	68
6. To prepare students to make responsible environmental decisions in the future.	22	58
7. Other - To foster stewardship of students to their surrounding communities.	1	3
8. Other - To appreciate the positives of Oklahoma.	1	3

TABLE 14

TO WHAT EXTENT ARE SPIRIT MATERIALS HELPFUL IN ASSISTING EDUCATORS IN MEETING THEIR GOALS



Differences between Users and Nonusers

Research Objective 4 sought to determine the differences that exist between the respondents who used the Spirit materials and those that did not. This objective was met through the testing of six null hypotheses (Appendix D). Hypotheses $H_0$1, $H_0$2, $H_0$3, $H_0$4, $H_0$5 and $H_0$6 were tested by applying the chi square statistic to the results of Survey Questions 1 through 7. Differences in job description, number of years of professional teaching experience, grade level taught, subject area taught, length of the workshop attended and the length of time the respondents have had the Spirit materials were examined. Only $H_0$1, job description was rejected. Table 15 displays chi square values for the selected variables. Appendix E contains the contingency tables on which these values are based. Tables 16 through 21 delineates the data for the selected variables.

TABLE 15

CHI SQUARE VALUES

Variable	df	Chi Square Value	Table Value
$H_0$1 - Job Description	1	5.05*	3.841
$H_0$2 - Teaching Experience	3	4.94	7.815
$H_0$3 - Grade Level	1	2.36	3.841
$H_0$4 - Subject Area	2	2.10	5.881
$H_0$5 - Length of Workshop	1	2.70	3.841
$H_0$6 - Length of Possession of Materials	2	4.57	7.815

*Significant at the .05 level of confidence

TABLE 16

JOB DESCRIPTIONS OF RESPONDENTS

Response Options	Users	Nonusers	Total
Classroom Teacher	20	11	31
Curriculum/Resource Specialist	7	0	7
Teacher/Curriculum Specialist	2	0	2
Teacher/Youth Organization Representative	0	1	1
Classroom Teacher - Unemployed	0	2	2
Adjunct College Faculty/Graduate Student	1	0	1
Subtotal (Teachers)	30	14	44
College Student - Education Major	4	0	4
Resource Agency Representative	2	0	2
Cooperative Extension Service Agent	1	0	1
Developer - Nature Center	1	0	1
Recreation Specialist	0	1	1
Other (nonspecific)	0	1	1
Subtotal (Nonteachers)	8	2	10
TOTAL	38	16	54

TABLE 17

NUMBER OF YEARS OF PROFESSIONAL TEACHING EXPERIENCE OF RESPONDENTS

Response Options	Users	Nonusers	Total
0 years	2	0	2
1 - 3 years	3	3	6
4 - 6 years	4	5	9
7 - 9 years	6	2	8
10 or more years	23	6	29
TOTAL	38	16	54

TABLE 18

GRADE LEVEL OF RESPONDENTS

Response Options	Users	Nonusers	Total
Elementary			
K-3rd	2	5	7
4 - 5th	12	5	17
1 - 5th	4	1	5
Subtotal	18	11	29
Elementary & Middle School (1-8)	0	1	1
Middle School (6-8)	9	1	10
Middle & High School (6-12)	1	0	1
High School (9-12)	3	2	5
K through 12th	2	0	2
College	2	0	2
Pre-School through Adult	1	0	1
No Answer	2	1	3
TOTAL	38	16	54

TABLE 19

SUBJECT AREA OF RESPONDENTS

Response Options	Users	Nonusers	Total
Science	14	5	19
Elementary - Self-contained	8	6	14
Special Education	2	0	2
Teacher Education	2	0	2
Elementary Science/Art	1	0	1
Science/Social Studies/Art/ Language Arts/Indian Education	1	0	1
Social Studies	1	0	1
Social Studies/Computer Science	1	0	1
Social Studies/Music	1	0	1
Media Resource	1	0	1
Gifted	1	0	1
Social Studies/Art/PE/Spanish	0	1	1
Spanish	0	1	1
Other - No Specifics	1	0	1
No Answer	3	1	4
TOTAL	38	16	54

TABLE 20

LENGTH OF WORKSHOP ATTENDED BY RESPONDENTS

Response Options	Users	Nonusers	Total	Number Mailed	Percentage Returned
Less than 4 hours	4	6	10		
4 to 6 hours	10	4	14		
Subtotal	14	10	24	53	45
More than 6 hours	24	6	30	51	57
TOTAL	38	16	54	104	52

TABLE 21

LENGTH OF TIME RESPONDENTS HAVE HAD SPIRIT MATERIALS

Response Options	Users	Nonusers	Total	Number Mailed	Percentage Returned
Less than 1 year	18	12	30	53	57
1 to 2 years	16	2	18	32	56
More than 2 years	4	2	6	21	29
TOTAL	38	16	54	104	52

Reasons for Nonuse of the Spirit Materials

Research Objective 5 sought to identify the reasons why respondents are not using the Spirit materials after training. This research question was answered by examining the responses to Survey Question 7. Table 22 provides a summary of the descriptive data for this research objective.

TABLE 22

REASONS FOR NONUSE OF SPIRIT MATERIALS BY RESPONDENTS

Response Options	Selected as Only Option	Total Number of Selections
1. Insufficient planning time	2	6
2. Not teaching at present time.	1	4
3. Materials do not fit my needs.	0	1
4. Materials not appropriate for my students.	0	1
5. My job does not provide an opportunity to use these materials.	0	1
6. Lack of administrative support for use of these materials.	0	0
7. Do not feel comfortable with the materials.	0	0
8. Do not feel proficient in the use of the materials.	0	0
9. Plan to use the materials in the future.	3	12
TOTAL	16	

To What Extent Use of Spirit Materials Affects Time Spent on Environmental Issue

The purpose of Research Objective 6 is to determine whether or not educators perceived a change in the amount of time they spend on environmental issues with their students due to use of the Spirit materials. The responses to Survey Question 16 used to answer Research Question 6 are shown in Table 23.

TABLE 23

TO WHAT EXTENT DOES USE OF SPIRIT MATERIALS AFFECT AMOUNT OF TIME SPENT ON ENVIRONMENTAL ISSUES?

Response Options	Number	Percentage
Increased somewhat (+1)	13	34
Increased (+2)	9	24
No change	7	18
Greatly increased (+3)	3	8
No answer	6	16
TOTAL	38	

Respondent's Plans for Future Use of the Spirit Materials

Research Objective 7 sought to identify how respondents plan to use the Spirit materials in the future. Nearly all respondents will continue to use the Spirit materials. Specific responses to Survey Question 17 are shown in Table 24.

Comments or Suggestions for Improvement of the Spirit Materials or Workshops

The intent of Research Objective 8 was to accumulate data concerning respondent suggestions for improvement or comments concerning the Spirit materials or the Spirit workshops. This was an opportunity to give individual respondents a chance to provide input into some aspects of the Spirit curriculum that were not directly addressed by the survey. In order to answer Research Question 8, all comments and suggestions were compiled and organized according to specific areas of concern.

TABLE 24

RESPONDENT PLANS FOR CONTINUED USE OF SPIRIT MATERIALS

Response Options	Number	Percentage
1. Will use some of the materials.	19	50
2. Will use all of the materials as an integral part of future instruction.	11	29
3. Will use a few of the materials.	2	5
4. No future plans to use the materials.	1	2.5
5. Would use the materials if possible but will not be in a situation where use is possible.	1	2.5
6. Prefer other materials.	0	0
7. Other - Would use more materials if available.	0	2

The most frequent comments made by respondents concerned the Oklahoma focus of the Spirit materials. They include 1) "Have only had time to use one of the units - the one on the Oklahoma ecosystems. It was great!" 2) "Good for Oklahoma history." 3) "I had already done many environmental activities, I liked these because of the Oklahoma influence." 4) "This is great for Oklahoma teachers." and 5) "The tape and other materials were great with our Oklahoma unit."

Several comments dealt with providing additional information. They were 1) "Need more additional activities!" 2) "More updated data and additional activities," and 3) Keep it up - add more - I will go to part II!" Additional comments include praise for the Spirit materials, such as 1) "Excellent for my 6th graders," 2) "I thought the materials

were wonderful," 3) "I really enjoyed the workshop" and 4) "Materials and workshop are both very good." One respondent addressed the content of the workshop, "The more activities we covered in the workshop, the more likely I was to use them."

A letter summarizing how she planned to use the Spirit materials during the summer of 1997 was included by one respondent. "I have a summer program to present this summer to Native American children. It will run 10 days and be held in our school library with outdoor activities and bus trips planned to the Tallgrass Prairie, Philbrook Art Center, local nature hikes and backyard habitats. I also plan to use this curriculum during the two weeks that I attend the Oklahoma Alliance for Geographic Education to be held at the University of Oklahoma with field trips in the Arbuckle Mountains near Ardmore."

There was one comment that was not exactly complimentary of the Spirit materials. "I am amazed to see that many of the lessons were a take-off of lessons found in PLT and Project Wild, the only difference is a little bit of Oklahoma information added to 'change' the original lessons. If you have already used the PLT and PW lessons you couldn't use the 'Spirit' lessons. Is it legal to borrow ideas like that so openly?"

Other remarks made by respondents were in the form of suggestions or indications of how the educator had modified the materials for their own use. One respondent stressed that educators need to consider the age-appropriateness of individual Spirit activities before presenting them and make modifications as needed. Another respondent also discussed modifying the materials, "I like to use worksheets, so I am rewriting the activities to fit my classroom. I plan to use more of the program as time allows me to rewrite each lesson."

Suggestions were also made concerning the continuation of the Spirit training. They were 1) "Continue to provide in-service training for educators throughout the State of Oklahoma. Stay in touch with school districts, State Department of Education and OSTA." and 2) "Please continue to provide the curriculum at a reasonable cost. Also, continue to provide TNC staff assistance in training teachers to use the curriculum guide."

In all 15 individuals made comments or suggestions in response to Survey Question 18. Other comments throughout the survey sought to clarify individual responses. These comments and suggestions provide insight into the survey respondents.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Introduction

This purpose of this study was to examine the implementation of The Spirit of the Last Great Places, an interdisciplinary environmental curriculum supplement for use by educators in Oklahoma. The study sought to identify how the Spirit materials were used, the effectiveness of the Spirit curriculum as seen by instructor evaluation and demographic information related to the educators using the Spirit materials.

Discussion of Findings

Findings of this study, based upon a review of the 10 research objectives, are:

Research Objective 1:

The Spirit materials have been used by 70 percent of the 54 individuals who responded to the survey. The major reason given for use by 80 percent of the respondents was to provide opportunities to learn about the environment. Providing an opportunity for interesting supplemental activities was chosen by 77 percent, while providing students with opportunities to learn about Oklahoma ecosystems was chosen by 73 percent. Each of these three reasons was chosen at least twice as many times as the 4th reason - to meet science requirements. The other options dealing with the use of the Spirit materials to meet requirements received very light response. Looked at as a group,

the responses dealing with meeting specific curriculum requirements begin to look different. Half of the respondents use the materials to meet curriculum requirements in sciences, social studies or language arts. One respondent stated that the materials were used to build map skills.

Of those who have used Spirit, nearly 70 percent select activities to integrate into their already existing curriculum. Over half use the materials as reference materials or in informal settings. Only 10 percent use the materials as a unit of study. The data indicating that half of the respondents were using these materials to meet subject requirements would seem to corroborate the finding that the Spirit materials are being integrated into existing curriculum.

All 20 of the activities were used by respondents. The activity that received the most uses (41) was 2A - Go Bats! This activity is easy to do with a group of students. It requires no supplies and is a hands-on activity. In short, it is one that can be done by almost anyone, anywhere. This activity was one of three used by a Physical Education Teacher respondent who used it a total of 10 times with her classes. The activity used by the fewest respondents (3) was 10A - A Land-Use Case Study Activity. This activity is lengthy and requires at least 2 class periods to complete. Its partner, 10B - Making Environmental Decisions, also received scant usage. This activity requires the students to examine their own personal views. In these days of environmental backlash, some teachers may choose to refrain from activities such as this due to fear of offending someone and facing a potential threat to their job (Satchell, 1996).

From 2-17 activities were used by the individual respondents, average use was six different activities. The total number of times Spirit activities were used by the 35

respondents to this Survey Question was 317. While not everyone who used the Spirit materials is a classroom teacher, one might assume that most of these activities are being used with students. If the 317 repetitions of Spirit activities were done with a group of 20 individuals, that would represent 6,340 individuals who participated in Spirit activities. Nearly half of those using the Spirit materials indicated they have used some of the activities more than once. Several respondents did not indicate the number of times they had used each activity. The actual number of repetitions of the Spirit materials may easily be higher than reported.

Individual Spirit activity use by elementary and secondary respondents was compared (Table 7). There were 17 respondents who could be identified as elementary educators only and 13 who could be identified as secondary educators only. The grade level of five of the respondents did not fit into either of these two distinct groupings. Overall secondary respondents tended to use more of the individual activities than elementary respondents. There were differences in activity usage by elementary and secondary respondents but for the most part, these were minor differences. There were a couple of differences that appear worthy of note.

Activity 6A - "On Some Other Prairie" received no usage by elementary respondents while 62 percent of secondary respondents used this activity. The other activity in this unit, 6B - Prairie Food Web, was used by an almost equal number of elementary and secondary respondents. In Activity 6A students are asked to listen to a scenario and then imagine themselves as a part of the ecosystem. They must then figure out how they will manage to survive or fit into this ecosystem. Activity 6B is the actual

depiction of a food web where the students play the different roles of the members of the ecosystem.

The activity receiving the most use by the secondary respondents was 1A - Oklahoma Ecosystems, not Go Bats! It was used by twice as many secondary respondents. It was expected that the usage pattern of this activity would have been the opposite. Many elementary classroom educators teach a yearly unit on Oklahoma; it would seem that this activity would be tailor-made for just such a unit. An indication of the reason for secondary usage of this activity may be gleaned from respondent comments. Respondents who indicated that the Spirit materials had been used to teach Oklahoma history units were secondary educators.

Approximately two-thirds of the respondents who use the Spirit guide also use the videotape. Over three-fourths of these individuals use the tape as an introduction to the Spirit unit and over half use the tape as a stimulus for discussion. Of those respondents who do not use the tape, two-thirds would use the tape if they were able to do so. They either do not have a copy of the tape or have no way to play their copy. At some of the workshops, the videotapes were not distributed with the printed materials. The video had to be obtained from The Nature Conservancy. One of the two individuals that indicated that the tape was too time-consuming was a Middle School teacher. Middle School class periods are usually from 30 to 45 minutes in length. If an educator is attempting to complete an activity in one class period, this time constraint may preclude their use of the video. Even though the tape segments are generally only from five to seven minutes long (Spirit, 1994), educators may choose to use that time in other ways.

Out of 38 respondents only five of the respondents had not shared their Spirit materials with anyone else. Nine respondents had shared the materials with more than five others. The 33 individuals who shared their materials shared the Spirit materials with a minimum of 104 other individuals, a number equal to the number of participants in this study. Sharing a curriculum with another educator does not mean that the educator will use the materials. However, if these "newly-exposed" educators were to use only one of the Spirit materials with a group of 20 students, that would represent an additional 4,080 individuals who participated in Spirit activities. A more likely result of sharing the Spirit materials with an educator may be that the educator will be motivated to attend a Spirit workshop.

In general, if an educator thinks a curriculum works they will share these materials with others. As any educator knows, preparation time is too precious to waste on ineffective materials. This is one reason educators pool their knowledge and experiences and share those materials they believe are worthwhile. One way in which teachers take part in the curriculum process is by discussing curriculum ideas with others. Sharing information about what works in a classroom and what does not is a common practice in practically every school (Doll, 1989).

Research Objective 2:

Ninety-seven percent of the respondents in this study believe that all or most of their students have increased their environmental awareness as a result of use of the Spirit materials. Ninety percent believe that all or most of their students have also increased their knowledge skills. Approximately two-thirds of these respondents believe that Spirit

use increased all or most of their student's inquiry and social skills as well. Specific areas of increased student knowledge as a result of Spirit use are the necessary components of ecosystems, the diversity and composition of Oklahoma ecosystems, the overall importance of wildlife and their habitats, and how people affect the environment. The response options dealing with making responsible environmental decisions, a generally accepted goal of environmental education, were chosen by only 30 percent of the respondents.

Research Objective 3:

A major goal of nearly all (84%) of the respondents who use the Spirit materials was to help students acquire both an appreciation and an understanding of their environment. Another major goal for instruction for 70 percent of respondents was to help student develop a better understanding of environmental relationships including their own role in the environment. Only one respondent indicated that the Spirit materials had not helped them reach their goals. Forty percent of the respondents felt that the Spirit materials were very helpful.

To foster a demonstration of responsible environmental behavior involves attention to 4 levels of activity: 1) ecological concept level, 2) conceptual awareness, 3) issue investigation, and 4) environmental action skills (Hungerford, etal 1990). The findings in both Research Objectives 2 and 3 would indicate that according to the perception of these respondent educators, use of the Spirit materials is helping students develop these levels of activity. However, the action element is not stressed by the Spirit

materials or by the educators. Unit 10 of the Spirit materials has an action component and it received little use by these respondents.

Research Objective 4:

There were no significant differences between the user and nonuser groups for the variables of years of teaching experience, grade level taught, subject area taught, length of workshop attended or the length of time the respondents had had the Spirit materials. The only significant difference between the groups was for the variable of job description. Although the largest segment in both groups were classroom teachers, only two of the nonuser respondents were not classroom teachers while 17 of the user respondents were not classroom teachers. The user group includes a group of seven curriculum specialists, five college students and five other environmental educators.

Seventy percent of nonusers (11 individuals) were elementary level educators, while 51 percent of users were elementary level educators. One of the major reasons for nonuse of the Spirit materials was insufficient planning time. Elementary teachers tend to teach more subjects than teachers in other grade levels. This may affect the amount of planning time some educators have to incorporate new materials into the curriculum.

It was interesting to note that there were only five respondents who classified themselves as students, one was a graduate student who was also an adjunct professor. Since one half of the population of this study received Spirit training at OSU, it would seem logical that a larger proportion of the population would identify themselves as students. There are several possible explanations for this discrepancy in expectation. One, students who took the workshop are also teachers and classified themselves as such.

Two, participants who took the Spirit training when they were students are now gainfully employed and classified themselves as teachers on the survey. Three, students often move and the student portion of the population may represent a large part of those individuals who did not return the survey.

When examining the variable of years of teaching experience there were no statistically significant differences between the user and nonuser groups; however, it should be noted that in both groups there were more educators with 10 or more years experience than any other category, 54 percent of the respondents. In the user group, there were nearly four times as many respondents with 10 or more years of experience (23) than in its closest competitor, the seven to nine years experience group, with six individuals.

Classroom teachers accounted for more than two-thirds of the respondents. There were 17 elementary respondents and 13 secondary respondent in the user group. Over half of the respondents were elementary self-contained or science educators.

While there were no statistically significant in the variable of length of workshop attended by the users and nonuser, there is an educational one. There is an inverse relationship between the two groups. Sixty three percent of the nonuser respondents attended staff development workshops and the same percent of user respondents attended the OSU workshops.

The difference in use may be related to the fact that the OSU workshop is a 16-hour training session that generally allows time to do at least one activity from each of the ten units. This more intensive preview of the Spirit materials may make integration and implementation easier for the educator. One respondent comment adds credence to

this explanation. "The more activities we went over in the workshop, the more activities I was able to use."

When looking at the variable of the amount of time the respondent had the Spirit materials, there were differences within the two groups. In the user group, the respondents were almost evenly split between less than one year and one to two years with only a token representation (4) of more than two years. In the nonuser groups those respondents that had the Spirit materials less than a year accounted for 75 percent. The largest number of surveys mailed was to the "less than one year" group. This group also had the highest return rate. The number one reason for not using the Spirit materials is insufficient planning time. Those respondents who have had the Spirit materials for less than a year would have had less opportunity to plan that those who have had the materials for a longer time. However, sixty percent of those respondent who indicated that they had had the Spirit materials less than one year had used the materials.

Research Objective 5:

There were two main reasons for nonuse of the Spirit materials. Most respondents either had not had sufficient planning time to use the materials or they were not teaching at this time. Most of those who have not used the Spirit materials (75%) indicated that they would use the Spirit materials in the future. Three individuals indicated in the comment portion of the survey, that the materials fit best into a unit that they had completed before attending the workshop and receiving the Spirit materials. Besides the finding that nonusers tend to have had the Spirit materials for less time than the user, there is also the tendency for the nonusers to be elementary teachers.

Elementary teachers often have less planning time in their school day than middle or high school teachers, and they generally have more subjects to plan. This may have an affect of how quickly they implement a new curriculum.

Research Objective 6:

Over three-fourths of respondents indicated an increase in the amount of time spent on environmental issues as a result of Spirit use. Three of the seven respondents of that marked the no change response to this question were instructors of environmental science. These respondents indicated that for them an increase in the amount of time spent of environmental issues was not possible.

The purpose of environmental education is to promote environmental literacy. Environmental literacy has as important components the necessity for personal and active involvement as well as improvement in knowledge, skills, attitudes and values involving the environment. The goal of environmental education is to produce an environmentally active citizen. Just as providing additional practice in multiplication will enhance a student's math literacy, so will increased time spent on environmental issues provide the student with the "practice" necessary to increase their environmental literacy.

Research Objective 7:

Respondents will continue to use the Spirit materials, 50 percent will use some of the materials, 29 percent will use all of the materials, and 5 percent will use a few of the materials. Only two individuals indicated that they did not plan to use the Spirit materials

in the future. One of these respondents will be unable to use the materials due to the fact that he/she is changing jobs and there will not be an opportunity to use the Spirit materials in this new position.

Eleven individuals indicated that they would use all of the materials in the future, this represents an increase in the use of the Spirit materials. There were no respondents to this survey that had used all twenty activities

Research Objective 8:

Respondents were enthusiastic about the use of the Spirit materials. There were 15 comments and suggestions for improvement of the Spirit materials or workshops. Several comments offered praise, especially of the Oklahoma focus of the Spirit materials. Specific suggestions were: continue to offer the training, continue to provide TNC personnel to help train teachers, stay in touch with other educators, continue to offer the materials at a reasonable cost, add more activities and cover as many activities as possible in the workshops. One respondent returned a plan for use of the Spirit curriculum in two separate summer activities in which she will participate.

One respondent thought the materials too closely resembled Project Learning Tree and Project Wild to be worthy of use. Some of the activities in the Spirit materials do follow the same format as some of the PLT and Project Wild activities. Any modifications made to existing copyrighted materials were discussed with the authors and permission received for use.

The enthusiasm displayed by the respondents to Survey Question 18 may help to explain the fact that the educators who responded to the survey shared their Spirit materials with an average of 3 other educators.

Recommendations

Since the Spirit materials are being used by participants in both the staff development and OSU workshops, both of these methods for training educators in Spirit use should be maintained. Due to the successful use of the Spirit materials in a variety of disciplines and grade levels, educators in all disciplines and grade levels should be encouraged to attend these workshops.

Additional Spirit research focusing on the workshops, both the staff development and the workshops held through OSU, could provide input concerning the effectiveness of the workshop and how it relates to educator use of the Spirit materials. In order to make additional research or other inquiries easier to accomplish, the facilitators of the workshops might consider compilation of a master list of participants of the workshop. Inclusion in such a list would have to be with the consent of the participants to address right-to-privacy issues.

Since the Oklahoma ecosystems focus of these materials was a positive factor in their use by some respondents, the development of more activities based on additional Oklahoma ecosystems should be considered. Many students and educators think of environmental issues on a global or national level. Proving opportunities for additional information on the state could add credence to the well-known environmental slogan,

"Think globally-Act locally." Education for many does not become real until it becomes personal.

The videotape segment of the Spirit materials should be provided at the workshops along with the printed materials. The video should also be made available for order at a reasonable price from the State Department of Education.

Conclusions

The following conclusions are presented with some reservations due to the limitations of this study.

The Spirit materials are being used by educators to provide opportunities for access to the necessary environmental education components of awareness of the environment, knowledge, attitudes and skills necessary to enable students to participate in responsible environmental decision-making in the future.

Educators using Spirit materials have increased the amount to time spent on environmental issues in their educational setting.

The Spirit materials are appropriate for use with various ages, grades, disciplines and educational settings.

There was some indication that respondents who attended the longer workshops were more likely to use the Spirit materials.

The "typical" user of the Spirit materials who responded to this study was an educator with 10 or more years of experience that teaches elementary school science and attended a Spirit workshop at OSU.

The "typical" nonuser was a classroom teacher who teaches either an elementary self-contained classroom or science and has had the Spirit materials less than a year.

The Spirit of the Last Great Places represents a viable environmental education curriculum supplement for use by educators in Oklahoma. The stated purpose of the Spirit curriculum was "to assist teachers of grades four through eight to teach the next generation about the ecology and beauty of natural systems within the state of Oklahoma." (Spirit, 1994). The curriculum is fulfilling its stated purpose and additionally providing assistance to educators of various ages, grades and subject areas who teach in a variety of settings.

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APPENDIXES

APPENDIX A

SURVEY REVIEW COMMITTEE

SURVEY REVIEW COMMITTEE

Thesis Committee Members:

Dr. Ted Mills, Thesis Advisor
Editor, The Spirit of the Last Great Places
Associate Director of the Center for Environmental Education
Emeritus Professor of Science Education
Oklahoma State University

Dr. Kate Baird, Assistant Professor
Curriculum and Instruction - Science Education
Director of the Center for Environmental Education
Oklahoma State University

Dr. Don French, Assistant Professor
Zoology
Oklahoma State University

Other Reviewers:

Mary McIntyre, Author - The Spirit of the Last Great Places
Education and Outreach Coordinator
Oklahoma Chapter of The Nature Conservancy
Tulsa, Oklahoma

Dr. Sheila Forbes, Associate Professor
Extension Program Specialist
Oklahoma State University

Iris McPherson, Data Analyst
Oklahoma State University
Stillwater, Oklahoma

Harriet Patterson, Principal
Tulsa Public Schools
Tulsa, Oklahoma

Cynthia Smalley, Classroom Teacher
Tulsa Public Schools.
Tulsa, Oklahoma

Meghan Wright, Curriculum Specialist
Vian Public Schools
Vian, Oklahoma

APPENDIX B

SPIRIT SURVEY AND COVER LETTER

May 14, 1997

Dear Educator:

We know this survey is arriving at a busy time, but we need your assistance in determining the use and implementation of the Spirit of the Last Great Places curriculum materials. Since you are familiar with these materials, your input is invaluable. Even if you did not use the Spirit materials, please complete the first section of the survey. Naturally, your participation is voluntary. We can assure you that your individual responses are anonymous.

The survey may look time consuming, but should only take 5-10 minutes to complete. Please complete the survey as soon as possible, and return it in the enclosed addressed and prepaid envelope. We would like to begin tabulation of the surveys by May 24, 1997.

If you would like to know the results of the survey or have additional input concerning the Spirit materials, please contact Ms. Carpenter at the address given below. Thank you for your time and assistance with this important project!

Sincerely,

Dr. Ted Mills, Director
Center for Environmental Education

Vicki Carpenter
Project Research

Project address:
Vicki Carpenter
7715 S. Quebec
Tulsa, OK 74136
(918) 493-1837

SECTION I

1. Please mark the job title or description that best describes your current position.
   - _____ Classroom Teacher
   - _____ Curriculum Specialist or School Resource Person
   - _____ School Administrator
   - _____ College Faculty
   - _____ College Student - Education Major
   - _____ College Student - Non-education Major
   - _____ Resource Agency Representative
   - _____ Youth Organization Representative
   - _____ Parent or Volunteer
   - _____ Other (specify): _____.

2. Please indicate the amount of time you have had your Spirit materials.
   - _____ Less than a year
   - _____ 1-2 years
   - _____ More than 2 years

3. Please indicate the length of the Spirit workshop you attended.
   - _____ Less than 4 hours
   - _____ 4-6 hours
   - _____ More than 6 hours

4. Please mark the category which best describes your professional teaching experience.
   - _____ 0 years ——> **GO TO QUESTION 7.**
   - _____ 1-3 years
   - _____ 4-6 years
   - _____ 7-9 years
   - _____ 10 or more years

5. Please mark the category which best describes the grade level you teach.
   (If more than one, indicate the percentage for each area.)
   - _____ Kindergarten
   - _____ Primary: Grades 1-3
   - _____ Upper Elementary: Grades 4-5
   - _____ Middle School: Grades 6-8
   - _____ High School: Grades 9-12
   - _____ College

6. Please mark the category which best describes the subject or area you teach. (If more than one, indicate the percentage for each area.)
   _____ Elementary - self-contained
   _____ Science
   _____ Social Studies
   _____ Language Arts/English
   _____ Math
   _____ Art or Music
   _____ Industrial Arts
   _____ Vocational Agriculture or Home Economics
   _____ Business
   _____ Physical Education
   _____ Other (specify): _____.

7. Describe your use of the Spirit materials.
   _____ I use the Spirit materials as a basis for a unit of study.
   _____ I select individual Spirit activities/units to include in existing curriculum.
   _____ I use the Spirit materials as reference materials.
   _____ I use the Spirit materials in an informal educational setting.
   _____ I have not used the Spirit materials.

   If you have not used the Spirit materials, why not? (Mark all that apply.)
   _____ The materials do not fit my teaching needs.
   _____ The materials are not appropriate for the students in my classroom.
   _____ I have not had sufficient planning time to enable me to use the materials.
   _____ There is a lack of administrative support for the use of these materials.
   _____ My job does not provide an opportunity to use the materials.
   _____ I do not feel comfortable with the materials.
   _____ I do not feel proficient in the use of the materials.
   _____ I plan to use the materials in the future.
   _____ I am not teaching at the present time.

IF YOU HAVE NOT USED THE SPIRIT MATERIALS, STOP NOW. PLEASE PLACE SURVEY IN THE ENVELOPE PROVIDED AND MAIL.

THANKS AGAIN FOR YOUR PARTICIPATION!

SECTION II

8. There are 10 topic units in the Spirit curriculum with two activities per unit. **Indicate approximate number of times each activity was used during the last year.**

_____ 1A Activity Webs	_____ 6A On Some Other Prairie
_____ 1B Oklahoma Ecosystems	_____ 6B Prairie Food Web
_____ 2A Go Bats!	_____ 7A Bison Tic-Tac-Toe
_____ 2B What's Your Niche?	_____ 7B How Many Whatzits
_____ 3A Water Moves	_____ 8A Fire!
_____ 3B Water/Wetland Investigations	_____ 8B Prairie Hi-Lo
_____ 4A Exploring Soil	_____ 9A Migration Station
_____ 4B Looking at Erosion	_____ 9B A View from the Air
_____ 5A Rainfall on the Prairie	_____ 10A A Land-Use Cast Study
_____ 5B Make a Grass	_____ 10B Personal Views/Action

9. Did you use the video tape along with the printed materials?

_____ YES ----> What were your reasons for using the tape?
(Mark all that apply.)
_____ It is a useful way to introduce the unit.
_____ It is a good stimulus for discussion.
_____ It is a good review of the unit.
_____ Other (specify):_____.

_____ NO -----> What were your reasons for NOT using the video tape?
(Mark all that apply.)
_____ It was too time consuming.
_____ It added little to the instruction.
_____ I do not have access to video equipment, but I would use tape if I could.
_____ I do not have a copy of the tape, but I would use the tape if I had one.
_____ Other (specify):_____.

10. With how many others did you share your Spirit materials?
(Circle the number that best fits your response.)

More than 5 5 4 3 2 1 0

11. The Spirit materials help me: (Mark all that apply).
    _____ Provide opportunities for students to learn about their environment.
    _____ Provide interesting supplemental activities for my students.
    _____ Provide students with opportunities to learn about Oklahoma ecosystems.
    _____ Meet science requirements.
    _____ Meet social studies requirements.
    _____ Meet language arts requirements.
    _____ Meet math requirements.
    _____ Other (specify):_____.

12. My goals for use of the Spirit materials with my students are: (Mark all that apply.)
    _____ To help students acquire an appreciation of their environment.
    _____ To help students acquire a greater understanding of the environment
    _____ To provide students with increased knowledge and skills.
    _____ To foster in students an understanding of environmental relationships.
    _____ To prepare students to make responsible environmental decisions.
    _____ To help students acquire greater understanding of their environmental role.
    _____ Other (specify):_____.

13. As a result of instruction using Spirit materials, my students have increased their understanding of the following: (Mark all that apply.)
    _____ The necessary components of healthy ecosystems.
    _____ The overall importance of wildlife and their habitats.
    _____ The diversity and composition of ecosystems found in Oklahoma.
    _____ How people can affect the environment.
    _____ The varying perspectives from which people view environmental issues.
    _____ The importance of responsible decision-making concerning the environment
    _____ Other (specify):_____.

14. As a result of their experience with the Spirit materials, what portion of your students have acquired: (Circle the number that best fits your response.)

	ALL				NONE
Greater awareness of the environment	4	3	2	1	0
Knowledge	4	3	2	1	0
Inquiry Skills	4	3	2	1	0
Social Skills	4	3	2	1	0

15. Did the Spirit materials help you meet your teaching goals?

_____ YES ----> To what extent? (Circle the number that best fits your response.)

Very Helpful- +3 +2 +1 0

_____ NO----> Why not? (Mark all that apply.)
_____ The materials were too difficult for my students.
_____ The materials were too easy for my students.
_____ The students did not find the materials interesting.
_____ Other (specify): _____.

16. After attending the Spirit workshop, to what extent has the amount of time you spend teaching about environmental issues changed?

Greatly increased- +3 +2 +1 0 -1 -2 -3 -Greatly decreased

17. My plans for continued use of the Spirit material are:
_____ I will use all the materials as an integral part of my teaching.
_____ I will use some of the materials.
_____ I will use a few of the materials.
_____ I have no plans to use the materials in the future.
_____ After using the Spirit materials, I prefer other materials on this subject.
_____ I would use the materials if I could, but I will not be in a situation where use is possible.

18. Suggestions for improvement or comments concerning Spirit materials or workshop?

_____

_____

_____

_____

PLEASE PLACE THE COMPLETED SURVEY IN THE ENVELOPE PROVIDED AND MAIL.
THANKS AGAIN FOR YOUR PARTICIPATION!

APPENDIX C

TEXT OF THANK YOU/REMINDER CARD

HI! JUST A NOTE TO THANK YOU AGAIN FOR CONTRIBUTING YOUR VALUABLE TIME BY PARTICIPATING IN THE SURVEY OF THE SPIRIT MATERIALS.

IF YOU HAVE NOT YET RETURNED THE SURVEY, IT IS NOT TOO LATE TO DO SO. PLEASE COMPLETE THE SURVEY ASAP AND RETURN IN THE ENVELOPE PROVIDED.

YOUR ASSISTANCE WITH THIS PROJECT IS SINCERELY APPRECIATED!

APPENDIX D

RESEARCH HYPOTHESES

APPENDIX E

CHI SQUARE CONTINGENCY TABLES

CONTINGENCY TABLES FOR RESEARCH HYPOTHESES

$H_0$1 - Job Description

	Classroom Teachers	Others	
Users	21	17	38
Nonusers	14	2	16
	35	19	54

$X^2 = 5.05$ df = 1 $p < .05$

$H_0$2 - Teaching Experience

	0 to 3 years	4 to 6 years	7 to 9 years	10+ years	
Users	5	4	6	23	38
Nonusers	3	5	2	6	16
	8	9	8	29	54

$X^2 = 4.936$ df = 3 $p > .05$

$H_0$3 - Grade Level of Respondents

	Elementary Only	Other	
Users	18	18	36
Nonusers	11	4	15
	19	22	51

$X^2 = 2.36$ df = 1 $p > .05$

$H_0$4 - Subject Area of Respondents

	Elementary Self-Contained	Science	Other	
Users	9	15	11	35
Nonusers	6	5	2	13
	15	20	13	48

$X^2 = 2.10$ df = 2 $p > .05$

$H_0$5 - Length of Workshop

	Staff Development	Oklahoma State	
Users	14	24	38
Nonusers	10	6	16
	24	30	54

$X^2 = 2.7$ df = 1 $p > .05$

$H_0$6 - Amount of Time Respondents Have Had Materials

	Less than a year	1 to 2 years	More than 2 years	
Users	18	16	4	38
Nonusers	12	2	2	16
	30	18	6	54

$X^2 = 4.57$ df = 2 $p > .05$

APPENDIX F

INSTITUTIONAL REVIEW BOARD

APPROVAL FORM

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
HUMAN SUBJECTS REVIEW

Date: 05-02-97 **IRB#: GU-97-006**

Proposal Title: AN ASSESSMENT OF THE SPIRIT OF THE LAST GREAT PLACES CURRICULUM SUPPLEMENT

Principal Investigator(s): Ted Mills, Vicki Carpenter

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

ALL APPROVALS MAY BE SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD AT NEXT MEETING, AS WELL AS ARE SUBJECT TO MONITORING AT ANY TIME DURING THE APPROVAL PERIOD.
APPROVAL STATUS PERIOD VALID FOR DATA COLLECTION FOR A ONE CALENDAR YEAR PERIOD AFTER WHICH A CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE SUBMITTED FOR BOARD APPROVAL.
ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR APPROVAL.

Comments, Modifications/Conditions for Approval or Disapproval are as follows:

Signature: _____ Date: May 5, 1997

Chair of Institutional Review Board

cc: Vicki Carpenter

VITA

Vicki Irene Carpenter

Candidate for the Degree of

Master of Science

Thesis: AN ASSESSMENT OF THE SPIRIT OF THE LAST GREAT PLACES CURRICULUM SUPPLEMENT

Major Field: Environmental Science

Biographical:

Personal Data: Born in Mangum, Oklahoma, in September 4, 1949, the daughter of Calvin D. and Wenonah Harris.

Education: Graduated from East Central High School, Tulsa, Oklahoma in May 1967, received Bachelor of Science degree in Elementary Education from Oklahoma State University, Stillwater, Oklahoma in May 1971. Completed the requirements for the Master of Science degree with a major in Environmental Science in July 1997.

Experience: Employed by the Oklahoma State Department of Vocational and Technical Education as secretary from January 1970 to September 1972; as classroom teacher for the Broken Arrow Public Schools from September 1972 to May 1975; as secretary for the University of Michigan Hospital from September 1976 to May 1977; and as classroom teacher for the Tulsa Public Schools from September 1980 to May 1985.

Professional Memberships: The North American Association for Environmental Education, the Oklahoma Association for Environmental Education and Phi Delta Kappa.