THE USE OF RECREATIONAL ACTIVITIES TO TEACH ENVIRONMENTAL CONCEPTS TO FAMILY CAMPERS

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CHAPTER I

A GENERAL STATEMENT OF THE PROBLEM

Introduction

In today's highly technological society man has an abundance of leisure time. More and more he has a tendency to want to "get away from it all." In an attempt to escape the artificiality of urbanization, many people have turned to the outdoors. The sheer enjoyment of the environment for its own sake is a major source of satisfaction to many people. Aesthetic appreciation is as well applied to natural beauty as it is to art and music. Yet today, America is in the midst of a surge of activity to save the environment and educate the people to care for the environment (Carlson, 1970).

How then is it possible to create the proper environmental awareness in the general public? Or more appropriately, how does one educate people in the use of the outdoors. The recreational trend of the American family offers a possible solution. Since the late 1940's the concept of family travel and camping has been growing at a phenomenal rate (Carlson, 1959). Where is there a better place to teach outdoor education than in a national forest? Why not

utilize this setting for public awareness in environmental education?

During the summer of 1977, the Department of Education at Oklahoma State University in conjunction with the United States Forest Service, conducted a pilot project at Cedar Lake Campground in the Ouachita National Forest in southeastern Oklahoma. The purpose of the project was to determine the feasibility of offering an environmental education program to family campers through recreation. This investigation, an extension of that pilot study, seeks to determine if cognitive environmental concepts can be taught through the use of recreational activities and if there is a difference in affective attitudes among the various camper categories.

Outdoor Recreation and Environmental Attitudes

It is possible to teach facts, but it is important to realize that the development of attitudes, particularly those relating to the natural world, are dependent on many factors (Barnhart, 1973). Appreciation of the natural environment often is developed through participation in outdoor recreational activities. The quality of the environment in which recreational activity takes place is directly related to formation of attitudes (Donaldson, 1972).

According to Barnhart (1973), outdoor recreation reacquaints and reunites man with the natural world. It de-

velops within the individual a personal interest in quality of natural resources. This concern often grows beyond one of passive interest to one of highly motivated efforts toward protecting environmental quality. Outdoor experiences must be more than just looking and seeing; they must involve the learner in an exploration of the relationships of living things to each other and to their environment. The learners own place in the universal scheme must be included (Carlson, 1970).

Assuming the theories of Barnhart, Donaldson, and Carlson are correct, then the use of recreation as a vehicle to teach environmental concepts should be an appropriate undertaking.

Family Camping in Public Areas

The growth of outdoor recreation has created a need for the education of the users of such areas -- campers, fishermen, boaters -- in learning how to protect the environment as they use it. It is imperative that this education integrate intellectual, physical, and spiritual capacities if it is to have productive results (Smith, 1972).

Outdoor education is no longer considered as an aspect of institutional education, but rather as a lifelong process involving all age levels and segments of society. With this consideration, family camping offers a unique opportunity for the educator. Of the many institutions and forces that

shade an individual, the family unit is the most prominent (Hutchins, 1970).

In the past, the public school was considered the basic education agency of America. Outdoor education is too big to be confined to just the public school. It should be an integrated effort of the various local, federal and state agencies to present a comprehensive and worthwhile program. Cooperation, coordination and the free exchange of opinion among the many groups interested in environmental improvement are essential (Carlson, 1970). It would be foolish and wasteful not to use the land and waters held by governmental agencies for educational purposes (Smith, 1972).

Justification of the Study

Limited research has been done in outdoor education and what has been done fails to fit the needs of today's society. During the last decade there has been mounting concern over the state of the environment. This concern is long overdue. Educational programs have a responsibility to increase the intensity of this concern and to help channel it toward meaningful goals (Jeske, 1973). It is the responsibility of the educational programs to sustain this interest until many of the problems can be solved. "Outdoor education may well be the means of man's very survival on the planet earth." (Carlson, 1971, p. 7). Research is badly needed in these areas: (1) the philosophical basis of outdoor education stressing the major shifts that have taken

place throughout the course of development and, (2) studies which clearly distinguish between cognitive and affective domains (Donaldson, 1972). The pilot project conducted at Cedar Lake and the subsequent study suggest a possible method of achieving objective number two.

Limitation of the Study

This study has investigated a specific application of the theory that active participation in recreational activities could be used to teach cognitive environmental concepts. It has also investigated a comparison of environmental attitudes between various camper categories. There was no attempt to investigate the associated motivational aspects.

The campground from which the control and experimental groups were selected was a small campground of approximately ninety campsites surrounding a ninety-five acre lake. There was a daily fee assessed on the use of the campsites and no electrical hook-ups were available. All water activities were limited to swimming, sailing, or fishing. No power boats or water skiing were allowed. Over ninety per cent of the participants were from a radius of two hundred and fifty miles from the campground. Because of these constraints, the study may not be generalized beyond that population.

Terms Defined

1. Cognitive Environmental Concepts. Cognitive environmental concepts refers to those factual concepts which, in general, are held to be true and important in the realm of environmental education.

2. Environmental Attitudes. Environmental attitudes are those which are associated with the environment by emotional feelings as opposed to factual information.

3. Outdoor Education. Outdoor education refers to the concept that man's relationship with nature should be in a conservation ethic only.

4. Outdoor Environmental Education. Outdoor environmental education refers to the concept that man's relationship with nature should be based on the sum total of the factors that act on living things.

5. Natural Arts Program. A two hour program utilizing the making of decorative accessories from natural materials to teach cognitive environmental concepts.

6. Reptile Program. A two hour entertaining lecture-demonstration program designed to teach cognitive environmental concepts associated with reptiles.

7. Night Walk Program. A two hour program consisting of an informative hike during darkness designed to teach cognitive environmental concepts associated with nocturnal life.

8. Wind is a Natural Program. A two hour program utilizing the recreational activity of sailing to teach cognitive environmental concepts about the wind and water.

9. Energy Program. A two hour program utilizing the building of energy saving solar devices to teach cognitive environmental concepts about energy.

10. Spice of Life Program. A two hour hike during the daylight hours designed to teach the cognitive environmental concepts associated with the relationship among soil, climate and vegetation.

11. Cognitive Performance Test. There were five different cognitive performance tests. Each was associated with a particular program. They consisted of five multiple-choice items, with each item associated with a particular concept taught during the program.

12. Environmental Attitude Questionnaire. A questionnaire consisting of nine paired statements. Each pair consisted of a cognitive statement and an affective statement, both of which were true.

CHAPTER II

REVIEW OF LITERATURE AND HISTORICAL BACKGROUND

This chapter is a review of selected literature related to the historical development of the outdoor education movement and the philosophical changes that accompanied the movement.

Historical Background

The idea of outdoor education is not new. The human race has used this method to pass on cultural developments long before the advent of professional education. In this context, the idea of outdoor education had its beginning when learning by direct experience accompanied by personal instruction was the customary method of passing on attained knowledge to the next generation. The effectiveness of this form of education would be hard to critize, inasmuch as it must have been successful because the evolution of societies as we know them today came from these rudimentary beginnings.

Historically, the most progressive nations have been those whose educational practices were reasonably balanced between textbook learning and direct experiences which con-

sisted of observation and investigation of nature and real life situations. (Freeberg, 1961).

Prehistory and Early Civilization

Life and education must have been one and the same for early man, yet he represents a very important facet of outdoor education -- the emphasis on direct and real life experiences. Although the cultures at this time could not have had the ability to understand and control their environment, man was endowed with a brain and continued to develop (Butts, 1955).

The beginning of the so-called "text book education" with formal instruction by a teacher is usually credited to the Egyptians. But even at that time words of warning were voiced by the scholars when they expressed the sentiment that this new found knowledge was only an aid to education and not a replacement (Sharp, 1947).

Western Civilization

In Western cultures the individual was turning his mind outward to his environment and to nature. Probably the culture which best represents the concept of outdoor education of this era is the Greek. To them, the purpose of education was to develop the individual and help him to make his place in society. The method of education was not rote memory and imitation, but observation and investigation. The major philosophers of the period amassed a tremendous amount of

experience and knowledge because of their strong belief in observation, inquiry, critical thinking, and analysis of nature and life about them (Cass, 1974).

The Dark Ages

Little, if anything, that was positive about education occurred during this period. The Romans took what the Greeks had developed but failed to recognize the value of observation, inquiry, investigation and critical thinking. The tremendous progress civilizations had made for centuries almost came to an abrupt end. Education was primarily concerned with preparation for life in the next world and was almost directly opposite to what is recommended in outdoor educational methods (Freeberg, 1961).

Renaissance and Reformation

During the Renaissance the outdoor education movement did not have much recognition. The Reformation period overlapped the Renaissance period in both time and accomplishment as it was part of the general intellectual awakening throughout Europe. The change was slow and did not gain momentum until sometime during the seventeenth century. This is the period of time when our whole modern scientific world concept started as an intellectual and rational contradiction of previous religious, mythological and prophetical world conceptions based on irrational and metaphysical

bases, and which primarily had an emotional approach of belief as the main assertion of truth (Harms, 1953).

The seventeenth century became known as the Age of Science and the educational philosophers of the era laid the groundwork for the outdoor education movement of the future. This group felt that learning should return to the experiencing mode of education. It was during this period that the term "useful knowledge" became extremely influential (Cass, 1974). According to Freeberg and Taylor (1961) this was also the period where the concept that education is related to life and that learning is best accomplished by direct experience was introduced. The idea was that studying from a textbook filled the child's mind with hazy ideas and meaningless words, whereas teaching through observation and direct experience gave him clear ideas, greater knowledge, and more natural experience in oral expression. Also, as Brumbaugh (1963) relates, there was an emphasis on the importance of play in education, the importance of interest in learning, and the idea that the child must learn, and develop, and grow from within.

1750 - 1860

The development of the outdoor education movement during this period can be closely tied to the development of the United States itself. The way of life was being drastically changed by the onset of the industrial revolution. While the frontier was expanding westward, the east was be-

coming urbanized and many people lived their entire lives within the confines of these areas, but the artificial method of living produced by this urbanization was against the inherent ideals of the American way of life. The frontier tradition and the challenge of the wilderness were underlying traits left from the first Pilgrims who landed in New England. And as Sharp (1947, p. 16) states, " . . . it is only natural perhaps, that organized camping as a method of youth education should have been conceived and born and grown into maturity in America."

In all probability, outdoor education would not have developed to the extent that it has today without meeting some special need. Along with the developments of the industrial revolution in social life, the education process was undergoing a transformation. With education established as a responsibility and necessity of our democratic nation, the trend in educational instruction was now to move away from the smaller one-room schools to larger classes and more subjects. Agencies were developing to aid the youth of the period in the use of their leisure time, an area traditionally left to the family (Gibson, 1936).

1861 - 1910

As Sharp (1947) pointed out, the outdoor education movement in the United States began as organized camping. There is some controversy among authors as to who was the first person to establish a certified camp. Freeberg (1961)

and Miller (1936) attribute the first camp to Ernest Balch in 1870, but it is quite evident, as Gibson (1936) points out, that the first camp established was by Frederick William Gunn and his wife Abigail in 1861 at Washington, Connecticut. The most probable explanation for this discrepancy, according to Freeberg (1961) is that Balch is the recognized founder of the outdoor education movement and through his efforts and writings the movement began to spread rapidly.

The organized camping movement in America followed two general lines of development during the first 50 years. First there were the private camps which catered to the upper income levels and the organizational camps which were designed to provide outdoor experience for the lower income children. Both of these tended to exclude the vast majority of the American youth, that of the middle income family (Sharp, 1947).

Private Camps

During the period of 1861 to 1910 there was a plethora of private camps established, some of which ran only a very few years. A chronological listing of these camps with discussion of their philosophies would be beyond the scope of this thesis. The major contribution that these camps made to the outdoor education movement is that they were the first to consider the argument that a latent need in our society was being forgotten, that of realism and naturalism,

and that an outdoor experience could satisfy that need. These first private camps, although established primarily for the purpose of making a profit, did have a basic philosophy: that of getting back to the simple life; teaching the participants the value of good citizenship, good morals, simplicity of living, love of nature and God,; and enhancing their ability in physical activity.

The private camp still exists today, but it has in many cases strayed from the basic principles on which it was established. In many cases it is run entirely on the premise that its function is to give the participants two weeks of fun and allow the parents that same period of time to be without the responsibilities of caring for the children.

Institutional Camps

In the summer of 1885, Sumner F. Dudley gathered seven boys who belonged to the Newburgh, New York, Y.M.C.A., and took them for a camping trip to Pine Point on Orange Lake, about six miles from Newburgh. From this tiny beginning sprang a camping movement that evolved into a multitude of organizations offering camping experiences to thousands of children each year. Included in these are Boy Scouts, Girl Scouts, Camp Fire Girls, Boys Club of America, and many others.

Through institutes, conferences, and seminars, the philosophy of institutional camps evolved into a movement which called for individualization of counseling and guid-

ance when dealing with the boys and girls. The old traditional type of camping with its awards and honor system was replaced by stimulation for self-improvement, personality enrichment, and individual achievement. Field work and research projects involving life situation studies, were developed by the use of the camps as laboratories. Probably the greatest contribution that organized camps made was to establish standards and develop camping to a fine art (Gibson, 1936).

1910 - 1930: School Camps

The first school camp was established in 1912 when the Board of Education in Dubuque, Iowa cooperated with the visiting nurse association in establishing a summer camp for malnourished children. This was followed by the Temple University Project in 1917, Chicago Public Schools Camp for Normal Boys in 1919, the Irvington Health Camp in 1925 (partially supported by the Board of Education, Irvington, New Jersey), and the Clear Creek Camp of Los Angeles Public School System in 1925.

Although separate in control and support, all of these camps shared a basic philosophy. Mainly, that the camping atmosphere had contained in it values for expanding and improving educational aspects along with the skills of camping and health, growth of character, leadership and the development of patriotic leadership.

By this time progressive educators were well aware of the educational aspects of camping. To them camping furnished an environment in which certain things could be taught better than in city schools. It was an environment to supplement the yearly school program. And although educators at that time were not completely ready to sponsor the camping idea, they were ready to support it in principle. Looking back over camping history one can note that education was as much a part of the camping program as was recreation (Mitchell, 1938).

1930's

Hammerman (1963) calls the 30's the "Period of Inception", when schools were broadening their views and camping education was being considered as ideal for expanding school functions. According to Miller (1936) the educational philosophy influencing this expansion was that bookish education was being questioned as sufficient by itself. It was being proposed that real life should become the workshop of the classroom. Camping, with its variety of activities, would afford closer coordination between the work of the school and its purpose. Thus, a child attending a camp would be aided in thinking and planning for himself.

The reason for the expansion of the movement during this period is primarily based on three changes: (1) urbanization of the American family, (2) changes in social and environmental conditions, and (3) the relegation of authori-

ty and responsibility formerly held by the family to schools and municipalities (Patty, 1938).

There was a growing tendency during this period to question why the public schools were not involved in the camping movement. There was the idea that to turn children loose in the summer for just idleness was not good for them (Patty, 1938) and that to herd them into crowded buildings in winter would leave a lot to be desired also (Mitchell, 1938). This tendency to involve the schools in the camping program at this time could be explained by the objectives of the programs in that they were educational and recreational in nature and seemed to fall within the realm of the school boards. This involvement would by necessity include a great mass of children.

Two important objectives underlay the philosophy of the camping program during this time. The first was that the camp would create within the child a sort of civic responsibility, strictly by the nature of the camp itself with all participants being involved in the running of it. The second was that through learning to live happily and loyally with others a socialization process would take place. Children would develop the ideals, the traits of character, and the intellectual appreciations that are essential for good democratic citizenship (Sharp, 1947).

In order to provide proper leadership and instruction in these summer camps, an improved leadership training program was needed. Teacher-training institutions had a re-

sponsibility for organizing a well-balanced program of professional training for those camp staff. It was the opinion of the day that school administrators should study the summer camp program with a view to determining the proper relationship that should develop between the school administration and the summer camp administrative staff (Patty, 1938).

1940's

This period can best be summarized as the period of transition of philosophical concepts. The country was flung into the throes of war and to many educators the ideals of democracy were not as prevalent in the minds of America's youth as they should be. To some the attitudes engendered in the minds of Nazi Germany youth was so much stronger than in America that any form of education which had a semblance of connection with democratic ideals was leaped upon as a solution. So it was that during the first portion of this decade camping education was looked on as a solution to the teaching of democracy.

An excellent example of this philosophy is that of Bode (1942), who related democratic loyalty and camping education with the current educational thought. The philosophy of learning being proposed during that time was that learning is a process of effecting changes in the experiences of the students so as to make them more effective for guidance. This seemed to be directly aimed at the education received

in the camping atmosphere. Camping experiences would have a direct educational significance in so far as they build up the reactions which are necessary if the student is to see and hear and feel in a certain way. In explanation, reading a book will not of itself give one a sense of beauty or comradeship or social responsibility. These things must be lived to become realized.

Although the idea of learning democracy in camping situations continued to persist throughout this era it did not dominate the entire scene as in the beginning. Subsequently, the philosophy of first hand experience began to surface. In the out of doors, the child can be in contact with the very things about which he reads and talks. According to the psychologists of the day it was impossible to convey the meanings of many concepts to children except by actual experience. It seemed as though the camping situation was "tailor made" for these experiences (Partridge, 1943).

The philosophy of the latter portion of the 1940's is well represented by the Kellogg Foundation experiment in cooperation with the Battle Creek Schools under the direction of George Donaldson, the Life Camps experiment under the direction of L. B. Sharp, the San Diego City-County Experiment, and the George Peabody College Experiment. The results were categorized into two areas. The first, was labeled as "tangible" and included such areas as knowledge of nature, how to prepare food, safety, and camp crafts.

The second area was labeled as "intangible" and included such ideas as cooperation, knowing each other better, knowing other people, independence, and better social adjustment. The evaluation was strictly subjective, but from the observation of the experimenters it was inferred that the objectives of the programs had been met. The counselors, children, and parents were convinced that these phases of education could not have been accomplished so well in the classroom as they were in camp (DeWitt, 1949).

1950's

With school camping now firmly entrenched in the school curriculum, many felt that the era of the fifties could be called the period of standardization. But it is also interesting to note that an extremely important evolution of philosophy occurred during this time. Beginning as a continuation of the 1940's, of course, a great deal of concern was still with health, recreation, and social adjustment (Donaldson, 1945 and Potter, 1961). Getting youngsters out-of-doors and teaching them self-reliance, how to think, work, and solve their own problems were prime objectives. Youngsters were beginning to make day-long trips, night hikes, weekend camps and seasonal camps throughout the country.

The idea that by living independent of the parents with peers and performing all of the social services of the camps just as if they were a community would put democracy to work at the level of the child.

Additional tasks of the camps were now beginning to emphasize the concept of conservation. Each of the students was involved in long range projects such as seedling planting and soil erosion control. There was no attempt to apply classroom techniques to the outdoor experience. It was felt that many things could be taught here that were not taught in the classroom which were necessary for social adjustment and the physical well-being of growing children. Recreation was not of prime importance but it was observed that recreation did motivate the camp and provide a meeting place for recreation and education (Donaldson, 1945 and Potter, 1961).

Harms (1953) on discussing the Broadview Farm Camp, was one of the first to observe the effect of scientific development of mankind during this century. It was so enormous that one could not grasp it all and man's relationship to nature was being affected by this explosion.

Man's world was being changed by the knowledge explosion, and his relationship with the scientific world was encumbered by his lack of understanding of it. This was concluded when young people of the age of twenty-five who had successfully completed high school but who were not scientifically oriented were tested and it was found that only one out of ten could remember simple scientific facts.

Broadway Farm Camp was not established for the purpose of scientific education; rather the three major objectives were to determine: (1) what specific knowledge of nature is most desired by what age levels, (2) what methods are best

for presenting this information, and (3) how security for youth can be achieved from such knowledge.

What was found was that instruction should be based on the general attitudes of the age group. The human youth is a child of nature and part of the basic need is to know about his environment in terms that are most natural. One prime factor associated with learning, they discovered, was that children should be kept active on a self-searching level during instruction.

Although this philosophy is concurrent with today's humanistic educational approach, the idea of self-realization did not catch on at this time. The philosophy of outdoor education was changing. The idea of democracy as the prime objective was being replaced partially by what can be termed as a conservation ethic.

Vivian (1953) relates that the objectives of outdoor education should be related primarily to nature study. Through learning the past history of the area in which the camp is situated and its relationship to agriculture and natural resources, the student would gather an understanding of nature.

The early fifties was also the time when outdoor education was being considered as a supplement to classroom education. There was an emerging concept that school camping should take education beyond the walls of the classroom and into the center of life. It was considered a rich laboratory for extension of learning into the open spaces

where mother nature had supplied a well-equipped classroom that preceded those of mortar and brick (Finnie, 1954).

Finnie further elaborates that by taking the traditional program outside into the open spaces it can be rejuvenated and can give more meaning to classroom subjects. Still, though, the idea of democratic living was stressed in that camping provides an ideal opportunity for practicing it. And the out-of-doors provides a physical environment for a better understanding of the wise use of natural resources.

As the era progressed, the slant on outdoor education took a different direction. There was nothing abrupt, yet a transition of a very gradual nature was occurring. Year by year the concept of relating outdoor education with general education was changing. No longer was the prime objective democracy, but rather that the use of democracy learned in the outdoor setting would enhance other portions of the program.

At the Cortland State Teachers College camp for thirty-four 7th and 8th graders the goal of the camping program was to learn by doing, to let it come naturally (Holiber, 1954). It was believed that at camp the learners had a situation very similar to real life, where decisions about each situation must be made independently. Furthermore, by integrating the factors of getting along with one another and appreciation for others' points of view, tolerance and respect for another persons rights were stressed. It was also

felt that through utilization of the natural setting, the staff had a perfect opportunity to stimulate the children toward nature.

Apparent now is that the philosophy has expanded to encompass all subject areas and not to restrict itself to any single discipline. The emphasis is still on camping, yet in many instances the authors are advocating just the use of outdoor settings to enhance education.

Smith (1955) supported the concept that man's relationship to his physical world is a fundamental factor of life and that this relationship could best be enhanced through an appreciation of the outdoors. In his analysis of school curricula much learning considered essential could be achieved through outdoor education, particularly that which was encompassed by what he termed "general goals of education" such as self-realization, human relationships, worthy use of leisure time and ethical character.

Until now the concept of outdoor education, by major contributors, had a rather rigorous influence on the participants. In the mid-fifties a novel idea began to emerge, that of motivation through enjoyment. Berka (1956) deplores the traditional approach of recitation in the schools' nature programs and proposes that the use of all the senses will not only enhance the program but at the same time stimulate the students to learn. Appealing to the curiosity of the students through their senses would being about enjoyment.

By 1957 the concept of conservation was becoming prominent in all areas of outdoor education literature. The definition of conservation at that time differed a great deal from the accepted concept of today, but the basic principle is still justified. Boyd (1957) analyzed the concepts of conservation in the light of what problems the children of that generation would be facing in the future. The one new idea beginning to make itself known was that a mounting birth rate was producing many new demands: a greatly increased demand for food supply, clothing, shelter and adequate education. Thus, shortages of the future should be considered in the curriculum and emphasis should be placed on educating the children to live in an increasingly crowded land. One vital lesson to be learned is that one should conserve as well as possible the natural resources of the country. Thus the thought of the day may be interpreted that conservation education was mainly the saving of natural resources for future generations so that there would be an adequate supply.

Although October 4, 1957, to many educators, is a day of infamy in the history of educational philosophy, the apparent effect of sputnik and the ensuing subject-centered, content-oriented curriculum did not immediately cause concern in the outdoor education movement. It continued to become more and more oriented toward conservation and the wise use of natural resources.

A novel idea of family camping (Monroney 1957, Taylor 1957, and Kessel 1960) was developed during this time. The general idea was that the camps would be based on informality with voluntary participation in activities. Evaluation was limited to assessing the feelings of the participants after involvement with the camps. In all there were significant commendations toward a greater appreciation of the natural world and a better understanding of attitudes between parents and children, and through the relaxed atmosphere a new meaning was given to areas of study.

The year 1959 was a prominent pivotal year in outdoor education. An assessment of the 1950's to 1959 would reveal that the outdoor education philosophy had evolved from the use of camping experience to instill democratic ideas in the youth through self-realization into a conservation education movement or more precisely the wise use of natural resources. And, as related, a beginning of asthetic values was being incorporated. The total cause for this transition is extremely complex and varied, yet as Carlson (1959) explains, there is one major influence that must be considered. The growth of the family camping experience was quite explosive. In 1957 alone there was a 16 per cent increase in state park use over the previous years. He attributes this increase to five major factors: (1) a new damand for outdoor living; a seeking of pleasurable experiences; (2) increased leisure, higher income, greater mobility, (3) the use of camping to do things as a family, (4) reliving some

of the experiences of their ancestors, and (5) a means of having extended vacations which would not be affordable otherwise.

The year 1959 also brought with it a decisive blow that was to have an impact for years to come. The subject-centered curriculum was now in the forefront and completely dominated the outdoor education movement. To proponents of outdoor education the only way to justify it was through subject matter. An example of the trend is shown in Slesnick's (1959) article "Camping with Accent on Science." In introducing the article he acknowledges that outdoor education had grown to be accepted by American schools, but it was time that the major responsibility of organization of the program be given to the science teachers. In order for the students to gain an appreciation and respect for nature, a body of specific disciplines should first be introduced to the student. Conservation was thus to be taught inductively with six specific disciplines -- entomology, botany, vertebrate zoology, ornithology, geology and astronomy -- which provided the material for concepts for the formation of conservation generalization. Thus the specialist would inspire the group with knowledge and spirit of and reverance for details in the design of nature.

Even proponents of aesthetic values in outdoor education felt compelled to justify their position with subject centered concepts. Browning (1959) explained that in gaining satisfaction from a creative experience a camper must

first identify himself with the subject matter. Creativity should require testing to prove its worth so that the good may be selected from the bad.

1960's

As would be expected, the early 60's continued the trend of the late 50's. If any subtle change is perceivable it is that a more subject-centered approach was expanded to different areas, as exemplified by Roossinck (1960) when she advanced the proposition that arithmetic learning could be enhanced through the use of the outdoors. Through the students' quantitative relationship with the environment a student would be able to define and analyze problems and develop a respect for the orderliness of the environment. In addition the student would be able to demonstrate quantitative concepts through practical applications that had been derived from direct experience.

Beker (1960) also extended the philosophy to the elementary science program. In his opinion the outdoor situation is extremely favorable for the learning of "facts" more easily. The environment would provide the laboratory and the teacher's function would be that of interpreter so that learning is more than observation.

The overall philosophy of the early 1960's might well be best represented by Freeberg (1961). Outdoor education was seen by Freebert as a method of education. The use of the outdoors was best suited for the interpretation of the

subject matter areas normally found in the school curriculum. It was his opinion that outdoor education would not be restricted to any one area. In utilizing the out-of-doors the teacher could provide learning experiences which were closely related to library materials, textbooks and classroom lessons. The basis for outdoor education was that it utilizes the best technique for gaining knowledge. Textbooks must be supplemented and complemented by adequate experience. He explained by saying that when students experience directly what they study in the textbooks, they have a better understanding of the material.

As one looks through the articles of this period, the same theme prevails. Outdoor education is an excellent supplement to the subject-centered school curriculum. Strobbe (1962) cites that studies have revealed that the utilization of natural resources to supplement the textbooks tends to motivate the interest of the students.

It is of interest to note that in 1962 a book was published that contained within it a theme which had not been previously explored. The book, Silent Spring, by Rachel Carson (1962) dealt with the effect of the pesticide DDT on the natural environment. The subject matter had been common knowledge in the scientific world, but this was the first non-scientific publication. The effect of the book was quite profound in the developments of the attitudes of the American public. Although it cannot be proven that the release of this book and the subsequent deluge of contempo-

rary articles had an immediate effect on the philosophy of outdoor education, it is quite obvious that a new dimension became apparent in the articles.

Hammerman (1963) was one of the first to begin to criticize the tendency of school programs to utilize the outdoor programs as highly organized and standardized. The complementary aspect of outdoor education and the school curriculum should not be structured like a classroom, but rather it should retain its individuality and make its contribution through the use of it as an entity by itself.

In the 1960's the ebb of subject-centered curriculum for outdoor education began to fade. The traditional concept of conservation was being replaced by what would be termed "outdoor environmental education." The emphasis was on the concept that man's relationship with nature should be based on the sum total of the factors that act on living things. This shift is exemplified by Brainerd (1964) when he stressed that the greatest problem of modern times is the rate at which man is altering his natural environment. He felt that the concept which placed man as an integral part of nature and not a ruler could best be taught in the outdoor classroom. The ways in which this concept could be taught should not be limited to just the science courses. The outdoors should also be used as a laboratory.

The idea of discovery learning, which has been proposed in the late 1950's was being reintroduced. As Blackwood (1966, p. 18) states, "the great value of the discovery

approach is that pupils have real experience in using the methods of scientists." Through discovery the students have the opportunity to develop their inquisitive powers which will remain with them long after specific facts have been forgotten.

Blough (1966) reinforces this theory of discovery. He believed that the best way to help students understand the methods of the sciences was to have them use those methods in the process of inquiry and problem solving. Doing so would broaden their appreciation for the scientific environment.

Another new concept was also beginning to appear. Busch (1966) was one of the first to theorize that the many problems that were beginning to surface, that were related to the environment, could be reckoned with in the outdoors. The growing awareness of pollution, overpopulation, destruction of natural beauty and run-away technology was that these problems needed to be dealt with. Busch was not explicit in how to handle these problems, yet felt that the outdoors was a better place in which to receive a more proper perspective.

The 1960's continued in the concern and eventually all but obliterated the subject-centered supplemental role to which outdoor education had been relegated in the earlier part of the decade. Donaldson (1972) summarizes it best when he states,

> . . . outdoor education is recovering from the academic panic it, like education in general, suffered in the 1950s and which spilled over into the 1960s. Until Sputnik, outdoor education was developing in a healthy balanced fashion. Once again outdoor education will be education in and for the outdoors (p. 27).

1970's

Donaldson (1972) characterizes the 1970's as "a decade bright with promise" in the field of outdoor education. There was a qualitative and quantitative growth in the 1960's urged on by a powerful movement of increased ecological awareness. Every section of the country had become involved, from inner city youth to rural America.

Smith (1972) observes that not only had outdoor education expanded beyond the sixth grade excursions but also it had made inroads into community education. It is not only a matter of education in the facts of conservation, but the outdoor classroom can also be considered an important force in creating desired behavioral changes essential to quality living.

It is only natural then that the concept of outdoor environmental education should be extended to the adult world. Jeske (1973) points out that through the recent years a great deal of concern about the environment had developed. To Jeske this concern is long overdue, and one of the best methods to help focus that concern, he feels, is through adult education programs. It has been shown that more than one in four American adults is active in some

form of educational endeavor. The courses offered should not be of the vocational training type, but rather they should encompass experience that could relate to the lay people and help them to recognize their individual responsibility for maintaining and improving the environment.

It was during the early part of this decade, that once again the idea of leisure and recreation was brought to bear on outdoor education. Rogers Morton (1973), Secretary of Interior, reflects that because of the affluence of modern man the quality of leisure must be improved. The outdoor recreation areas have become overcrowded. In his opinion a comprehensive land use policy must be developed to protect the environment, and at the same time to create recreational areas for the public to use.

This national trend of environmental concern was taking an impact on the concept of outdoor education in public schools. No longer was it possible for the school just to teach environmental relationships; the lesson was also applied to the present problems of society. Qutub (1973) interprets the teaching of outdoor education in the context that interesting activities could be built around solid waste recycling and resource recovery.

Others, such as Genge and Santosuosso (1974) even proposed that part of the outdoor curriculum could be built around values clarification relating to the environmental

concerns facing the world today. Through this process the student could attain a more thorough understanding of the ecological world.

It appears then, that the philosophy of outdoor education has taken the road to social involvement. No longer is it restricted to just the moral, democratic, citizenship, scientific aspects, but rather the complete phenomenal of complexities that face a technological society (Welisch, 1974). He further explains that although the role of education is small it is of prime importance. The stressing of the interrelationships within the environment and the inevitability of change in nature is a vital factor in the teaching of "environmental ecological education." Though there is much more to be accomplished, he feels that a start has been made. The environmental crisis cannot be corrected by the schools alone for the problems are immediate and there is a specific need for education of the adult population, yet the effects of education through the schools will be slowly shown.

It is thus that one finds the current philosophy of outdoor education. There is a great deal of stress placed on the education of the adult population for the problems are immediate (Emmelin, 1976). A public school curriculum has evolved that encompasses the interrelationship of man and nature and extends the concept to society as a whole (Donaldson, 1972). And while the term <u>conservation</u> is still prevalent in the literature, the concept behind it has com-

pletely changed from the hoarding nature (Odom, 1959), to one that is best expressed by Curry and Williams (1976, p. 508) when they stated that the concept of outdoor education is to ". . . develop in the young attitudes, tendencies and behaviors that embody environmental responsibility. This has become a fully accepted goal in American education -- and rightly so."

CHAPTER III

METHODOLOGY AND DESIGN

Introduction

The purpose of this study was to determine if the use of recreational activities offered on a volunteer basis to family campers could be used (1) to teach environmental concepts and (2) to determine if there were any differences in environmental attitudes when comparing age, occupation, mode of camping and camping experience.

Null Hypotheses

The null hypotheses tested are as follows:

1. There will be no significant differences in performance test scores between experimental and control groups in the Natural Arts Program.

2. There will be no significant difference in performance test scores between experimental and control groups in the Reptile Program.

3. There will be no significant difference in performance test scores between experimental and control groups in the Night Walk Program.

4. There will be no significant difference in performance test scores between experimental and control groups in the Wind is a Natural Program.

5. There will be no significant difference in performance test scores between experimental and control groups in the Energy Program.

6. There will be no significant difference in performance test scores between experimental and control groups in the Spice of Life Program.

7. There will be no correlation between environmental attitude and occupational groups.

8. There will be no correlation between environmental attitude and age groups.

9. There will be no correlation between the environmental attitude and modes of camping.

10. There will be no correlation between environmental attitude and levels of camping experience.

Independent Variable

The independent variables are referred to as the recreational activities offered on a volunteer basis to the campers at the Cedar Lake Campground. Each program was approximately two hours in length. All were recreation oriented and stressed the use of active participation by the subjects after a short introduction to the concepts of the program.

The programs had been previously prepared during the pilot study under the supervision of the program director. Prior to the research phase, the researcher and director refined each program's objectives to be consistent with the recreation orientation.

It was imperative that each program presentation was consistent, therefore; the instructors, all of whom had had some form of teaching experience, met twice prior to the program for pre-service workshops to acquaint them with the methodology of presentation. During the time of the experiment, there were weekly in-service meetings to refine the methodology, and the activities were continually monitored by the researcher and director to ensure consistent application of this methodology.

Testing Instruments

The dependent variable was a test score on one of six different 5-item, multiple choice tests with four possible answers per item. The tests were researcher prepared and related directly to specific objectives associated with cognitive environmental concepts presented in each program. Content validity was verified by the director of the program. There was no reliability established as the tests were designed to measure only mastery.

The affective questionnaire consisted of nine paired statements. One of the statements was cognitive and the other was affective, and each related to the same environ-

mental concept. After initial construction, content validity was verified by the director of the program. The paired statements were then jury validated to determine if each paired statement contained a cognitive and affective statement. The questionnaire was then revised and jury validated again to insure correctness.

Research Design

The subjects were those campers who participated in the program offered at the Cedar Lake Campground in southeastern Oklahoma during the weekends of May 26 to July 4, 1978. The weekends were randomly selected as control and experimental. As a result of the random selection, the first three weekends were control and the last three were experimental. From each activity, every fifth person age sixteen and over was selected to be a participant in either the control or experimental group.

On the weekends that were designated as control, the subjects were administered the instrument as a pre-test only and on the weekends that were designated experimental, the subjects were administered the instrument as post-test only. Any person who had attended a program before was excluded from the experiment.

Those subjects who were selected for the affective questionnaire were randomly selected from the control weekends as every fifth person above age sixteen beginning with the second person so as not to interfere with the cognitive

test. Experimental group testing was not done because program influence of affective attitudes was not a portion of the research design.

On each of the six weekends, identical programs were given and teachers were instructed not to vary in any portion of their presentation.

Statistical Analysis

For those activities whose N was less than 30 a t-test was used to analyze the difference between control and experimental group scores on the independent variable scores of the cognitive test. On those groups whose N was greater than 30 a Z score was tabulated.

For the affective questionnaire a Chi-square analysis was used to compare differences in attitudes between (1) age, (2) mode of camping, (3) camping experience and (4) occupations. It was researcher and director-determined that a score of 5 or greater on the affective questions constituted a positive environmental attitude.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

The presentation and analysis of data for this research will be reported as they relate to each of the hypotheses. In the testing of hypotheses it was assumed that differences were not statistically significant unless they were at or above the .05 level of confidence.

Hypothesis I

Hypothesis I: There will be no significant differences in performance test scores between experimental and control groups in the Natural Arts Program.

Tables I and II present the data for the experimental and control groups treated with the t-test technique. Interpretation of these results is as follows.

Table II indicates a t-test ration of 4.79 (df = 26) and a critical value of 3.707 (p = .001, df = 26). Therefore, with respect to the performance test, this hypothesis may be rejected at the .001 level of confidence, supporting the model proposed by this study that recreation may be used as a vehicle to teach environmental concepts.

TABLE I

PERFORMANCE TEST RESULTS FOR CONTROL AND EXPERIMENTAL GROUPS IN THE NATURAL ARTS AND CRAFTS PROGRAM

Subjects	$\bar{X}$	Sd	N
Control	1.9	1.52	15
Experimental	4.2	0.74	13

TABLE II

T-TEST RESULTS FOR CONTROL AND EXPERIMENTAL GROUPS IN THE NATURAL ARTS AND CRAFTS PROGRAM

df	$S_{D_{\bar{x}}}$	t-test ratio	p	Critical value
26	0.48	4.79	.001	3.707

Hypothesis II

Hypothesis II: There will be no significant difference in performance test scores between experimental and control groups in the Reptile program.

Tables III and IV present the data for the experimental and control groups treated with the Z-score technique. Interpretation of these results is as follows:

TABLE III

PERFORMANCE TEST RESULTS FOR CONTROL AND EXPERIMENTAL GROUPS IN THE REPTILE PROGRAM

Subjects	$\bar{X}$	Sd	N
Control	2.52	2.47	61
Experimental	4.72	0.32	50

TABLE IV

Z-SCORE RESULTS FOR CONTROL AND EXPERIMENTAL GROUPS IN THE REPTILE PROGRAM

$S_{D_{\bar{x}}}$	Z-score ratio	p	Critical value
0.35	6.29	.01	3.70

Table IV indicates a Z-score ratio of 6.29 and a critical value of 3.70. Therefore, with respect to the performance test, this hypothesis may be rejected at the .01 level of confidence giving an element of support to the model proposed by this study.

Hypothesis III

Hypothesis III: There will be no significant difference in performance test scores between experimental and control groups in the Night Walk Program.

Tables V and VI present the data for the experimental and control groups treated with the Z-score technique. Interpretation of these results is as follows.

TABLE V

PERFORMANCE TEST RESULTS FOR CONTROL AND EXPERIMENTAL GROUPS IN THE NIGHT WALK PROGRAM

Subjects	$\bar{X}$	Sd	N
Control	2.6	0.94	28
Experimental	4.5	0.60	38

TABLE VI

Z-SCORE RESULTS FOR CONTROL AND EXPERIMENTAL GROUPS IN THE NIGHT WALK PROGRAM

$S_{D_{\bar{x}}}$	Z-score ratio	p	Critical value
0.19	10.0	.01	3.70

Table VI indicates a Z-score ratio of 10.0 and a critical value of 3.70. Therefore, with respect to the performance test, this hypothesis may be rejected at the .01 level of confidence giving an element of support to the model proposed by this study.

Hypothesis IV

Hypothesis IV: There will be no significant difference in performance test scores between experimental and control groups in the Wind is a Natural Program.

Tables VII and VIII present the data for the experimental and control groups treated with the Z-score technique. Interpretation of these results is as follows.

TABLE VII

PERFORMANCE TEST RESULTS FOR CONTROL AND EXPERIMENTAL GROUPS IN THE WIND IS A NATURAL PROGRAM

Subjects	$\bar{X}$	Sd	N
Control	2.07	1.02	29
Experimental	4.40	0.72	42

TABLE VIII

Z SCORE RESULTS FOR CONTROL AND EXPERIMENTAL GROUPS IN THE WIND IS A NATURAL PROGRAM

$S_{\bar{D}_{\bar{x}}}$	Z-score ratio	p	Critical value
0.21	11.10	.01	3.70

Table VIII indicates a Z-score ratio of 11.10 and a critical value of 3.70. Therefore, with respect to the performance test, this hypothesis may be rejected at the .01 level of confidence giving an element of support to the model proposed by this study.

Hypothesis V

Hypothesis V: There will be no significant difference in performance test scores between experimental and control groups in the Energy Show Program.

Tables IX and X present the data for the experimental and control groups treated with the Z-score technique. Interpretation of these results is as follows:

Table X indicates a Z-score ratio of 9.03 and a critical value of 3.70. Therefore, with respect to the performance test, this hypothesis may be rejected at the .01 level

of confidence giving an element of support to the model proposed by this study.

TABLE IX

PERFORMANCE TEST RESULTS FOR CONTROL AND EXPERIMENTAL GROUPS IN THE ENERGY SHOW PROGRAM

Subjects	$\overline{X}$	Sd	N
Control	1.82	1.23	22
Experimental	4.44	0.85	32

TABLE X

Z-SCORE RESULTS FOR CONTROL AND EXPERIMENTAL GROUPS IN THE ENERGY PROGRAM

$S_{D_{\overline{x}}}$	Z-score ratio	p	Critical value
0.29	9.03	.01	3.70

Hypothesis VI

Hypothesis VI: There will be no significant difference in performance test scores between experimental and control groups in the Spice of Life Program.

Tables XI and XII present the data for experimental and control groups treated with the t-test technique. Interpretation of these results is as follows.

TABLE XI

PERFORMANCE TEST RESULTS FOR CONTROL AND EXPERIMENTAL GROUPS IN THE SPICE OF LIFE PROGRAM

Subjects	$\overline{X}$	Sd	N
Control	2.2	1.33	10
Experimental	4.4	0.47	8

TABLE XII

T-TEST RESULTS FOR CONTROL AND EXPERIMENTAL GROUPS IN THE SPICE OF LIFE PROGRAM

$S_{D_{\overline{x}}}$	t-test ratio	p	Critical value
0.55	4.00	.01	3.055

Table XII indicates a t-test ratio of 4.00 (df = 12) and a critical value of 3.055 (p = .01, df = 12). Therefore, with respect to the performance test, this hypothesis may be rejected at the .01 level of confidence giving an element of support to the model proposed by this study.

Hypothesis VII

Hypothesis VII: There will be no correlation between environmental attitude and occupational groups.

Table XIII presents the data for the Chi-square analysis of occupational and environmental attitude.

TABLE XIII

CHI-SQUARE ANALYSIS OF OCCUPATIONAL AND ENVIRONMENTAL ATTITUDE

variation	O	E	O - E	$(O - E)^2$	$\frac{(O - E)^2}{E}$
Professional Cognitive	14	13	1	1	.08
Blue Collar Cognitive	28	29.1	-1.1	1.21	.04
Homemaker Cognitive	9	8.9	0.1	.01	.001
Professional Affective	2	3	-1.0	1	.33
Blue Collar Affective	8	6.9	1.1	1.21	.18
Homamaker Affective	2	2.1	-0.1	.01	.005

TABLE XIII (Continued)

df	Chi-square ratio	p	Critical value
2	0.636	.05	5.99

Table XIII indicates a Chi-square value of 0.636 (df = 12) and a critical value of 5.99 (p = .05, df = 2). With respect to occupation and environmental attitude, this hypothesis may not be rejected at the .05 level of confidence.

Hypothesis VIII

Hypothesis VIII: There will be no correlation between environmental attitude and age groups.

Table XIV presents the data for the Chi-square analysis of age groups and environmental attitude.

Table XIV indicates a Chi-square value of 7.05 (df = 4) and a critical value of 9.49 (p = .05, df = 4). With respect to age groups and environmental attitude, this hypothesis may not be rejected at the .05 level of confidence.

TABLE XIV

CHI-SQUARE ANALYSIS OF AGE GROUPS AND ENVIRONMENTAL ATTITUDE

variation	O	E	O - E	$(O - E)^2$	$\frac{(O - E)^2}{E}$
Cognitive					
16 - 25	11	13	-2.0	4.0	.31
26 - 35	26	22.7	3.3	10.89	.48
36 - 45	10	12.1	-2.1	4.41	.36
46 - 55	3	2.4	.6	.36	.15
over 55	1	0.8	.2	.04	.05
Affective					
16 - 25	5	3.0	2.0	4.0	1.33
26 - 35	2	5.3	-3.3	10.89	2.05
36 - 45	5	2.9	2.1	4.41	1.52
46 - 55	0	.6	-0.6	.36	.60
over 55	0	.2	-0.2	.04	.20

df	Chi-square ratio	p	Critical value
4	7.05	.05	9.49

Hypothesis IX

Hypothesis IX: There will be no correlation between environmental attitude and modes of camping.

Table XV presents the data for the Chi-square analysis of modes of camping and environmental attitude.

TABLE XV

CHI-SQUARE ANALYSIS OF MODES OF CAMPING AND ENVIRONMENTAL ATTITUDE

variation	O	E	O - E	$(O - E)^2$	$\frac{(O - E)^2}{E}$
Cognitive					
Tent	21	23.5	-2.5	6.25	0.27
Trailer	23	19.4	3.6	12.96	0.67
Mobile Home	7	8.09	-1.09	1.19	0.15
Affective					
Tent	8	5.5	2.5	6.25	1.14
Trailer	1	4.6	-3.6	12.96	2.82
Mobile Home	3	1.9	1.1	1.21	0.67

df	Chi-square ratio	p	Critical value
2	5.72	.05	5.99

Table XV indicates a Chi-square value of 5.72 (df = 2) and a critical value of 5.99 (p = .05, df = 2). With respect to modes of camping and environmental attitude, this hypothesis may not be rejected at the .05 level of confidence.

Hypothesis X

Hypothesis X: There will be no correlation between environmental attitude and levels of camping experience.

Table XVI presents the data for the Chi-square analysis of levels of camping experience and environmental attitude. For purposes of this analysis, it was assumed that those who had camped less than 11 times were non-campers and those who had camped 11 or more times were campers.

TABLE XVI

CHI-SQUARE ANALYSIS OF LEVELS OF CAMPING EXPERIENCE AND ENVIRONMENTAL ATTITUDE

variation	O	E	O - E	$(O - E)^2$	$\frac{(O - E)^2}{E}$
Cognitive					
non-camper	12	10.3	1.7	2.89	0.28
camper	38	39.7	-1.7	2.89	0.073
Affective					
non-camper	1	2.7	-1.7	2.89	1.07
camper	12	10.3	1.7	2.89	0.28

df	Chi-square ratio	p	Critical value
1	0.0111	.05	1.703

Table XVI indicates a Chi-square value of 0.0111 (df = 1) and a critical value of 1.703 (p = .05, df = 1). With respect to levels of camping experience and environmental

attitude, this hypothesis may not be rejected at the .05 level of confidence.

CHAPTER V

SUMMARY

This study was concerned with the use of recreational activities as a vehicle to teach cognitive environmental concepts and the correlation between various camper categories and environmental attitudes. Cognitive concepts were analyzed for six recreational activities and environmental attitude was compared with four camper categories.

The cognitive instruments used in this investigation were experimenter-prepared and were content-validated by the program director. No reliability was established as they were testing for mastery. The environmental attitude questionnaire was experimenter-prepared and jury-validated twice with revisions each time.

The population consisted of those campers at Cedar Lake Campground in southeastern Oklahoma during the period of May 26 to July 4, 1978 that participated in the program. The weekends were randomly selected as control and experimental with the first three being control and the last three being experimental. The subjects were then selected by a stratified random sampling technique taking each fifth person over the age of sixteen to be tested.

In statistical analysis, whenever N was less than 30 a t-test was used to compare the experimental and control group. When N was greater than 30 a Z-score ratio was used. For the affective environmental attitude comparison with different camper categories a Chi-square was used. In each of the statistical analyses it was assumed that differences were not statistically significant unless they were at or above the .05 level of confidence.

Results and Conclusions

Cognitive Performance Tests

Experimental subjects who received the treatment in the Natural Arts Program scored significantly higher on the cognitive performance test than the control subjects who did not receive the treatment ($p = .001$); null hypothesis I was, therefore, rejected. This rejection may be interpreted as evidence that basic ecological facts may be taught through the process of using natural materials in the construction of decorative accessories. It is also supportive of the model proposed by this research that recreational activities may be used as a vehicle to teach environmental concepts.

Experimental subjects who received the treatment in the Reptile Program scored significantly higher on the cognitive performance test than the control subjects who did not receive the treatment ($p = .01$); null hypothesis II was,

therefore, rejected. This rejection may be interpreted as evidence that ecological facts about the relationship between man and other levels of life may be taught through an entertaining and recreational lecture demonstration program. This rejection may be interpreted as further evidence in the support of the model proposed by this research that recreational activities may be used as a vehicle to teach environmental concepts.

Experimental subjects who received the treatment in the Night Walk Program scored significantly higher on the cognitive performance test than the control subjects who did not receive the treatment ($p = .01$); null hypothesis III was, therefore, rejected. This rejection may be interpreted as evidence that ecological facts of a nocturnal nature can be taught through a program which involves the participant in activities associated with a recreational hike. This rejection may also be interpreted as further evidence in the support of the model proposed by this research.

Experimental subjects who received the treatment in the Wind is a Natural Program scored significantly higher on the cognitive performance test than the control subjects who did not receive the treatment ($p = .01$); null hypothesis IV was, therefore, rejected. This rejection may be interpreted as evidence that basic ecological facts may be taught through a recreational activity such as sailing. This rejection also supports the model that recreation may be used as a vehicle to teach environmental concepts.

Experimental subjects who received the treatment in the Energy Program scored significantly higher on the cognitive performance test than the control subjects who did not receive the treatment ($p = .01$); null hypothesis V was, therefore, rejected. This rejection may be interpreted as evidence that ecological facts concerning man's relationship to the energy concerns of today may be taught through a program which involves the participant in the construction of energy saving solar cooking devices. This rejection also supports the model that recreation may be used as a vehicle to teach environmental concepts.

Experimental subjects who received the treatment in the Spice of Life Program scored significantly higher on the cognitive performance test than the control subjects who did not receive the treatment ($p = .01$); null hypothesis VI was, therefore, rejected. This rejection may be interpreted as evidence that basic ecological facts may be taught through the process of active involvement of the participants in an informative day hike. This rejection of hypothesis VI, like the previous five rejections, is supportive of the model proposed by this research, that recreational activities may be used as a vehicle to teach environmental concepts.

Environmental Attitude Questionnaire

A Chi-square analysis of different occupations compared with environmental attitude did not produce a signifi-

cant ratio (p = .05); null hypothesis VII was, therefore, not rejected. This failure to reject may be seen as evidence that persons of different occupations who participate in camping observe the environment with approximately the same attitude. Though not statistically significant, it is of interest to note that from Table XIII it may be shown that in some instances the ratio of cognitive attitude to affective attitude for certain occupations is as much as 7 to 1.

A Chi-square analysis of age groups compared with environmental attitude did not produce a significant ratio (p = .05); null hypothesis VIII was, therefore, not rejected. This failure to reject may be seen as evidence that persons of different age groups observe the environment with approximately the same attitude. Again, in this comparison, it should be noted that the ratio of cognitive response to affective responses was very high.

A Chi-square analysis of modes of camping compared with environmental attitude did not produce a significant ratio (p = .05); null hypothesis IX was, therefore, not rejected. This failure to reject may be seen as evidence that persons who use different modes of camping observe the environment with approximately the same attitude. While in this variable the ratio of cognitive to affective still remains high, it should be noted that the Chi-square value obtained in this analysis (5.72) was extremely close to being significant with a critical value of 5.99.

A Chi-square analysis of levels of camping experience compared with environmental attitude did not produce a significant ratio ($p = .05$); null hypothesis X was, therefore, not rejected. This failure to reject may be interpreted like the other three, that persons who have different levels of camping experience observe the environment with approximately the same attitude. While the comparison was not significant, it is of interest to note that the ratio of cognitive to affective attitudes for the non-camper was 12:1 while the ratio for the camper was 3.2:1.

Further Discussion of Results

In general the results of this study suggest that the use of recreational activities to teach cognitive environmental concepts is a valid teaching tool. Although the idea of using recreation as a vehicle to teach environmental concepts has not been utilized in previous research, the philosophy of environmental education is consistent with that which has been proposed since the late 1960's. Busch (1966) and Donaldson (1972) emphasized that growing awareness over environmental problems needed to be dealt with. This in turn has been expanded by others (Jeske, 1973 and Morton, 1973) to include the concept that environmental education must not be restricted to public education systems but rather it must be extended to the adult world as well. It is imperative that environmental education be extended to the general public to educate them to their individual respon-

sibility for maintaining and improving the environment. In recent years the increased use of outdoor recreation has overcrowded the areas, and the quality of these areas must be improved.

It is also the opinion of the researcher that the use of recreation is very consistent with current educational theory of discovery learning. When compared to inquiry and problem solving associated with this process, recreational activities encompass the major considerations, such as active involvement; and when presented properly the participant is required to synthesize and hypothesize in pursuance of these activities.

In consideration of affective attitudes, it is now theorized (Genge and Santosuosso, 1974) that values clarification be the central theme for part of the outdoor curriculum, thereby creating a more thorough understanding of the ecological world.

Implications

The selective nature of the campground from which the experimental and control subjects were drawn will not permit the study to be generalized beyond that area. However, some valuable inferences may be drawn.

The results of the statistical analysis on the performance test scores imply that environmental concepts may be taught to the general public through the use of recreational

activities. This implication gives one possible method of education for the environmental concerns facing the world today.

The results of the statistical analysis on the environmental attitude questionnaire implies that there is no correlation among the various camper categories. If this is a correct assumption then Genge and Santosuosso's (1974) theory that values clarification should be a central theme for a portion of the outdoor curriculum has a lot of relevance in situations such as this study.

Recommendations

Because of the restrictive nature of the campground where the research was conducted it is recommended that further research be conducted in areas which provide different recreational offerings, especially those campgrounds which allow motor boating and water skiing.

It is also recommended that the scope of the research be enlarged possibly to include a more comprehensive performance test; either by increasing the length of the test or by extending the concepts to more comprehensive ones.

In the area of environmental attitudes it is recommended that a possible refinement of the questionnaire would yield more substantial findings. This would help to answer the question as to whether or not the instrument was of sufficient discerning qualities to distinguish between the various groups.

In certain areas not covered by this research but which became apparent through the course of the research the following two recommendations are made. First, research is needed to determine the method of advertising the programs which would be the most productive in attraction of participants. Secondly, research is needed to determine the types of programs which would be most appealing to participants and why such programs are appealing.

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APPENDIX A

ANALYSIS OF DEMOGRAPHIC DATA FOR THE CAMPERS WHO PARTICIPATED IN THE PROGRAM

ANALYSIS OF DEMOGRAPHIC DATA

1. Location (distance from home)

distance from home	N	%
0 - 50 miles	63	28
51 - 150 miles	64	29
151 - 250 miles	83	37
over 250 miles	13	6

2. Family Size

number in family	N	%
1 - 2	48	22
3 - 4	94	42
5 - 6	69	31
over 6	12	5

3. Occupation

area	N	%
Professional	91	41
Homemaker	17	8
Student	27	12
Self-employed	15	7
Trade-technical	73	32

4. Camping Experience

number of times	N	%
0 - 5	32	14
6 - 10	27	12
11 - 20	31	14
21 - 50	57	26
over 50	76	34

5. Camping Trips per Year

number of times	N	%
0 - 4	113	51
5 - 9	47	21
10 - 14	41	18
over 14	22	10

6. Reason for Camping

purpose	N	%
Vacation	51	23
Weekend	152	68
Other	20	9

7. Mode of Camping

type	N	%
Tent	98	44
Trailer	76	34
Mobile home	24	11
Other	25	12

8. Age

range	N	%
16 - 25	62	28
26 - 35	80	36
36 - 45	61	27
46 - 55	17	8
over 55	3	1

APPENDIX B

LESSON PLAN OUTLINES FOR PROGRAMS CONDUCTED

WIND IS A NATURAL

GOAL: Through the process of teaching a recreational activity the participant will gain factual knowledge about wind as an alternative energy source.

OBJECTIVES: Given a multiple choice test with 4 answers per question, the participant will be able to correctly answer questions which correspond to the following:

1. Where the wind really comes from
2. What affect wind has on wave action
3. The major parts of a sail boat
4. Simple methods of telling wind direction
5. Major sailing terminology

LESSON PLAN: Time 2 hours

The program begins by a 15 minute introduction by the instructor from the following outline.

I. Wind

- A. Causes
- B. Wave action
- C. Energy uses

II. Sailing

- A. Parts of the boat
- B. Sailing techniques
- C. Safety

The participants then help rig the boats and then two participants and one instructor sail the boat for 1½ hours allowing the participants to observe for a period of time and then taking command of the boat. While sailing, reinforcement of the objectives is done by the instructor.

ENERGY PROGRAM

GOAL: Through an activity designed around construction of an energy saving device, the participant will gain basic ecological facts about energy.

OBJECTIVES: Given a multiple choice test with 4 answers per question, the participant will be able to correctly answer questions which correspond to the following:

1. How much energy recycling saves
2. How to conserve energy in the home
3. Characteristics of solar cookers
4. Characteristics of home solar collectors
5. Sources of energy in the United States

LESSON PLAN: Time 2 hours

The program begins by a 15 minute introduction from the following outline:

I. Energy conservation

   A. Industrial recycling
   B. Home conservation

II. Alternate Energy (Solar)

   A. Parabolic cookers
   B. Home Use

III. Energy sources in the United States

The participant then selects a project for construction of either a parabolic cooker or charcoal starter, each of which is an energy conserving device. The construction is supervised by the instructor who reinforces the objectives during that time.

NIGHT WALK

GOAL: Through an informative, activity-involved night walk, the participant will learn basic ecological facts associated with nocturnal life.

OBJECTIVES: Given a multiple choice test with 4 answers per question, the participant will be able to correctly answer questions which correspond to the following:

1. The absorption and loss of heat by trees
2. Characteristics of forest canapy
3. Characteristics of spider webs
4. How to tell direction by the stars
5. Classification of diurnal and nocturnal

LESSON PLAN: Time 1½ hours

The program consists of a hike along a camping trail of approximately ½ mile in length with 11 stops where activities are conducted.

Stop 1. Shelter -- observation of orb-weavers beginning to spin their webs.

Stop 2. Lower part of beginning of trail -- observe sounds and temperature.

Stop 3. Beginning of upper trail -- spider sniffing activity

Stop 4. Middle of upper trail -- tree hugging activity and observe sounds and temperature

Stop 5. Latter part of upper trail -- black light feeding activity

Stop 6. Descending portion of trail -- observation of sounds and temperature.

Stop 7. Beginning of lower trail -- observation of sounds and temperature.

Stop 8. Middle of lower trail -- white sheet activity

NIGHT WALK (Continued)

Stop 9. End of lower trail -- observation of sounds and temperature

Stop 10. Shelter -- observation and feeding of orb-weavers

Stop 11. Open clearing -- stargazing and direction finding.

REPTILE PROGRAM

GOAL: Through a lecture-demonstration program, the participant will gain an understanding of the basic ecological facts about reptiles.

OBJECTIVES: Given a multiple choice test with 4 answers per question, the participant will be able to correctly answer questions which correspond to the following:

1. The number of poisonous snakes in Oklahoma
2. The characteristics of the strike of a rattlesnake
3. How to treat a snakebite
4. The characteristics of poisonous snakes
5. The characteristics of reptile physiology

LESSON PLAN: Time 1½ hours

The program consists of a lecture and demonstration with live reptiles from the following outline.

I. Reptiles -- their characteristics

II. Snakes

A. Non-poisonous -- characteristics and economic value

1. black rat snake
2. corn snake
3. coachwhip
4. boa constrictor
5. king snake

B. Poisonous -- characteristics and economic value

1. copperhead
2. cottonmouth
3. rattlesnake
4. snakebite treatment

NATURAL ARTS AND CRAFTS

GOAL: Through the involvement of making decorative accessories from natural materials, the participant will learn some basic ecological facts.

OBJECTIVES: Given a multiple choice test with 4 answers per question, the participant will be able to correctly answer questions which correspond to the following:

1. What factor is responsible for influencing plant life in a particular area
2. How coniferous trees reproduce
3. Where the ownership of forest land in the United States is concentrated
4. The function of bacteria in the natural world
5. The three major classifications in the natural world

LESSON PLAN: Time 2 hours

The program is begun by a 10 minute narrative from the following outline.

I. Forests
   - A. Ownership
   - B. Catagories
     1. Hardwood characteristics
     2. Coniferous characteristics

II. Natural Systems
   - A. Characteristics
   - B. Components
     1. Producers
     2. Consumers
     3. Decomposers

The participant selects one of the following accessories to make by using the natural material of the area.

NATURAL ARTS AND CRAFTS (Continued)

1. Wall plaque
2. Floral arrangement from dried material
3. Leaf print
4. Animal paper weight from rocks

As the participant constructs their decorative accessory, reinforcement of the narrative is carried out by the instructor by explaining the ecological function of the material used.

SPICE OF LIFE

GOAL: Through the use of an informative day hike, the participant will gain basic ecological facts about the relationship between the soil, climate and vegetation of an area.

OBJECTIVES: Given a multiple choice test with 4 answers per question, the participant will be able to correctly answer questions which correspond to the following:

1. What factor is most important to the stability of natural systems?
2. What are the levels of ecological organization?
3. What are the requirements of a natural system?
4. What is man's position in the natural world?
5. What is animal adaptation?

LESSON PLAN: Time 2 hours

The program is a day hike over a circular trail approximately ½ mile in length where 9 stops are made at points along the trail.

Stop 1. Assembly area -- general characteristics of forests and requirements for conifers and hardwoods.

Stop 2. Base of upper trail -- characteristics of interface between forest and streambed.

Stop 3. Beginning of upper trail -- transgression from streambed to forest area.

Stop 4. Middle of upper trail -- animal organization and adaptation to particular areas.

Stop 5. End of upper trail -- rock decomposition and lower levels of life: licens, mosses and decomposers.

Stop 6. Beginning of lower trail -- difference between upper trail and lower area near water.

SPICE OF LIFE (Continued)

Stop 7. Middle of lower trail -- water ecology (plants and animals)

Stop 8. End of lower trail -- diversity covered during trail represents stability.

Stop 9. Assembly area -- summation of concepts and conclusion that man is symbiotic with nature.

APPENDIX C

COGNITIVE PERFORMANCE TESTS

ENERGY

Circle the best answer

1. For the amount of energy it takes to make one aluminum can from the raw materials you could recycle

   a. 10
   b. 20
   c. 30
   d. 5

2. A flurescent light is approximately how many times as efficient as an incandescent

   a. 5
   b. 6
   c. 3
   d. the same

3. A simple homemade parabolic cooker can create temperature up to

   a. 250
   b. 300
   c. 500
   d. 650

4. A solar collector in the home should be built in a window that faces

   a. north
   b. south
   c. east
   d. west

5. Approximately what percent of our nation's energy comes from nuclear energy?

   a. 5
   b. 10
   c. 8
   d. 2

SPICE OF LIFE

Circle the best answer

1. To keep nature stable there should be

   a. maximum difference
   b. minimum difference
   c. no difference
   d. differences don't matter

2. Which is the highest level of organization or matter?

   a. cells
   b. organisms
   c. communities
   d. populations

3. Which of the following is not absolutely required in order to keep a natural system going?

   a. decomposers
   b. herbivores
   c. producers
   d. energy

4. Man's relationship with the environment should best be described as

   a. caretaker
   b. consumer
   c. producers
   d. symbiotic

5. The ability of certain animals to live in different habitats is an example of

   a. being limited
   b. adaptation, being able to adapt
   c. rejection, being able to be rejected
   d. action upon one another

NATURAL ARTS AND CRAFTS

Circle the best answer

1. The plants that can live in a certain area are determined primarily by

   a. climate
   b. soil
   c. animals
   d. terrain

2. A pine cone can best be described as

   a. the seed of the pine tree
   b. the seed spreader of the pine tree
   c. a non-functional part of the tree
   d. an insect attractor

3. Most of the forest land in the United States is owned by

   a. Federal government
   b. State governments
   c. timber industries
   d. private individuals

4. Approximately what percent of known bacteria are harmful to man?

   a. 3
   b. 20
   c. 10
   d. 1

5. Producers in a natural system are

   a. carnivores
   b. herbivores
   c. bacteria
   d. green plants

SNAKES

Circle the best answer

1. The number of poisonous snakes in Oklahoma is

   a. 4
   b. 3
   c. 5
   d. 2

2. Before a rattlesnake strikes it must

   a. coil
   b. rattle its tail
   c. both of these
   d. none of these

3. The best treatment for a snake bite is

   a. suck out the poison
   b. use a snake bite kit
   c. put on a tourniquet
   d. cyrotherapy

4. Poisonous snakes in Oklahoma may be identified by

   a. thermosensitive pits
   b. slit eyes
   c. rattles
   d. A and B

5. A snake is cold blooded, therefore

   a. its blood is cold to touch
   b. it must have heat at all times
   c. its body temperature is regulated by the environment
   d. all of these

Circle the best answer

1. If you were to feel a tree for temperature, which of the following would feel the warnest?

   a. large diameter
   b. small diameter
   c. medium diameter
   d. they would all feel the same

2. If you were to sniff a spider you would be looking for

   a. a characteristic smell
   b. a type of web
   c. the eyes
   d. tarantulas

3. Webs of the spiders are

   a. characteristic of the individual spider
   b. characteristic of the individual species
   c. all spider webs are alike
   d. a somewhat 8 sided figure

4. The constellation that the North Star belongs to is

   a. Ursa major
   b. Ursa minor
   c. the big bear
   d. cassiopeia

5. An animal that is most active at night is

   a. diurnal
   b. nocturnal
   c. dinocturnal
   d. docturnal

WIND IS A NATURAL

Circle the best answer

1. The reasons that wind blows can ultimately be traced back to

   a. the sun
   b. the earth's rotation
   c. the north and south poles
   d. the earth's revolution

2. When the wind blows the water and causes waves the following would happen

   a. the water flows with the waves
   b. oxygen is absorbed into the water
   c. the lake turns over
   d. fish become more active

3. When righting a tipped boat you should pull down on the

   a. rudder
   b. daggerboard
   c. halyard
   d. cleat

4. To tell when you are facing the wind you should

   a. have to close your eyes
   b. not be able to feel the wind at your back
   c. feel the wind of both ears
   d. look at the direction of the tree's movement

5. If you come about too slowly and the boat stops pointed into the wind, you are caught in

   a. luff
   b. doldrum
   c. leeward
   d. irons

APPENDIX D

AFFECTIVE ATTITUDE QUESTIONNAIRE

NATURE

From each pair make a check (✓) by the one you agree with the most.

(Choose 1) ____ Man can be a menace to the environment
____ Man is part of the environment

(Choose 1) ____ Stars are nature's paintings in the sky
____ Stars are far away suns

(Choose 1) ____ Snakes are friends of man
____ Snakes are reptiles and crawl on their stomachs

(Choose 1) ____ Pine cones carry the seeds of pine trees
____ Pine cones are nature's work of art

(Choose 1) ____ The smells of a forest are restful and peaceful
____ A pine forest has a certain kind of smell

(Choose 1) ____ Spider webs are used for capturing prey
____ Spider webs are put together in beautiful patterns

(Choose 1) ____ Wind is a possible future source of energy
____ Wind filling a sail is a beautiful sight

(Choose 1) ____ A tree is warm and protective
____ The bark of the tree provides protection for the tree

(Choose 1) ____ Man will some day appreciate nature as it is
____ Sometimes man attempts to control nature

APPENDIX E

DEMOGRAPHIC DATA QUESTIONNAIRE

WOULD YOU PLEASE ANSWER THE FOLLOWING QUESTIONS?

1. Where are you from? (City and state)

_____

2. How many members are in your family?

_____

3. What is your occupation?

_____

4. How many times have you been camping before? (Circle one)

   A. 0 - 5
   B. 6 - 10
   C. 11 - 20
   D. 21 - 50
   E. More than 50

5. How many times do you camp in a year?

_____

6. Are you on vacation or just a weekend camping?

_____

7. What is your mode of camping? (Circle one)

   A. tent
   B. camping trailer
   C. mobile home
   D. none

8. What is your age range? (Circle one)

   A. 16 - 25
   B. 26 - 35
   C. 36 - 45
   D. 46 - 55
   E. over 55

VITA[2]

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