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THE EFFECTS OF AN ADOLESCENT APPRENTICESHIP PROCESS
IN ENVIRONMENTAL EDUCATION ON THE DEVELOPMENT OF
CITIZEN PARTICIPATION CHARACTERISTICS IN
HIGH SCHOOL SENIORS

A Dissertation Presented

By

SHIRLEY LIBBY GRIFFIN

Submitted to the Graduate School of the
University of Massachusetts in partial fulfillment
of the requirements for the degree of

DOCTOR OF EDUCATION

September 1982

Education

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Shirley Libby Griffin

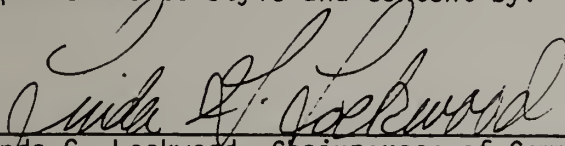
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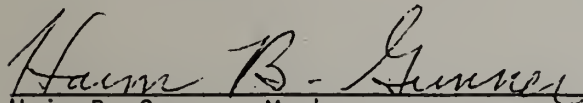
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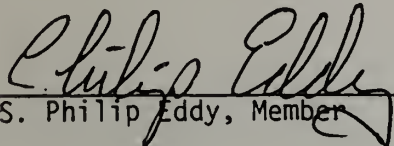
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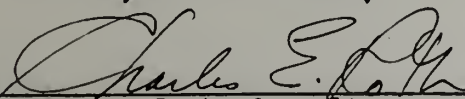
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School of Education

DEDICATION

To my parents, Shirley H. and Vernon H. Griffin who throughout my life have provided me with a desire to ever learn and become involved, and whose love, encouragement, and patience motivated the completion of this dissertation.

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Herein is represented years of planning, work, frustration, disappointment, as well as knowledge, reward, strength, personal growth, perseverance, and the final joy of accomplishment.

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ABSTRACT

The Effects of an Adolescent Apprenticeship Process in Environmental Education on the Development of Citizen Participation Characteristics in High School Seniors

(September, 1982)

Shirley Libby Griffin, B.S., Fitchburg State College

M.Ed., Fitchburg State College, Ed.D., University of Massachusetts

Directed by: Dr. Linda G. Lockwood

Through an analysis and synthesis of various educational theories, this study documented those cognitive, affective and participatory characteristics most likely to enhance environmental citizen participation. Field research determined the effects of an action-oriented environmental education program (Adolescent Apprenticeship process) on the development of students' self-concept, locus of control, actual commitment to environment, and principled moral reasoning.

Specifically, this study interrelated the cognitive theories of Bloom and Piaget, the affective theories of Krathwohl, Piaget and Kohlberg, and the environmental morality concepts suggested by Nash, Leopold and Krutch. Additional areas of analysis included: the relationship of educational theory to environmental ethics, a review of current citizen participation research, and a review of experiential education programs.

A literature search revealed that action-oriented education programs, involving students in local community concerns are more likely to develop citizen participation characteristics. Utilizing the theoretical component of this study, an action-oriented program was designed

for Oakmont Regional High School to enhance citizen participation characteristics.

The field study used a Nonequivalent Control Group Design. The experimental group and the control group were pretested and posttested for five variables.

Data were collected using the Tennessee Self-Concept Scale, the I-E Scale, actual commitment to environment (Ecological Attitude Inventory), the Defining Issues Test, and the Environmental Issues Test. Data were analyzed using descriptive statistics, significance tests, gain scores and student evaluations.

While the results showed no statistically significant changes in the experimental group's mean scores on four of the five variables, the individual posttest scores reflected positive changes. Written student evaluations suggested changes were due to participation in the Oakmont Adolescent Apprenticeship process.

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C H A P T E R I
AN ORIENTATION TO THE STUDY

Introduction

Educators have theorized that the failure of past educational movements to firmly establish themselves within the United States' educational system may have been due to a lack of understanding of their movements' goals and objectives. To avoid a similar fate in environmental education, professionals, educators, and various organizations have attempted to simplify and clarify the goals of environmental education, locally and world-wide.

A major attempt at goal clarification took place in 1975 when one hundred educational specialists from sixty-four countries met in Belgrade, Yugoslavia for a ten-day seminar. The Belgrade Workshop, sponsored by UNEP (United Nations' Environmental Program) and UNESCO (United Nations' Educational, Scientific and Cultural Organization) was the first phase in a three-phase multi-million dollar project to further environmental education in the world. A vital element of the workshop was the emergence of an environmental education goal.

According to the Belgrade Charter, the goal of environmental education is to develop a world population that is aware of, concerned about, which has knowledge, skills, attitudes, motivations, and a commitment to work for the environment.¹ Two years later, in Tbilisi, USSR during the third phase of the United Nations' project, participation and involvement were re-affirmed.²

Although the Belgrade goal is recognized and accepted by United

State's environmental educators, the distance between the ideal goal and its actual accomplishment is immense. For too long, high school programs have ignored the action and behavioral elements of environmental education. Most environmental education programs seem to stagnate at the awareness level, encouraging only knowledge and attitude development. To date, secondary environmental education programs in the United States offer little evidence of success in producing individuals who are capable of becoming involved in environmental issues and who demonstrate motivation and commitment.

The goal of environmental education should not be limited to developing an awareness and knowledge of environmental problems. It should, also, be devoted to developing appropriate characteristics that will enhance students' future participation in environmental issues and decision making as citizens within their local communities. The goal possesses cognitive, affective, and participatory components.

Not only is the goal of most environmental education programs incomplete, but also the educational methodologies and techniques need revising. At the junior and senior high school level, environmental education teachers have expressed their dissatisfaction with the current methods utilized in environmental education programs.³ According to Schmieder and others, in reviewing environmental education curricula in the United States, most educators do not know how to accomplish the components outlined in the Belgrade goal.⁴

Perhaps the "Achilles Heel" of today's environmental education is that there has been little attempt by educators to apply existing cognitive and affective educational developmental theories to the

accomplishment of the Belgrade goal. Environmental education cannot begin to produce individuals capable of participating in the problems of the environmental crisis and in environmental decision making until educators first understand how they can successfully implement the components suggested by the Belgrade goal--affective, cognitive, and participatory.

In conclusion, there is a need to re-examine current educational theories in order to develop environmental citizens, that is, individuals who are motivated to participate and committed to involvement. There is a need to create new environmental education techniques based upon these educational theories that recognize and promote characteristics necessary for citizen participation. In the public schools, the action component of environmental education has for too long been neglected.

General Problem

Environmental educators at the secondary level often unintentionally mislead their students because of their own inexperience in environmental decision making and a lack of training in environmental conflicts. How can educators possibly select appropriate and effective learning experiences if they themselves have not experienced the front lines of environmental decision making? They need to have experienced the expectations of political friendships, confronted the diversity of environmental values, become immersed in legal red tape, and observed the personal loyalties often favored over environmental costs, benefits, and protection.

Some teachers within the traditional, awareness-oriented classrooms do attempt to present the complexity of environmental problems to their students. But, unfortunately, the majority of teachers are only vaguely aware that environmental decision making involves difficult choices and often forces the individual into unusual value conflicts. Through class activities, the same teachers continue to convey that environmental problems can be solved easily through citizen involvement, a sharing of ideas, and with a minimal individual effort. Often mock environmental problems are selected that are solvable within one or two class periods rather than months of effort. This type of activity may mislead students making them susceptible to unnecessary frustrations and disappointments when they do confront real environmental decision making. Teachers may be reinforcing apathy rather than enhancing participation.

There is a need to utilize actual, in-the-field experiences in order to develop a motivation and commitment to act for the environment. To fully accomplish the Belgrade goal of citizen participation in environmental issues, firsthand field experience is essential. In addition, environmental educators have not clearly identified the characteristics that must be developed in each student in order to enhance participation, motivation, and a commitment to act.

The Adolescent Apprenticeship process, proposed in this study, is one alternative to current environmental education techniques being used in traditional secondary school systems in the United States. It is meant to serve not as a substitute for traditional classroom methods but as a supplement to these practices. The Apprenticeship process is

the result of a combination of educational theories and concepts, actual personal experiences in environmental decision making, study of citizen participation characteristics, the author's growth as an environmentalist, and her contact with professionals at governmental levels.

Background of the Study

Through ten years of personal experiences, the author developed a unique perspective on local environmental issues and problem solving. Through an inter-meshing of the needs of Massachusetts Conservation Commissions, high school seniors, and community adults, a technique and process emerged that enhanced the reality of developing environmental citizen participation characteristics in high school seniors.

Three experiences are responsible for the eventual development of the Adolescent Apprenticeship process (Environmental II) at Oakmont Regional High School.

Experience one - youth apathy. In 1974, students, ages sixteen to seventeen, after completing an intensive environmental awareness program, expressed an interest in becoming involved in local environmental issues. The Environmental I program at Oakmont Regional High School in Ashburnham-Westminster, Massachusetts involves students in basic ecology, environmental ethics, pollution issues, and environmental laws. At first the students were enthusiastic and eager to help. After several confrontations with adult attitudes in the community, adult thinking, and exposure to decision making by those who were often unaware of basic ecological principles, students became frustrated, discouraged, and

wanted nothing to do with local environmental issues. Follow-up discussions with students indicated they viewed their environmental action efforts as useless.

In the beginning, students had worthwhile intentions. But, it is theorized that because of a lack of appropriate cognitive and affective skills, a misunderstanding of local political systems, and a lack of experience with adults, students were unable to contend with the frustrations of local environmental problems and politics; thus, they withdrew from environmental involvement. It was apparent to the author that a second level, a more action-oriented rather than awareness-oriented focus of the Oakmont Regional Environmental Survival program might help to reduce the negative consequences of youth involvement with local environmental decision making.

Experience two - Massachusetts Conservation Commissions and the community. The author came face to face with personal frustrations and diversified problems involved in local environmental decision making during an eight-year position as a member and a chairperson of a town conservation commission, and a four-year role as a director on the Massachusetts Association of Conservation Commissions. The experiences were invaluable. They provided the author with a perspective on local environmental issues, people's environmental values, and the complexities involved in local decision making that are absent from environmental education textbooks and theory.

Massachusetts Conservation Commissions are legal entities that communities may establish for the protection of their natural resources.

Being comprised of volunteer members, the success or failure of a commission is totally dependent on the motivations and dedication of its members to the duties and responsibilities as established in the Massachusetts General Laws, Chapter 40, Section 8C. A copy of this law is presented in Appendix 1.

In 1971, the commissions were given legal authority to enforce protection of wetlands and their abutting lands through the Wetlands Protection Act (Massachusetts General Laws, Chapter 131, Section 40). The act requires conservation commission members to oversee proposed actions in or near wetlands, flood plains, streams, rivers, etc., to conduct public hearings, and to issue Orders of Conditions (permits) prior to the beginning of any proposed work or land changes. The problems grew when townspeople discovered the commission could regulate actions, could deny permits, and even fine or bring violators (friends, employers, relatives) to court.

Most conservation commissions in Massachusetts spend eighty to ninety percent of their time on the Wetlands Protection Act. As a result, the other duties specified in the Massachusetts General Laws are often abandoned (forestry management, wildlife, aquifer protection, and public environmental education). Key environmental issues, such as water supply and the development of land near or in aquifer areas are discussed and often approved at town meetings with little citizen factual understanding.

A need for adult environmental education was evident, but conservation commission members, overworked or so disliked because of their Massachusetts General Law 131-40 duties, often choose not to become

involved in any additional responsibilities. Thus, adult environmental education became shelved along with other important commission duties.

Conservation commissions need assistance in the education of citizens regarding local environmental issues. They need positive support in carrying out their other commission duties and responsibilities. Due to small budgets, commissions often are unable to obtain professional assistance and are not able to do the needed resource planning, publicizing, etc., that would facilitate the accomplishment of their responsibilities. It was apparent that a program was needed that could provide inexpensive assistance to commissions, aid sagging morales, and improve the commission's image. An idea began to form: could adolescents assist commissions, provide skills, and enhance their own need for experience in local environmental involvement?

Experience three - youth involvement. Anxious to design and develop an action-oriented Environmental II program at Oakmont Regional High School, the author began examining environmental community-action programs reported in educational publications. It was noted that high schools having action-oriented programs had certain common characteristics. These programs seemed to be located in wealthy communities with citizen populations supporting innovative educational curricula. Most did not lack budget support and/or had access to individuals gifted in grant application procedures. The school systems had flexible subject schedules and/or an administration who reacted positively to new scheduling ideas that favored creative environmental education programs. Many of the programs examined were interdisciplinary, utilized team teaching, or

displayed schedule methods very different from traditional systems. Teachers seemed willing, anxious and able to share ideas, were able to work together, and believed in the overall goal of environmental education. Teachers had an abundance of free time for meetings, goal planning and for the development of behavioral objectives, including the formation of a program evaluation strategy. Finally, most were large school systems (3,000 plus students) or were educational systems encompassing an entire county.

To mimic an already established environmental education program like those examined was out of the question for Oakmont Regional. Not only was Oakmont a small, rural, regional junior-senior high school (two communities and 1,000 students), but it had a limited budget, a traditional subject schedule (fifty-two-minute class periods, five periods per week per class), no team teaching, a faculty overloaded with subject and general duties (washroom patrol, homerooms, detentions, bus duty, study halls, corridor checks, etc.), and a faculty lacking in time for sharing ideas or planning. Because of the small high school student enrollment, new courses were not encouraged for fear they would draw students away from already established programs. The Oakmont situation was not unique; many schools within Massachusetts and the United States lack environmental education programs because the published curricula are not easily adapted to traditional scheduling and approaches.

Conclusion. The characteristics of the Environmental II program created for Oakmont had to mesh with the existing educational system and its traditions. In addition, it had to provide real experience, meet the

goals of action and involvement, satisfy community adult environmental education, provide assistance for the local conservation commissions, and not encourage additional taxes. Therefore, the Environmental II program at Oakmont had to be traditional in one sense and innovative in another.

Based on these needs, the Environmental II program for Oakmont Regional High School was implemented as a modified community-action approach. The Adolescent Apprenticeship is unique because it strives to enrich the needs of three groups: the conservation commission, the voters, and the adolescents. The high school students work with the local conservation commission as apprentices, assisting in community projects, adult environmental education, and local environmental decision making. For two years, the program was conducted on a volunteer basis with students donating their after school hours and study hall periods. Subsequently, in the fall of 1979, the school committee acknowledged the Environmental II as a part of the school curriculum and permitted it to be scheduled as an elective, meeting five times per week.

At the end of the program, the author observed several behavioral and personality changes in participating students. They were more willing to volunteer for positions of responsibility and did not hesitate to become involved. In addition, participating students expressed their lack of fear in becoming involved in local environmental issues and they responded to adults as political equals. Many have since selected environmental programs in college and have become involved in action-oriented projects. These observations supported the need to establish through research methods those specific changes that occurred in students

due to their participation in the Adolescent Apprenticeship process.

Purpose of the Study

The primary purposes of this study are to document those cognitive and affective characteristics most likely to enhance citizen participation in environmental issues, and to determine by field-testing the effects of an action-oriented environmental education process (Adolescent Apprenticeship) on the development of specific affective characteristics in high school seniors. Specific objectives include the following:

1. To relate the educational theories of Bloom, Krathwohl, Piaget, and Kohlberg in order to emphasize the cognitive and affective characteristics most likely to enhance the development of citizen participation in environmental issues
2. To examine current literature in order to determine the role of self-concept, locus of control, and principled moral reasoning in developing citizen participation in environmental issues
3. To support through the analysis of theory, adolescence as an optimum time for the development of key cognitive and affective characteristics including an individual's self-concept, locus of control, and principled moral reasoning
4. To identify, through a literature search, those experiences and methods most likely to enhance the development of specific characteristics and citizen participation in adolescents
5. To determine, through field-testing, the effects of the Adolescent Apprenticeship on participating students' self-concept, locus

of control, principled moral reasoning, and actual commitment to the environment.

The major focus of this study is to provide environmental educators with a rational and practical means of accomplishing the development of specific characteristics in high school seniors necessary for environmental citizen participation.

Significance of the Study

Educational practitioners, after several years of experience on classroom front lines, too often have a tendency to abandon educational theories. To many teachers, facing over 150 students per day and with five preparations, educational theory often seems to have no practical application. Environmental educators, for a diversity of reasons, one of which may be fear of indoctrination and criticism, have also ignored theory, including the affective and participatory components necessary for the development of environmental participation. Educators need to use existing theories in order to determine what characteristics should be developed to enhance student participation in environmental issues. They also need to apply theory in practical ways to stimulate motivation and a commitment to act as stated in the Belgrade Charter.

This study will establish the importance of considering a student's affective components of self-concept, locus of control, and principled moral reasoning development as characteristics necessary for the enhancement of environmental citizen participation. In addition, environmental ethics, as proposed by Roderick Nash and others, are gaining support in some environmental education programs as effective means in

stimulating student motivation in environmental issues. The merit of incorporating both human and environmental ethics within secondary environmental programs will be explored. The study will further examine the necessity of encouraging students' experiences with adults through real environmental decision making situations.

This study is educationally significant because it addresses several of the major needs of environmental education today, and it re-examines the role of the school in developing citizenship behaviors, an established aim of American education.⁵ It explores the validity of utilizing community-action programs as educational vehicles to assist in the transition of adolescents to adulthood. It attempts to relate for the practitioner's use the educational theories of Bloom, Krathwohl, Piaget, and Kohlberg in order to suggest possible cognitive and affective characteristics necessary for citizen participation. It also proposes to gather field data regarding the effectiveness of an action process in developing identified affective environmental citizen participation characteristics in adolescents.

Definition of Terms

Action-oriented as used in this study is a type of environmental education approach where students participate in solving real environmental problems within the local community. The approach is activity-focused, student-centered, and involves students working with adults.

Actual environmental commitment is an individual's actions regarding environmental issues and problems.

Adolescence is the age at which an individual enters puberty to the

time when the individual accepts a role of responsibility within the adult community.

Adolescent Apprenticeship is an action-oriented educational process designed for Oakmont Regional High School and described in this study. Adolescents work within the local community assisting a town board or commission in the solving of local issues, problems, and/or work projects. Students are given an opportunity to learn through actual experience and are given the responsibilities of adults. They are treated as associates by the members of the commission or board.

Affective characteristics are those factors, according to Krathwohl, that include an individual's interests, attitudes, values, moral framework, and specific emotional processes; and, according to Kohlberg, includes a person's moral reasoning stage and ethical framework.

Awareness-oriented is an environmental education approach where students learn factual information and develop attitudes and awareness concerning environmental issues and problems. The approach is teacher-centered and passive. Students are not actively involved with adults in the local community or in the solving of local environmental concerns.

Cognitive characteristics are those factors, according to Bloom, that include knowledge, skills, and the abilities of comprehension, application, analysis, synthesis, and evaluation; and, according to Piaget, a particular cognitive reasoning stage and perspective of the world around the individual.

Conservation commission is a board of three to seven individuals appointed by the Mayor of a city or the Board of Selectmen of a town. The commission has the duty of promoting, developing, and protecting

the natural and watershed resources of the community as specified in the Massachusetts General Laws, Chapter 40, Section 8C.

Environmental citizens, according to the Belgrade Charter, are individuals who are aware of, concerned about and have basic ecological/environmental knowledge, and have the skills, characteristics, and attitudes that promote motivation and a commitment to work for the protection of the environment. They participate in environmental issues and problems and possess specific cognitive reasoning and moral reasoning stages. They have an ethical framework that encompasses the natural environment.

Environmental morality is an individual's ethical framework of right and wrong behaviors towards the natural environment. It is determined, principally, by an individual's perspective of his/her relationship to the environment.

Internal locus of control is found in an individual who views his/her influence on an event or activity as directly within his/her control. Internal individuals do not believe the outcome of an event is due to luck, fate or chance.

Principled moral reasoning, according to Kohlberg and Rest, is reasoning used by an individual when confronting a decision of conflicting values that results in a decision based upon a morality of social contract, a morality of intuitive humanism or a morality of the principle of ideal social cooperation.

Self-concept is the individual's viewpoint of himself/herself in relation to his/her environment, be it family, school, world, physical structure, or other factors.

Nature and Scope of the Study

The proposed study will employ a theoretical and a quasi-experimental approach identified by Campbell and Stanley. Chapter II reports an extensive library and literature search to assist in the clarification and identification of the cognitive and affective characteristics most likely to enhance the development of environmental citizen participants. The theories of Benjamin S. Bloom's and David R. Krathwohl's cognitive and affective domains, and Jean Piaget's and Lawrence Kohlberg's cognitive and moral developmental theories will be studied, analyzed, and interrelated. Using recent research in citizen participation, the cognitive and affective stages most likely to enhance citizen participation will be identified in Chapter III. Throughout the study, efforts will be made to simplify both theories and data to assist in the practitioner's understanding.

The quasi-experimental approach will be used to field-test the effectiveness of the Adolescent Apprenticeship process at Oakmont Regional High School in accomplishing the development of specific environmental citizen participation characteristics. Research data will be collected from the school year 1980-1981 and from former environmental students during the 1979-1980 program. The study will include a presentation of the framework of both the Adolescent Apprenticeship process (Environmental II program) and the Environmental I program.

Although the Adolescent Apprenticeship process involves three groups, participating students (high school seniors), local conservation commissions, and local citizens, emphasis during the study will be

limited to the effects of the program on the participating adolescents and their development of specific affective characteristics: self-concept, internal locus of control, and principled moral reasoning.

In conclusion, the study will provide clarification concerning those characteristics most likely to enhance citizen participation in adolescents and will provide data regarding the effectiveness of the Adolescent Apprenticeship process used at Oakmont Regional High School.

Limitations of the Study

Some of the limitations existing within this study are the result of a need for the use of a quasi-experimental design, and the small sample employed in the field-test. A separate section in Chapter IV will discuss the quasi-experimental design limitations.

The author, throughout Chapter II and III, relates several educational theories in order to generate a group of characteristics needed for the enhancement of citizen participation in adolescents. The emerging characteristics are the products of the author's interpretation of theories based upon her experiences in local environmental decision making, and on the interpretation of current available literature regarding citizen participation and cognitive moral development. The selection of specific educational theories is due primarily to the author's high school teaching experience in traditional school systems.

The field of environmental education needs to incorporate a variety of educational theories in order to generate new paradigms and action-oriented curricula. Any limitations existing within the theoretical component of this study should serve to stimulate thinking rather than

limit it.

Outline of the Dissertation

The dissertation contains six chapters, and appendices which include the framework of the Adolescent Apprenticeship process. Chapter I provided an introduction to the study by presenting an accepted goal of environmental education in the United States based upon the Belgrade Charter. Chapter I stated there is a need to examine current educational theories and literature on citizen participation, and to clarify the cognitive and affective characteristics that must be developed in order to enhance participation. It also stressed there is a need for secondary environmental education to begin addressing the development of action-oriented curricula and to focus on the development of an action process suited for traditional systems. Chapter I also presented the historical development of the Adolescent Apprenticeship process at Oakmont Regional High School.

Chapter II focuses on the theories of Bloom, Krathwohl, Piaget, and Kohlberg in an attempt to identify the cognitive and affective characteristics needed for citizen participation. It also discusses environmental morality and its relationship to the development of citizen participation.

Chapter III presents current literature and research on self-concept, locus of control, and principled moral reasoning as necessary characteristics for citizen participation. It also explores the stage of adolescence as an optimum time for developing critical cognitive, affective, and participatory characteristics. It presents an examination

of existing environmental education programs and experiences that enhance citizen participation development.

Chapter IV describes the procedures and design of the field study. The study's research goal is to determine the effectiveness of the Adolescent Apprenticeship process at Oakmont Regional High School in developing self-concept, locus of control, and principled moral reasoning in Environmental II students. A description of the sample, hypotheses, assumptions, and testing instruments are provided. In addition, there is a discussion of the limitations of the research design.

Chapter V provides the results of the data and an analysis and interpretation of the data for the practitioner's understanding and use.

Chapter VI presents a summary of the study and conclusions. It discusses the implications and significance of the results. Recommendations for future studies are made along with suggestions for modifications in future Environmental II programs at Oakmont.

The appendices contain, in addition to the bibliography, a framework for the Environmental I and II programs at Oakmont Regional High School, copies of testing instruments used in the study, correspondence, and materials for assisting practitioners in the employment of the Adolescent Apprenticeship process in their school systems.

FOOTNOTES

¹Belgrade Charter, "Framework for Environmental Education," Environmental Education Report (December/January 1976): 4-5.

²World Confederation of Organizations of the Teaching Professions, "Report from Tbilisi," Environmental Education Report (December/January 1978): 13.

³William Carl Jameson, "Environmental-oriented Decision-Making Problems for Secondary Schools," The Journal of Environmental Education (Winter 1975): 27.

⁴Harold Hungerford, Ben R. Peyton and Richard J. Wilke, "Goals for Curriculum Development in Environmental Education," The Journal of Environmental Education (Spring 1980): 42.

⁵Ibid.

C H A P T E R I I
THEORETICAL RATIONALE FOR THE ADOLESCENT APPRENTICESHIP
PROCESS AT OAKMONT REGIONAL HIGH SCHOOL

Introduction

A major purpose of this chapter is to present the theoretical rationale of a process-oriented environmental education program designed to enhance citizen participation characteristics. Chapter II presents the theoretical rationale of the Adolescent Apprenticeship process by examining the educational theories of Bloom, Krathwohl, Piaget, and Kohlberg, and by exploring the theoretical underpinnings of environmental morality.

The literature indicates that, within traditional secondary schools, there is an absence of environmental education programs that encourage the development of citizen participation behaviors concerning environmental issues and problems.¹ Many young adults are graduating from high schools lacking the skills, knowledge, and experiences necessary for citizen involvement in environmental problems.² As a result, they are not becoming involved.

For years, democratically-oriented social scientists, laymen, teachers, and various professionals have been alarmed by the growing political apathy and lethargy among our young people.³ If the continued success of the American form of government is dependent upon an actively participating citizenry, then an immediate concern of civic and social studies education should be to determine what can be done to remedy this apathetic trend in order to provide future generations with involved

citizens. Environmental education is social education in that it is concerned with broadening potential citizens' decision making abilities in the environmental realm. Therefore, environmental educators need to recognize both the political and ecological aspects of developing potential environmental citizens.

Recent studies indicate that traditional cognitive/affective focusing within high school civic courses and environmental programs may not be sufficient to produce an active citizenry. The studies of Reisman and Glazer reveal knowledge and abilities development may be second to the role personality structures play in determining whether an individual will be politically interested or apathetic.⁴ According to reports by A. G. MacLaine, the most pressing task for the school system is to fashion educational experiences which will foster security, self-identity, and individuality traits considered vital to the development of citizen participation.⁵ Thus, there is a critical need to examine recent studies concerning the personality characteristics necessary for political participation, and to determine what traditional American high schools can do to enhance participation.

In order to facilitate the practitioner's use of this study and accomplish the objectives stated previously, Chapter II will focus on one major question: What cognitive, affective, and personality characteristics should secondary environmental educators develop in high school students in order to enhance citizen participation in environmental issues?

Citizen Participation

Citizen participation, according to recent literature, has been on the decline due to a lack of confidence in and respect for government.⁶ Environmental educators are naive in assuming that teaching of ecological knowledge and positive environmental attitudes will be sufficient to produce politically active citizens. If citizens are apathetic on general issues having immediate concrete consequences, they certainly will be apathetic when considering long-range, often abstract, environmental issues.

Citizenship and political involvement are all directly related to environmental education. The quality of environmental decision making in a democratic society is influenced by the quality of citizen participation. A major focus of United States' environmental education should be the development of participating citizens in a democratic system. The following section will explore the meaning of citizen participation.

Political involvement. According to Sigel and Hoskin, political involvement in a democracy means involvement in three different dimensions: cognitive, affective, and participatory. Cognitively, citizens should be knowledgeable about how the system works. Affectively, citizens should have a feeling of loyalty for the system and also participate in government.⁷ It is the third dimension, participation, that has been seriously neglected in traditional American high schools.

The goal of environmental education should include assisting the individual to see himself/herself as part of a political system. Participation within this system means an overt and visible form of political

activity. The key here is that the behavior is visible.

According to Stuart Langton, the specific types of citizen participation are citizen involvement and citizen action. Citizen involvement encompasses those activities initiated by government for the purposes of improving or gaining support for various decisions and programs. Examples would include citizen participation in hearings, consultation with advisory committees, and making surveys or having memberships in government review boards. Citizen action is more aggressive and is initiated by citizens for purposes they choose. It includes lobbying, public advocacy, protests, and the utilization of various kinds of citizenship skills.⁸

Hungerford categorizes specific citizenship skills necessary for solving environmental problems as: persuasion (argumentation, debate, speech, letter writing), consumerism (economic threat, boycotting), political action (lobbying, voting), legal action (law suits, injunctions, citizen interventions), ecomanagement (physical change in an environment), and interaction (a combination of two or more of the above).⁹

Citizen types. Many authors, in discussing citizen participation, have attempted to classify individuals as one citizen type. Sigel and Hoskin identified several citizen types according to individuals' comparative involvement in the cognitive, affective, and participatory dimensions. Figure 1 summarizes Sigel and Hoskin's citizen types according to an individual's development in each of the democratic political involvement dimensions. These are: rational activist, spectator,

Figure 1

A Summary of Sigel's and Hoskin's Major Citizen Types

Rational Activist	1. Satisfied Model	+Affective	+Cognitive	+Participatory
	2. Critical Model	-Affective	+Cognitive	+Participatory
Spectator	3. Satisfied Spectator	+Affective	+Cognitive	-Participatory
	4. Critical Spectator	-Affective	+Cognitive	-Participatory
Passive Citizen	5. Satisfied Apathetic	+Affective	-Cognitive	-Participatory
	6. Critical Apathetic	-Affective	-Cognitive	-Participatory
Mobilizable Citizen	7. Satisfied Subject	+Affective	-Cognitive	+Participatory
	8. Critical Subject	-Affective	-Cognitive	+Participatory

SOURCE: Robert S. Sigel and Marilyn B. Hoskin, The Political Involvement of Adolescents, (New Brunswick, New Jersey: Rutgers University Press, 1981), p. 154.

passive citizen, and mobilizable citizen. Citizens can have either a positive (satisfied) or negative (critical) affective, cognitive, and/or participatory development regarding the political system. Positive affective means having favorable political feelings of loyalty and respect towards the governmental system. Negative means dislike or lack of feeling for the system. Positive cognition indicates the individual has a high comprehension of the political system and how it functions, whereas negative means the opposite. Positive participation indicates the citizen is actively involved, and negative indicates the individual chooses to avoid participation.¹⁰

The Adolescent Apprenticeship process ideally strives to create citizens who are developed affectively and cognitively regarding the political and natural systems and who are motivated to participate. Using Sigel's and Hoskin's citizen types classification and combining it with the philosophy of environmental education, a major goal of environmental educators becomes the development of activists and the discouragement of passive citizen types.

Secondary schools and citizen participation.

The current situation. According to Patrick, the schools appear to have made a significant contribution to developing students' long-term supportive political beliefs and knowledge in the United States.¹¹ Traditionally, United States' social studies and/or civic courses have been viewed as the more appropriate vehicles to transmit the affective and cognitive dimensions of political involvement. It is usually assumed by course instructors that an interest in and understanding of

political participation develops from a knowledge of the facts of the political process. However, Struve and Snider observed that the dimension of participation is often ignored, and "little attempt is made to bring the student into contact with the actual experience of politics."¹²

The survival of any political system is dependent upon its youth acquiring not only the proper knowledge and attitudes regarding that system, but also how to participate in that system. Environmental educators, accepting as a goal the development of citizens who are concerned and motivated to participate, should examine current political science courses to see if students know how to participate. What good is it if young people feel strongly for the environment, understand ecological concepts, yet do not know how to solve problems within the existing political system?

The role of secondary schools. As citizen participants, students may be placed in a situation that is not popular with the ruling bureaucracy, local or national governments. Therefore, addressing the development of citizen participation within the school curricula may be a sensitive area.

In the past, it has been argued that the family was the major agency for developing a child's political socialization (political knowledge, sense of political efficacy, and political interest). In studies by Hess and Torney, it has been shown that today the public school appears to be the most important and effective instrument of political socialization.¹³ However, Hess and Torney, also found that the school underemphasizes the obligations and rights of a citizen to participate in government and does not provide the student with an

understanding of the procedures for legitimately influencing the government.¹⁴ Stentz agrees and states:

The aspect of effective and responsible democratic citizenship which has received least emphasis in the social studies classroom is that of activism orientation.¹⁵

According to John Dewey, the school has an ethical responsibility to permit the student to develop all his/her potential and show the student how to shape and direct change.¹⁶

Newman states the foremost consideration in social studies curricula should be the preparation of students for citizen action in the political realm. A top priority goal in general education should be to teach young people how to effectively exert influence in public affairs, including local issues.¹⁷ Citizen participation, valid in American secondary schools, should begin immediately encompassing local issues and concerns.

If citizen participation is not soon included in curricula, young people may become so frustrated they may view only two choices: withdrawal or unconventional aggressive participation. Therefore, secondary environmental educators need to begin incorporating the participatory element in environmental education programs.

The environmental crisis. A review of what young people will confront within the next few years serves to demonstrate why secondary environmental educators must now address the dimensions of political involvement. Millions of people have heard about the environmental crisis, but few actually comprehend it as a crisis or the survival challenge it poses.

The core world issue in the next 25 years will be the maintenance of an equitable and dynamic equilibrium between world population and world resources. . . . The price we actually incur, however, will depend largely on how quickly and effectively we make crucial changes along three principal fronts: cognitive . . . participative . . . perceptual.¹⁸

Evidence indicates American generations will need decision making skills and abilities yet unseen in human history. Decisions, actions, or lack of action will have profound effects and may determine human and life survival.

According to The Global 2000 Report to the President, completed in 1979, humans face a world that will increase its population by 50 percent in less than twenty-five years from four billion to 6.35 billion. Of this growth, 90 percent will occur in the poorish countries, where already quality environment, health conditions, and starvation are major governmental and social problems.¹⁹

Most of the food to be consumed by the world will most likely come from the United States. It is projected world water supplies will become more scarce due to over population, over use, and pollution. World forests are disappearing at the rate of eighteen to twenty million hectares a year (an area half the size of California). Prime agricultural soils will deteriorate worldwide due to erosion, loss of organic matter, desertification, salinization, alkalinization, and water logging. Each year, cropland, an area the size of Maine, becomes a wasteland. Atmospheric characteristics of carbon dioxide and chemicals effecting the ozone layer may significantly alter the world's climate and upper atmosphere by 2050. The accumulating radioactive and chemical wastes in industrial countries will threaten health and safety of both human

generations and all life for thousands of years.²⁰ Metals, pesticides, and other materials are entering food chains threatening hundreds of species, poisoning humans, and creating cancerous conditions within living cells. Within less than two centuries, humans have used up nearly all of the fossil fuel that took billions of years to accumulate.²¹ These projections are made with the assumption life styles and environmental conditions present in the world in 1975 will remain unchanged through 2000. This assumption, of course, is absurd.

Since The Global 2000 Report was published, the United States and Canada have had thousands of lakes made uninhabitable for fish due to acid rain contamination. The United States alone loses tons of top soil from erosion annually. Nature takes, under natural conditions, from one hundred to four hundred years or more to generate ten millimeters of top soil. To generate soil to a depth of eleven inches (the length of this page) requires three thousand to twelve thousand years.²² And of course recall, surrounding these increasing environmental dilemmas are the continuous presence of stress, desperation, hate, jealousies, crowding, and the ambitions of individuals, all amidst a world bulging with nuclear weapons.

Survival of society lies not in creating more technologies, but in making fundamental changes in our modes of thinking and our relationship with each other. We face not only an environmental crisis, but a social crisis of the first magnitude.²³

Environmental education. How is the current American citizen and those now in school being equipped to deal with these complex issues? According to the New York State Education Department, the average

individual is not equipped to determine the long-range consequences of actions or technologies now utilized in the United States. Most individuals do not possess the technical knowledge of thinking skills needed. Most citizens are unaware of the worldwide effects our current technology, philosophy, and behaviors are having on the total environment.²⁴

A majority of environmental education programs are not providing students with opportunities to apply learned knowledge to real life situations. Too often, many environmental education programs have been designed by individuals who themselves have never participated in the actual political arena. Also, many schools resist departing from established traditions due to their fear of losing taxpayers' support.²⁵

Environmental educators, as well as civic and social studies educators, have an ethical responsibility to develop the aspects of an individual's political involvement. Unless environmental educators provide their students with some political "teeth" (knowledge, skills, and direct experience in the political processes), and administrators and taxpayers give their support to participation development, school systems will continue to produce passive citizens. Students should know how to make and influence future decisions through actual participation. Educators should provide nothing less.

Conclusion. For too long, environmental educators have feared stressing the operant bureaucracy. We have the choice of redirecting environmental education to fit the current bureaucratic design or begin developing "a parallel system to interface with the bureaucracy and engage it in

a struggle for change."²⁶ This study proposes such a parallel system (Adolescent Apprenticeship) that incorporates the dimensions of political involvement through actual student participation in real environmental issues. The Adolescent Apprenticeship strives to transport students from a passive citizen, to spectator, to rational activist.

Research indicates that to be a citizen participant and rational activist, individuals must have achieved certain developmental criteria; a cognitive level necessary to comprehend, apply, and evaluate political information; and a particular level of emotional maturity that enhances an empathy for society.²⁷ Therefore, the development of the participatory dimension of political involvement requires an understanding of what specific cognitive, affective, and personality characteristics are needed by high school students. In the remaining pages of Chapter II, the author will attempt to explore current educational theories and studies in order to identify a set of specific characteristics needed to develop citizen participation in secondary students.

Educational Theory

Introduction. The Adolescent Apprenticeship process at Oakmont Regional High School is designed to enhance the development of environmental citizen participation. The following sections will explain the theoretical framework forming the foundation of the Adolescent Apprenticeship process.

The Belgrade Charter attempted to simplify the goal of environmental education by suggesting the following six objectives:

Awareness - to enable students and citizens to acquire strong feelings of concern regarding the environment.

- to develop motivation for actively participating in protection of the environment.

Knowledge - to develop ecological concepts in each student.

Attitude - to develop social values and responsibility towards the environment.

Skills - to develop those skills necessary for solving environmental problems.

Evaluation - to develop the ability for students to evaluate decisions regarding the environment in terms of ecological perspective, political consequences, economic issues, social ramifications, and educational meaning.

Participation - to develop the will and courage to take the necessary action to resolve environmental problems.²⁸

Educators have not been able to effectively design programs for traditional school systems which incorporate all of these objectives and especially the objective of citizen participation.

However, this author believes that when the Belgrade Charter's objectives are inter-meshed with the cognitive and affective domains of Bloom's and Krathwohl's Taxonomy of Educational Objectives (Handbook I and II), the cognitive developmental theory of Jean Piaget, and the cognitive moral developmental theory of Lawrence Kohlberg, a concise model will emerge for developing environmental citizen participants.

The following section will discuss: the cognitive and affective characteristics necessary for citizen participation; the methods for developing these characteristics in secondary students; and moralities necessary for citizen participation.

The cognitive domain.

The theory of Benjamin Bloom. The cognitive domain refers to all

the ways (biological development, experiences) an individual comes to know the world. It encompasses the individual's perspective of self in relation to the world.²⁹ Benjamin Bloom believes that as an individual internalizes a concept or perspective, it becomes measurable as a behavior.³⁰

In order to provide a classification system of the cognitive domain objectives possible within the American educational system, Bloom and his associates developed a taxonomy of behaviors. The cognitive objectives range from simple recall of learned material to highly creative ways of synthesizing new materials and ideas.³¹ Their resulting cognitive taxonomy has two levels comprising six major classes: level I - the Recall of Knowledge; knowledge and level II - the Development of Intellectual Skills and Abilities; comprehension, application, analysis, synthesis, and evaluation.

Knowledge involves the individual's remembering of ideas, material, or phenomena. The knowledge objectives are divided into categories that begin with concrete behaviors and become more complex and abstract. These categories are: 'knowledge of specifics', 'knowledge of ways and means of dealing with specifics', and 'knowledge of universals and abstractions'. To the educator, development of a student's knowledge would begin with the recall of specific facts and terminology; progress to ways of organizing, studying, judging, and criticizing ideas; and terminate with his/her mastery of major ideas, schemes and patterns by which ideas are organized. To the secondary environmental educator, this would mean a progression of a student's mastery of ecological/ environmental knowledge and political information to a level of

ecological principles and political ideologies.³² Regardless, in the knowledge category, the understanding of abstract principles is dependent on their relationship to the concrete.

The remaining classes in Bloom's taxonomy are concerned with developing students' intellectual abilities and skills. Comprehension enables individuals to know what is being communicated and enables them to use the material. Individuals who have obtained comprehension proficiency are able to demonstrate their ability to translate, interpret various types of data and facts, and extrapolate information.³³

Mastery of application requires that the student be able to use abstractions in concrete situations. An example of this within the realm of science might be if the student is able to predict the possible effect of a change on some component in a biological system.³⁴

Mastery of analysis and the remaining classes are dependent on the biological development of the brain. A student who is able to analyze is able to separate elements, identify relationships and organizational principles. Some specific analysis behaviors include: the student can recognize unstated assumptions; determine premises and conclusions in arguments; can verify the consistency of proposed hypotheses with given information; and can recognize persuasive techniques.³⁵

Synthesis proficiency requires the student connect pieces of information in order to generate a whole. The class of synthesis is divided into the subcategories of 'production of a unique communication', 'production of a plan', and 'derivation of a set of abstract relations'. Sample behaviors an educator might expect a student to demonstrate would be: skills in writing such as displaying organization of idea, planning

a unit for presentation, and formulating or modifying hypotheses.³⁶

Bloom's final cognitive class, evaluation, implies students are able to make judgments about materials, information, and methods. Evaluation is divided into two subcategories: 'judgments in terms of internal evidence', and 'judgments in terms of external evidence'. Specific behaviors representative of this class would be: the student is able to identify fallacious arguments, and compare theories and generalizations concerning particular subjects.³⁷ Figure 2 summarizes Bloom's cognitive domain theory.

When educators are selecting a particular curriculum for secondary students, it is useful to consider Bloom's cognitive domain framework. Educators should begin at the level of knowledge, and progress gradually to the level of intellectual skills and abilities. Environmental educators need to develop comprehension, application, analysis, synthesis, and evaluation skills within the context of environmental issues. They should recognize the validity of using Bloom's framework in developing the needed cognitive skills for participating in and making environmental decisions. They need to provide the experiences for the development of these skills within both the political and environmental domain. Students, to perform effectively as environmental citizens, must be able to think critically and apply ecological principles to environmental problems. Environmental education at the secondary level needs to develop not only knowledge of ecology and natural systems but also a basic knowledge of local, state, and federal political systems. Although the latter is viewed as the role of the social studies curriculum, it needs, at some point, to become part of environmental education.

Figure 2

A Summary of Bloom's Cognitive Domain

<u>KNOWLEDGE</u>	<u>INTELLECTUAL SKILLS AND ABILITIES</u>		
<u>Knowledge</u>	<u>Comprehension</u>	<u>Application</u>	<u>Analysis</u>
Knowledge of Specifics	Translation		Analysis of Elements
Knowledge of Ways and Means of Dealing with Specifics	Interpretation		Analysis of Relationships
Knowledge of Universals and Abstractions	Extrapolation		Analysis of Organizational Principles
		<u>Synthesis</u>	<u>Evaluation</u>
		Production of a Unique Communication	Judgments in Terms of Internal Evidence
		Production of a Plan, or Proposed Set of Operations	Judgments in Terms of External Criteria
		Derivation of a Set of Abstract Relations	

SOURCE: Benjamin S. Bloom, ed., Taxonomy of Educational Objectives Handbook I: Cognitive Domain (New York: Longman, Inc., 1977), pp. 201-207.

After reading Bloom's taxonomy, educators usually ask, "How does one develop knowledge and intellectual skills and abilities in students?" "At what age level is a teacher most likely to be successful in developing the complex cognitive skills, and what factors positively influence their development?"

As we learn new facts, our cognitive framework changes; it progresses with one level of complexity subsuming another.³⁸ Various theorists, such as Piaget, have suggested how this learning process occurs. It is logical to assume educators could be more effective in developing students' cognitive skills and abilities if they utilized these theories. In the following section, the author explores one cognitive developmental theory and its application to the enhancement of environmental citizen participation.

The theory of Jean Piaget. The process by which an individual's cognitive development evolves has been the subject of recent research and theory. Piaget's cognitive developmental approach hypothesizes a person's perception of reality is cognitively constructed and evolves into more elaborate systems through the individual's experiences.³⁹ The author identifies the theory of Piaget as beneficial to environmental educators because it incorporates Bloom's cognitive behaviors and has merit in accomplishing the Belgrade goal of environmental education.

Piaget defines cognitive characteristics of any particular age in terms of three components: mental structures, function, and content. An individual's mental structure or perspective is the view of self in relation to the world. Mental structures determine how and what individuals think, their attitudes, their values, and how they will interact

with their environments. Mental structures assist the mind to intellectually adapt to particular environments. As the individual grows, experiences, and develops, the structures are continuously modified.⁴⁰

Modification occurs through a process Piaget calls assimilation and accommodation. This process is the function component of Piaget's theory. Individuals receive a variety of stimuli as they experience their environment and, throughout their lives, build mental structures for these stimuli. When an individual experiences a new object, he/she places that stimulus in an already existing structure (assimilation) or modifies the existing structure (accommodation).⁴¹

Individuals seek biological adaptation when they confront disequilibrium in their environment. A person occupying a hot room adapts by perspiring in an attempt to cool the body surfaces. The individual also adapts intellectually when confronting mental disequilibrium through the processes of assimilation and accommodation. Misuse of these processes may generate mental structures that handicap the individual in the environmental decision making process, preventing adaptation, and limiting his/her ability to determine the consequences and the benefits of a particular action choice. Individuals who always assimilate stimuli are unable to detect differences between objects. Whereas, those who always accommodate are unable to see similarities between objects.

The degree to which an individual can obtain cognitive development is influenced by four factors: maturation, experience, social transmission, and equilibration. Maturation, the growth of brain tissues and endocrine systems, determines a child's mental capacity for processing information. Maturation, states Piaget, "can do no more than determine

the totality of possibilities and impossibilities at a given stage."⁴²

Experience from objects influences the development of different mental structures. Physical experiences extract the physical properties of objects and logical-mathematical experiences influence knowledge through internal coordination of the individual's actions.⁴³

Social transmission is the involvement of the individual with peers or a social group. Children have difficulty in seeing objectively because of a preoccupation with themselves. Loss of this egocentric focus and the development of a sensitivity to society is dependent on experience with others through social interactions. Equilibration refers to the individual's ability to bring himself/herself into harmony with the environment through a self-regulatory process.⁴⁴

In understanding the child's cognitive development, it is critical to realize the maturation, experience, social transmission, and equilibration strongly effect the individual's ability to build mental structures and grow cognitively. Mental structures operate to produce specific observable environmental behaviors, the content component of Piaget's theory. These behaviors reflect an individual's cognitive ability.⁴⁵ In studying children and adolescents, Piaget noted that cognitive development occurs as an invariant group of stages that unfold as the child matures biologically and interacts with his/her environment. He classified the cognitive stages according to their dominant mental structures and behaviors as: Sensori-Motor period (infancy or birth to two years of age); Preoperational (two to seven years of age); Concrete Operations (seven to eleven years of age); and Formal Operations (eleven to adulthood). Each stage proposed by Piaget is characterized by

specific intellectual tasks, generating a particular world viewpoint, utilization of assimilation and accommodation, and self-regulation abilities.⁴⁶

During the child's development from phase to phase, progressive development occurs not only in the child's object concept (his/her awareness of objects as more or less permanent), but also his/her concept of causality. In the Sensori-Motor period, the child's world is concerned with objects. At the end of this period, near age two, the child has the conceptual skills necessary for language development.⁴⁷

The Preoperational period, ages two to seven, is when children are able to use language or words as symbols in place of objects. Children's ability for verbal exchange with others increases their socialization, and their internalization of words enables more advanced thinking. Their growth of language skills facilitates a more complex development of cognitive abilities, and a specific group of characteristics and behaviors emerge.⁴⁸

Because of their limited social contact at the Preoperational period, children have a high degree of egocentrism. They cannot see the viewpoint of others. Egocentrism acts to maintain a structural status quo and inhibits the process of accommodation, thereby reducing the ability of individuals to question their own thinking. This egocentrism begins to change near age seven only when the child experiences peer group social interaction.⁴⁹

Preoperational children, because they lack transformation, are unable to identify or visualize the in-between steps of an action. They can only understand what they observe. For example, they cannot transform

how an object ended up in a horizontal position. They are unable to understand relationships between events which limit their development of logical thought and their ability to make long-term decisions.⁵⁰

In centration, children focus their attention on perceptual aspects. If an object appears a certain way, they view it that way. They are unable to decenter this attention and unable to think about the object. As an example, assume there are two rows of buttons all the same, one row contains nine buttons, the other row six buttons. The six buttons are spread further apart than the nine. When the child is asked which row is longer and why, the response is that six buttons are longer. They are unable to separate number from what appears perceptually.⁵¹

Preoperational children are unable to apply reversibility, the ability to apply thought to perceptual change. If shown two equal rows in length of eight coins, children will agree that each have the same coins. But if we lengthen one row by spreading the coins out, they cannot maintain the equivalence of number in the face of perceptual change. They are unable to reverse their thinking. Preoperational individuals would be greatly handicapped in their ability to make environmental decisions.⁵²

As children interact with peers and egocentrism breaks down, Piaget theorizes they will eventually be able to transform, decenter, and apply reverse thinking. When children are able to do these operations, they enter the Concrete Operations period. Many of ecology's key concepts: biogeochemical cycles, food chains, biological magnification, recycling, and interrelationships, cannot be comprehended until the child attains at a minimum, the period of Concrete Operations.⁵³

The Concrete Operations period, ages seven to eleven, illustrates the child's development of elementary forms of logical reasoning that can be used to solve elementary problems. They no longer rely totally on trial and error techniques to solve problems, are able to use intellectual processes, and are able to differentiate between present and historical time. They are able to carry out the intellectual tasks impossible in the Preoperational individual. They can decenter their perception, attend to transformations, and reverse operations. They are less egocentric, more sociocentric, able to take the role of others, and they can grasp cause and effect on a simple level.⁵⁴

It is during the Concrete Operations period that the child's concept of causality changes significantly. The most important development during this period is the appearance of logical operations, where the individual is able to mentally arrange objects according to changes in their size, length, volume, or weight, and is able to classify and relate objects or events.⁵⁵

The Concrete Operations period is often referred to as a transition between Preoperational and Formal Operations. Although children are able to solve problems involving concrete objects and events, they are unable to solve verbal hypothetical problems. They cannot imagine unreal events.⁵⁶

Piaget hypothesizes that the period of Formal Operations begins between the ages of eleven to fifteen years. During this period the individual is able to deal with variables simultaneously, can understand abstract relationships, and reasoning becomes more adult-like.⁵⁷ Unlike Concrete Operations, the Formal Operations period includes verbal and

abstract reasoning.⁵⁸

According to Piaget, three specific forms of verbal logic are usually displayed by individuals having Formal Operational thought. The first, propositional logic, is demonstrated through "if . . . then reasoning." A second, combinational logic, requires the recognition of several dependent and independent variables and the elimination of irrelevant variables. "This system of thinking permits the combining of propositions."⁵⁹ The final logic observed in Formal Operational thought is proportional logic, the capacity for reasoning and self-representation according to two reference systems at the same time.⁶⁰

The acquisition of Formal thought means an individual can deal effectively and efficiently with complex problems of reasoning. They can think critically, analyze, synthesize, and evaluate (Bloom's upper cognitive level), and they can also imagine possibilities inherent in a situation. In fact, Formal thinkers when confronted by a problem usually begin by thinking of many possibilities inherent in the situation. They are able to deal with problems in a variety of ways and from many different perspectives.⁶¹

The major difference between Concrete Operational and Formal Operational thought is the type of problem the individual is able to solve. Formal Operational children can deal with all classes of problems: past, present, future, hypothetical, and verbal. The child with Formal Operations can use acquired theories and use several operations in solving problems. Formal Operational children demonstrate an application and comprehension of scientific reasoning, hypothesis building, hypothesis testing, and causation.⁶²

In conclusion, Piaget identified four major periods of cognitive development, each characterized by particular world views and behaviors. The ability to grasp complex problems and confront long-term decision making requires Formal Operational thought. To the environmental educator, an understanding of these periods, cognitive structures, their behaviors, and world viewpoints are critical in developing environmental citizen participants. According to Piaget, "the very nature of our interaction with the environment is determined by our cognitive structures."⁶³ The environmental educator's concern should be to develop the cognitive stages that will most likely enhance citizen participation.

Conclusion. To be a rational activist or environmental citizen participant requires a proficiency of Bloom's upper cognitive levels, application, analysis, synthesis, and evaluation. A comparison of Piaget's cognitive periods and Bloom's cognitive domain framework demonstrates a similarity.

In Piaget, Bloom's intellectual skills and abilities appear in the Concrete Operations and the Formal Operations periods. It would be educationally unsound for environmental educators to expect students at the Preoperational period to comprehend the complexity of community environmental problems. The cognitive goals of environmental education should encourage the development of those behaviors typical of the Concrete Operations period and, ideally, those of the Formal Operations period.

The ability to visualize long-term effects of human actions on the environment, the ability to utilize data from ongoing ecological and environmental studies, and the ability to judge current hypotheses against new data are all behaviors typical of Formal thinkers. The

ability to combine data from several informational areas (social, ecological, economical, and political) requires behaviors typical of Formal stage thinking, and a mastery of Bloom's upper levels of intellectual skills and abilities.

Because solving environmental problems often deals with one's ability to project long-range consequences of possible action choices, Formal thinkers are ideally better suited for environmental problem solving. The development of Formal thinkers is, therefore, a valid goal of environmental education. It is imperative educators understand the processes involved in moving students from a Preoperational period to Concrete Operations and onto Formal Operations. Recalling earlier, Piaget identified four factors that facilitated movement through the stages: the individual's biological maturation, social interaction, experience, and equilibration. Only social interaction, experience, and to some extent equilibration are within the educator's realm.⁶⁴

Piaget recognized the importance of social environments in developing Formal thought and identified the school as critical to its development when he stated: "Education in school or other instruction may hasten or retard the development of formal structures."⁶⁵ Bloom also emphasized the importance of social environments in developing intellectual skills and abilities. He stated:

. . . cognitive advance occurs as a function of appropriate neurological development, a proper social environment, experience with things, and internal cognitive reorganization.⁶⁶

Environmental educators need to encourage social interaction and appropriate experiences in order to enhance the development of Piaget's Formal Operational thinking and the attainment of Bloom's intellectual

skills and abilities. The challenge for the secondary environmental educator is not only to develop formal stage thinking in students but to encourage the student to regularly function at their highest intellectual level.

In defining the dimensions of involvement and the development of citizen activists, Sigel and Hoskin stressed not only the cognitive domain but also, the need to develop an individual's affective component. The following section will discuss the affective domain, explore theories concerning the development of human and environmental morality, relate these to environmental education and to the development of environmental citizen participants.

The affective domain. The affective domain has been only minimally utilized in most educational programs. The reason for this is probably because it is difficult for practitioners to evaluate its objectives. Research now indicates that the benefits of incorporating the affective domain in secondary education may far outweigh its evaluation limitations.⁶⁷ A cautionary note to educators: interests, attitudes, and personality characteristics develop relatively slowly and to be visible in evaluation tools often requires testing over long time periods, and Krathwohl suggests perhaps even years.⁶⁸

The affective domain is believed to govern and influence an individual's drive, motivation, and ability to endure frustrations in a variety of situations.⁶⁹ Many educational theorists, including Jean Piaget, have recognized the necessity of emotion and the need for including the affective domain in the education of American youth. As

emphasized in the Belgrade Charter, the development of environmental citizens is dependent on the nurturing of appropriate feelings, positive attitudes, and values about the environment. Unless individuals are able to identify emotionally with their environment and internalize values, they will not be willing to take action. An examination of the framework of the affective domain and a review of cognitive moral developmental theory may serve to assist the environmental educator in developing the affective component of environmental citizen participation.

The theory of David Krathwohl. The affective domain, according to David R. Krathwohl in his book entitled Taxonomy of Educational Objectives Handbook II: Affective Domain, includes: interest, attitudes, values, the development of appreciation and respect, and the development of an individual's moral framework and specific emotional processes. Krathwohl divided the affective domain into levels consisting of five categories: a lower level--receiving, responding, and an upper level--values, organization of values, and characterization.⁷⁰

The categories proposed by Krathwohl emphasize a feeling and a degree of acceptance or rejection. They progress from an individual's simple attention to selected phenomena, to complex and internally consistent qualities of character and conscience.⁷¹

At the lowest affective level, receiving, educators are most concerned that the student be sensitized to phenomena. Receiving is divided into three subcategories ranging from a somewhat passive role 'awareness' to one that involves visible action 'controlled attentions' on the part of the student. Students at the 'awareness' subcategory are merely conscious of an event or particular state of affairs. In

environmental education this might be providing students with visual or verbal information in order to develop their recognition of an environmental problem. From 'awareness', individuals progress to a 'willingness to receive', and they demonstrate a willingness to tolerate specific stimuli and take notice of certain phenomenon. Students become sensitized to news presentations about pollution or demonstrate an observable increase in their sensitivity regarding environmental issues. A final subcategory of the receiving level is 'controlled or selected attentions'. Students upon reaching this subcategory will notice one stimulus over others. When exposed to a television program regarding current issues, they may listen intently to information about pesticide use, acid rains or endangered species. They demonstrate some discrimination pertaining to environmental issues or problems. The student no longer appears passive to the stimulus but displays behaviors indicating an interest in it.⁷²

At the responding level, students demonstrate behaviors illustrating they are beyond the attending to phenomenon stage. They are now actively motivated so that they are in some way committed. Responding is divided into three subcategories. The first category, 'acquiescence in responding', causes the student to make an observable response to the stimulus, but he/she has not internally accepted the necessity for doing so. An example of the behavior typical of this level might be compliance with certain school rules or an environmental sphere (observance of "no littering" signs). The student is merely demonstrating a willingness to comply, not an internalized acceptance. In 'willingness to respond', a second category of responding, the individual demonstrates

a capacity for voluntary action by choosing between stimuli. Behaviors indicative of this category would be: an acceptance of a responsibility for his/her own health, the student's selection of a television program about hazardous wastes over another program, or the student's voluntary participation in class discussions. When students reach the subcategory of 'satisfaction of response', they discover their voluntary behavior is accompanied by a feeling of satisfaction, pleasure, enjoyment or some type of emotional response. The students will indicate that they enjoyed the lab, or they found pleasure in reading, or they were glad they viewed a movie on endangered species.⁷³

It is at the valuing level that educators can identify students as being committed. When students reach this level, they view the stimulus or phenomenon as having worth. Behaviors displayed during this level are not motivated by fear or a desire to comply or to obey some authority. Motivation is due to an individual's commitment to a belief and their internalization of that belief. The first subcategory of valuing, 'acceptance of a value', results in the student having internalized a belief so that it becomes a major controlling force in determining his/her behavior. Krathwohl gives examples of behaviors typical of this subcategory as: the students desire to attain optimum health; they feel they are a member of some group that is undertaking to solve common problems; or they develop a sense of kinship with the natural environment. The individual at this level is willing to be identified with the belief or value. He/she may join an environmental club, wear an ecology pin, or purchase an environmental T-shirt. A second subcategory, 'preference for a value', illustrates the individual's deeper

commitment to the stimulus. The student is no longer satisfied with being identified with the stimulus but is now sufficiently committed to the value and pursues it. Behaviors indicative of this level include: students assume responsibility for projects; initiate group action to clean up the environment; write governmental agencies concerning environmental legislation; and actively seek out a variety of viewpoints regarding controversial environmental issues. The final stage of valuing, 'commitment', illustrates the individual's acceptance and internalization of beliefs and attitudes regarding the stimulus. Individuals at this point value the stimulus and demonstrate strong, emotional commitment to it. A behavioral example would be: students show respect and commitment to the basic principles that regulate natural ecosystems. They convey to others the need for recycling of resources or the conservation of water. At this level, there is an intense internal motivation among individuals to become involved. They often volunteer for campaigns to further protect the environment.⁷⁴

After internalization of the worth of a particular stimulus, individuals who have become involved and participated through some type of socialization process begin to encounter situations where more than one value has relevance. The individual enters the organization level and begins organizing values into some type of system. He/she determines relationships and prioritizes values--identifying the most important or dominant ones from the least important or pervasive ones. At the first subcategory, 'conceptualization of a value', individuals begin to categorize values and their quality. Students, at this level, may begin forming judgments regarding the responsibility of human society in

maintaining the survival of an endangered species. They may also begin forming their own ethical standards and personal goals by reading about various environmentalists like John Muir, Aldo Leopold, etc.⁷⁵

At the final subcategory of organization, 'organization of a value system', students begin to develop some type of philosophy of life. Behaviors typical of this stage may result in students developing plans for regulating their behaviors in accordance with ecological principles. They may begin to weigh alternative solutions to environmental problems against the welfare of the ecosystem and the long-term effects on it, rather than the advantages of one species over another.⁷⁶

The last level classified by Krathwohl, characterization by a value or value complex, is usually not attained until the individual has completed formal schooling. What is noticeable about an individual at this level is that he/she acts consistently with his/her internalized values. These values make up his/her total world view or perspective. This is the highest level of the affective taxonomy, and its development requires a close functional relationship between cognitive and affective processes.⁷⁷ Krathwohl explains:

We can say that the man who knows who he is . . . has arrived at this truth through painful intellectual effort in which the more complex mental processes of the Cognitive Taxonomy are clearly functioning.⁷⁸

The value complex level is divided into two subcategories: 'generalized set' and 'characterization'. An individual having attained a 'generalized set' gives internal consistency to a system of attitudes and values at any given time. The individual is able, states Krathwohl, to reduce and order the complex world around him/her and to act

consistently and effectively with it. The individual is able to adjust to a variety of situations.⁷⁹

A person's evolved 'generalized set' determines the way in which he/she approaches problems. It determines what he/she will view as important in attempting to solve the problem, and how adaptable he/she is in accepting new ideas regarding solutions. According to Krathwohl, one type of behavior illustrative of this level would be, the individual is able to judge issues and problems in terms of the situation and the consequences involved, rather than in terms of fixed precepts or emotional thinking. The individual is ready and able to revise judgments and to change behavior if new evidence is presented. Students view problems in objective, realistic, and tolerant terms.⁸⁰

Krathwohl warns that 'generalized sets' take time to develop and represent the peak of assimilation. Educators can only hope to begin the emotional process in students that will lead to their formation of generalized sets in later adult years.⁸¹

The last subcategory of characterization by a value or value complex is 'characterization'. Krathwohl explains 'characterization' as the point at which an individual develops a code of behavior based on ethical principles:

Here are found those objectives which concern one's view of the universe, one's philosophy of life, one's Weltanschauung . . . a value system having as its object the whole of what is known or knowable.⁸²

In developing the affective taxonomy, Krathwohl found that the principles of simple to complex or concrete to abstract as used in the Taxonomy of the Cognitive Domain were not an appropriate continuum for

the affective domain. In his search, he noted that the affective objectives progress from a level of awareness to a level of internalization and the development of a philosophy of life.⁸³ Figure 3 provides a modification of Krathwohl's affective domain for use in environmental education programs.

A common element running throughout the taxonomy is the process of internalization. An individual's values pass from a level of awareness to becoming more internally controlled. Krathwohl noted the extent to which external control by the environment yields to inner control as one ascends the continuum. At the lowest end of the continuum, inner control directs attention, while at higher levels, inner control produces responses but only if directed by an external authority. At the higher levels, inner control causes the appropriate response regardless of the external authority.⁸⁴

In conclusion, two elements characterize an individual's progression in the affective domain: there is a change from external to internal control, and the effect of emotion increases up to a point and then decreases as the individual nears the upper levels. Thus, the relationship of the affective domain to the development of participating environmental citizens (who must be able to make decisions independent of authority influences) should become clear to environmental educators.

Environmental education needs to encourage the attainment of the 'valuing level' and the 'organization level', if students are to participate in environmental issues and decision making. The commitment, involvement, and motivation of students in solving environmental

Figure 3

Modification of Krathwohl's Affective Domain for Environmental Education^a

<u>Receiving</u>	<u>Responding</u>	<u>Valuing</u>	<u>Organization</u>
Awareness (acid rains)	Acquiescence in Responding (complies with no litering)	Acceptance of a Value (internalized belief, sense of kinship, wears buttons, T-shirt)	Conceptualization of a Value (priority of values, responsibility of humans to other life forms)
Willingness to Receive (sensitive to news items about acid rains)	Willingness to Respond (selects television programs on acid rains)	Preference for a Value (assumes responsibility to clean up the environment)	Organization of a Value System (ethic regarding stimulus)
Controlled or Selected Attention (listens to news items about acid rains)	Satisfaction in Response (enjoyed a television program an acid rains)	Commitment (strong emotional commitment, volunteers)	<u>Characterization of a Value or a Value Complex</u>
Receiving = simple awareness	Responding = demonstrate low key noticeable behaviors		Generalized Set (view problems objectively)
Valuing = commitment	Organization = prioritize values		Characterization (Philosophy of life)
Characterization of a Value = philosophy of life, conscience			

SOURCE: David R. Krathwohl, Benjamin S. Bloom, and Bertram B. Masia, Taxonomy of Educational Objectives Handbook II: Affective Domain (New York: David McKay Company, Inc., 1974), pp. 174-185.

^aExamples given in parenthesis are the author's interpretation.

problems will be influenced by how effectively environmental educators employ an understanding of the affective domain.⁸⁵

However, educators must realize they cannot begin the evolutionary process towards 'characterization' unless students are first able to analyze, synthesize, and evaluate information. It is essential that the development of the cognitive and affective domains occur together. Curricula addressing either one domain or the other, theoretically, will not yield environmental citizens. Figure 4 provides a summary of the relationship of the affective domain to the cognitive domain.

Cognitive moral developmental theory. The theories of "how an individual forms specific kinds of moral structures" (or as Krathwohl termed, organized systems of values) and "whether the educational system should undertake student moral development" has plagued schools for decades. Several theories have been supported in the literature including the cognitive moral developmental theory models. The developmental models are concerned with how people make decisions and focus on moral reasoning associated with their judgments.

Developmental theorists believe there are age-related stages of moral judgment that may be dependent upon cognitive and social role taking development. They adhere to the notion that an individual's structure of moral reasoning, like cognitive reasoning, progresses through a series of stages. The stages progress from a self-centered to a species-centered consideration.⁸⁶ The approach is considered cognitive because it recognizes that moral education, like intellectual education, has its roots in stimulating the active thinking of the child about moral decisions and issues. Because it views the aim of

Figure 4

A Summary of the Relationship of the Affective
Domain to the Cognitive Domain

<u>COGNITIVE DOMAIN</u>		<u>AFFECTIVE DOMAIN</u>
Knowledge	Receiving
Comprehension		Responding
Application		Valuing
Analysis	Conceptualization
Synthesis	
Evaluation		Organization and Charac- terization

(dotted lines indicate the closest parallel
relationship between Affective and Cognitive)

SOURCE: David R. Krathwohl, Benjamin S. Bloom, and Bertram B. Masia, Taxonomy of Educational Objectives Handbook II: Affective Domain (New York: David McKay Company, Inc., 1974), p. 49.

moral education as the movement through stages, it is termed developmental.⁸⁷

In cognitive moral developmental theory, moral judgment changes are classified as organized systems of emotional thought (Kraihwohl's organization level). These systems or moral stages, like Piaget's cognitive stages, occur in an invariant sequence where an individual's movement is forward with no skipping of stages.⁸⁸

The theories of the more published structuralists, Jean Piaget, John Dewey, and Lawrence Kohlberg, are gaining research support. Unlike earlier theorists, Piaget and Kohlberg are concerned with a child's moral reasoning and judgment rather than the development of specific moral behaviors. This change of focus makes the utilization of the cognitive moral developmental theory in education an acceptable possibility for school systems.

In proposing utilization of the cognitive moral developmental approach to morality, readers should be aware that no single theory or approach adequately treats all aspects of morality. The cognitive developmentalist attempts to understand morality from the inside out by first attempting to understand how the subject views the world, what his/her concerns are, and what he/she sees as possible action choices.⁸⁹

Environmental decision making often requires that the individual make choices between values that place immediate human welfare and long-term ecosystem welfare in conflict. Analysis of complex environmental issues often requires not only advanced cognitive thinking but also advanced moral reasoning. According to cognitive moral developmental theory, moral judgment of an individual changes and is directly

related to the individual's cognitive development. Environmental education that is concerned with the quality of citizen environmental decision making will find merit in examining moral developmental theory.⁹⁰

Cognitive stresses organized thought processes. Moral involves decision making in situations where unusual values, such as the sanctity of life and the need for authority come in conflict. And development suggests that patterns of thinking about moral issues improve qualitatively over time.⁹¹

In order to understand the cognitive moral developmental theory and its validity in developing environmental citizens, it is necessary to define moral terminology and clarify what is meant by a moral issue. Kohlberg identified ten universal moral values: punishment, property, love, authority, law, life, liberty, justice, truth, and sex.⁹² A problem, he states, becomes a moral issue when a choice must be made between them. The ultimate action choice or decision the individual selects is termed the moral judgment. In arriving at a moral judgment, the individual identifies the possible action choices of the issue or its moral content and identifies and weighs the consequences of an action choice by using moral structures. A moral structure involves the thinking processes at a given age and results in a value preference and the selection of an action choice. This selection process is called moral reasoning.⁹³

When facing a moral issue, individuals may all agree on the same action choice but have different moral reasons. The character of moral reasoning is determined mainly by the individual's stage of cognitive development. Moral maturity, according to Kohlberg and Piaget, reflects a specific kind of moral judgment and results from utilization of Formal

stage thinking. Moral behavior or action is when individuals follow through and implement their judgment in real situations.⁹⁴

Ability to make moral judgment is necessary for moral behavior, but possession of moral judgment does not necessarily lead to moral behavior. Therefore, making a moral judgment at any age does not mean the individual will follow through on his/her action choice and demonstrate moral behavior.⁹⁵ Although they are related, there is a clear difference between the affective domain and the action (participatory) domain. Figure 5 summarizes the terminology and its relationship to the cognitive moral developmental process.

The following pages will examine and compare the specific characteristics of the moral developmental theories of Dewey, Piaget, and Kohlberg. Although Kohlberg's work is controversial, his theories and techniques will be of central emphasis in this study because his focus concerns moral development in adolescents.

The theory of John Dewey. The cognitive moral developmental approach was first stated by John Dewey who identified three levels of moral development. At a Pre-moral level, the individual's moral judgment and behavior are motivated by biological and social impulses. The Conventional level is when the individual accepts the standard of the group in making a moral judgment. Dewey's final level of Autonomy describes the individual as making moral judgments according to individual thinking and reflection. Dewey presented his moral theory in theoretical terms and did not provide data for its support.⁹⁶ Figure 6 provides a summary of John Dewey's moral developmental theory.

The theory of Jean Piaget. Most investigators, prior to Piaget,

Figure 5

A Summary of the Terminology and its Relationship to the Cognitive Moral Developmental Process

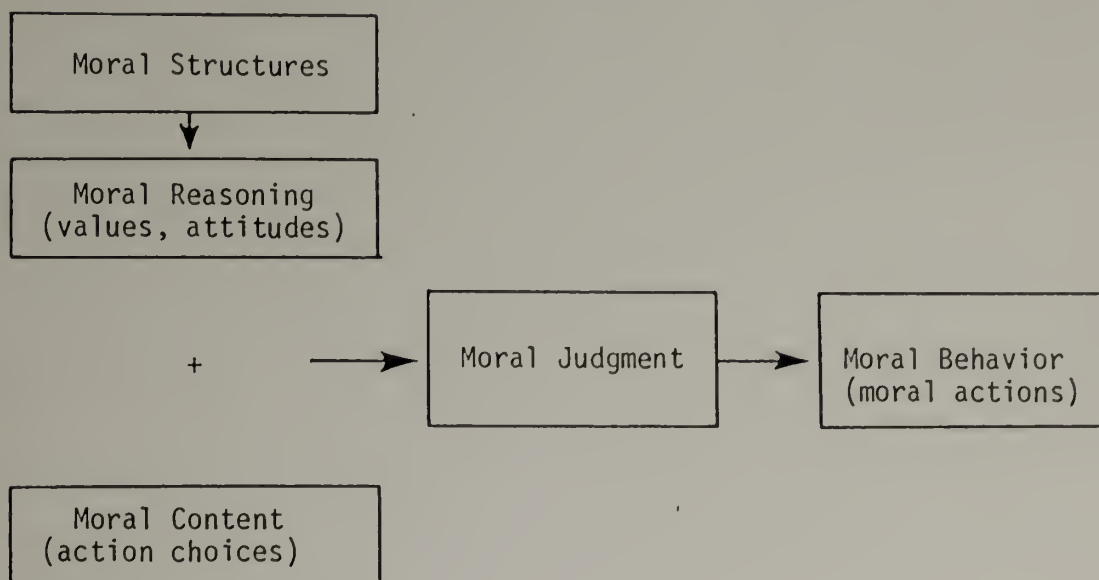


Figure 6

A Summary of John Dewey's Moral Developmental Theory

<u>LEVEL</u>	<u>MORAL MOTIVATION</u>
Pre-Moral	Biological and Social Impulses
Conventional.	Standard of the Group
Autonomy.	Individual Thinking and Reflection

SOURCE: Lawrence Kohlberg, "The Cognitive-Developmental Approach to Moral Education," Phi Delta Kappan, 56 (June 1975), p. 670.

were not concerned with the conceptualization of moral values, a characteristic identified by Krathwohl in the upper affective domain, or the development of methods for their measurement. Piaget's works, in 1932, pioneered the way for further study of values. Piaget interviewed children regarding what they would do in a variety of moral situations and found they had definite ideals of moral right and wrong that were drastically different from adults interviewed. He suggested that the differences in moral judgments were due to the individual's underlying cognitive structures and the way he/she interpreted experiences. From these early observations and experiments, Piaget began to create a theory regarding the development of moral structures.⁹⁷

Piaget was not interested in the moral behavior demonstrated by the child but rather in their types of moral judgments and reasoning. In studying children cognitively, he observed that moral judgment changed as they became older from a morality of constraint to a morality of cooperation. Three factors influenced this change: social interaction, cognitive development, and reduction in adult constraint. He noted these were similar to the factor that encouraged cognitive development: maturity, experience, social transmission, and equilibration.⁹⁸

Piaget identifies a first level Pre-moral stage where the child has no sense of obligation to rules. In Piaget's second level, Heteronomous stage (morality of constraint), there is a lack of any reference to internalized values, and the child makes all moral judgments based on established objective rules. To the child, right was literal obedience to rules and an equation of obligation with submission to power and punishment.⁹⁹ The child did not see rules and duties as social

arrangements or as devices for regulating cooperative interaction.¹⁰⁰

A third level, Autonomous stage (morality of cooperation), is regulated by a set of internalized values acquired from the child's experience and social interaction.¹⁰¹ At this stage, the child assumes moral rules are fixed like natural or physical laws and are the same for everyone. They are obligated to the rules based on mutual reciprocity and exchange.¹⁰²

Based on his observations, Piaget has divided the second and third stages into four phases of moral development: Heteronomous stage-- (1) Egocentric phase, the child views the environment as an extension of himself/herself and, therefore, will not cooperate with others; (2) Authoritarian phase, the child submits totally to authority and obeys rules and adults; Autonomous stage--(3) Reciprocal phase, the child views rules as a creation of society, believes society must be preserved, and demonstrates a mutual respect for others through cooperation; (4) Equity phase, the child views society as a brotherhood, is willing to make self-sacrifice for others, and demonstrates a type of altruism or social love toward others. During this last phase, the child, according to Piaget, makes moral judgments according to ideal rules and what ought to be. Piaget notes throughout his works that many children become fixated at one moral stage and, even in adulthood, maintain that moral stage.¹⁰³ Figure 7 provides a summary of Piaget's moral stages.

The theory of Lawrence Kohlberg. Lawrence Kohlberg, impressed with Piaget's and Dewey's theories, conducted additional field research. Although he followed Piaget's approach, he corrected many of Piaget's deficiencies. Specifically, Kohlberg increased the sample size, used a broader social base, provided better data proportions of population and

Figure 7
A Summary of Piaget's Moral Stages^a

STAGES	PHASES
<u>Pre-moral stage</u>	
(Morality of Constraint)	
<u>Heteronomous stage</u>	Egocentric Phase (Will not cooperate with others)
(Judgments based on established objective rules)	
.	Authoritarian Phase (Obeys existing rules and adults)
(Morality of Cooperation)	
<u>Autonomous stage</u>	Reciprocal Phase (Society and its rules must be preserved)
(Internalized values; mutual reciprocity)	
.	Equity Phase (Society a brotherhood; self-sacrifice)

SOURCE: William Kay, Moral Development, (Bristol, England: Western Printing Services, 1968), p. 154.

^aExplanations in parentheses provided by the author.

socially isolated children, elaborated the cognitive moral developmental approach, and applied his ideas to education. Kohlberg's concerns with adolescents, neglected by Piaget, and also his concern with how social forces and experiences influenced adolescent moral development, makes his studies especially significant for secondary environmental educators.¹⁰⁴

The techniques for obtaining Kohlberg's data involved the use of taped moral problems that reflected a conflict between values. He presented older subjects with complex moral dilemmas and interviewed them concerning their ideas of what should be done, and why. The reasoning was evaluated and used to classify children according to a particular moral level of development. Kohlberg, based on his research, developed a typological scheme that described the moral structures of an individual's thoughts, similar to Piaget's cognitive mental structures. Kohlberg determined that Piaget's two stages, Heteronomous and Autonomous, did not fully describe the kinds of reasoning produced in Kohlberg's subjects. In Kohlberg's typology, he identified three levels of moral thinking with each level having two stages. Each level and stage provides a distinct moral view of the world just as Piaget's cognitive levels demonstrate a particular way of organizing the world.¹⁰⁵

Based on his findings, Kohlberg concluded that all human beings think about social justice but their thought systems differ according to their stage of development. In developing his typology, he used justice as the major concept in defining the various moral levels and stages. He stated:

Justice is not a rule or a set of rules, it is a moral principle. By a moral principle we mean a mode of choosing which is universal, a rule of choosing which we want all people to adopt always in all situations. . . . A moral principle is a principle for resolving competing claims, you versus me, you versus a third person. There is only one principled basis for resolving claims, justice or equality. . . . A moral principle is not only a rule for action but a reason for action. As a reason for action, justice is called respect for persons.¹⁰⁶

Kohlberg divides his typology into moral rules versus moral principles. On the lower levels of moral development, individuals adhere to moral rules of conventional morality, whereas, on the upper levels, individuals use principled morality. Rules, Kohlberg states, are supported by social authority, whereas principles are chosen freely by the individual because of some internalized moral values. Decisions based on conventional morality will result in humans disagreeing because they are rooted in specific cultures and/or social position. Decisions based on principled morality are considered better by Kohlberg because they are 'universalities' in that all humans will agree with them. Moral judgment in Kohlberg's theory is based on how the social system identifies people's rights and responsibility within that system.¹⁰⁷

Kohlberg's moral stages, structures of moral judgment, are made up of three levels: Pre-Conventional, Conventional, and Post-Conventional. Each level is divided into two stages. During the Pre-Conventional level, ages four to ten years, the child decides action choices in terms of the physical consequences to himself/herself. In stage one, the child makes a moral judgment in order to avoid personal punishment. The child's potential physical consequences determine what behavior is right. During stage two, the child conforms in order to obtain rewards. A morality of instrumental hedonism exists, and what is considered right

is satisfying one's own needs.¹⁰⁸

As the child expands his/her knowledge and social experiences, he/she enters the Conventional level. During this level, conforming to the individual social order and maintaining and supporting that social order is valued most. In stage three, a morality of "good boy," "nice girl" is a goal. Maintaining the relations with others and obtaining their approval is what is right. Stage four reflects a morality of maintaining law, obeying authority, and doing one's duty is viewed as right. What is best for society or one's group is maintained.¹⁰⁹

A final moral level, Post-Conventional, abandons the authority of the group and the thrust is towards autonomous moral principles. All moral issues at this level are judged internally apart from the external pressures of the group. During stage five, a morality of contract and individual rights exists. Those standards discussed democratically and agreed on by the majority of society are viewed as right. There is respect for the rights of individuals. Stage six, the most complex moral development according to Kohlberg, is a morality of individual principles of conscience. The decision of one's conscience, in accordance with self-chosen principles appealing to universality and consistency, determines what is right. At this level, personal principles and societal rules are tested against higher life goals: freedom, love, justice, self-respect, etc. Societal rules will be broken or set aside for furthering the pursuit of these higher values.¹¹⁰

Kohlberg argues that one stage is better than another because the upper stages are more differentiated and are able to take into account increasingly complex problems. Kohlberg argues that each step in the

hierarchy is the result of a higher cognitive organization than the one before it. Each later or higher stage subsumes everything in the previous stage but, in doing so, makes new distinctions and organizes information and experiences into a more comprehensive structure.¹¹¹

Thus, in 1976, Kohlberg described moral stages in terms of different kinds of "social perspective." The Pre-Conventional level reflected a perspective of individuals concerned with personal interests. At the Conventional level, individuals viewed themselves as participants in a group. At the Post-Conventional level, individuals have made moral commitments and hold standards on which a just society is based.

In summary, the early stages of moral development have only the beginning elements of the concept of a stabilized and equilibrated social system. Individuals at the lower levels do not view people's relationships within an encompassing social system. They view people as collections of individuals who interact in isolated groups.¹¹²

Figure 8 provides a summary of Kohlberg's cognitive moral developmental theory.

When used in environmental decision making, each moral stage presents a particular view of the problem and influences the eventual decision made. There are stages of moral development that are more likely to achieve environmental protection and maintenance of the earth's natural system. Environmental educators need to identify these stages and their effects on environmental decision making.

Kohlberg made the following generalizations regarding his moral developmental theory: (1) Individuals show moral judgment according to

Figure 8

A Summary of Kohlberg's Cognitive
Moral Developmental Theory

Preconventional Level - Physical consequences of an action choice
(punishment, rewards, exchange of favors)

Stage 1 - Punishment avoidance

Stage 2 - Reward orientation

Conventional Level - Maintaining rules

Stage 3 - Obtaining approval of others

Stage 4 - Obeying authority and law

Post Conventional Level - Internalized, Autonomous moral principles

Stage 5 - Morality of contract or majority

Stage 6 - Morality of conscience

SOURCE: Lawrence Kohlberg, "The Cognitive-Developmental Approach to Moral Education," Phi Delta Kappan 56 (June 1975): 670-677.

six stages arranged in three levels. (2) At any age, a stage of moral thinking is how an individual views self in relation to environment. (3) Most of the time, individuals reason at one stage. (4) The stages are natural steps in an ethical development and are similar across cultures. (5) All people move through the stages in an invariant sequence with only the speed varying. (6) Very few people attain stage six reasoning, mainly because they lack the Formal thinking abilities or have not had experiences that facilitate movement to the next stage. (7) People can understand moral reasoning at stages below theirs and only one stage above theirs. (8) Higher moral stages are better than lower stages because they are more universal and consistent. (9) In order for stage transition to occur, conflict in moral reasoning must occur between the individual's moral stage and one higher. (10) Moral judgment is a necessary but not a sufficient condition for moral action.¹¹³

Conclusion. The cognitive moral developmental theory may have significance for environmental education. Educators should realize that moral rules and principles regulate and guide which social practices, laws, and institutions will be permitted in society. They also determine what rights and responsibilities are common to all members of society. Ideally, the moral stage common to the majority of people in a democracy influences the environmental action choices made. The moral stages of representatives, senators, and Congress influence which laws and programs are passed. The moral stages of our leaders in the various state and federal agencies effect how environmental programs and public lands are regulated and administrated.

Kohlberg found that many adults never reach principled morality, and that most are on stage four of conventional morality.¹¹⁴ Thus, in a democratic society, what Congress and state legislatures approve may often be accepted by society, because they are viewed as authorities. For environmental education, an aim should be to encourage people to attain higher moral levels, using either Kohlberg's or Piaget's moral stages, and to strive to develop in our leaders the moral reasoning that includes the welfare of the environment.

How individuals view themselves in relation to the environment has a strong effect on their moral responsibility and eventual action towards the environment. As moral decisions become more complicated and we are required to choose between the ecosystem's welfare or short-term economic gain, principled morality and autonomous thinking become more important. The level of the majority of citizens' moral development influences the laws the American democratic system will establish. Regardless of whose theory is supported, autonomous and/or principled thinking need to be encouraged.

Relationship of the cognitive and moral developmental theories.

Introduction. L. C. Lee, an educational researcher, conducted a study to verify Piaget's hypothesis that there is a relationship between cognitive and moral development. Lee found that individuals having a particular cognitive level usually possessed a particular moral level.¹¹⁵ Figure 9 provides a summary of the relationship between cognitive and moral developmental theories as presented by Lee.

Kohlberg claims that cognitive development establishes limits on

Figure 9

A Summary of the Relationship Between Cognitive and Moral
Developmental Theory According to L. C. Lee

<u>Piaget's Cognitive Stage</u>	<u>Moral Judgment Stage</u>
Pre-Operative Thought	Moral judgment based on authority
Concrete Operational Thought	Moral judgment based on cooperation and reciprocity (mutual exchange of privileges)
Formal Operational Thought	Moral judgment involves idealism, idealist and ideologist orientations

SOURCE: Elizabeth A. McMahon, Level of Moral Reasoning,
(Washington, D.C.: American Education Research Association, 1970),
pp. 3-4.

an individual's progress in moral development.

Since moral reasoning clearly is reasoning, advanced moral reasoning depends upon advanced logical reasoning: a person's logical stage puts a certain ceiling on the moral stage he can attain . . .116

Possessing a particular cognitive stage, Concrete Operational, Formal Operational, does not guarantee the possession of advanced moral reasoning abilities. Data reveal that most individuals are higher in cognitive stages than they are in moral stages. According to a study by Lawrence Kohlberg:

Over 50% of late adolescents and adults are capable of full formal reasoning, but only 10% of these adults (all formal operational) display principled (stages 5 and 6) moral reasoning.117

Piaget suggests that cognitive maturity, Formal Operational, is a necessary, but not a sufficient condition for moral judgment maturity, Post-Conventional or principled morality.

While formal operations may be necessary for principled morality, one may be a theoretical physicist and yet not make moral judgments at the principled level.118

In a speech by Dr. Leo Buscaglia, entitled The Art of Being Fully Human, the need for the development of principled morality along with cognitive development becomes evident. Buscaglia quotes a school principal:

I am a survivor of a concentration camp. My eyes saw what no person should witness. Gas chambers built by learned engineers. Children poisoned by educated physicians. Infants killed by trained nurses. Women and babies shot and killed by high school and college graduates. So I'm suspicious of education. My request is: help your students to be human. Your efforts must never produce learned monsters, skilled psychopaths, or educated Eichmanns. Reading and writing and spelling and history and arithmetic are only important if they serve to make our students human.119

As environmental educators, our first responsibility is to develop human beings. Our second responsibility is to teach that being human means a membership in and a moral responsibility to a life community.

Kohlberg's and Piaget's theories only suggest how moral reasoning might develop. They do not profess to believe that the attainment of moral judgment will result in appropriate moral behaviors. Both state, in order to be at maximum moral reasoning, the child must have attained Formal Operations. Therefore, moral maturity or the development of principled morality has a direct relationship to cognitive maturity.¹²⁰ Even if environmental educators are successful in developing Formal Operational thought and principled morality, can we be confident this will encourage student participation?

Principled Morality, autonomous morality, and the action domain.

The magic link between one's moral judgment and moral action is exposure to experiences that encourage moral actions within the individual. According to cognitive moral developmental theory, five factors influence moral action: the situational stress, the degree of diffused responsibility, an individual's motives and emotions, the complexity of the moral issues involved, and the individual's sense of ego strength.¹²¹

Kohlberg argues that moral maturity, principled morality, and action are related. The more advanced a person is on moral reasoning, the more likely they will act morally. In studies by Kohlberg, it was found that principled subjects cheated much less, and they resisted pressures by authorities to inflict pain on others, than did less morally mature subjects. Additional studies support Kohlberg's findings. Brown and colleagues, in 1969, found only 11 percent of college students

who were tested to be on stages five and six (principled morality) cheated on an exam, compared to 42 percent at the conventional morality level, stages three and four. Krebs and Kohlberg, in 1973, found 80 percent of stage five, sixth graders, resisted temptations to cheat, whereas 45 percent stage four, 22 percent stage three, 36 percent stage two and 19 percent stage one, resisted temptation to cheat. Haan, Smith, and Block, in 1969, studied two hundred students at Berkeley who staged a sit-in at the administration building in the name of freedom. They found 80 percent at stage six and 50 percent at stage five sat-in, while only 10 percent at stages three and four sat-in. Kohlberg, in 1969, administered a Moral Judgment Interview to some participants of the Milgram Obedience Study and found 75 percent of stage six participants refused to shock the victim, while only 13 percent of subjects at stage four or below refused shocking the victim.¹²²

In conclusion, environmental educators should realize whether a person chooses to act in a real life situation according to moral structures depends on many factors, including the way one's rights and duties in any situation are defined, and their stage of cognitive development. It is obvious moral reasoning does influence moral behavior by providing individuals with concrete definitions of rights and duties in behavioral situations. Moral reasoning, also, has a direct influence on the action choice made regarding an environmental issue and is often more influential than the individual's level of cognitive development. Figure 10 provides a summary of the factors that influence both cognitive and moral development.

The following section will explore the application of Kohlberg's

Figure 10

A Summary of the Factors that Influence an Individual's
Cognitive and Moral Development

<u>Cognitive</u>	<u>Affective</u>	<u>Moral Action</u>
Maturity	Social Interaction	Situational Stress
Experience	Cognitive Development	Diffused Responsibility
Social Transmission	Reduction in Adult Constraint	Individual Motives and Emotions
		Complexity of Moral Issues Involved
		Ego Strength

and Piaget's moral developmental theories to the development of an environmental morality in students and its role in further enhancing an individual's participation in environmental issues.

Environmental Morality

Introduction. As one examines environmental issues and concerns, it becomes clear that individuals need not only an understanding of ecological facts but also a grasp of the relationship of ethical principles to environmental decision making. Thus, educators in curricula development are justified in incorporating ethical concerns regarding the natural environment.

Previously, environmental ethics were explored mostly by naturalists, scientific people, and/or psychologists. Although their reasoning may have been faulty from the perspective of philosophers, it has provided a foundation for present-day discussions. The following reviews this development of environmental ethics and provides a rationale for incorporating it into the Adolescent Apprenticeship process at Oakmont Regional High School.

The previous sections provided the reader with those cognitive and affective theories pertinent to the development of environmental citizens. However, a criticism by this author of Kohlberg's and Piaget's theories is their use of dilemmas that are limited to a humanitarian focus. Kohlberg and Piaget did not recognize environmental issues or problems. Environmental educators might ask, "How is the environment viewed within Kohlberg's concept of justice?" "Can justice be expanded to encompass the environment?" "Would destruction of a particular

animal species for immediate human economic gain be just according to Kohlberg's theory?" "Is stage six reasoning limited to the human species or is it meant to encompass all life?"

According to this author, the concept of justice used in cognitive moral developmental theories needs to be expanded to encompass the environment. Therefore, environmental morality throughout this study is defined as the extension of moral reasoning to encompass the relationship between and among humans, other life forms, and the physical environment.

In the following sections, the author will discuss the idea of extending principled and autonomous moral reasoning to include the environment, and the effect cognitive perspectives have on the development of an individual's environmental morality. A final section will illustrate the practical application of the concept 'environmental morality' in environmental decision making.

Moral framework and the environment.

Introduction. Ethics assume the individual is a member of a specific community of interdependent parts where survival in that community is dependent on cooperation with its members. It is the concept of "community" that shapes an individual's ethical framework.¹²³ A major difference between human-centered ethics and environmental ethics is in this concept of community.

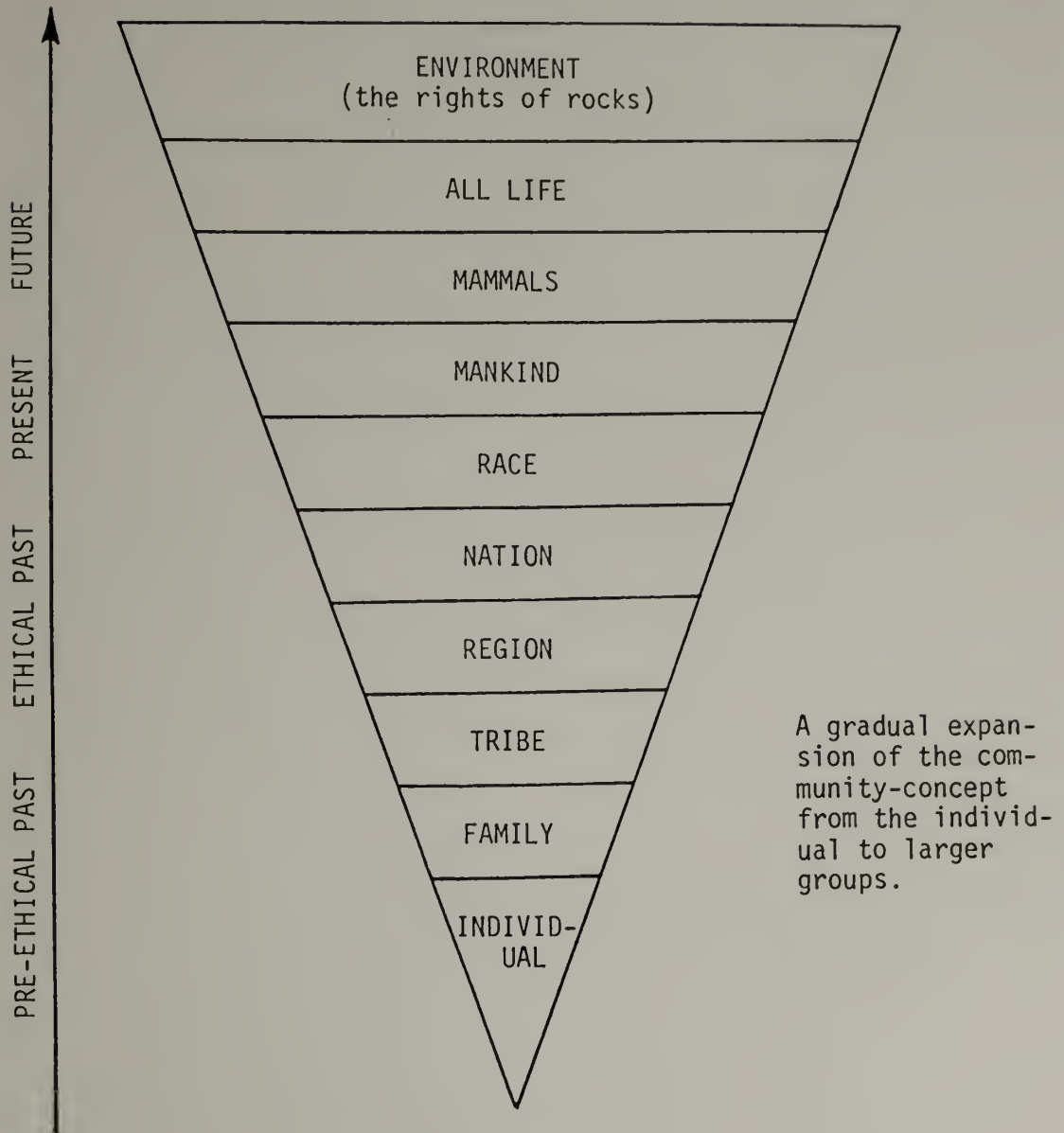
Ethical frameworks suggest guidelines for behaviors, right actions and wrong actions, that maintain cooperation and survival within a community. To belong to a community means certain rights for its members

and responsibility of the membership towards others. Those not belonging to the "community" are viewed as outside the ethical framework, and actions against them are not judged as right or wrong. Historically, the concept of community has broadened to include tribe, race, nation, species, etc. A basic premise of environmental education is to expand an individual's community-concept. One way of doing this would be through the concept of environmental morality. Affectively, environmental education's role is to facilitate the expansion of the ethical community to encompass the environment.

What are environmental ethics? Roderick Nash, professor of environmental history at the University of California, Santa Barbara, suggests that the evolution of ethics to include the environment is possible. He argues, human ethics have expanded over time to include larger and larger groups.¹²⁴ In Figure 11, "The Evolution of Ethics", Nash presents a theory proposing the possible evolution of human ethics to include the environment. For thousands of years, ethics centered around the individual and eventually, expanded to include the family and the tribe. If a warrior of one tribe encountered a woman from another tribe, rape was not judged as wrong behavior. However, raping a member of the same tribe was wrong. Historical accounts demonstrate ethics were eventually extended to include regions, nations, and races.¹²⁵

The simplest method for judging a group's ethical structure and its community-concept, according to Nash, is to examine its laws.¹²⁶ Several events, today, suggest the ethical pyramid is expanding to include other species. Laws suggest societies have placed various

Figure 11
 The Evolution of Ethics
 (A Theory Proposed by Roderick Nash)



SOURCE: Roderick Nash, "American Environmental History: A New Teaching Frontier," Pacific Historical Review (August 1972): pp. 363-371, Diagram B.

animals within the ethical sphere: dogs, horses, and whales, and movements like the Prevention of Cruelty to Animals and the Endangered Species Act reflect this expanding ethical consciousness.

Aldo Leopold, the first conservationist to verbalize an environmental ethic, in explaining ethics, discusses Odysseus's return from the Trojan wars when Odysseus hanged a dozen slave girls of his household. The hanging involved no question of propriety. The girls were viewed as property, and their disposal was a matter of expediency, not a question of right or wrong.¹²⁷ According to Leopold:

There is as yet no ethic dealing with man's relation to land and to the animals and plants which grow upon it. Land, like Odysseus' slave-girls, is still property. The land-relation is still strictly economic, entailing privileges but not obligations.¹²⁸

The environmental ethic, as proposed by Leopold, extends the concept of community beyond humans and includes all life within the ecosystem. Leopold states, "The land ethic simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively; the land."¹²⁹ An environmental ethic, he states, is a mode of guidance for meeting ecological situations.

Leopold's environmental ethic suggests that the role of humans should no longer be that of conqueror-controller of nature but part-and-citizen of nature. Membership within an environmental community implies a respect, a responsibility, and a love for all its fellow members, granting nature rights to existence and freedom from economic value, pressure, and exploitations.¹³⁰ Simply stated, Leopold's environmental ethic is:

A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise.¹³¹

Interrelating Leopold's idea of community and Nash's concept of ethical expansion, the author suggests a guideline for understanding ethical structures. When members of another race, tribe or the environment are viewed within what this author terms an 'outside sphere', the ethical situation becomes similar to the example of tribal rape used by Nash. Actions are not judged as right or wrong because they were on a non-tribal member considered outside the ethical structure. Therefore, organisms viewed as part of an 'outside sphere' are not subject to a community's ethics.

Organisms viewed within a 'property sphere' are subject to certain types of privileges determined by an owner. The 'property sphere' represents the view of Odysseus as told by Leopold. An organism's location within this sphere gives it some value either economic or spiritual, however, not rights.

When individuals or the environment are viewed within a 'community sphere', they have an equity with other members. This equity suggests mutual respect, rights, and responsibility toward members of the community. Organisms become subject to an ethical framework only when they are viewed within the 'community sphere'.

Whether the individual views the environment as property, part of the same community, or considers it outside the realm of human consciousness determines an individual's level of environmental morality. According to Nash, the extension of ethics to include environment within a 'community sphere' is an evolutionary possibility, and "an ecological

necessity" states Leopold.¹³²

Conclusion. The goal of the early United States conservation programs, according to Leopold, was to establish harmony between man and nature, however, harmony did not occur. The reason for the conservation movement's failure, according to Leopold, was the program's founders believed the solution to problems in conservation was more public education. It is now evident that it was not the volume of education that needed to be increased but the content altered.¹³³

Leopold argued that conservation programs, stressing economic self-interest and rooted in a 'property sphere' would not bring about the environmental ethic. Instead, an internal, emotional, and moral change was needed. According to Leopold, education needed to develop the people's affections and attitudes toward nature. They needed to learn to love nature, to respect it, value it philosophically rather than economically, and to recognize it as part of their community-concept.¹³⁴

To accept and believe in an environmental ethic, as stated by Leopold, requires that individuals have a cognitive awareness and an understanding of ecological concepts and principles, and that they understand the interrelatedness of all life. Affectively, they need to have internalized feelings of love, respect, and wonder for nature, and have developed an empathy for other life forms. Leopold emphasized the importance of individuals' affective development when he stated:

It is inconceivable to me that an ethical relation to land can exist without love, respect, and admiration for land, and a high regard for its value. By value, I of course mean something far broader than mere economic value; I mean value in a philosophical sense.¹³⁵

Development and internalization of an environmental ethic

necessitates a basic change in an individual's concept of the human/nature relationship from one of separateness to one of earth kinship. Incorporation of environmental morality (the extension of moral reasoning to include the environment in environmental education) provides ethical frameworks from which potential environmental citizens can more effectively judge possible right and wrong environmental action choices.

Educational theory and the development of an environmental morality.

Introduction. According to Bloom, Piaget, and Kohlberg, as individuals experience and learn, their cognitive structures are modified. As individuals interact socially, they begin to develop structures that influence various human moral concepts, Pre-Conventional, Conventional, Post-Conventional, or heteronomous and autonomous. The author utilizes moral developmental theory and the works of Nash and Leopold to suggest that individuals progress through stages of environmental morality. The stages change as individuals interact both physically and intellectually with their natural environment. Environmental morality, like human morality, can be explained through sequential development.

In analyzing an environmental problem or issue, the individual makes a moral judgment between two values resulting in a particular action choice. The selected moral judgment varies with age, cognitive ability, and the individual's perspective of environment. The placement of the environment within one of three spheres: outside, property, or community, identifies the individual's stage of environmental morality or specific environmental ethic.

Each environmental moral stage, as in cognitive moral developmental

theories, represents a specific system of cognitive and emotional thoughts, feelings, attitudes, and values regarding how the individual views himself/herself in relation to the environment. The stages are assumed to be invariant, each encompassing the previous one, and regression to an earlier stage is assumed to result only from trauma. The most developed stage in human moral reasoning is called moral maturity. In environmental morality, moral maturity is represented by an environmental ethic characterized by ecological morality and the environmental ethic proposed by Leopold.

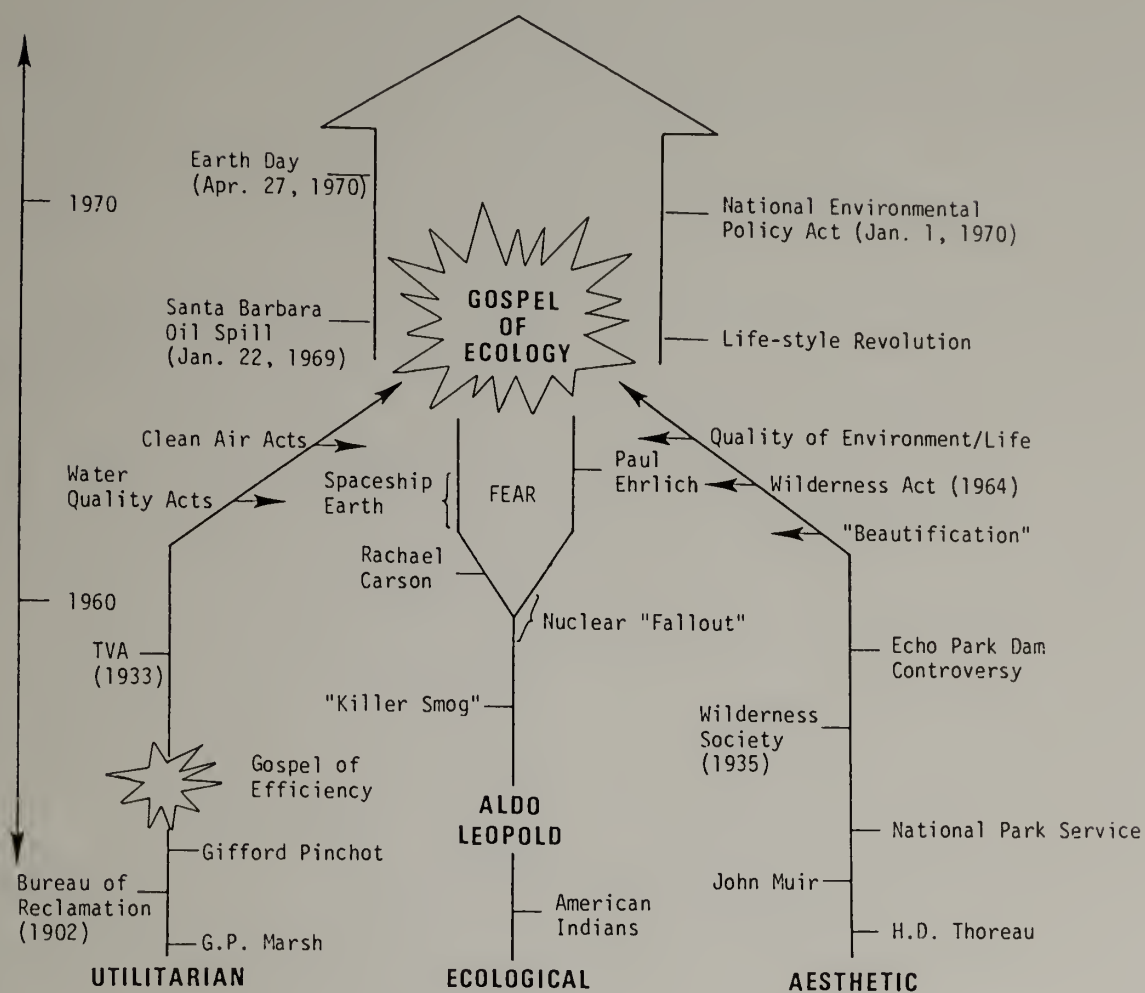
It is assumed that, like the human morality described by Piaget and Kohlberg, identification of an individual's stage of environmental morality and progression towards moral maturity can be accomplished by an examination of an individual's moral reasoning in environmental problems. In environmental morality, ethics are not limited to an anthropocentric focus but extend to include an ecosystem focus.

Stages of environmental morality. Roderick Nash, in reviewing historical environmental behaviors of Americans, divided the conservation movement into Utilitarian, Aesthetic, and Ecological. His works support a historical change in the environmental perspectives of Americans. Figure 12 describes the historical development of various environmental perspectives in American history.

Using Nash's reasoning and the works of Leopold and Kohlberg, this author suggests the existence of a three-level concept of environmental morality. Figure 13 provides a summary of the stages of environmental morality as proposed in this study. The first and most limited level, Pioneerism, views the environment in an 'outside sphere'. Like the

Figure 12

A Summary of the American Environmental Movement
(as Proposed by Roderick Nash)



SOURCE: Roderick Nash, "American Environmental History: A New Teaching Frontier," Pacific Historical Review (August 1972): pp. 363-371, Diagram C.

Figure 13

A Summary of the Stages of Environmental Morality Based
Upon the Author's Interrelationship of the Works
of Kohlberg, Nash and Leopold

<u>Stage</u>	<u>Perspective</u>	<u>Ethical Sphere</u>	<u>Value</u>	<u>Behavior</u>
Pioneerism	Self	Outside	Personal Use or Limited Group	Exploitation
Conservationist				
Utilitarian	Human	Property	Economic	Control - Ownership, Privileges
Aesthetic	Human	Property	Spiritual	
			(Human "common good")	
Environmentalist	Ecological	Community	Philosophical	Stewardship - Kin- ship, Rights, Re- sponsibility
			(Whole earth "common good")	

non-tribal member, behavior towards the environment is not judged as right or wrong. This view, similar to human morality in Piaget's Ego-centric phase, Dewey's Pre-moral, and Kohlberg's Pre-Conventional, dictates a behavior of exploitation. Exploitation is the unjust use of another for one's own profit or advantage.¹³⁶ Nature has value only if it serves the immediate interests of the individual or a few special interest groups. The object being exploited is removed from the group's respect, obligation, or responsibility.

The second level of environmental morality, Conservationism, is comparable to the human morality of Dewey's Conventional and Autonomy, Piaget's Authoritarian, Reciprocal and Equity phases, and Kohlberg's Conventional and Post-Conventional level. The Conservationist views the environment on the sphere of 'property', dictating privileges for its owners. Right actions are judged in terms of the "common good", and "what is right" is that which provides for the greatest number of humans. Conservationism comprises two groups that are determined by their environmental values: those viewing environment as having economic value for humans, utilitarians; and those viewing environment as having spiritual value for humans, aesthetic. Whether these groups lead to each other or they are separate has not been theoretically explored by this author. Regardless, the resulting environmental behavior is human control of nature.

A third environmental morality level, Environmentalism, supporter of ecological morality, expands the social community-concept beyond humans and places the environment within the ethical sphere of 'community'. Environmentalism reflects a morality that includes and goes

beyond a human paradigm to a whole-earth paradigm. According to Bruce Allsop:

We are accustomed to think of morality at two levels; the religious and the social. . . . Social morals are the customs of a community and are generally necessary to its communal life. . . . Ecological morality is a third level which does not exclude the other levels but may need to override them. The basis of ecological morality is awareness of the world as an organism in which all the living parts contribute to the whole.¹³⁷

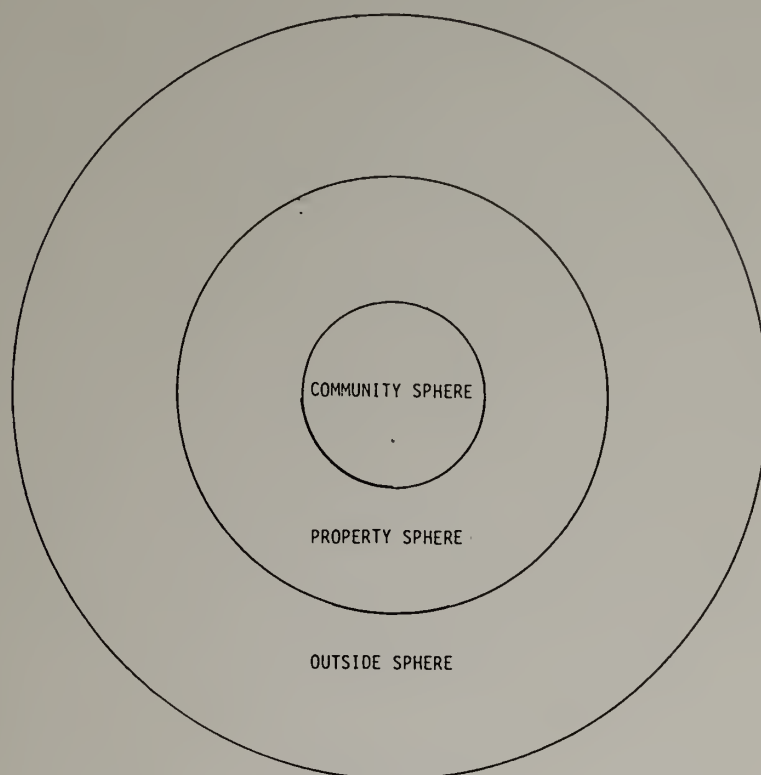
Acceptance of ecological morality necessitates the individual's development of an extensive sociocentric viewpoint that envisions humans and environment as one community, and of a paradigm that views the ecosystem as a living organism. In such a morality, humans and all life forms are viewed as species comprising equal components of the earth organismic structure. This paradigm encourages a behavior of stewardship, where the human species display kinship with all animals and plants. The human species' role is to oversee the total workings of the ecosystem and to maintain it in a health organismic existence. Figure 14 summarizes the types of environmental morality according to the placement of environment within specific spheres.

As first emphasized by Joseph Wood Krutch, a major difference between the Conservationist and the Environmentalist viewpoint is their conception of the common good and self-sacrifice. Krutch explains this further by using the term "practical ecologist" for a Conservationist:

. . . what every 'practical' ecologist is trying to do is maintain the balance of nature without facing the fact that man himself is part of it, that you cannot hope to keep the balance unless you admit that to some extent the immediate interest of the human species may sometimes have to be disregarded. . . . Must we not recognize the fact that any real 'management of resources' is impossible unless we are willing to sacrifice to some extent the immediate interests not only of certain individual men but also those of the human species itself? Most of us have reached the point where we recognize that the immediate interests of the lumberman or the rancher must sometimes be sacrificed to 'the

Figure 14

A Summary of the Types of Environmental Morality and Their Placement within the Concept of Community



COMMUNITY SPHERE (Intrinsic Value): The environment is a part of the ethical framework, e.g., ECOLOGICAL MORALITY (Environmentalist).

PROPERTY SPHERE (Aesthetic or Economic Value): The environment is viewed as property of humans, e.g., HUMAN MORALITY (Conservationist - Utilitarian, Aesthetic).

OUTSIDE SPHERE (Environment has no value except for personal ends): The environment is outside the realm of ethical considerations, e.g., SELF MORALITY (exploitist, Pioneerist).

general good'. Ultimately, we may have to recognize that there is also a conflict between what is called the general good and a good still more general--the good, that is to say, of the whole biological community. . . .138

Conservationists and Environmentalists may differ on their ultimate action choices in an environmental problem due to the idea of common good. To the Environmentalist, human short-term wants may have to be sacrificed in order to maintain the long-term good of the ecosystem. Figure 15 summarizes the relationship between cognitive moral developmental theory (human morality) and environmental morality.

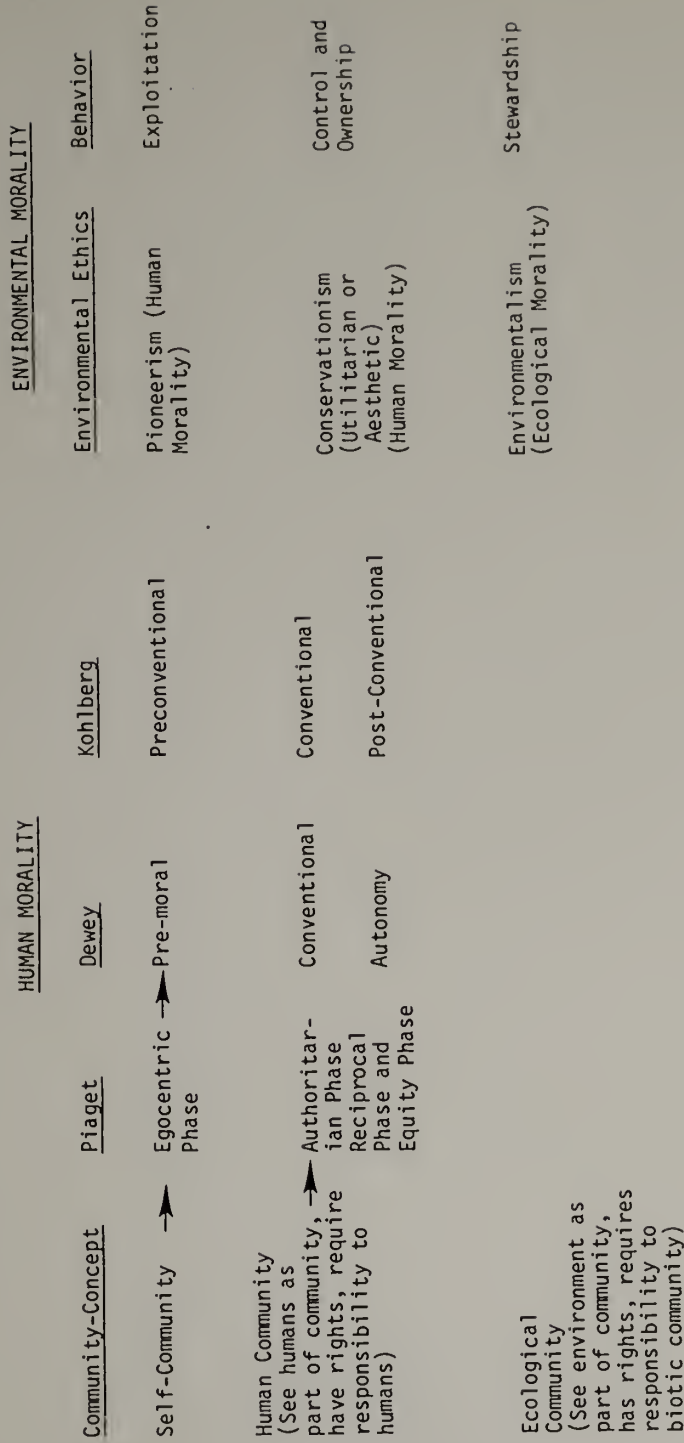
Responsibility, altruism and environmental morality. Acceptance of ecological morality requires the characteristics of Formal Operational thought and the individual's ability to think ecologically and apply ecological principles abstractly in environmental situations. It also assumes the individual has attained Kohlberg's human morality Post-Conventional level or Piaget's Autonomous stage.

The development of ecological morality assumes a willingness to make personal and species sacrifices for the "common good" of the total biotic community. The concept of sacrifice for the good of the biotic community raises significant differences between Kohlberg's and Piaget's human ethics, and Leopold's environmental ethic.

Krutch suggests that to develop Leopold's environmental ethic, humans need to evolve from a human species egocentric focus to a holistic sociocentric life perspective. It requires a humbling and decentering of the concept of the human species' importance in the natural ecosystem. In Kohlberg's and Piaget's theories, individual human life is of major concern. Whereas, in ecological morality, individual life

Figure 15

A Summary of the Relationship Between Cognitive Moral Developmental Theory (Human Morality) and Environmental Morality as Suggested by the Author



appears second to survival of individual species, and the survival of individual species is second to the total survival of the ecosystem.

In reviewing the earlier question concerning Kohlberg's concept of justice, it can be suggested that justice means responsibility for the welfare of individuals. At its broadest stage, justice necessitates that all human life be treated with respect, value, and reciprocity. Taking this interpretation further, the concept of Kohlberg's justice, when applied to the theoretical framework of environmental morality, means that at its broadest stage (Environmentalism or ecological morality), the human species has a responsibility for maintaining the welfare of the total ecosystem. Thus, all species should be treated with respect and reciprocity within that community, according to ecological principles.

Kohlberg's use of justice to frame an ethic is questionable. Although his upper moral stages do convey a responsibility for human life, in a situation where one life must be sacrificed for another, the concept of what is just becomes confused. Several authors, in criticizing Kohlberg's moral theory, emphasize this same point. The difficulty in Kohlberg's theory appears with a discussion of stage six. The meaning of stage six is difficult to clarify and has been interpreted differently in the literature.

Thomas Lickona suggests a fault with Kohlberg is that he does not utilize the concept of altruism to its fullest potential. Lickona further states that perhaps an ethic that encompasses altruism and carries moral reasoning to an ethic of love is more appropriate than an ethic based on justice.¹³⁹

Altruism, defined as "unselfish regard for or devotion to the welfare of others,"¹⁴⁰ at its strictest interpretation, implies a willingness to sacrifice individual wants or perhaps even individual life for the welfare of others. Using Kohlberg's moral theory, Lickona suggests an ethic based on altruism. In Kohlberg's Pre-Conventional stage one, altruism does not exist; the individual is concerned primarily with the survival of the self. However, in stage two, the individual does feel some responsibility towards others, providing favors are returned for favors. At the Conventional level, stage three, there is an appearance of a concern for the other's welfare. The individual, at this point, is recognizing the existence of social groups where individual wants may have to be forgotten for the group's welfare. However, responsibility at this stage does not permit individual actions against what is socially disapproved, and it does not extend beyond the individual's immediate social group.¹⁴¹

At stage four, the true beginning of altruism emerges. Although still unrefined, the individual has a sense of duty and responsibility to a larger human social system. At stage four, altruism is greatly limited because the individual will not challenge authority to help someone. Individuals will not help if a duty is assigned to someone else. They do not, if carrying out the authority's assigned duty, see themselves as responsible for hurting others.¹⁴²

As previously stated, responsibility and possible altruism apply to only those individuals viewed as members of one's community-concept. The concept of community undergoes transformation and broadening during the Conventional phase. Piaget's moral theory also suggests a broadening

of the community-concept from self to a larger social group as the individual moves through the phases of the Heteronomous stage.¹⁴³

At Kohlberg's Post-Conventional stage five, Lickona suggests individuals begin to demonstrate a concern for all humans. However, members of this stage display responsibility and elements of altruism only if it is within the realm of existing legal structures and has been decided, democratically, by a majority of the group. They often operate on the greatest good for the greatest number of humans. At this stage, like the previous one, individuals generally support an environmental morality of Conservationism, utilitarian, or aesthetic.¹⁴⁴

At Kohlberg's Post-Conventional stage six, according to Lickona, individuals feel responsible for preventing harmful consequences to others (human life) regardless of existing laws. The recent concern over human rights worldwide, echoes a stage six human morality. However, states Lickona, altruism is still limited when one's own welfare is directly threatened. Kohlberg has discussed the sacrifice of individual life for the belief of principle. However, whether voluntarily sacrificing one's life for the group's welfare would be considered stage six by Kohlberg is questionable. Sacrifice of individual life for others reaches beyond the concept of justice as originally implied by many of Kohlberg's works, and reaches, states Lickona, into the realm usually associated with love.¹⁴⁵

This leads the environmental morality discussion to an interesting point. Does an ecological morality, Environmentalism, level three of environmental morality, follow Kohlberg's stage six, or does it run parallel to human morality, or perhaps a comparison with Piaget's

equity phase morality would be more appropriate. The intent of the theoretical chapter of this dissertation is not to resolve the philosophical dilemmas generated by the literature regarding environmental ethics. The major concern is to emphasize that how an individual cognitively views the environment in relation to his/her community-concept generates a specific set of behaviors towards the environment.

A morality, rooted in a community-concept of self, generates an environmental morality of Pioneerism, whereas, one rooted in a community-concept of humans generates an environmental morality of Conservationism. The prime difference between these earlier stages of environmental morality is that at the third level, ecological morality, the human community is no longer considered of prime importance. In fact, decisions that require choices between immediate human species' gains and the long-term environmental effects on the ecosystem may result in third level choices that favor the ecosystem through the maintenance of ecological principles. Therefore, sacrifice of immediate human species' gains for ecosystem long-term survival may become a necessity.

Possession of ecological morality requires an extension of one's cognitive structures and the modification of community-concept, resulting in a broadening of stages five and six to concern for all life. Ideally, individuals possessing these moral stages feel internally responsible and have empathy for and a kinship with all life forms.

According to Lickona, an environmental ethic as raised by Leopold may better support not a justice ethic as Kohlberg proposes but rather an ethic founded on love.¹⁴⁶ Joseph Wood Krutch summarizes regarding the development of an emotional process leading towards Leopold's

environmental ethic:

Something is lacking and because of that lack education, law . . . fail to accomplish what they hope to accomplish. . . . And the thing which is missing is love, some feeling for, as well as some understanding of, the inclusive community of rocks and soils, plants and animals, of which we are a part.¹⁴⁷

The development of an environmental ethic is based primarily on cognitive schemata; how an individual perceives the environment; and how he/she defines his/her responsibilities to it. In looking back at environmental morality and studying Pioneerism, the behavior of exploitation (as an example, the slaughter of buffalo) is wrong and totally irresponsible from an ecological perspective. If people today were exposed to those same stressful conditions and lacked ecological knowledge, they would probably react the same. What environmental educators should be worried about and quick to criticize are not the actions of Pioneers but those of new "neo-frontiersmen" who carry Pioneer ethics into current times.¹⁴⁸

Ecological morality calls for cooperation of the human species with other species in the ecosystem and for an internalized respect for the natural balance, relationships, and cycles that maintain the ecosystem. The principles that govern ecological morality are universal and reach across species and through time. Perhaps Roderick Nash in a foreword to Leopold's *Land Ethic* summarizes an ecological morality best:

The environment, Leopold pointed out, did not 'belong' to man; he shared it with everything alive. And because of his power, man bore the responsibility of maintaining it in the best interests of the life community.¹⁴⁹

Environmental morality at the third level, ecological morality, goes beyond the human-centered focus of Kohlberg or Piaget. Unlike human

ethics that have religious or sentimental roots, the environmental ethic, as stated by Leopold, has scientific roots.¹⁵⁰

Environmental morality, education and action.

Environmental education. Environmental educators have for too long, ignored the merit of developing an individual's morality and encouraging its expansion to include the environment. How one sees oneself in relation to the world determines the position of "environment" within an ethical framework of right and wrong behaviors. To some, the environment is viewed as having rights, demanding responsibility; to others, it is property and requires only obligation; to still others, environment is outside the community-concept and is free of obligation.¹⁵¹ Leopold states:

As long as one considers himself as an entity separate from his environment, he feels no responsibility to the environment, because his actions have no consequences for himself. When one sees himself as part of the environment, he cannot normally behave in a manner that is deleterious to that environment.¹⁵²

A discussion of environmental morality within the classroom is a relatively new idea in environmental education. An environmental ethic based on ecological morality encompasses ecological principles and a concept of ecosystem. Because of its surficial, anti-human appearance, or its indoctrinative undertones, many secondary environmental educators have avoided it. Environmental morality, if incorporated in curricula, may provide a guiding framework for human behavior towards the environment.

The most serious obstacle in environmental education, today, is that programs are headed away from, rather than towards, an intense

consciousness and responsibility towards the whole environment.¹⁵³ The development of environmental citizens who are willing to participate and take action depends on the emphasis of environmental morality in the secondary school curriculum. The development of an environmental citizen depends on the concept of ecosystem becoming a part of the student's community-concept and a part of his/her ethical framework. It also assumes the internalization of human principled morality.

In a study by Haan and Haan, it was found that a majority of activists used principled reasoning as a way of resolving hypothetical dilemmas; however, only a small percentage of non-activists did. Development of human principled morality and Post-Conventional reasoning is a necessary element for the development of upper stage environmental morality; both are necessary characteristics of environmental activists.¹⁵⁴

Through an examination of Roderick Nash's studies, the works of Aldo Leopold and Joseph Wood Krutch, the possibility of an evolutionary development of human ethics to include environment is possible.

Environmental Education is the contemporary progressive impulse to bring about social reform through education and extend the ethical framework of our society to the ultimate degree, to include the environment itself.¹⁵⁵

Environmental action. Environmental morality, if understood, can be used to enhance protection of the environment. When coming face-to-face with fellow citizens on environmental issues, students may become frustrated if they do not understand how to use environmental morality to persuade and convince audiences of particular action choices. Too often, environmental issues are decided by self-interest. The decision to have pollution control devices installed often becomes a conflict between individual economic interests and the notion of "common good."

What is critical to understand is that everyone possesses some type of environmental morality.

Although in examining local environmental problems, people may agree on the same course of action, moral judgment; a closer study reveals that the reasons for their action choice may be quite different. When an individual works in a community to bring about maximum protection of the environment, it is critical that he/she examines the reasoning that generates citizens' motivation. Kohlberg's research suggests that moral reasoning identifies an individual's level of morality. It is only from an understanding of an individual's environmental moral reasoning that the student will be able to most effectively present arguments that appeal to an individual's morality and enhance protection of the environment.

It is unfortunate many Environmentalists, when confronting community meetings, choose to argue from an environmental ethic of ecological morality; speaking for the birds' rights or a wetland's role within the ecosystem. Although this is a valid ethic, most people, due to a lack of ecological training, their location at the Concrete cognitive level, their lack of appropriate experiences or their stabilization at a particular moral level, cannot comprehend the meaning of ecological morality. Arguing from this moral level will do little to protect the environment within most communities and, most likely, will antagonize the audience.

In conclusion, individuals have different environmental morality levels and specific concepts of the location of environment within the ethical model: 'outside', 'property', 'community'. One responsibility

of an environmental educator should be to teach students how to identify a citizen's environmental morality level and how to work within that framework for environmental protection. Arguing from the audience's environmental morality enables the audience to more fully comprehend and identify with the issues.

Secondary environmental education programs, to stimulate environmental decision making and citizen involvement, need environmental moral theory that encompasses cognitive and moral developmental theories.

A practical application of environmental morality. In concluding, it would be beneficial to briefly illustrate how environmental morality and Formal Operational thought might influence environmental decision making. George's Bank, along the continental shelf of the Massachusetts coast, is a unique environment for a diversity of fish species. The water is shallow and two currents collide causing the water to rotate slowly around the shoal. These abiotic characteristics create a multidimensional habitat concentrated in one area and make George's Bank one of the richest fisheries in the world. Economically, the area has supported over one billion dollars in revenue for commercial fishing. Besides immediate economic value, it serves as a spawning ground for large numbers of fish species, maintaining future fish populations.¹⁵⁶

Also, geologists believe that beneath this area lies gas and oil deposits. Here begins the problem, fish or oil? The Department of the Interior recently announced its intention to sell leases to oil corporations to drill. Although actual oil amounts are not known, the Department of the Interior projects a probable find of 150 million barrels total. The actual problem: "Should George's Bank be opened for oil

exploration leases?"¹⁵⁷

To fully evaluate the problem, certain cognitive skills are needed to facilitate a decision. An individual must know where to get facts and how to use those facts. To project all possible consequences and benefits of the proposed action requires Formal Operational thought. The benefits and consequences to the fish and the oil must be identified, listed, and considered in making a decision. This includes determining the long and short-term effects on the fish populations, the potential oil, the human population, and the ecosystem.

Regardless of the facts, eventually a decision will be made that employs the affective domain and one's moral reasoning level. How individuals view themselves in relation to the environment; how they view their needs in relation to others and the environment; and their responsibilities regarding the self, fellow humans, and the environment will all be weighed. The moral reasoning level employed will support what the individual sees as having the most value based on the perspective of the world around him/her. Depending on the individual's perspective, experiences, and moral framework, as defined by Krathwohl, a decision will be made.

Additional facts were summarized in an editorial published in the Washington Post, Sunday, September 23, 1979, including a statement regarding the possible removal of 150 million barrels from the proposed drill area as being small.

To judge how small, assume for the sake of argument that the actual find is double what the government predicts. That would be an amount of energy equal to eight days of current U.S. consumption. Or, spread over 20 years (the estimated life of the field), the most promising area of the George's Bank might contribute as much as 9.5 hours of U.S. energy needs every year.¹⁵⁸

Economically, from this information, the yield is poor. The editorial continues by suggesting, let's assume at the time of the Bank issue, the selling price of oil was thirty dollars per barrel. The fishery is economically worth many times more than the expected oil yield. This is still not totally accurate because, if the fish are properly managed, the value cannot be calculated since it has a potential, barring natural geomorphic changes, climatic changes, etc., of producing indefinitely. Thus, a decision to drill pits two values against each other and emerges as a moral issue, fish-for-food versus oil-for-energy.¹⁵⁹

Those who support drilling generally believe safeguards can be installed that will reduce risk to the fish. But one blow-out possibly could destroy the area as a spawning ground. The data concerning a blow-out are not currently available. The time of a spill and the individual fish species in the area would all affect the overall consequences. Is technology for underwater drilling predictable and safe. The opposition believes that the safeguards proposed to date are not worth the overall risk to the fishing ground and the ecosystem. Other facts also emerge in this issue--George's Bank is not the only area, others less important as fisheries could be drilled. Perhaps, sacrifice of human species' wants for the protection of this area should be made in order to insure protection of the natural system and future food supplies.

From the information presented, an individual having a Pioneer environmental ethic could support one of two possible positions: pro-drilling, because of personal economical gain, or anti-drilling, to protect fish for the same economic reasons. Individuals reasoning along the Conservationist utilitarian level could argue support for oil

drilling because it is for the "common good" of humans, or a similar argument could be presented for support of the fish because of the "common good" of humans. The Conservationist aesthetic argument is concerned with the visual and spiritual impacts of the proposed activity and would most likely not support drilling. The Environmentalist would support no drilling because the data as presented, and the project's hypothesized effects over the long-term could endanger and possibly destroy the entire fish species system.

From this example, two major points need to be emphasized:

(1) An Environmentalist viewpoint supports the welfare of fish species and encompasses all arguments below it that support the fish. (2) In general, environmental morality in this example provides reasoning that can support or not support several possible actions in the George's Bank environmental problem. Therefore, it is possible to be a Conservationist-utilitarian or aesthetic and argue pro-fish or pro-oil. Since Conservationist represents a type of conventional morality and is concerned with the "good of humans", as Kohlberg noted, there is often conflict between these pro and con reasons. However, using Kohlberg's justice concept, arguments from an ecological morality level are "just" because they maintain the ecosystem and consider the long-term effects on other species, including humans. Ecological moral reasoning, as Krutch indicated, often necessitates sacrifice of the "common good" of a specific group for a larger "common good".

However, let us assume facts pertaining to George's Bank are somewhat modified, and oil is in abundant supply. In such a situation, the Pioneerist and Conservationist would favor either the economic value of

the oil or the fish or human welfare in arriving at a final decision. However, the Environmentalist would consider the effects of the oil excavation on the potential survival of both the fish species and the marine ecosystem. It is in this latter position that the true characteristics of Environmentalism can be observed. No longer is the welfare of the human species or a specific group considered of central importance in decision making, rather human species and fish species are given equal consideration. The long-term effects on the ecosystem and the possible extinction of a species are considered as having value.

Kohlberg's morality began with individual self-centeredness and expanded to include a small social group, to a nationalistic focus, and terminated with a concern for human life. Ecological morality represents the expansion of a decentering process, first evidenced in Kohlberg's and others' moral theories, to encompass a social structure of ecosystem and respect for all species. In human morality, the sanctity of human individuals is supported, whereas Environmentalism suggests a sanctity of species.

The author recognizes that there are complex questions and conflicts that can be raised in intellectually pursuing a scenario in environmental morality. The focus of this paper is not to resolve these dilemmas but rather to provide ideas that may stimulate philosophers to pursue the realm of extending ethical principles to include the natural environment.

Summary: What is an environmental citizen? An environmental citizen is defined by this author as a rational activist, according to Sigel's and Hoskin's eight citizen types. The environmental citizen possesses

specific cognitive and affective characteristics. The environmental citizen develops moral levels that facilitate his/her ability to make effective long-term decisions regarding environmental problems and issues as these effect the entire ecosystem and are not limited to the effects on human species.

Cognitive characteristics. The environmental citizen needs to possess a mental schemata, using Piagetian terms, that incorporates the environment, humans, and individuals as members of the same community, interrelated, and interdependent. This perspective, encouraged by an individual's comprehension of ecological knowledge and facts and the experiences with and from the environment, is more generally referred to as an ecological perspective. Ideally, through the development of Bloom's intellectual skills: comprehension, application, analysis, synthesis, and evaluation, the individual should be able to utilize ecological concepts and principles in the decision making process, resulting in the ability to think ecologically.

In addition, environmental citizens need to have developed political skills. They should have knowledge of the democratic political system and should be able to use that knowledge through application, analysis, synthesis, and evaluation in order to function effectively within the political system. Mastery of these intellectual skills necessitates that the individual be at a cognitive developmental stage of Concrete Operational and, ideally, is progressing towards or has attained Formal Operational thought. Although environmental citizens at a Concrete Operational level can make positive decisions regarding the environment, their ability to judge the long-range consequences of an action is

limited. Environmental citizens are more effective, therefore, if they possess abstract thinking abilities characteristic of the Formal Operational level.

Affective characteristics. Environmental citizens need to have achieved the levels of Krathwohl's affective taxonomy. Actual action, according to Krathwohl, will be determined by individuals achieving the levels of organization and characterization by a value complex. To enhance their actual commitment to participation, environmental citizens need to have internalized a set of environmental values through the development of the upper levels of Krathwohl's affective taxonomy. Educators can only hope to stimulate, through experiences and social interactions, students' movement toward these upper levels.

Internalized environmental perspectives affect the individual's environmental morality. A property perspective precipitates an environmental ethic that is Conservationist aesthetic or Conservationist utilitarian. Finally, a community perspective precipitates Environmentalism.

Individuals need to develop and internalize some type of environmental morality that identifies their relationship and degree of responsibility towards the environment. Actual acceptance of a particular environmental morality by students, identified by Krathwohl as generalized set and characterization, is probably not attainable within the high school years. However, students, to become environmental citizens, need to begin the acceptance of some type of environmental morality. Awareness of environmental morality is the first step towards shaping a framework that defines right and wrong behaviors toward the environment. Possession of either a human morality of conventional or principled will

result in the individual's ability to understand a Conservationist or Environmentalist viewpoint.

A Conservation ethic, even though limited in many regards, can be utilized to obtain maximum protection of the environment. If the environment suffers, humans will also suffer. Therefore, the Conservationist who sees the environment valuable for the "common good" can be convinced of the protection of the environment because humans need it. Arguing for the good of humans can be a most effective form of reasoning. Figure 16 summarizes the cognitive and affective characteristics necessary for the enhancement of environmental citizens.

Conclusion. Creation of an environmental citizen or rational activist needs to encompass, besides the cognitive and affective components, the participatory component. Many factors influence whether an individual will participate and the quality of the participatory behavior displayed. An individual having Formal thought and ecological morality may not necessarily act. It is possible, as evidenced at town meetings or other public sessions, that individuals who possess low levels of cognitive abilities, cognitive reasoning, only a few elements of Krathwohl's affective taxonomy, and are limited in the development of their moral reasoning, can still be the most vocal and motivated participants.

The factors that influence participation emerge from the affective domain, and as Krathwohl states, comprise a spectrum of personality factors.¹⁶⁰ Chapter III will examine these personality factors, discuss their influence on participation, and will identify those personality factors identified in the literature as most critical to the development of citizen activists. Chapter III will also examine the phase of

Figure 16

A Summary of the Cognitive and Affective Characteristics Necessary for the Development of Environmental Citizens

<u>COGNITIVE</u>			
<u>Intellectual Skills</u>	<u>Knowledge Base</u>	<u>Cognitive Reasoning Stage</u>	<u>Environmental Morality</u>
Comprehension	Political Knowledge and Skills	Concrete Operational or Formal Operational	Conservationist (Utilitarian or Aesthetic)
Application	Ecological Knowledge (Facts, Concepts and Principles - Ecological Thinking)		
Analysis			
Synthesis			
Evaluation			
<u>AFFECTIVE</u>			
<u>Affective Characteristics</u>	<u>Environmental Paradigms</u>	<u>Moral Reasoning Stage</u>	<u>Environmental Morality</u>
Valuing	Spaceship Earth or Organismic Earth	Conventional Morality	Conservationist (Utilitarian or Aesthetic)
Organization		Principled Morality	Environmentalist
Characterization by a Value Complex			

adolescence and its potential for the initial development of environmental citizen characteristics. A final section will examine those educational techniques, methods, and programs successful in developing specific participation characteristics necessary for the information of environmental citizens.

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CHAPTER III
REVIEW OF THE LITERATURE

Participation and Environmental Citizens

To be an environmental citizen in a democratic society implies action and involvement. Even if secondary programs focus on developing the lower and upper levels of the cognitive and affective domains, it will mean little if students do not become involved upon graduation. Data indicate students who experience environmental education through traditional awareness-oriented programs have only a general knowledge of the environment and the issues.¹ Research studies also indicate exposure to an awareness-oriented approach does not necessarily lead to the development of the individual's citizenship responsibilities or his/her participation.² To quote Hungerford:

Awareness, appreciation, and understanding of the environment are only the first steps and do not necessarily lead to effective action.³

Barbara Winston, in a dissertation study entitled "The Relationship of Awareness to Concern for Environmental Quality Among Selected High School Seniors", found many current environmental education programs are based on the assumption that increased awareness will lead to involvement. In her studies, Barbara Winston found no significant relationships between any combination of expressed concern, visual awareness, and demonstrated concern for environmental problems.⁴ Chapter III will identify what additional factors should be considered by secondary environmental educators in order to enhance citizen participation in environmental issues.

Personality factors and participation. An individual's psychological dispositions and prior experiences, interacting with the characteristics of the situation, influence whether an individual will participate. Most individuals become involved only when they feel their efforts outweigh the costs of not becoming involved. Sigel and Hoskin recognize the forces operating to prevent involvement when they state:

Time and energy are limited human resources which can be devoted . . . to pursuits such as economic gain, recreation, or social activity . . . opting for political efforts involves the probable sacrifice of some of these . . . pursuits.⁵

Many young people do not feel the costs of political involvement are worth the benefits. Yet even when the benefits far outweigh the costs, some individuals still do not become involved. According to D. Riesman and N. Glazer, there is significant evidence to suggest that certain personality factors play a role in determining whether an individual will be politically interested or apathetic.⁶

Involvement in the political system does not normally occur because of a concern for environmental issues. Individuals, based on their moral structures, may know what is the "right" course of action in a given moral situation, yet may not carry out the behavior. Macaulay and Berkowitz hypothesize that situations which increase the likelihood individuals perceive their responsibilities are more apt to foster desirable moral behaviors. Situations that shift responsibility away from the self, therefore, reduce the likelihood of demonstrating morally desirable behaviors.⁷ Whether individuals act often depends on both their moral frameworks, and if they see themselves responsible for carrying out necessary actions.

Hornstein and others, in 1968, found that subjects returned a lost wallet more frequently when the victim was like themselves.⁸ Whether individuals are able to identify with some character in the moral issues determines the likelihood they will act on their moral judgment. Similar data exist in the environmental movement. Environmental organizations often report greater ease in obtaining financial support for the protection of seals than the snail darter fish. A possible reason may be that people identify better with seals than fish and, therefore, feel more responsible for the seals' welfare.

Individuals are less likely to act on their moral judgments when responsibility can be diffused. Darley and Latane suggested that an individual is far less likely to help a seizure victim when there are many bystanders because the responsibility to do so can be diffused to others, government, officials, representatives.⁹

Individuals who have a poor self-concept and who are concerned about themselves are less likely to be performing altruistic acts, a characteristic necessary for upper moral development. In a study conducted by Selman, it was found that egocentrism and low self-esteem are both cause and effect of retarded social moral growth. Hoffman, in reviewing research, found there was a positive relationship between altruistic behavior and emotional security. People who were preoccupied with themselves were unable to recognize the needs of others.¹⁰

Altruism is motivated by empathy. A poor self-concept interferes with empathy and thus the production of altruistic behaviors. Self preoccupation may keep a person from being aware of social ideas that call for helpful behavior. Worrying about the self may distract the

individual from the morally right thing to do.¹¹ For example, it is highly unlikely that individuals will become involved and act to protect wild lands if they are concerned only about themselves and their psychological survival.¹² Elizabeth Simpson suggests that to progress to a higher moral stage (altruism and empathy), one must first develop a more positive self-esteem.¹³

Individuals have to believe that the environment and the world around them is controllable. Those who picture themselves as victims of the system will generate little emotion for becoming involved.¹⁴ Therefore, an individual's locus of control may be more important than other affective characteristics.¹⁵ Kohlberg recognized this when he emphasized that under trauma or stress, the ideal moral level of an individual may be reduced. Perhaps this is why some members are most active at town meetings; the issues affect them personally. Their motivation to act is intense and the responsibility to self is strong.¹⁶

After investigating the personality differences between politically active and apathetic individuals, Paul H. Mussen drew the following general conclusions: Politically active individuals have an internalized set of ethical standards or principled morality; they are more self aware; have better self-concepts; have higher self-esteem; and accept personal moral responsibility for their actions. They are not power or personal success-oriented. They have a social consciousness, demonstrate altruistic behaviors to varying degrees, and have an internal locus of control. Internal locus of control will be discussed in further detail later in this study.¹⁷

Politically inactive individuals were found to be preoccupied with

personal problems, had negative self-concepts, and showed no recognition of personal responsibility. They generally were externally-oriented, and were controlled by external forces. They made no attempt to examine their personal feelings in an effort to improve themselves. Mussen summarizes:

Nevertheless . . . the individual's interest and participation in politics are not independent of basic aspects of personality. Political activity or apathy are not functions only of the general social structure and current historical events. The personality of the individual operating within the social historical context must also be considered.¹⁸

The following sections will discuss three personality factors identified in the literature as most influential in determining an individual's potential for involvement.

Self-concept and self-esteem.

Introduction. Self-concept is how individuals see themselves, their strengths, weaknesses, values and goals, and how they feel and think. Self-esteem is how individuals judge themselves. It includes their attitudes, positive or negative, regarding their own worth and importance. An individual's self-concept and self-esteem changes as his/her body changes and is influenced by family, friends, schools, peers and other social interactions. The self is an individual's basic beginnings for organizing the world. A clouded self-concept blocks the view of the immediate world, and distorts reality.¹⁹

Individuals with low self-esteem are easily recognized. They are sensitive to criticism, deeply disturbed when blamed or scolded, are very prone to being easily hurt, and deeply concerned with poor performance on a task.²⁰ Individuals with a high self-esteem, according to

Coppersmith, have a great deal of confidence in their own judgment, and form friendships with less difficulty. Because they feel good about themselves, and accept themselves, they are not preoccupied with self-worry.²¹

Self-concept and participation. Self-concept is critical to participation because it functions to direct an individual's cognitive development, moral reception and behavior. Jack Canfield and Harold G. Wells reported that cognitive learning was found to increase as an individual's self-concept increased.²² Milbrath and Klein found significant correlation between political participation and esteem.²³ Rosenberg observed that individuals having a low self-esteem were relatively uninterested in public affairs, were apathetic and participated in few political discussions.²⁴ Coppersmith found individuals with high self-esteem could more easily take leadership roles or devote time to helping others.²⁵

Participation requires that individuals be able to relate and work with others. Often individuals who have a poor self-concept and self-esteem are less able to cooperate well with others. Further studies indicate individuals who have a low self-esteem are unusually concerned about the impression they will make and with what others think. If individuals do summon the courage to participate and their statements are rejected, their feelings of worthlessness are reinforced and their anxiety and depression magnified. Therefore, people with low self-esteem are threatened by participation.²⁶ Their low self-esteem retards the learning of necessary social and political values that would encourage participation.²⁷

Goldhamer states, individuals with negative self-concepts are so exhausted by their inner conflicts that there is no energy left for public affairs, or altruistic behaviors.²⁸ Horney states, individuals who have personal emotional problems are so wrapped up in the inner world of self that elements of the outside world are unreal or irrelevant to them. Studies show that people feeling competent in themselves have the energy, confidence, and skill to be concerned with what goes on around them and involve themselves in their environments.²⁹

The major source of an individual's self-concept and self-esteem comes from an interaction with others, family, relatives, peers, and adults. Research reports the school, through exposure to significant experiences, plays an enormous part in the development of an individual's self-concept and self-esteem.³⁰ Experiences that build an individual's confidence should be planned by educators as part of the normal school experiences.

Conclusion. Individuals' self-concepts are pivotal determinants of their perception of the outside world and influence their behavior in that world.³¹ An individual's self-concept and self-esteem have been found to correlate highly with an individual's degree of altruism.³² Although a positive self-concept and a high self-esteem are necessary for participation, these alone do not assure it. The affective and cognitive components must also be encouraged along with the development of other personality factors.

Locus of control.

Introduction. Rotter, using social learning theory, developed the

idea of internal-external control now called locus of control. Basically, it is concerned with the degree to which an individual believes that reinforcements, negative or positive, are contingent upon their own behavior. It is a psychological attribute which characterizes how an individual views his/her influence on an event.³³ In studies conducted by Lunneborg and Lunneborg, it was found that an individual's locus of control is a psychological part of human life that influences an individual's behavior, beliefs, attitudes and values, and environmental perceptions.³⁴ According to Phares, individuals possessing an internal locus of control perceive events as contingent upon their behavior. Persons with an external locus of control perceive the outcome of events as being due to luck, fate, individuals, or societal groups.³⁵

Rotter states, internals are confident they control themselves and their destinies. They believe the environment will respond to their efforts, and that rewards or punishments are directly related to their behaviors. Externals, he states, feel their fate is determined by others, and that their behaviors have nothing to do with rewards or punishments they may receive. They are docile, suspicious, and feel events are uncontrollable.³⁶ Therefore, locus of control is an aspect of character that plays an essential part in determining an individual's likelihood of becoming involved.

Locus of control and participation. Before individuals will act, they must feel they can do something to change the state of problems. To those who feel control is out of their realm, apathy may well be the only behavior left. Mussen supports this when he states:

People who feel impotent, dependent, or completely occupied with personal problems will not have the energy and courage necessary for political activity, and consequently, will be politically apathetic.³⁷

P. M. Gore and J. B. Rotter have demonstrated through a variety of research studies that individuals who view themselves as determiners of their own fate often participate in social action. A study, conducted by Bonnie Strickland, comparing internally scoring individuals with their social actions, confirmed Gore and Rotter's conclusion.³⁸

Adams and Webber found that internals have an advanced moral development and have shown significantly more internalized moral sanctions and a sense of right and wrong. Janzen and Boersma, using Kohlberg's interview scale on a sample of sixteen and seventeen year olds, determined that internals functioned at Kohlberg's principled moral stages.³⁹

The California Commission for the Reform of Intermediate and Secondary Education identified characteristics most likely to be found in individuals who possessed internal beliefs. Studies indicated internals had a greater thirst for knowledge, possessed skills needed to succeed at a variety of tasks, were able to maintain their self-esteem under a wide range of pressure, worked towards the improvement of the environment and maintained a global perspective. Internals, as a whole, were more actively involved in social actions, demonstrated their ability to understand and appreciate a diversity of people, were less susceptible to social influence, and were more likely to help others. Internals also seemed to have a more comprehensive understanding of democracy, citizen rights, and the responsibilities necessary to be an effective citizen.⁴⁰ Lastly, internals seemed to have a high

psychological understanding of themselves, demonstrated sensitivity towards artistic, literary, and other aesthetic experiences, and their values were more strongly developed than externals.⁴¹

Studies conducted by Rosen and Salling found a significant correlation between I-E scores (internal and external) and the Political Activity Scale. An internal orientation:

. . . might reasonably be expected to generalize to the political area and lead the internally oriented person to engage in political activity because he believes it will be effective. Alternatively, a person high in internal control may be especially sensitized to the constraints of political reality and participate more actively to extend his range of freedom.⁴²

In addition, internality may influence other personality factors deemed necessary for participation. Internals are more cognitively active and are able to master intellectual skills quicker than externals. They also are more confident and have shown higher levels of self-esteem. In over one thousand research studies involving internality correlations, it was found internals are less impulsive, demonstrate the use of foresight (a Formal Operational skill), have a higher level of functional intelligence, are more objective in perceptions of self, and are more likely to use information in problem solving. The traits associated with internality support the cognitive and affective characteristics identified earlier in this study as necessary for environmental citizens.⁴³

Research indicates, in general, that internality is necessary for participation and leadership. Internals tend to make decisions independent of the demands of others, weighing evidence, facts, and data, more carefully than externals who tended to be compliant in similar situations. Internals were less likely to use violence, threats or

coercion in interpersonal situations.⁴⁴

Developing locus of control. Whether an individual develops an internal or external orientation depends on how they perceive the relationship between their own behavior and the reward or consequences. Rotter believes that a person's development is largely dependent on his/her experiences with other people. Additional factors that are believed to enhance the development of internality are: maturation, counseling, world and national events, and participation in action programs. P. S. Dua found that action programs that utilized behavioral treatments rather than cognitive processes and/or verbal interaction were far more effective in changing locus of control towards internality.⁴⁵ In general, research studies indicate changes in an individual's locus of control can take place under a wide range of conditions.

Conclusion. Participation in environmental issues is dependent on the student's development of an internal locus of control. Studies support the need to develop internally controlled individuals if participation is to occur. To Samuel L. Alaimo and Rodney L. Doren: "The ecological problem we face today may be symptomatic of a general lack of environmental knowledge and concern on the part of today's citizenry, along with a belief that little can be done to solve environmental dilemmas."⁴⁶

Political efficacy and participation. A major idea behind democratic theory is that responsible citizens will take active roles in the political system. The attainment of a positive self-concept, a high self-esteem, and an internal locus of control may not be sufficient to

motivate action within a democratic system. Feelings of personal control (internality) have more influence on political involvement when individuals feel politics are salient and relevant to their own lives.⁴⁷ Before individuals will invest the personal energy and time in participation, they must have developed feelings that such participation will be worthwhile. This feeling is referred to as political efficacy.

Although efficacy is not a major variable in this study, its connection to internality and participation must be recognized and discussed. It may be a variable that needs to be recognized in future studies concerning both the Adolescent Apprenticeship at Oakmont Regional High School and other secondary environmental education programs. Political efficacy is a person's feelings that his/her political actions or his/her participation will have an impact on the political process. It is an attitude accepted by individuals that political and/or social change is possible, and can be caused by individuals.⁴⁸

According to research by Lane, political efficacy has two parts. The first part is the belief that the individual can be politically influential, and the second is that governmental authorities, local, state and/or national will be responsive.⁴⁹ The overall responsiveness and treatment of the citizen by government, according to Angus Campbell and his colleagues, has a strong effect on the shaping of an individual's political efficacy.⁵⁰

In addition, the kind of political action one takes depends on the political efficacy of the individual and the level of injustice a given situation activates in an individual. The level of injustice perceived is directly determined by the individual's community-concept,

responsibility feelings, and moral stage. If individuals perceive injustice, they will attempt to act if they believe they have the personal resources necessary, and if they believe their actions will have a reasonable chance of success.⁵¹

Verba and Nie found that activists exhibited higher levels of political efficacy than those who were apathetic to some degree. Hess and Torney found that the individual's participation in the family had an influence on their development of political efficacy.⁵² Participation is not only influenced by individuals' beliefs they control their own fate, but also by their belief that they can influence the political system.

Principled morality.

Introduction. Principled morality in Kohlberg's moral developmental theory encompasses stage five and six of the Post-Conventional level. According to Kohlberg, individuals possessing principled morality are thought to be autonomous or self-governed. They judge rules and laws of society in relation to a concept of justice. They feel personally responsible for their moral judgment, have a broad sense of community as it applies to humans, possess a conscience, and are not egocentric. Their moral principles are more able to be universalized, and act as a moral guide to decision making.⁵³

Principled morality enhances citizen participation because it provides an internal motivation to act. It serves, when extended beyond the human sphere to an ecological morality, as a guide for making decisions that could influence a large section of society. It enables the

individual to visualize and judge the consequences of actions in relation to the welfare of humans and of the whole earth. It provides a community-concept, an emotional kinship, and the psychological raw materials necessary for making environmental decisions.

The expansion of Kohlberg's principled morality and Piaget's autonomous level from a human sphere to include the environment is critical to the development of active environmental citizens. Environmental morality organizes the world, at its highest level, suggesting a community-concept that dictates social cooperation between all life forms. An individual's concept of community influences his/her motivation to act.⁵⁴

Principled morality and participation. A study conducted by Iozzi revealed that environmental activists reasoned at significantly higher levels on moral problems presented in an environmental context than those presented in a human context on Kohlberg's test. However, there was no difference observed in non-environmental people on the same Kohlberg moral dilemma test. From this, Iozzi concluded that people reason at different moral levels on different moral issues. This suggests that environmental education needs to concentrate on developing an individual's community-concept that includes the environment, if an ecological morality is to be enhanced.⁵⁵

Developing principled morality. According to various research studies, age, education and I.Q. seem to be related to principled morality. Formal Operational cognitive development, according to the research, is a necessary prerequisite to advanced moral judgment. Moral judgment seems to advance as long as a person is in school, and the

termination of an individual's formal schooling seems to bring the stabilization of moral judgment.⁵⁶ Research also demonstrates that there seems to be a lag between the acquisition of logical operations and their application to moral development.⁵⁷

A study involving thirty sixth-grade girls and twenty-four coeds revealed that all subjects who showed principled morality were reasoning at the Formal Operational level, and there were no Concrete Operational students using principled moral reasoning. It was observed that the transformation to Formal Operations was accompanied first by a transformation to conventional moral reasoning, and not directly to principled moral reasoning. Thus, movement of students to Formal Operations did not guarantee their development of principled morality, however, principled morality cannot develop without Formal Operational thought.⁵⁸

Evidence from the sixth-grade coed study did indicate that social experiences and the level of cognitive development are major factors in developing principled moral reasoning.⁵⁹ Another study involving a random sample of ninety individuals, ages eighteen to twenty-three years of age, confirmed that Formal Operational thought was necessary for the development of principled morality.⁶⁰ However, principled morality is not a necessary condition for participation but is necessary for making environmental decisions that consider the welfare of the entire ecosystem. Because many students never attain cognitive Formal Operations, the development of principled morality within the high school population may be greatly restricted. Thus, secondary education needs to focus on the development of Formal Operational and logical reasoning skills, as defined by Piaget, before principled morality and ecological morality

can hope to be developed.

Conclusion. Development of specific cognitive skills, cognitive reasoning levels, affective traits, and moral reasoning levels, individually or together, are not sufficient to cause participatory behaviors. Additional personality factors and elements within the realm of morality must be developed that enhance motivation and a person's strength to become involved.

Individuals' self-concepts and self-esteem are the central controlling factors, that not only influence cognitive and affective development, but also their behavior. Educators, in developing environmental citizens who will participate, need first to develop within students a positive self-concept and a high self-esteem.

Locus of control is a major determiner of whether an individual will enter the involvement mode. Internality, when it is combined with an individual's level of self-esteem, generates the belief that an individual's actions can influence events. This belief is a prime motivator in deciding if a person will act. The development of internal control and a high self-esteem by themselves, however, are not sufficient for developing participation.⁶¹

Individuals not viewing the environment within their community-concept, not feeling a social responsibility towards the environment, and not being on a principled moral reasoning level will not act to protect the environment for its sake. Ecological morality, through first developing principled morality, must be encouraged in secondary education. The need to develop these personality factors and moral characteristics in potential environmental citizens is supported by studies

involving environmental activists. Studies reveal that members of the Sierra Club and the Audubon Society exhibited more positive environmental attitudes and behaviors than members of the general population. The Sierra Club and the Audubon Society members also exhibited high social responsibility scores and internal locus of control scores.⁶²

The remaining sections will explore adolescence in an attempt to determine what cognitive, affective, and personality characteristics exist. By comparing what exists with what characteristics are needed, practitioners should be able to effectively design programs that enhance the development of citizen participation in students.

Adolescence, an Optimum Time for the Development of the Participatory Component of Environmental Citizens

Adolescence, using its Latin translation, means to grow up or grow into maturity. Sociologically, it is the transition from a dependent childhood to a self-sufficient adulthood. Psychologically, it represents a marginal period, between the fantasy concepts of childhood and the reality of adulthood. Chronologically, it involves the age of about thirteen years to the early twenties. Regardless, most agree adolescence is a transitional period between dramatic physical, psychological, social, and emotional changes.⁶³ This section will focus on the mental, social, and emotional changes within American adolescents and how these influence the potential development of cognitive, affective, and participatory characteristics necessary for environmental citizens.

What is adolescence in the United States? Margaret Mead reports that the

unusual adolescent problems present in western and technological societies are because of society's tendency to extend the dependency period during adolescence.⁶⁴ Schools within the United States still employ techniques and philosophies that continue to favor enhancing this dependency period.⁶⁵ Yet, by the time the adolescent period is completed in the United States, society expects the teenager to have moved from a status role of nonresponsibility to responsibility, a personality of submissiveness to one of dominance, and to have developed a clear understanding of parental and adult sexual roles.⁶⁶

Adolescents in the United States are caught between two worlds for an extended time period as a type of marginal person. The adult society often denies adolescents opportunities to encourage the development of responsibility and maturity behaviors. At one moment, adults expect adolescents to display adult behaviors, and the next, they treat them as children. The dilemma of having one foot in two worlds encourages the adolescent to develop loyalties to unique peer cultures, confuses their transition to adulthood, and adds to the frustration of the adolescent.

General characteristics of adolescents. Characteristics typical of most adolescents between twelve years and twenty years are: shyness at times, sensitivity regarding their physical development, an aggressiveness at other times, a devotion to peer group, a continuous turmoil concerning values and ideologies, an increased and unpredictable emotional tension, and their readiness to take extreme positions. They fluctuate in behavior and rebel against authority.

Lewin, in studying adolescence, identified the individual's

perception of environment or "life space" and identified it as a major factor in facilitating the adolescent's transition to adulthood. Lewin comments that in the adolescent life space there is an increased differentiation of concepts, social relations, and other activities and experiences. The adolescent is able to organize thoughts, concepts and relationships into patterns. Their space is less rigid and they are able to experience, learn, and modify their ideas, thus demonstrating a greater fluidity enabling them to be more adaptable to life situations.⁶⁷

Western society, states Lewin, prolongs the adolescent period, expects adolescents to no longer see themselves as children, and continues to prevent them from seeing themselves as adults. This dilemma creates stress, instability, uncertainty, and self-hate. Lewin suggests there is a need in western education to acknowledge adolescent characteristics; to make this transitional period into adulthood as smooth as possible; and to provide experiences that facilitate the development of an adult life space.⁶⁸

Cognitive development.

The adolescent and Piaget's theory. Adolescence, states Piaget, marks the emergence of Formal Operational thought. Specifically, the appearance of Formal Operations means the individual is able to use combinatorial reasoning, hypothetical deduction and can comprehend relationships between reality and possibility. Combinatorial reasoning means the individual is able to project possible consequences, implications, and interactions of a possible behavior or action choice.

Hypothetical deduction facilitates an individual's ability to hypothesize cause and effect relationships, comprehend principles, and apply these to concrete or abstract situations.⁶⁹

Piaget maintains that, by the end of adolescence, an individual's mode of thinking is almost completely formed and will most likely undergo little alteration after adolescence. Any changes from this point on will be quantitative and not qualitative. He also emphasizes that adolescents may not display their maximum capabilities in the intellectual realm because of boredom or fatigue.⁷⁰

Formal thinking influences adolescents in a number of ways. According to Piaget, early adolescents express feelings of inferiority and subordination towards adults, creating an atmosphere where the adults are seen as the enemy. Later, adolescents begin to consider themselves as the equal of adults and judge them with complete reciprocity. It is during this stage of development that the adolescents are motivated with an urge to change society, to become active, involved, and do something for the well-being of all.⁷¹

Formal thinking, as it develops in adolescence, also has a direct effect on the development of political orientations. It increases the adolescent's awareness that change is inevitable. The adolescent begins to accept that as time changes and human societies develop, laws will also need modification.⁷²

If adolescents have Formal Operations and the mental structures required to solve problems, why don't adolescents think as adults? Perhaps the major reason, suggests Piaget, is the adolescent's unusual egocentrism. The adolescent becomes possessed with his newly found powers of

logical thought and this limits the adolescent's ability to "differentiate between his idealistic thought and the real world."⁷³

Therefore, perhaps the most critical task for the secondary environmental educator is to provide experiences that function to break down the barrier of egocentricity. As the adolescent interacts with reality and begins a decentering process, the influence of egocentrism fades, permitting the full development of Formal thinking.⁷⁴ The literature suggests that the key to moving the adolescent away from egocentrism is to permit him/her to assume adult roles in the real world. This results in not only further cognitive development but also parallel affective development.⁷⁵ According to Piaget, although the adolescent's thought systems are awkward, educators need to remember that they are significant because they furnish the cognitive and evaluative basis needed in later adult roles.⁷⁶

Recent cognitive research regarding adolescents. Unlike Piaget's statements regarding the development of Formal thought in adolescence, research now reveals that, although all children will ultimately display some clear capacity for Concrete Operational thinking, many will never attain Formal Operational thought. It is not until the ages twenty-one to thirty that a majority of Formal reasoners begin to appear. Studies reveal there is no further development of Formal reasoning after age thirty, and almost 50 percent of American adults never reach adolescence in the cognitive developmental sense. Because of the variation in the appearance of Formal Operations, no definite age can be associated with it. However, most who do develop Formal thought begin doing so in early adolescence, ages eleven to fifteen years of age.⁷⁷

Those adolescents who do attain Formal reasoning, usually reason Formally in some situations and not in others. Formal stage thinking does not seem to appear to be typical of adolescence, as previously suspected. It is not a routine or a likely mode of thought for even a majority of adolescents.⁷⁸

The reason why Formal thinking is not as common as originally theorized may be due to several factors. A study measuring Formal thought in over 162 junior-senior high school students suggests that egocentrism of adolescence may hinder the individual's ability to think Formally about problems relevant to themselves. Adolescents, therefore, have difficulty approaching problems objectively. Their personal involvement encourages them to use Concrete Operational thought, and this factor may also carry over into adulthood. Piaget, according to research completed in 1972, suggests failure to apply Formal Operational thinking to all problems may be due to specific interests and vocational specialization.⁷⁹

In conclusion, full development of Formal Operations is a type of cognitive maturity, not common among adolescents and adults. However, research exists that suggests adolescents and adults may possess partial development of Formal Operational thought dependent on the situation and personal interests involved.

Branch model of cognitive development. Recent data support a theoretical modification regarding cognitive development. Up through early adolescence, intellectual development seems to be characterized by a sequence of stages: Sensori-motor, Preoperational, Concrete Operational through which all children pass. Everyone goes down this single

path with differences being only in speed. After Concrete, the path branches into a full Formal track and several other track types that include Formal reasoning to only a limited extent.⁸⁰ Based on recent studies, Dulit has proposed the "Branch Model", a modification of the original Piaget model. Although its explanation is not a focus of this dissertation, its recognition is necessary for the environmental educator.

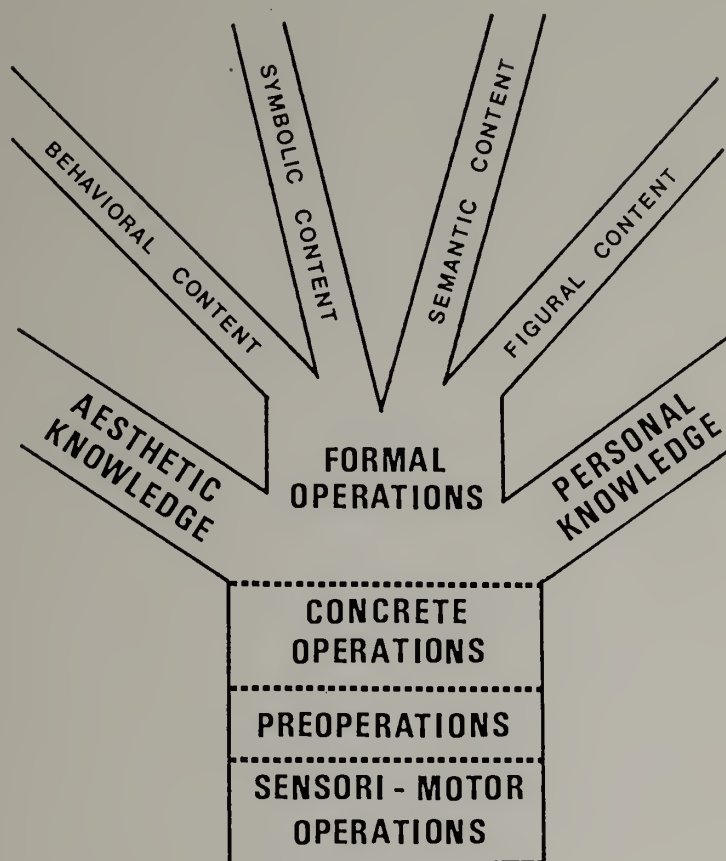
The potential onset of Formal thinking does begin during adolescence, and adolescence is a more critical time for its development than childhood. It is during adolescence that the parallel track followed by everyone begins to branch. Figure 17 summarizes the "Branch Model" of cognitive development. One of the branches, found only in a minority of the population, indicates full development of Formal Operational thought. Piaget suggests the potential for full Formal thought may be present in most individuals, however, whether it develops or alternative tracks are used depends on specific learning experiences. Dulit suggests the use of Formal reasoning may also be restricted to a limited amount of subject areas. Additional studies are needed to determine which develops and promotes Formal thinking.⁸¹

Moral development.

Adolescence and Kohlberg's moral theory. Kohlberg found that a majority of adolescents stabilize their moral judgment at the Conventional level. Location at this level results usually in one of two moral stages. Stage three adolescents assume justice means to go along with the crowd and display a type of externally controlled behavior. Adolescents at stage four assume justice means to apply rigidly a

Figure 17

A Summary of the Branch Model of Cognitive Development



SOURCE: Michael D. Berzonsky, "Formal Reasoning in Adolescence: An Alternate View," Adolescence Vol. XIII No. 50 (Summer 1978): 286, Figure 1.

standard of law regardless of the circumstances. Kohlberg, also, sites that most teenagers take three to four years to move from stage three to stage four, and a good minority rarely make it past stage three.⁸² Those adolescents at the Conventional Morality level will not take risks, will not develop a morality controlled completely within themselves and instead will follow to varying degrees the crowd or what society dictates.⁸³ In conclusion, during adolescence conventional moral reasoning and principled morality can be encouraged. Development of citizens, who are capable of possessing an environmental morality of either Conservatism or Environmentalism need, at a minimum, to have developed a level of conventional morality and, ideally, principled morality.

Adolescent cognition and moral development. There is a major shift in an individual's overall sociocentric perspective as he/she moves from childhood to adolescence. The child cognitively cannot easily conceive of society. When making a decision that has political overtones, the child is unable to visualize its effects on society as a whole. He/she is concerned with its impacts on specific individuals.

In mid to late adolescence, individuals are able to grasp social concepts. The adolescent, when receiving appropriate triggering experiences, is able to weigh the effect of actions on other social groups, i.e., community, school, peers, and environment.⁸⁴ Adolescents, once escaping egocentrism, begin to develop a social consciousness for society and the environment.

During adolescence, the sense of responsibility and an understanding of human complexity is also changing. Responsibility now takes on two forms, an interior responsibility, accepting responsibility for

one's self and actions; and an exterior responsibility, acknowledging responsibility for others.⁸⁵

In addition, judgments are no longer viewed as black or white, good or evil. The adolescent begins to recognize that there are other methods of social change besides laws. This modification in moral reasoning is due mainly to the development of hypothetical deductive reasoning and the beginnings of Formal Operational thought. The modification in cognition lays the foundation for the potential development of principled morality.⁸⁶

Self-concept.

The adolescent self-concept. Adolescence marks the period when the critical aspects for constructing a self-concept are underway. Because of the changing life space or perspective and social group movement of the adolescent, the self-image is constantly under seige. The development of self-concept is the most important aspect of adolescence. It establishes the emotional and perceptual foundation for the individual. An adolescent with a positive self-concept seeks out moral decisions while those with poor self-concepts find the entire area of morality frightening.⁸⁷

A major dilemma of adolescence, according to Mead, is its search for identity. She emphasizes in all cultures the adolescent needs to explore and experience the world, stimulate his/her curiosity and find out his/her true identity. Adolescents in western society, in comparison to others, are more easily intimidated by modern society. Technology to the adolescent makes the world appear too complex, too unpredictable,

and too ambiguous to provide them with a stable frame of reference.⁸⁸

The lack of a frame of reference further threatens their self-image.

Jurich and Kadel describe the adolescents' dilemma. It is like an individual at the edge of a cliff whose entire energies are focused on maintaining a balance to avoid going over the edge. Interest in the sunset is farthest from their minds. The individual is so concerned with keeping balance that invasions into the inner thoughts are not tolerated. Adolescents with poor self-concepts are socially, cognitively and emotionally handicapped. They are on a type of cliff's edge, balancing between liking oneself enough to make life bearable and not liking oneself at all.⁸⁹

To the adolescent, falling over the edge means feeling worse than one already feels. Thus, receiving public ridicule by participating could cause personal despair and push one's self over the edge. All this to the adolescent with a poor self-concept means a "psychological death". The survival strategy for this type of individual is clear; devote all personal time and energies to holding the self-concept where it is; and avoid contacts that could push it even lower. The adolescent with a poor self-concept avoids participation and decision making. Being a follower becomes easier and safer. Adolescents with low self-concepts do not try to improve. They are locked into lower moral stages and are unable to progress to principled morality.⁹⁰

Improvement of an adolescent's self-concept is within the realm of educational techniques, providing educators recognize the role of peer groups. The peer group is perhaps one of the most influential factors in an adolescent's self-concept. His/her dependence on peer group

acknowledgment and approval seems almost slavish. Such dependence was alien to the middle childhood years.⁹¹ The educator's use of the peer group and increased social contacts in the classroom can enhance an individual's self-concept.

Adolescence and egocentrism. Egocentrism is a special type of self-concept dilemma, common to the adolescent period. According to Piaget, the appearance of egocentrism is normal as individuals move from one moral stage to another.⁹² Educators attempting to encourage the germination of principled morality would be wise in recognizing the egocentric mode of adolescence. This characteristic often brings the younger generation into conflict with the older generation, leaving adolescents unable to relate to adults on social issues.

Adolescents having egocentric personalities, whose entire focus is on their own needs, are so retarded morally it is impossible for them to put the need of others above their own. Egocentric morality is often the result of several factors: a low cognitive and/or a low moral development, and/or a poor self-concept. Environmental citizens, whose concern must be with the earth community, need to be free of egocentricity. Egocentrism in adolescents is usually temporary, providing the proper experiences stimulating sociocentrism are provided.

The dangers of this temporary egocentrism are serious, however. It tends, if continued, to encourage early perceptual closure on problems. The emergence of relativistic thinking during adolescence can also magnify and promote egocentrism. Educators should be careful when encouraging movement from Concrete to Formal thinking, to be sure experiences decrease movement towards egocentric thinking.⁹³

Elkind noted that the presence of egocentric thinking in adolescence also affects emotional growth. Adolescents who are egocentric and preoccupied with themselves are usually unaware of others. Their empathy is blocked and they become unusually self-conscious.⁹⁴ If allowed to grow, the self-consciousness will deteriorate the self-concept, resulting in serious psychological developmental impairment.

Conclusion. The child and the adult have a concise concept of the group they belong to. But adolescents, belonging part to the child and part to the adult, have difficulty identifying a stable frame of reference. Adult behaviors are not accepted by the child world, and child behaviors are not accepted in the adult world.⁹⁵ Adolescents do not have a clear idea of social status or obligations, and their behavior reflects this uncertainty. The self-concept suffers the battle scars of this tumultuous period, and the ego attempts to salvage the self-concept.

Locus of control.

The adolescent locus of control. Adolescence not only marks the development of an individual's self-concept, it also is the period when the individual develops internality or externality locus of control characteristics. In review, locus of control is the degree to which the individual has control over environment, and his/her behaviors. The internally controlled individual believes actions will effect an outcome, whereas, the externally controlled person believes there is no control over the outcomes. Locus of control is measured on a continuum scale where individuals may be highly internal, highly external, or possess

degrees of each.

Biondo and MacDonald stress the need for environmental education programs to identify the highly external adolescents and begin their development towards internality.⁹⁶ The highly external adolescents will most likely conform to whatever position is advocated because they feel it really doesn't matter. They will also be more likely to accept propaganda and fallacious reasoning. The crippling effects of ignoring external adolescents will be felt in future years as a major contributing factor to apathetic behavior, and poor decision making.

Political participation, as stated earlier, is more likely to occur in individuals who are internally controlled. The majority of adolescents are externally controlled. Movement to higher cognitive levels, the development of positive self-concepts, and encouragement of principled moral reasoning enhances internality. The period of adolescence is more suited for the development of internality than any other school period because the adolescent, most likely after high school, will be without the support of the peer group or the family.

Nowicki and Barnes conducted a study involving inner-city teenagers. They found the adolescents gained in internal control after participating in a one-week structured camp program that emphasized working together to accomplish goals. The emphasis on self-responsibility, reports Nowicki and Barnes, made the teenagers feel in control of events. This made it possible for them to see a connection between their behavior and its effect.⁹⁷

Conclusion. Adolescents who are externally controlled can be moved to an internal locus of control by participation in specific types of

programs. These programs should include three elements: an environment that encourages and rewards individual responsibility in decision making, presents the concept of internal control as an important personal value, and teaches skills that enable students to be effective and able to exert some control over their environment. These skills include analysis, synthesis and evaluation.⁹⁸

Internal control is a necessary element for participation, political involvement, and the development of environmental citizens. Environmental educators need to identify the status of this personality characteristic in their adolescents and develop it.

Political thought. The political comprehension of the American adolescent is poor. Many writers portray adolescents as "apathetic individuals who harbor undemocratic beliefs that are covered . . . with a veneer of patriotism."⁹⁹ There is concern within political circles regarding the effectiveness of the school's political socialization process in developing a sense of citizenship that includes not only an awareness of but also participation in the American political system. It may well be that experiences within the public school systems are alienating youth. The purpose of this section is to briefly examine adolescent political thought and its development.

Research and adolescent political thought. According to Adelson, adolescence shows a rapid growth in political ideas:

At the threshold of adolescence, at 11 or 12, the youngster has only a dim, diffuse and incomplete notion of the political order; by the time he has reached 18, he will, more often than not, be a fully formed political creature, possessing a stable and coherent understanding of political structures and functions, and in many cases, committed to a philosophy of government.¹⁰⁰

Adolescent political thought, documents Joseph Adelson, is influenced by the advent of Formal Operational thought.¹⁰¹ In a study by Adelson, it was found that as the adolescent's modes of thought shifted from Concrete Operational to Formal Operational there was a decline in authoritarianism and a growth in democratic and humanistic views of social and political issues. There was also an increased understanding of total community needs versus a single individual. In general, there was an overall shift from absolutistic to relativistic and pragmatic ways of formulating political issues.¹⁰²

In a cross-cultural study, reports Adelson, it was found that children under fifteen, because of their limited cognitive structures, were unable to imagine social order or political ideas. They, therefore, when involved in political judgments, were unable to account for general necessities. High school seniors, however, have an advantage because their cognitive reasoning enabled them to comprehend politics realistically and abstractly. They also were able to think in terms of a larger community, United States, western world, etc. Their political thinking abilities are equal to adults.¹⁰³

Adolescents rarely find politics very absorbing. Because of their preoccupation with self-concept and egocentrism, they are usually not fired-up for participatory behavior. But adolescence is the period when their potential for future participation will be formed. Once the self-concept is balanced and egocentrism evolves to a more sociocentric level, they will be ripe for participation. At this time, they will look back to the political foundations established during adolescence for guidance in how to become involved.¹⁰⁴

Relationship of cognitive, moral reasoning, self-concept and locus of control to political thought. Adelson and his colleagues have found that Piaget's stages of cognitive reasoning relate to observed changes in political reasoning during adolescence. The major changes in adolescent political thought from childhood is abstractness, the extension of a time perspective beyond the present, increased understanding of human complexity, emergence of hypothetical deductive reasoning, decline of authoritarianism, the growth of a sense of principle, and the sense of community.¹⁰⁵ According to Rosenau, "The steady advance of the sense of principle is one of the most impressive phenomena of adolescent political thought."¹⁰⁶

Adolescents, being more principled, are not as easily influenced by appeal to the obvious. Adolescents are also very capable of using democratic procedures to govern themselves. These skills facilitate their movement to higher stages of moral reasoning. Unfortunately, adolescents may understand political structures but be totally ignorant of political processes within the real world. They have little knowledge of lobbying groups, argumentations, or conflict management. In general, most are unable to apply democratic principles to real situations.

To aim for participation in environmental issues assumes students have a proficiency in political cognition. The components of political cognition are: factual information about public affairs, awareness of the important sociopolitical issues, and comprehension of democracy. An adolescent's psychological make-up, self-concept, locus of control influences the way he/she perceives, evaluates, and eventually acts on political stimuli.¹⁰⁷ The development of political skills is dependent

on cognitive, affective, and personality factors in adolescence.

Adolescence and political participation. Why haven't adolescents become involved? A study by Long found adolescents were politically alienated. Most believed they would never be able to effect the socio-political system, no matter what they had been taught in school. A possible conclusion is that their low self-concepts and external locus of controls may be contributing factors to this belief. Yet members involved in Long's study showed high self-esteem and were internally controlled. Long identified the problem to be that adolescents view the political system as threatening. Their level of political efficacy was low, and they did not know how to work within the system.¹⁰⁸

The family has been identified as playing a major role in the individual's political socialization. In general, activists or apathetics are molded in the home.¹⁰⁹ This makes the role of the secondary school even more important, for many systems will have to recognize and concentrate on undoing the family's negative effects. A viable alternative for school systems is to involve students in the local community's political processes, campaigns, issues, and government.

A poll by Gallup indicated youth are willing to participate and their apathy is not permanent. There remains in most adolescents a glimmer of hope that can be fanned, using appropriate educational methods, into a fire of motivation and commitment. The poll confirms the willingness of youth to serve. Of 1,115 students, ages thirteen to eighteen years, 88 percent of them stated they would be willing to participate in some form of volunteer work regarding the political and/or social front if they received course credit.¹¹⁰

Alaimo and Doran report that a study by Rickson found that adolescents were very concerned about environmental pollution. A study by McTeer revealed adolescents expressed more concern than adults.¹¹¹ Another study found adolescents were more likely to participate in issues that concerned them if they had been allowed to participate and gain experience directly in the political, environmental, and community affairs.¹¹²

Environmental education, to develop participation in environmental/political issues, should remove the threatening aspects of government. Students, while at the secondary level, need to gain personal confidence and develop political efficacy by experiencing political environments. Adolescents are cognitively adapted for beginning their experiences in political environmental decision making. There is not a better time to begin their initiation into community environmental issues than during these middle to late years of adolescence.

Conclusion. Schools, in general, have assumed their mission was to focus on the intellectual development of their students. A study by Coleman, Jackson and others, reveals:

Intrinsic interest in learning declines and negative self-concepts increase, the longer the pupil remains in school. Stereo-typed surface and judgmental thinking increases. Self-confidence in problem solving decreases. Personal autonomy in learning tasks decreases. Personal alienation, inhibition, and isolation increase.¹¹³

Educational theories and research reveal adolescence is an optimum time for encouraging the personality, and cognitive and affective characteristics necessary for environmental citizenship. The only difficulty is that education programs are often aimed at retarding development. Eric

Erikson summarizes the school's dilemma . . .

Society rebaptizes its youth during adolescence. This confirmation can be as active, psychologically healthy, mature, significant humans with a strong sense of personal identity, or the obverse--as passive, dependent, inferior, other-directed humans with a confused and diffused identity.¹¹⁴

If we believe environmental education is a preparation for life's environmental decision making, then our programs must be designed to enhance certain behavioral and social development. Making complex environmental decisions that determine future survival and affect unborn generations require that citizens operate at full mental and emotional capacity. Environmental decision making will benefit more from individuals who have a positive self-image than from those suffering from ego problems.

Because adolescents are less set in their ways, they are more open to new ideas. Their budding cognitive and moral reasoning ability make them ripe for teaching the political skills and providing the experience needed to enhance the formation of key personality characteristics and participatory behaviors. Polls indicate that adolescents are more concerned about nuclear war, the deterioration of the environment, and the quality of environment than are adults. Adolescence is an optimum time for environmental education to develop rational environmental citizen activists.¹¹⁵

On the current environmental front, Roth critically states: "The presence of environmental education in public school curricula can often be characterized by loose organization and little sense of direction."¹¹⁶ The direction needed is towards the development of citizen participants through programs that use appropriate educational theories and data from

recent studies. For years, environmental educators have been expressing dissatisfaction with methods used in environmental education.¹¹⁷

Environmental education at the secondary level has not effectively focused on the development of adolescent cognitive, affective and personality characteristics needed for citizen participation.¹¹⁸ Young adults are not being adequately prepared for their future roles in society as the public secondary school system now exists. The lack of incorporation has had direct negative effects on the development of adolescents' cognitive, moral reasoning structures, and self-concepts. Various studies and programs have demonstrated it is possible to enhance adolescent development by real interaction with social problems. Adolescents who have had experiences in the community have developed more sophisticated concepts and understandings of citizenship.¹¹⁹

Professor James Coleman, chairman of the National Commission on Youth, argues that a transition to adulthood exclusively through the school is an environment that is rich in information but poor in those experiences necessary for citizen maturity.¹²⁰ Adolescence is a unique stage where almost all individuals can develop their potential levels of cognitive development, moral reasoning, ego, and personality. Of course, whether this development occurs depends on the general educational experiences provided.

A major failure is that environmental education has not involved adolescents in real problems through field work in the community. A new trend should become action-oriented learning, experiential programs, community-action, and involvement of students. Action learning not only enhances adolescent development but facilitates the transition to

adulthood. In the remaining section, emphasis will be on methods that can be employed in the education system to develop the adolescent's cognitive and moral structures, self-concept, internal locus of control, political efficacy and environmental citizen role.

Developing Citizen Participation Characteristics Through Environmental Education

The traditional environmental education approach.

Introduction. It is assumed that after twelve-years attendance in the American public school system, students will be able to make political decisions and take action within the community, state, or nation. Yet during the students' educational enrollment, adults often discourage student participation in a number of ways. For example, students wishing to question a decision by local officials or wishing to provide input into an issue are either discouraged outrightly or ignored by the governing officials. Teachers, too, share some blame for the lack of young people's participation in issues by conducting autocratic rather than democratic classrooms. The result is that, often, young people graduate unprepared for political involvement, decision making or group participation.

Political scientists suggest that political attitudes, feelings and behavior are not influenced by current educational programs.¹²¹ It is sad when we review the amount of time students spend in the high school and consider that, during this period, little is done to enhance their knowledge, abilities, confidence, and perspective through actual experiences in real environmental political decision making.

Margaret Mead stresses that a major challenge for youth in western societies is the ability to make decisions.¹²² Because of America's technological focus, the rapid change in its environment, the ability to make effective long-term decisions is critical. In reality, most students are receiving little training or practice in political decision making.

Social studies curricula and participation. The social studies curricula are usually considered to be the courses that focus on citizen participation development. Most do, but their focus needs enlarging. Social studies curricula, for a variety of accountability reasons, tend to overemphasize knowledge and have limited types of skills. They avoid any aspect of the affective domain, critical thinking, personality development, or moral reasoning. When we examine the broad definition of what is needed in order to enhance the student's likelihood of participation, we observe the emphasis on knowledge and skills falls short of developing responsible, committed, and motivated citizens.¹²³

Environmental education curricula and participation. In general, on the secondary environmental education front, the development of participating citizens is not much more promising than on the social studies front. To produce a group of citizens who are able to deal with complex environmental issues and problems, an immediate change in the current environmental education process is suggested. Many of the environmental education programs, today, are nothing more than a replication of past techniques with new bandwagon names that make no attempt to deal with the issues of today.¹²⁴

The focus of environmental education programs has been based on the

ungrounded assumption that increased environmental awareness will result in concern. Little attempt has been made to determine the overall effectiveness of secondary environmental programs in developing student action behaviors.¹²⁵

Conclusion. Most environmental education programs have for too long ignored their role in promoting active environmental citizen participation and the development of participation skills and behaviors. For too long, environmental education and citizenship education have been separated in the high school curriculum.¹²⁶ Citizenship education is in shambles on all fronts including the environmental. According to William Stapp, "Few environmental education programs emphasize the role of the citizen in working both individually and collectively toward the solution of problems."¹²⁷

The fact remains, young people are buried in the American school systems from age six to seven years of age to almost twenty years of age and are often discouraged from participation in the political process.¹²⁸ Studies indicate that isolation in classroom settings and the lack of appropriate and real social roles within the community and political situation only delay the development of an individual's confidence in the political process.¹²⁹

In actuality, the American public school system, because of its compulsory attendance, is probably the only remaining institution that is capable of reaching almost all young people, and therefore capable of assisting in the transition to citizen participation. Schools should focus not only on the passive techniques of teacher-talk, student-listen, but also include actual opportunities for students to be involved, make

real decisions, and be an active part of the local community decision making process.

Research and literature suggest the recent trend of action learning in American education may assist the school in redefining its relationship with the student and the community.¹³⁰ This new methodology offers hope for several educational fronts including the environmental.¹³¹ Through the employment and incorporation of specific experiences, students may be able to not only develop the needed cognitive, affective, and personality characteristics for participatory behavior, but actually cross into their adult roles and responsibilities with less trauma. Both the general and environmental education systems need to incorporate specific types of experiences within their curricula in order to enhance the development of citizen participation characteristics.

The public school has a responsibility for developing environmental citizens. It is critical that formal education recognize that in a free society, it is the individual citizen who bears the ultimate responsibility for the choices made and the political actions taken.¹³²

What is experience?

Introduction. John Dewey emphasized the importance and need for experience in learning. He saw the purpose of the school as social: to educate young people for a better society and to use "the democratic principles of life by promoting freedom of activities and thought, by stressing individuality, and by learning self-discipline through first-hand experiences."¹³³ To encourage participation and to provide the necessary emotional and intellectual strengths to follow through on

moral decisions, the student, according to Dewey, must "have a genuine situation of experience . . ." ¹³⁴

Education has attempted to protect young people from possible confusion and frustrations by avoiding contact with real community and local experiences. This has often resulted in "turning off" young people to community involvement. The traditional approach does provide experiences, but their participation accomplishments have been limited. To John Dewey, experience should connect to other experiences, promoting and motivating the student to seek more experiences. The job of the educator is to provide experiences that promote students' motivation. ¹³⁵

Experiences favoring participation. Experiences to develop environmental citizen participants should be both real and practical for the student. ¹³⁶ Knowledge and thought must be rooted in reality and reinforced through real experiences if the student is to gain confidence in cognitive reasoning skills and moral judgments. Real experiences utilize the students' world and place them as active participants in the family, school, and community. ¹³⁷

The experience should also be practical. These experiences are useful to the student and enhance the development and understanding of their role in society. Practical experiences within the students' community promote the development of the individual's sociocentric viewpoint. John Dewey states:

I believe that the individual who is to be educated is a social individual, and that society is an organic union of individuals. If we eliminate the social factor from the child, we are left only with an abstraction; if we eliminate the individual factor from society, we are left only with an inert and lifeless mass. ¹³⁸

Effective action learning, community-action or experiential learning

programs strive through the use of valid experiences, as defined by John Dewey, to develop in students, their competence, their use of resources, their ability to communicate with different people, their willingness to take responsibility, their concern for others, and their motivation and commitment to carry out decisions. In general, those experiences that place students in real decision making, and that increase social contact are most likely to enhance the development of necessary environmental citizen characteristics.

Experience and environmental citizen characteristics.

Cognitive development. A major fault with secondary educational programs is that they assume students have already attained Formal Operational thought.¹³⁹ Educators should remember grade level does not determine a student's stage of cognitive development.¹⁴⁰

As individuals develop, there is an evolutionary shift in cognitive processes. The rate of shift depends upon the kind and quality of an individual's interaction with the environment. Without significant experiences at appropriate times, movement to higher stages of cognitive development will not occur, and the individual will stabilize at stages below their full potential. Estimates indicate that only 50 percent of secondary school students actually develop the ability to use Formal Operations, and almost all could learn Formal Operational thought.¹⁴¹ This data indicate the need for education to provide those key experiences at specific ages necessary to promote cognitive development towards Formal thought.

Moral reasoning. Mature moral development is dependent on the

individual's attainment of Formal Operational thought. A characteristic of Formal thought is reflective thinking, and, according to Dewey, reflective thinking can arise only in problematic situations.¹⁴² Students will most likely develop their cognitive ability, their moral capacities, and their motives to act, only if they have experienced and assisted in solving real and practical problems. Educators need to recognize how experience stimulates the development of Principled Moral reasoning in adolescents. Both Thomas Lickona and Lawrence Kohlberg stressed the need for students to be exposed to differing viewpoints and to participate in real responsibilities, if the development of moral and social reasoning is to occur.¹⁴³

The development of moral motivation depends on the individual's awareness that some action choices have more serious consequences for the welfare of the group than other choices. The individual must realize that choices do affect others. To demonstrate actions protecting a group, individuals need to feel and believe they are part of and that their action choices will effect a particular group.¹⁴⁴ Such a moral perspective is enhanced through in-the-community decision making experiences.

Self-concept and locus of control development. An individual to participate in political and environmental issues needs to have a positive self-concept. Community experience has a direct effect on self-concept, self-esteem, and locus of control. According to Kinch, an individual's self-concept emerges from social interaction.¹⁴⁵ Much of what individuals believe about themselves is the result of feedback gathered from interactions with others. Group experiences provide vital

feedback that enable individuals to judge and redirect their behavior.¹⁴⁶

Participation in community decision making, experience in group problem solving, and community projects enhances individual self-worth.¹⁴⁷

Erikson states the most effective method for developing psychosocial identity in adolescents is to provide them with opportunities to make commitments and take responsibility. Adolescents should be placed in environments where they cannot withdraw from responsibility and where they can accomplish their chosen goal.¹⁴⁸ Through contact with various community tasks where individuals are given responsibility, the accomplishment of tasks strengthens the individual's belief he/she has control of a situation and thus, internal locus of control beliefs are enhanced.

Political efficacy. Adolescence, to Adelson, is a watershed era in the emergence of political thought. An impressive phenomenon of adolescents' political thought is their sense of principle, and their desire to fill adult roles, and become involved.¹⁴⁹ Potentially, adolescents are capable of developing the cognitive and affective skills and behaviors necessary for citizen participation. A needed stimulus to encourage this development and provide reinforcement of participatory behavior is social interaction in the local community.

Whether students become involved in political issues depends mainly on the political lessons they learn during their adolescent years. It seems, from studies available, that teachers have not effectively conveyed through experience the message that politics is relevant to the average citizen.¹⁵⁰ Government and civics courses have had little impact on political interests, attitudes or political behaviors.¹⁵¹

How educators react to adolescents' pollution and environmental concerns now will have a definite impact on their adult political behaviors and attitudes.

Additional factors. An individual's maturity is determined by the ability to follow through on responsibilities for not only one's self, one's family, but also one's community. The responsibility for the conduct of society and government, its decisions, and the consequences of those choices rests on every member of society. According to Kohler, "To make the transition to adulthood, young people urgently need opportunities to be responsible, caring, participating members of our society."¹⁵² Decision making experiences within the community place the individual within a social group requiring interaction and realization of responsibility.

Potential environmental citizens need to develop a social consciousness and empathy. These can only be developed if students have been exposed to social situations demanding stimulation of all of their cognitive and emotional abilities. They must experience society if they are to abandon the egocentric character of the adolescent viewpoint. Development of a social consciousness and a concern for the welfare of the group is critical to the formation of principled and ecological morality.

The action-oriented approach.

What is an action-oriented approach? Action-oriented programs provide experiences that have the potential for increasing moral development, self-concept, and the development of an internal locus of control.

Action-oriented programs are also known as youth participation, youth involvement, work projects, experiential, community-action, and action programs.¹⁵³ Regardless, programs discussed in this section will refer to all educational curricula that place students in responsible roles and engage them in cooperative goal directed activities with other youth and adults in their local communities.

Action programs are designed to narrow the gap between acquisition of knowledge and its application, an element often missing in conventional classrooms. A danger of the adolescent period is that students often become so impressed with their capacity to comprehend abstract ideas that they lose sight of reality and project unrealistic solutions into problems. Action programs provide an outlet for adolescent idealism by tempering it with practical experience.¹⁵⁴ In addition, action programs strive to increase student motivation, assist in reinforcing school subject materials, provide opportunities to apply classroom knowledge, and promote a smoother transition to adulthood and citizen responsibilities.¹⁵⁵

The structure of action-oriented programs. The actual structure of action programs is greatly diversified. Some, particularly those referred to as community-based action learning, involve youth in actual community projects. The student's role may be that of an observer, as a researcher gathering needed data for community officials, as a service aid providing direct help to young or old and, finally, as an apprentice performing some specific role along side supervising adults. Regardless of the student's role within the program, the curriculum reflects an interrelationship and cooperation with the adolescent, the school and

the community. Together they define the programs' overall goals and objectives, individuals' roles and responsibility, and key learning outcomes. A major feature of any action-oriented community-based program is that the adolescent has a responsible adult role and provides a need for the community or agency.¹⁵⁶ The goal of action programs is not to discuss public concerns and problems but to do something about them.¹⁵⁷

The majority of action-oriented approaches proposed in the literature overwhelm many high school educators. There is a need to develop an environmental education model that utilizes an action-oriented approach that can be plugged into a traditional system, conducted by one teacher, and does not require extensive funding. To accomplish this, an analysis of some current action-oriented models will be undertaken. The following section will discuss the pros and cons of some of these action-oriented models and their effectiveness in developing environmental citizen participation characteristics.

Examples of action-oriented programs. Perhaps the most published experiential-type program is the Walkabout approach proposed by Maurice Gibbons. Its major goal is to develop students' ability to make decisions, and prepare them for future roles in adult society through the exposure to and participation in specific experiences. Gibbons states the approach helps to enhance the formation of adult independence and self-direction by developing students' sensibilities, knowledge, attitudes, and competencies.¹⁵⁸

The concept of Walkabout was first introduced into education by Gibbons in 1974. Based on a movie about the Australian Aborigines' practice of requiring young warriors to complete six-months endurance tests

before being accepted as young men, Walkabout suggests a training program for enhancing adolescents' transition into American adult society.¹⁵⁹ Maurice Gibbons states:

What I find most provocative is the stark contrast between the Aborigine's walkabout experience and the test of an adolescent's readiness for adulthood in our own society. . . . By contrast, the young North American is faced with written examinations that test skills very far removed from the actual experience he will have in real life . . . he does not act . . . he does not apply what he knows in . . . real situations.¹⁶⁰

A major difference between the American adolescent and the young Australian Aborigine is that the young native can clearly see that future life and survival depends on skills he is learning. The American adolescent's preparation is, primarily, for mastery of a given subject content and skills, often unrelated to future adult roles.¹⁶¹

The application of the Walkabout concept to the American educational system would generate programs with several major characteristics. Programs employing the Walkabout goals and philosophy would be experiential, involving adolescents in real, rather than simulated experiences. Chosen by the students, the experiences would challenge them to their fullest potential and involve them in both individual and group decision making situations. The experiences would be recognized by and significant to the adult community.¹⁶²

Walkabout establishes a validity for learning and actually shows the adolescent how and why particular knowledge and skills are needed. A program designed to develop environmental citizens would benefit greatly by adopting the Walkabout approach, through the placement of students within the community, participating in actual environmental issues, problems, and decisions.

Stephen F. Hamilton, a member of the Extension Service, suggests experiential learning can best be fostered through two types of environmental projects: informational projects, and work projects. Informational projects involve young people in gathering information and then presenting it to the public and community decision makers. Work projects involve youth in physical labor to improve the environment. Through such projects, adolescents use learned skills and knowledge and discover how to interrelate these to enhance one's ability to function within the adult community as an effective participant and citizen. These projects encourage group planning, cooperation, the development of leadership skills and individual responsibility and belonging. Individual concepts, esteem, and personal efficacy are also enhanced.¹⁶³

Hamilton further suggests that information and work projects can be either youth or adult-centered. Youth-centered projects are designed for youth and carried out by youth. An example of an environmental youth-centered information project was Project LOST (Laboratory of Scientific Testing) in a New York high school. Students designed a project to preserve a wetland area along the Hudson River. They were responsible for the public awareness and were able to achieve protection for Grassy Point Marsh.¹⁶⁴

In an adult-centered project, the activity is usually carried out by adults and is modified to accommodate participation by youth. An example of an environmental adult-centered information project would be the appointment of youths as "youth members on various town and/or city governmental boards." Young people can also participate by preparing environmental impact statements, monitoring environmental quality, or

preparing Natural Resource Inventories.¹⁶⁵

Project KARE is a third type of experiential program. KARE stands for Knowledgeable Action to Restore Our Environment. It is based on investigating real environmental issues within the students' local communities. The program, designed for K-12 in southeastern Pennsylvania, has developed twelve curriculum guides for use in a variety of subject areas. In the program, students, teachers, and community members work together attempting to solve environmental problems.¹⁶⁶ A similar program, Project SCATE, emphasizes the active interrelationship between political action and environmental quality through the interrelationship between adolescents and adult participation.¹⁶⁷

Dean Bennett, in Maine, has developed a five-year program that involves over 1500 students in K-12 in an environmental education project. The program attempts to link the school and the community by utilizing local people in the classroom as information resources.¹⁶⁸

A listing of additional adolescent experiential programs that include and reach beyond the environmental realm is available from the National Commission on Resources for Youth (NCRY) in New York City. For the past thirteen years the Commission has promoted youth participation programs. It agrees with theorists and the Walkabout approach that young people are capable of accepting responsible roles and will be more effective citizens if they see the relationship of learning with their future community involvement.¹⁶⁹

The programs identified by NCRY cover a broad range, from students in Connecticut raising money to save and renovate a historical building, to California teens providing a food service for senior citizens.

Regardless of the experiential program reviewed, it was found by NCRY that most possessed four major characteristics: they required decision making by students; they involved adolescents in working relationships with adults; they satisfied a genuine need in the community; and they provided regular opportunities for students to reflect on the work and skills learned.¹⁷⁰

Action-oriented programs and the research findings. What does research indicate regarding the effectiveness of experiential programs in developing specific cognitive and affective characteristics? Unfortunately, most of the research on experiential learning has been made to obtain knowledge development with almost no attention paid to the development of personal growth, value change, moral development, self-concept, or locus of control.¹⁷¹ However, the findings do indicate that students who participate in programs involving them in decision making do enhance their motivation to make decisions both in and out of school and promote their student self-confidence.¹⁷²

An unsettling fact is that experiential programs rarely, especially when compared to traditional programs cause significant increases in student knowledge gained. Experiential programs, by explanation of their philosophies, strive principally to develop individual affective and personal growth.¹⁷³

Locus of control and action-oriented programs. Harry Gottesfeld and Gertebyn Dozier found individuals who had participated as leaders in community-based programs demonstrated a more internal locus of control (using Rotter's I-E Scale). Jackson Van Buren Parker, III found that

students participating in a small school experiential learning program showed significant changes towards internality when compared to students in a traditional school. David E. Hunt and Robert H. Hardt found that students who participated in an Upward Bound Program showed a shift to internality. Theodore Chandler found when underachieving junior high school students were tutors of lower elementary school children, they showed a significant trend towards internality.¹⁷⁴

In a dissertation study developed by Gary Lewers, it was found that an experiential program caused a dramatic change towards internal locus of control in participating students. Additional changes observed were development of high moral reasoning levels and positive self-concepts.¹⁷⁵ Studies, therefore, indicate that action-oriented programs are effective in changing locus of control towards internality, a characteristic identified in this study as necessary for environmental citizen participation.¹⁷⁶

Self-concept, self-esteem, and action-oriented programs. Aronstein conducted a study to determine the effects of a community service project on college students. His results revealed experiential programs have an effect on self-concept and self-esteem, and students' attitudes toward the community. Students expressed an overall attitude change regarding their self-direction, their effectiveness as critical thinkers, their insights into environmental problems, their ability to exercise leadership, their feelings of self-confidence, and their ability to develop social relationships.¹⁷⁷ A study of an off-campus field education program found participating students experienced significant positive changes regarding their feelings of personal and social efficacy.¹⁷⁸

Experiential programs seem to have the potential for positively influencing participants' self-concept, self-esteem, and personal and social efficacy.

Principled morality and action-oriented programs. An element necessary for the development of principled morality is the individual's sense of responsibility. Responsibility refers to the quality of an individual being accountable for personal action changes. The National Commission on the Reform of Secondary Education states that learning outside the classroom through community involvement is necessary for the development of responsibility. Studies indicate that schools need to utilize community experiences to develop student responsibility.¹⁷⁹

Conclusion. A study involving four thousand students in twenty secondary public, private, and parochial school systems is revealing. Participating students in experiential programs were asked to state what they learned. The responses included: they learned to solve problems; accept consequences for one's actions; gather and analyze information; feel and act like a useful member of the community; develop greater self-esteem; become more self-motivated; and were more concerned about others.¹⁸⁰ In those experiential programs that have been studied, data in general seem to support the action-oriented approach as an effective means of enhancing specific cognitive and affective characteristics, and personality factors identified as necessary for the development of participating environmental citizens.

According to Edward G. Olsen and others, action-oriented or experiential programs have several advantages over traditional approaches. They provide hope and courage to young people who are in danger of

demoralizing frustrations. They affect definite social improvements and promote status for youth. They stimulate growth and development and help to enhance the development of citizens.¹⁸¹

According to the National Commission on Resources for Youth, the following characteristics were observed in outstanding youth participation programs: (1) The programs filled genuine needs for both the participating adolescents and the community. (2) They provided actual experience and involvement in real issues and problems within the student's community. (3) They offered a challenge to youth and an opportunity to do something meaningful and difficult. (4) They demanded from the adolescent a full expenditure of mind and spirit. (5) They promoted maturity and responsibility on several levels: developmental, interpersonal, and cognitive. (6) They provided participants with opportunities to make decisions, share in governmental questions, and perform leadership behaviors. (7) They utilized major cognitive, affective, and personality developmental theories. (8) They provided the adolescent with opportunities to experience the adult world. (9) They encouraged partnerships between adolescents and adults. (10) Finally, they offered participation in a community experience that enabled the students to expand their concept of community and develop a more holistic group.¹⁸²

Experiential programs enhance the development of the adolescent on four levels. Through teaching, counseling and helping roles, adolescents can learn to perform functions that stimulate intellectual and moral/ethical/psychological development. Through significant social role taking, as Piaget and Kohlberg emphasized, the adolescent is able

to affect their moral maturity. By participating in experiential programs, adolescents can learn to think through value questions, critically analyze value clashes, and begin the process of discerning the ethical implications of decision choices. Through analysis, adolescents can begin to attain higher levels of moral and cognitive growth, and their movement towards principled moral thinking is enhanced. Through experiential programs, adolescents can learn to recognize and participate in "just" communities and better understand the role of democratic citizenship. Finally, through experiential programs, adolescents are able to learn to analyze behavior, understand its causes and develop empathy for others.¹⁸³

Therefore, the development of citizen participation characteristics in adolescents within the American education system is possible, according to theory and research studies, providing experiential-type learning programs are utilized.

An Alternative Action-oriented Environmental Education Approach

Chapters II and III addressed a major question: What cognitive, affective, and personality characteristics should secondary environmental educators develop in students in order to enhance their citizen participation in environmental issues? Theory and research revealed that to be an environmental citizen means individuals need to develop specific cognitive, affective, and participatory characteristics.

The development of citizen participation characteristics is dependent on several factors. According to research studies reviewed earlier, cognitive characteristics are enhanced by an individual's

biological maturation, social interaction, and social transmission. An individual's affective and moral development is enhanced by social interaction, cognitive development, and a reduction in adult constraint. An individual's positive self-concept and internal locus of control is encouraged by increased responsibility, role taking, peer interaction, and successful task accomplishments. Political efficacy is enhanced through actual contact with the political system and the solving of real problems. Figure 18 provides a summary of those specific factors that stimulate the development of environmental citizen participation.

Chapter III addressed a second question: What educational methods, techniques and programs are most likely to enhance student development of citizen participation characteristics? Evidence indicates traditional awareness-oriented programs develop concern but not commitment. Schools have usually avoided experiences that involve the student in community environmental problems.

In addition, there has been little emphasis in the public secondary schools on development of upper cognitive intellectual skills and abilities, or the development of value systems and the internalization of a value complex. The development of positive self-concepts, political efficacy, and internal locus of control in the individual is absent from the majority of existing public secondary school curricula.

Research indicates action-oriented programs have been successful in changing students' self-concepts, political efficacy and locus of control. However, additional data are needed to further determine the effectiveness of these programs in accomplishing specific citizen participant characteristics necessary for participation in environmental

Figure 18

A Summary of those Factors that Stimulate Development
of Environmental Citizen Participation

<u>CHARACTERISTIC</u>	<u>FACTOR</u>
<u>Cognitive Component</u>	
Skills	Biological Maturation
	Social Interaction
Reasoning	Social Transmission
<u>Affective Component</u>	
Attitudes/Values	Social Interaction
	Cognitive Development
Moral Reasoning	Reduction in Adult
	Constraint
Environmental Morality	
<u>Participatory Component</u>	
Self-Concept	Increased Responsibility
	Role-taking
Self-Esteem	Peer Interaction
	Success in Tasks
Locus of Control (internal)	
Political Efficacy	Contact with Political
	System
	Solving Real Environmen-
	tal Problems

issues.

The Adolescent Apprenticeship process.

Introduction. The Environmental II program at Oakmont Regional High School in South Ashburnham, Massachusetts uses the Adolescent Apprenticeship process as an alternative approach to action-oriented programs. It is unique in that it requires one teacher, has few expenses, can be used within a traditional public school curriculum, incorporates modern educational theories, and utilizes community-based experiences necessary for developing citizen participants.

The Environmental II is an optional second year course of the Environmental Survival program. The Environmental I, offered during the junior year, is awareness-oriented and strives to develop students' ecological knowledge and their environmental awareness. Appendix 2 provides a copy of the Environmental I course outline. The Environmental II is action-oriented and uses an Adolescent Apprenticeship process by placing the student in the local community amidst environmental issues.

In the Adolescent Apprenticeship, students work as "apprentices" for a local environmental group, usually the conservation commission. The Apprenticeship process stresses team and individual responsibility through the completion of personal and class goals and projects. All decisions are decided by the students through democratic procedures. In addition, team representatives report regularly to the local governmental groups and participate in their decision making processes. The Adolescent Apprenticeship process encompasses a general framework where

specific course content varies from year to year depending on the needs and requests of area communities.

Apprenticeship focus. The program provides students with two types of participation: political and community. In community participation, students evaluate the environmental needs of the local community. As a group, they design a work project to improve the environment and enhance citizens' feelings toward the environment and the local conservation commission. Students obtain the approval of the conservation commission and divide the work into phases to be accomplished each marking term. Throughout the work project, students continuously return to the governmental group for advice, guidance, final approvals, and any necessary funding.

Political participation is far more complex and involves the cooperation of not only the students, the school, the conservation commission but, also, other town boards. This experience emphasizes legal, political, and lobbying actions. The overall purpose of the political participation experience is to gather data regarding a local environmental issue or problem, conduct public education and information sessions about the issue, and with the local conservation commission seek a remedy to the problem through political means, i.e., town meeting.

Apprenticeship structure. Throughout the year, the political experience is divided into phases. During the introductory period, students are exposed to specific environmental citizen skills necessary for participation. Conducted in a traditional school format, students are exposed to local governmental procedures, bylaws, state and federal environmental laws, intellectual skills and abilities, library resources,

communication skills, and detailed knowledge about Massachusetts Conservation Commissions: history, duty, legal responsibilities. Students learn how to become involved and how to work within the existing political system. Figure 19 summarizes the phases of the Adolescent Apprenticeship process.

During Phase I - Discovery and Inquiry, students develop their knowledge about a specific environmental problem, identified by the local conservation commission, by working with current publications, consulting firms, regional, state, and federal environmental agencies. During Phase II - Problem Identification, students plan and coordinate adult environmental education sessions on the environmental concern. Each student becomes a teacher for a group of eight to fifteen adults and is responsible for planning the lessons, the teaching materials, the demonstrations, and activities for three class sessions. At the end of the three teaching sessions, the conservation commission and the students present to the adults, a proposal for improving the environmental problem. During Phase III - Problem Solving, the conservation commission, the students, and interested adults decide on a specific method for improving the environmental problem: bylaw, town meeting article. Students are given the task of lobbying the issue by writing press releases, distributing posters, creating handouts for voters, and providing persuasive displays at town meeting. The Conservation Commission assumes the job of presenting the proposal at town meeting. During Phase IV - Evaluation, the students discuss their experiences and compile suggestions for next year's class.

Throughout the school year, each student, in addition to

Figure 19

A Summary of the Phases of the Adolescent
Apprenticeship Process
(Environmental II)

POLITICAL PARTICIPATIONCOMMUNITY PARTICIPATION

(Education/Action)

(Work Project/Action)

Introduction: Environmental
Citizen SkillsIdentify work project and
team goalsPhase I - Discovery and Inquiry
(Building knowledge about a spe-
cific environmental concern)Continuous work on selected
community projectsPhase II - Problem Identifi-
cation (Adult environmental
education sessions and de-
veloping a plan of action)Phase III - Problem Solving
(Implimentating an Action
Plan through the local politi-
cal process)Presentation of work project
to local Conservation Com-
missionPhase IV - Evaluation (Review-
ing the Adolescent Apprentice-
ship experience)

participation in experiences, selects a town board to monitor and provides the class with monthly reports regarding decisions made and issues discussed. Students, through teams, review state and national environmental issues and provide verbal reports to their classmates. Continuous reporting to classmates is designed to enhance the individual's self-concept and confidence in front of groups. Classes are maintained at a carrying capacity of fifteen students to facilitate social interaction.

To broaden the student's perspective of environmental concerns, the local issue identified by the conservation commission is studied from a state and national perspective. Students complete the year with a field trip to a national park, usually the Florida Everglades, and study the effects of human development on a wetland system.

During the beginning of the year, almost all of the five class sessions are devoted to formal instruction. Students, brought up in a passive classroom situation, often have difficulty accepting roles of active participants. To facilitate this new focus, the classroom is gradually modified from teacher-centered to student-centered. Eventually, days are set aside for work projects, community participation, educational projects, and political participation. By late second marking term, almost all of the five-day class week is devoted to either planning and practicing for adult education sessions, completing the work projects, developing lobbying and informational materials, or presenting summaries of board meetings, and current, local, regional, state, or national environmental issues. Appendix 3 provides a listing of what has been accomplished during each of the Environmental II programs from

1979-1981.

Conclusion. The Adolescent Apprenticeship is a community-action approach. It is different and unique because it places the adolescent directly in the community, working with adults in solving local environmental concerns. Adolescents work with a specific group of adults and together identify a major environmental concern. The adolescents utilize research techniques to develop their knowledge and design and implement community environmental education sessions. Adolescents work with a local environmental group to design a solution package and together use a political vehicle to attempt improvement of an environmental problem. In the Apprenticeship process, adolescents are training in the community under the supervision of both the teacher and an environmental group.

The approach provides adults with an understanding of environmental issues through the students' education sessions. It encourages the adolescent's continued involvement in local environmental issues. It enables the student to experience the frustrations of the political system and encourages the development of methods for overcoming political obstacles.

The unique advantages of an Adolescent Apprenticeship process are:

- (1) It is designed to accomplish the goals and objectives of environmental education through a practical methodology.
- (2) It provides the student with actual experience in local community environmental decision making.
- (3) It allows students to experience the frustrations and complexities of local environmental decision making.
- (4) It develops student self-confidence in discussing environmental issues with adults.

(5) It demonstrates the limits and values of individual involvement in community problem solving. (6) It places the adolescent in an adult environment requiring utilization of learned skills, knowledge, and attitudes. (7) It gives the adolescent an opportunity to practice thinking and reflective skills.

The Adolescent Apprenticeship process extends and synthesizes the cognitive developmental theory of Jean Piaget, incorporates the cognitive domain as described by Bloom, the moral developmental theory of Lawrence Kohlberg, the affective domain of Krathwohl, the framework of environmental morality, the characteristics of adolescence, and the research regarding experiential programs as a means of facilitating development of ecological thinking, ecological morality, and political participation. The author proposes the Adolescent Apprenticeship process as an exciting, valid, and challenging alternative approach to supplement existing awareness-oriented, secondary environmental education programs in the development of environmental citizen participants.

This dissertation attempts to accomplish two purposes: to provide a theoretical identification of cognitive, affective, and personality characteristics necessary for the enhancement of citizen participation in environmental issues, and to determine if an action-oriented environmental education program that utilizes an Adolescent Apprenticeship process can develop specific affective characteristics in participating high school seniors. The study accomplished four of its five objectives in the presentation of Chapters II and III. The remaining chapters of this study will attempt to accomplish objective five: to determine through field-testing the effects of an Adolescent

Apprenticeship on participating students' self-concept, locus of control, and principled moral reasoning, and their actual commitment to the environment. More specifically, the study is concerned with determining if an Adolescent Apprenticeship process, based on the educational theories presented and the literature reviewed, can enhance the development of specific participation characteristics in students.

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CHAPTER IV
METHODOLOGY AND PROCEDURES

Introduction

This study's research component examines the effects of an Adolescent Apprenticeship process on the development of participating students' self-concept, internal locus of control, principled moral reasoning, and their demonstration of actual environmental commitment. The study was conducted during the 1980-1981 school year in an environmental education program at Oakmont Regional High School in South Ashburnham, Massachusetts.

The study considers the following questions: (1) Do students after participating in an Adolescent Apprenticeship program (Environmental II) at Oakmont Regional High School show an increase in their total self-concept, internal locus of control, principled moral reasoning and their actual commitment to the environment? (2) Do students who have participated in an Adolescent Apprenticeship program (Environmental II) at Oakmont Regional High School show an increase in their total self-concept, internal locus of control, principled moral reasoning, and their actual commitment to the environment when compared with students who have not participated in the Environmental II program?

Chapter IV states the hypotheses to be tested; describes the research approach, including the research design, research methodology, and the sample; contains the assumptions and data collection procedures; provides a description of the instrumentation used; and presents data analysis and the limitations of the research design.

Hypotheses

According to the theoretical and research information presented in Chapters II and III, it is logical to hypothesize, stated in the null hypothesis format, that:

1. Students after participating in an Adolescent Apprenticeship process (Environmental II) at Oakmont Regional High School will show no significant difference between their:

(a) pretest and posttest mean scores for total self-concept as measured by the Tennessee Self-Concept Scale;

(b) pretest and posttest mean scores for locus of control as measured by the Rotter Internal-External Scale;

(c) pretest and posttest mean scores for actual commitment to the environment as measured by the subscale Actual Commitment in the Ecological Attitude Inventory;

(d) pretest and posttest mean scores on principled moral reasoning as measured by the Defining Issues Test;

(e) pretest and posttest mean scores on principled moral reasoning as measured by the Environmental Issues Test.

2. Students after participating in the Adolescent Apprenticeship process (Environmental II) at Oakmont Regional High School will show no significant difference:

(a) in their total self-concept posttest mean score when compared to students who did not participate in the Environmental II;

(b) in their locus of control posttest mean score when compared to students who did not participate in the Environmental II;

(c) in their actual commitment to the environment posttest mean score when compared to students who did not participate in the Environmental II;

(d) in their principled moral reasoning posttest DIT mean score when compared to students who did not participate in the Environmental II;

(e) in their principled moral reasoning posttest EIT mean score when compared to students who did not participate in the Environmental II.

Research Method

Throughout the study, the researcher's prime goal was to obtain data regarding the effectiveness of the Adolescent Apprenticeship process and to use that data to modify and/or broaden the Environmental II program at Oakmont Regional High School.

Due to the structure of the particular school system used in this study, it was impossible to randomize the samples and control all variables. A quasi-experimental method was employed because, according to Campbell and Stanley, it is the design most suited for educators involved in research within field study situations.¹

Research Design

The specific "quasi-experimental design" to be used in this study is number ten by Campbell and Stanley, entitled Nonequivalent Control Group Design.² Weiss states that this design type is most common in evaluation research where randomization of subjects is impossible.³

A major characteristic of this design is a pretest-posttest, where the control group and the experimental group do not have pre-experimental sampling equivalence.⁴

Two major internal validity problems exist in the utilization of this design type, (1) the possible lack of control of maturation between the control and experimental groups, and (2) the effects of regression on one of the groups or both. Statistical tools and biographical data will be used to help reduce the effects of these validity problems. The design utilized in the study is represented by Figure 20.

The X represents the experimental treatment (independent variable, Adolescent Apprenticeship process). Y_b and Y_a represent the pretest and posttest measurement of the dependent variables. The dependent variables stated in the hypotheses are: total self-concept, locus of control, actual commitment to the environment, and principled moral reasoning. The broken line indicates that the experimental and the control groups are not formed randomly. The symbol $\sim X$ represents the lack of the experimental treatment in the control group.

A major design difficulty is that the experimental and control groups may differ in some uncontrolled characteristics that could influence the experiment's outcome. To overcome this situation, Campbell and Stanley suggest several alternatives, one of which will be applied in this study. Through the collection and comparison of biographical information, a modified preliminary matching will be made to equalize the treatment and control groups.⁵

An instrument, the Ecological Attitude Inventory by Michael P. Maloney, Michael P. Ward, and G. Nicholas Braucht, tests for four

Figure 20

Quasi-Experimental Design (Non-equivalent
Control Group Design)

Experimental	Yb	X	Ya

Control	Xb	~X	Ya

variables: ecological knowledge, environmental attitudes, verbal, commitment, and actual commitment to the environment. It is assumed because both the control and the experimental groups participated in the Environmental I program, they should be similar in knowledge, attitudes and concern. The actual commitment to the environment subtest will be used as a dependent variable to further equate the control and experimental groups. The remaining subtests will also be used to establish equality between the groups.

Sample

The subjects consist of two groups from Oakmont Regional High School during the 1980-1981 school year. Oakmont Regional Junior-Senior High School is a small regional school system. The junior-senior high school has an enrollment of under one thousand students. It has two full-time administrators, one junior high school and two high school guidance counselors, and a faculty of sixty-two teachers.

The school encompasses the communities of Ashburnham, including South Ashburnham, and Westminster. The school is located in north central Massachusetts between the cities of Gardner, Leominster and Fitchburg. The communities are made up of several ethnic groups, principally Finnish, French, Irish, and English who came to the area originally to farm, work in the paper mills or furniture industries. Westminster, however, has recently acquired a major electronic industry, attracting families from wide distances. In the process, it has become a bedroom community for many executives in the firm, and also from Leominster's plastic industries and Fitchburg's General Electric. Both

communities have about the same population size with basically similar economic and educational characteristics.⁶

All subjects took the Environmental I (awareness-oriented) program during their junior year, 1979-1980. Subjects, at the beginning of the 1980-1981 school year, were divided into two groups, experimental and control, according to whether or not they were taking the Environmental II (action-oriented) program during their senior year, 1980-1981.

The experimental or treatment group was made up of eleven students in grade twelve who ranged in ages from seventeen to eighteen years. The experimental group participated in the Environmental II program during their senior year. According to biographical data obtained in the fall of 1980 and a review of guidance records, the majority of students in this sample were from a lower-middle to upper-middle economic class, from small families, and desired furthering their education after high school. They were all caucasian and were comprised of eight females and three males.

The control group was made up of twenty-nine students in grade twelve, ranging from seventeen to eighteen years of age. The control group did not participate in the Environmental II program during their senior year. According to the same biographical questionnaire and a review of guidance records, the majority of students in the control group were from a lower-middle to upper-middle economic class, from small families, and planned on furthering their education after high school. They were all caucasian and were made up of eighteen females and eleven males.

All students had the same teacher for Environmental I and were

distributed in one of the two classes scheduled randomly without regard for intellectual ability or verbal ability. In addition, all students, at the completion of the Environmental I program, had an equal opportunity to apply for the Environmental II program 1980-1981. Since Environmental II is scheduled for the last period of the day, many students who wanted to take it were unable to because of schedule conflicts.

Because of the "in community involvement" of the Environmental II program, only a maximum of fifteen seniors were permitted to participate. Students were selected for participation in the Environmental II program according to specific criteria and faculty evaluation. Appendix 4 provides a list of the selection criteria and a copy of the faculty evaluation sheets used in the program. Not all students who expressed a desire to take the Environmental II program during the 1980-1981 school year were permitted to enroll in the program. Other students wishing to take the program were eliminated from the selection process due to their guidance counselor's recommendation.

Assumptions

In this study, it was assumed that:

1. Both the experimental and control groups had similar environmental knowledge, attitudes, and commitment to the environment at the beginning of the 1980-1981 year, because of their participation in the Environmental I program during their junior year

2. Specific affective changes, observed by this researcher in students during the previous year, 1979-1980 Environmental II program,

were due to their participation in the program as stated in their written evaluations

3. Specific affective changes, observed in students during the previous Environmental II program, 1979-1980, can be measured by available instruments

4. Specific affective characteristics, identified as necessary for participation in environmental issues in Chapter III, can be measured in adolescents by available instruments

5. The Rotter Internal-External Scale, developed by Julian B. Rotter, measures what it is purported to measure and is a valid and reliable instrument for testing locus of control

6. The Tennessee Self-Concept Test measures what it is purported to measure and is a valid and reliable instrument for testing total self-concept

7. The Defining Issues Test measures what it is purported to measure and is a valid and reliable instrument for testing principled moral reasoning in this study

8. The Environmental Issues Test measures what it is purported to measure and is a valid and reliable instrument for testing principled moral reasoning in this study

9. The Ecological Attitude Inventory measures what it is purported to measure and is a valid and reliable instrument for testing verbal commitment to the environment, actual commitment to the environment, attitudes toward the environment, and knowledge about the environment

10. Students were honest in their responses to the testing

instruments used in this study

11. Environmental II students were honest in their written responses describing their changes due to participation in the Adolescent Apprenticeship process

12. Based on a review of theory and research, concerning adolescent development, the high school students have developed sufficient cognitive and affective abilities to learn from the Adolescent Apprenticeship experience.

Data Collection

Preliminary. Preliminary procedures include those steps undertaken by the researcher prior to the actual data gathering phase.

The administration at Oakmont Regional High School was contacted in the fall of 1980 to obtain permission to test students as part of a dissertation research project: The purpose of the dissertation project being the evaluation of the overall effectiveness of the Environmental II program in developing specific affective citizen participation characteristics in students. The administration gave permission to test students, and it was recommended by the administration and decided by the researcher that the test format selected should be the one which best meshes with the school's daily routine.

In order to enhance the validity of the testing results, it was decided to test all seniors rather than just seniors who had taken Environmental I during their junior year. Testing, limited to only students who had Environmental I during their junior year, might encourage students' biases in responding to the testing instruments.

Originally, it was hoped English teachers would be able to administer the pretests over a four-day period within their classes, since this was the common testing practice used by the guidance department at Oakmont. This format was eliminated for two major reasons: (1) it involved too much class time effecting the English department curriculum, and (2) by having a diversity of teachers administering the tests, the chance of incorrect directions was enhanced.

To resolve the difficulty of testing, the guidance department was contacted. The senior high guidance counselors, for a variety of reasons, were reluctant to become involved. The junior high counselor agreed to administer the tests to all students in the senior class. The use of the junior high counselor was more valid. Many seniors often assume tests administered by senior high counselors influence their college acceptance or after-graduation job acquisition.

After reviewing all possible methods, it was decided to test students during their study halls. This was acceptable to both the administration, English teachers, and guidance counselor. The senior English teachers agreed to permit students to fill out updated study hall schedules. Using the student study hall information, appropriate rooms and a draft testing schedule was prepared.

Since the pretesting sessions involved obtaining biographical information and the use of four test instruments, it was decided to collect data two days the first week, and two days the second week. The testing schedule was suitable because none of the testing instruments were timed; they could be completed in an average of fifteen minutes; and they were written at a sixth grade reading level.

The draft schedule was shown to the administration and guidance director for approval. A statement explaining the test program, its purpose, and a copy of the draft schedule was given to each teacher for comments. Appendix 5 presents a copy of the draft letter given to the teachers. Using the student schedules, the researcher assigned students to specific testing rooms on two days of each week. It was discovered that some students had a conflict with gym, music or chorus. Through a discussion with chairpersons of the music department and the athletic department, permission was obtained for students to be absent during the testing period from music or gym.

Student testing schedules were given to all senior English teachers to distribute. A copy of the testing schedule was posted in each senior homeroom, outside the main office, and was briefly explained over the morning announcements one week prior to the testing. Students were told if they had any questions or had conflicts in their scheduled test time to see Miss Griffin (researcher).

Students were told to report directly to the testing room and when finished, would be given a pass to their study halls. Special passes were printed for use in the testing program. Students, teachers, and the test administrator were told the purpose of the testing was to help evaluate the Environmental program at Oakmont and that students would be posttested in May.

A day before the testing program, students were reminded over the school intercom, in their English classes and in senior homerooms. The researcher administered tests according to the following format described in Figure 21. Students who did not finish the biographical

Figure 21
Pretest Schedule

Week 1 - Day 1	Tennessee Self-Concept Biographical form
Day 2	Internal-External Scale
Week 2 - Day 3	Ecological Attitude Inventory
Day 4	Defining Issues Test Environmental Issues Test

information in class were permitted to complete it at home.

Because most of the tests required fifteen minutes or less, students absent during testing days were able to make up missed tests during the remaining test periods. Otherwise, students made appointments with the researcher to complete missed tests.

Each student was assigned a code number and was instructed to use the code number instead of his/her names. Each test answer sheet had a code number printed on it. Also, attached to the answer sheet on a small piece of paper was the student's last name. When the student completed the answer sheet, the stapled last name was removed and discarded. This was necessary to insure the correct code went to the correct student, and also for attendance purposes. The researcher kept a list of the codes for both the experimental and control groups.

The test administrator read all test directions to the students prior to beginning. In addition, during the first week, the test administrator read to all students the purpose of the test program as prepared by the researcher. Appendix 6 contains a copy of the test purpose as read to the participating students.

Although extensive efforts were taken to insure the testing program went smoothly, some students reported to the wrong locations. Therefore, it was necessary to allow fifteen minutes before the beginning of each test to call the office and have the missing students paged. In some cases, teachers scheduled students for make up work and extra help during the testing periods. Therefore, some of these students were never tested.

A similar format was followed during the May posttesting, however,

three major difficulties occurred. The original test administrator, junior high guidance counselor, became pregnant and was absent from school during May 1981. The remaining guidance counselors, overloaded with college acceptances and graduation responsibilities, could not assist in the testing. The situation necessitated some changes.

(1) The researcher, certified as a school guidance counselor and guidance director, and having a Master's degree in guidance and psychology, tested the students. (2) The original student testing group, comprised of the entire senior class had to be reduced to forty; those students who had taken Environmental I during their junior year. (3) Students were tested in the researcher's classroom while the researcher taught regular class assignments. The researcher's classroom was well suited for this change. Students who were being tested, never more than five at any time, sat at lab tables away from the regular students in the room. Because the tests, according to the manual directions, could be taken unsupervised, close observation by the researcher at all times was not necessary.

Students took the spring tests according to the same sequencing as in the fall. However, instead of taking four days over a two-week period, the posttests were completed in one week over a three-day period. The schedule used in the posttesting period is outlined in Figure 22. Absent students made up tests at their convenience. Prior to beginning the posttests, the researcher repeated the purpose and directions. Pretests were given in October 1980 and posttests were given in mid-May 1981.

Figure 22

Posttest Schedule

Week 1 - Day 1 Tennessee Self-Concept
 (Tuesday)

 Day 2 Internal-External Scale
 Ecological Attitude Inventory
 (Wednesday)

 Day 3 Defining Issues Test
 Environmental Issues Test
 (Friday)

Operational. Operational procedures include those steps taken by the junior high guidance counselor and researcher in the administration of the testing instruments during the pretest/posttest data gathering phase.

1. Attendance was taken by the test administrator
2. Sharpened pencils were distributed to all students
3. The test administrator read to all students a statement containing the purpose of the testing program
4. The code system and the student's last name was stapled to the answer sheet and explained to the students by the test administrator
5. The appropriate test booklet and answer sheet were distributed to each student
6. The students and test administrator read the directions together. Any questions were answered by the test administrator. Students were reminded that the tests did not affect their post graduation status. They were told if they did not finish, they could stay and complete the test during the next period
7. When students completed the tests, they were given to the test administrator who removed the name tags from the answer sheets and discarded them. The answer sheets, with the same code number as used on the pretest, were collected and separated from the test booklets
8. Prior to leaving, each student was reminded of the next scheduled testing period.

Other data sources. Additional data were collected from graduates of the Environmental II program. All 1980-1981 Environmental II students

at the end of the year were asked to provide written comments on how the program affected them. The researcher recorded Environmental II students' attendance at board meetings, their volunteering, general class attitudes, and personal changes as they were observed in the participating individuals.

Instrumentation

Testing instruments having a high level of validity and reliability were critical to the research study because of the limited experimental and control groups' size. A thorough search of environmental education dissertations, current research studies, and work involving the four variables of self-concept, locus of control, principled moral reasoning, and actual commitment to the environment revealed several possible test instruments. After further examination of the instruments through Tests in Print and the Test Collection in Princeton, New Jersey, five were selected based upon: (1) their validity, (2) their test-retest reliability, (3) their group administration characteristics, and (4) their relaxed administrative atmosphere. In all cases, the reading level required by the instruments was grade six, and all could be completed within an average class period.

The Tennessee Self-Concept Scale. The Tennessee Self-Concept Scale was developed by William H. Fitts and others for the Tennessee Department of Mental Health in 1955. Originally, Dr. Fitts and his associates compiled a large collection of self-descriptive items from other personality tests, from patients, and from nonpatients. The items were

divided into positive and negative descriptions according to a pre-determined classification system that included physical self, social self, etc., with ten remaining items to become the self-criticism scale. Seven clinical psychologists judged the items according to the pre-determined classification scheme and also, as to whether they felt the descriptions were positive or negative. The final ninety items used in the self-concept scale are the result of unanimous agreement between the judges.⁷

The items selected were tested over several years on persons of known background in order to validate the instrument. The instrument was standardized by utilizing a sample of 626 people from various parts of the country that included an age range of twelve to sixty-eight years, equal numbers of both sexes, blacks, white, and representatives from all social, economic, intellectual, and educational levels, including sixth grade through Ph.D.⁸

Reliability and validity. The test-retest reliability for the total positive score, the variable of concern in this research study, was .92. William Fitts found evidence of reliability through repeated use of the measure over long periods of time and found through profile analyses that the distinctive features of an individual's profile were still present a year or more later.⁹

The instrument was checked for content validity, its ability to discriminate between groups, its correlation with other personality measures, and its ability to record personality changes under particular conditions. It was found through research that the Tennessee Self-Concept Scale reflected changes in predictable ways adding evidence for

the validity of the instrument.¹⁰

Description. For the purpose of this study the Counseling Form rather than the Clinical and Research Form of the Tennessee Self-Concept Scale (TSSC) was used. The TSSC consists of one hundred self-descriptive statements which the subject uses to describe a portrait of himself/herself. The instrument can be self-administered and can be used with twelve year olds or higher, providing they have at least a sixth grade reading level. In reading a descriptive statement, subjects were to indicate if the statement was (1) completely false, (2) mostly false, (3) partly false and partly true, (4) mostly true, (5) completely true for themselves. All answers were recorded on separate answer sheets that could be hand or machine scored.

The Counseling Form provides the researcher with a maximum of twelve scores, nine of which are dimensions of the self-concept. The additional scores are total positive score, total variability, and distribution score. Although this study was concerned only with the students pre and post total positive score, additional scores were included on the total data sheets.

The total positive score is all the nine dimensions combined and reflects the overall level of self-esteem. The nine scores making up the total positive score reveal the subject's external and internal frames of reference.

The external frame of reference is comprised of:

- (1) Physical self is the individual's perception of his/her own body, state of health, physical appearance, skills and sexuality
- (2) Moral-ethical self is the individual's moral worth of self,

relationship to God, and feelings of being a good or bad person

(3) Personal self is the individual's sense of personal worth and his/her feelings of adequacy as a person

(4) Family-self is the individual's feelings of adequacy, worth and value as a family member

(5) Social-self is the individual's sense of adequacy and worth in his/her social interaction with other people in general

The internal frame of reference is comprised of:

(6) Self-identity is how the individual describes his/her basic identity and how he/she sees himself/herself

(7) Self-satisfaction is how the individual describes feelings about the self he/she perceives

(8) Behavior is how the individual describes his/her perception of his/her own behavior.

The final dimension of self-concept is a self-criticism score. A low score suggests an individual is being defensive in answering the statements, while a high score reflects a healthy openness.¹¹

The total positive score (P score) used in this study reflects the individual's overall level of self-esteem. Persons with high scores like themselves, feel they have worth, have confidence in themselves and act accordingly. Persons with low scores are doubtful about their own worth, see themselves as undesirable, often feel anxious, depressed, unhappy and have little faith or confidence in themselves.¹² Appendix 7 provides information concerning where the copyrighted Tennessee Self-Concept Scale may be obtained.

Rotter Internal-External Scale. The Rotter Internal-External Scale

(I-E Scale) was developed by Julian B. Rotter in 1966 to measure an individual's locus of control. The scale is a modified version of an original scale of sixty-six items, developed by Phares and James and the late Shepard Liverant under the direction of Julian B. Rotter. The test measures a person's beliefs that forces are or are not beyond his/her control. According to Rotter, internals are people who believe that events are under their own control, whereas externals believe that outcomes are controlled by outside forces like luck, fate, God, or powerful others.¹³

Reliability and validity. Test-retest reliability over a two-month period ranged from .49 to .83 with most results in the 70s. Internal-external reliability coefficient was calculated at .83. In a test-retest situation Rotter found the means for the second administration typically dropped about one point in the direction of less externality.¹⁴

In order to determine construct validity, Rotter used several methods. A correlation coefficient of +.60 was obtained by comparing a Likert-type scale to the I-E Scale.¹⁵ Rotter reported good discriminant validity for the I-E Scale indicated by low correlation with such variables as intelligence, social desirability, and political affiliation.¹⁶

Description. The Rotter Inventory is different from previous locus of control tests in that it is a force choice questionnaire rather than a Likert-type scale. The first scale contained one hundred items each comparing an internal and external belief. The earlier scale was reduced to a sixty-six item scale by Liverant. After identification of

problems, extensive work and revision, Rotter, Liverant and Crowne in 1961, developed a twenty-three item scale. The final version of the scale is a twenty-nine item test including six filler items intended to disguise the purpose of the test.¹⁷ According to Rotter, the scale being an additive scale, attempts to sample internal-external beliefs in a variety of situations. These situations include, but are not limited to, interpersonal relations, work, school, and politics. This additive characteristic enables the scale to measure a generalized belief and predict moderately well across a number of situations.¹⁸

On each scored pair, there is one statement that represents an external orientation and one that represents an internal orientation. The score, the total number of external choices, ranges from zero to twenty-three; the higher the score, the more external an individual's locus of control. Subjects in the upper half of the distribution on the I-E Scale are referred to as externals, and those in the lower half of the distribution as internals. "Rotter conceptualized people as being more or less internal or external and not as being either internal or external."¹⁹ The I-E Scale was meant to be a general measure of locus of control and may miss internal-external belief in a specific situation.

The Rotter Locus of Control Inventory was selected for use in this study because of its extensive use in hundreds of studies including dissertation studies, and because the same test can be used worldwide. Since it has been used in over 50 percent of the locus of control research studies, the I-E Scale is an accepted measure of locus of control for events in general. Both Lefcourt and Phares, in recent reviews of the I-E variable, recommend that the I-E Scale be used when measuring

general expectancy. The Rotter I-E Scale has been normed with high school students and has been used with high school populations.²⁰ For a copy of the I-E Scale and a letter from Dr. Rotter granting permission to use the instrument in this study, see Appendices 8 and 9.

Ecological Attitude Inventory. The Ecological Attitude Inventory was developed in 1973 by Michael P. Maloney and Michael P. Ward as a tool to measure behavior change towards the environment. Maloney and Ward conceptualized the ecological crisis, not as a technological problem, but as a crisis of maladaptive behaviors. Therefore, the solution to the ecological crisis was not in finding new technological approaches but rather in the alteration of human behavior. In order to measure these behavior changes, they developed a 128-item Inventory made up of four subscales: The VC Scale (verbal commitment to the environment), the AC Scale (actual commitment scale), the A Scale (affect scale), and the K Scale (knowledge scale). The VC Scale consists of thirty-one items and measures what a person states he/she is willing to do in reference to pollution and environmental issues. The AC Scale, made up of thirty-six items, measures what a person actually does in reference to pollution and environmental issues. The A Scale, containing thirty-seven items, measures the degree of emotionality related to such issues. The K Scale contains twenty-four items and measures specific factual knowledge related to ecological issues.²¹

The items in the Inventory were selected and modified from a pool of five hundred questions. The draft Inventory was presented to three independent judges (Ph.D. Psychologists) who eliminated some of the items.

The resulting final Inventory was made up of 128 items. Maloney and Ward have since revised the original long form and developed a shorter and more practical version.²²

Reliability and validity. A one-way analysis of variance for each of the long and short scales was conducted. The F ratios of the short form were essentially at the same level as those pertaining to the long scale. Maloney and Ward in 1973 reported, using Cronbach's Alpha, that the reliability of the A Scale short form was .85, the VC Scale was .81 and the AC Scale was .89. Because the K Scale used different methods of item selection on the original and revised scales, the reliability analyses was not computed. However, Maloney and Ward in 1973 reported a Pearson Reliability Coefficient of .89. Reliability was determined using the split-half technique with a randomly selected group of college students.²³ Maloney and Ward found that when the reliability of the short form was compared to the original form, it decreased only slightly. Table 1 provides a summary of Scott's Homogeneity Ratio and Cronbach's Alpha regarding the Ecological Attitude Inventory.

Criterion validity was determined by administering the scale to conservation committee members of two Chapters of the Sierra Club in the Los Angeles area of California. Analysis of the data showed the Sierra Club people scored significantly higher on all subscales than groups of college or non-college adults. The Sierra Club members functioned at the high end of the scale.²⁴ Table 2 presents the means and standard deviations for various groups on the Ecological Attitude Inventory. Table 3 presents test comparisons of various groups on the Ecological Attitude Inventory.

TABLE 1

A Summary of Scott's Homogeneity Ratio (HR) and Cronbach's Alpha (α) for the Original and Revised Scales (All Groups on the Ecological Attitude Inventory)

Scale	HR		α	
	Original	Revised	Original	Revised
A	.201	.358	.899	.846
VC	.212	.296	.888	.805
AC	.243	.442	.918	.888

Note. A = affect; VC = verbal commitment; AC = actual commitment. Two items were omitted from the original 130-item scale.

SOURCE: Michael P. Maloney, Michael P. Ward, and G. Nicholas Braucht, "A Revised Scale for the Measurement of Ecological Attitudes and Knowledge," American Psychologist Vol. 30, No. 7 (July 1975): 790, Table 3.

TABLE 2

A Summary of the Means and Standard Deviations for the Various Groups on the Ecological Attitude Inventory

Group	N	VC		AC		A		K	
		M	SD	M	SD	M	SD	M	SD
Sierra	32	24.75	3.87	24.28	5.03	31.06	4.17	16.88	3.44
College	56	19.43	5.75	15.04	6.89	26.14	5.95	13.00	3.51
Noncollege	40	16.15	6.35	10.50	5.29	21.25	8.14	10.45	3.45

Note. VC = verbal commitment; AC = actual commitment; A = affect; K = knowledge.

SOURCE: Michael P. Maloney and Michael P. Ward, "Ecology: Let's Hear from the People An Objective Scale for the Measurement of Ecological Attitudes and Knowledge," American Psychologist, July 1973, pp. 583-586, Table 1.

TABLE 3

A Summary of the Test Comparisons for Various Groups
on the Ecological Attitude Inventory

Group	VC	AC	A	K
Sierra Club and college (df = 86)	4.67***	6.65***	4.14***	5.04***
Sierra Club and noncollege (df = 70).	6.72***	11.20***	6.21***	7.84***
College and noncollege (df = 94)	2.62*	3.49***	3.40**	3.54***

Note. VC = verbal commitment; AC = actual commitment; A = affect;
K = knowledge.

*p < .02

**p < .01

***p < .001.

SOURCE: Michael P. Maloney and Michael P. Ward, "Ecology: Let's Hear from the People An Objective Scale for the Measurement of Ecological Attitudes and Knowledge," American Psychologist, July 1973, pp. 583-586, Table 2.

Description. The shortened scales (VC, AC, A) have an equated true-false format that is more resistant to possible systematic response biases.²⁵ In the shortened form, VC, AC and A, all have ten questions, whereas the K subscale has fifteen questions. This researcher noted some geographical bias in the knowledge subscale regarding smog and air pollution questions. It is unlikely the Oakmont Regional High School students could answer these questions due to their inexperience with city air pollution.

Only the AC (actual commitment) subscale will be used to monitor a behavior change in this study. Because the control and experimental groups both experienced the Environmental I program, an awareness-oriented program, it is assumed they will possess similar scores on the A (affect) subscale, VC (verbal commitment) subscale, and K (knowledge) subscale. This will be supported or rejected in the data.

In answering the questions on the AC subscale, the VC and A subscales, students must either select T for true or F for false. A true answer indicates the student agrees with the statement or it represents the way he/she feels, or it is something he/she has done. False indicates the student disagrees with the statement, or it does not represent the way he/she feels, or it refers to something he/she has not done. In answering the questions on the K subscale, the student records the letter of the correct answer on the answer sheets. For a copy of the Ecological Attitude Inventory and a letter from Michael Maloney granting permission to use the EAI in this study, refer to Appendices 10 and 11.

Defining Issues Test. The Defining Issues Test was developed by James Rest, et al., in 1973 and is designed to identify the conceptual framework by which an individual analyzes a social moral problem and arrives at a course of action. To date, most moral reasoning tests parallel those designed by Lawrence Kohlberg and cannot be taken in a group testing situation. The Defining Issues Test (DIT), based on Kohlberg's developmental theory, can be administered to groups.²⁶ The characterization of the stages in the DIT are basically Kohlberg's, following the three major levels: Pre-Conventional, Conventional, and Post-Conventional.²⁷

Although Rest utilizes the framework of Kohlberg's moral developmental theory, many differences between the Kohlbergian instruments and the DIT exist. Kohlberg asks subjects to generate solutions to moral problems, whereas the DIT asks subjects to evaluate considerations to moral problems. The Kohlbergian test requires judges to classify subjects' responses, while the DIT requires subjects to classify their own responses. Kohlberg's test places the subject in a developmental sequence by stage typing, but the DIT uses a "P Index" that locates a subject in a developmental continuum. However, both the DIT and Kohlberg's method assume there are qualitatively different cognitive organizations involved at different stages of development.

James Rest has found that stage typing is often a poor way to index moral development. The DIT does not give scores strictly equivalent to Kohlberg's test. It was found by Rest that for heterogeneous groups, the DIT correlated with Kohlbergian tests up to .70s and homogenous groups correlated lower. It is inappropriate, therefore, to use the DIT

to predict scores on a Kohlbergian test.²⁸

Reliability and validity. Rest states that since the theoretical implications of the test design are multi-faceted, there is no one piece of evidence that can offer validation of a test of moral judgment. However, a case for the DIT's validity can be built from the many studies that have used it.²⁹ Studies conducted by M. L. Davison and S. Robbins in 1978 conclude test-retest reliabilities for the major indices of the DIT (P and D Scores) in the high .79s or .80s. The Cronbach's Alpha Index of Internal Consistency is generally in the high .70s. Rest found that experiences which focus on structural aspects of moral reasoning were more effective over longer durations of several months rather than several weeks or several hours. The construct validity, according to Rest, is in the .60s.³⁰

James Rest developed the DIT principally to provide an instrument that could be easily scored by a variety of people who did not have to be specially trained and could be administered to many individuals at one time. The DIT (long form) takes a maximum of fifty minutes class time, but most students will finish it in thirty-forty minutes. Although there is a shorter form taking less time, it suffers in having a lower reliability.³¹

Description. The DIT contains six moral dilemmas written in a story format. For each dilemma, the individual reads the dilemma and examines twelve statements listed at the end. Each statement expresses different concerns or questions that an individual might seek answers to in order to make a decision as to what should be done. The person is then asked to rate each of the twelve statements, according to its

importance, making a decision in the dilemma as either of great importance (G), much importance (M), of some importance (S), of little importance (L), or of no importance (N). The person then looks over the twelve statements and selects the four most important in making a decision and rates these as: most important, second most important, third most important, and fourth most important.

Each of the twelve statements for each of the six moral dilemmas are designed to exemplify some distinctive characteristic of a stage. The dilemma statements were selected by Rest because they represented the responses most commonly given by a majority of the subjects who have taken the Kohlberg interview test.

The statements reflect either stages two, three, four, five A, five B, or six. James Rest has modified the statements to include not only the Kohlberg traditional stages, but he has also divided stage five into five A and five B, included statements that are anti-establishment (represented by A on the score sheets), and included a series of M or nonsense statements. Also, included in the DIT are several internal checks on the subject's seriousness in taking the test. These include a three-part consistency check that will be discussed later in this chapter.³²

Because the DIT utilizes Kohlbergian theory and the individual's level of cognitive development is significant, the dilemma statements were written to reflect the following:

(1) The underlying stage structure of the statement was emphasized so that the higher stage statements seemed stark and abstract, rather than lending themselves to being interpreted as fancier ways of stating

a lower stage idea.

(2) Among statements representing the stages were nonsense statements (M) that used high sounding phrases. Such phrases provide a check on the tendency for some subjects to deliberately choose high sounding statements on the basis of their complex wording, rather than on their meaning

(3) Care was also taken to match issues from various stages on work-length and complexity

(4) In each set of dilemmas, several statements representing a stage were presented so that if an individual could not understand a statement, there were still other statements representing the same stage that the individual could choose.³³

In using the DIT, several scores may be recorded. The researcher, being interested in principled morality, used the P Score. The P Score is the sum of the weighted ranks given to statements reflecting stage five A, five B or six reasoning. The P Score indicates the relative importance an individual gives to principled moral considerations in making a decision about moral dilemmas and includes morality of social contract, morality of intuitive humanism, and morality of principles of ideal social cooperation. Additional scores include stage scores two, three, four, or taken together as the conventional morality score (CM), the A score (anti-establishment), the M score, and not used in this research, the D score.

In conclusion, James Rest's pencil-and-paper version of Kohlberg's assessment test solves many of the problems often inherent in the interview technique. The DIT can be administered to many students at the

same time, can be scored easily, and the reading level required to understand the dilemmas reflects that of eleven to thirteen-year olds. Its reliability and construct validity are suitable for this study, and it is not subject to scorer biases. For these reasons, the DIT was selected for use in this study. A copy of a letter from James Rest granting permission to use the DIT in this study can be found in Appendix 12.

Environmental Issues Test. In 1975, Louis Iozzi in a dissertation study modeled and developed a moral reasoning test after the Defining Issues Test by James Rest entitled the Environmental Issues Test (EIT). The DIT employs many of Kohlberg's ideas in the development of moral reasoning. Kohlberg's emphasis of social concern, justice, and universality in the stages is directly related to a human perspective. What is "just" and universal pertains to humans only. The dilemmas which involve a choice between immediate human effects and the long-term effects on the ecosystem are not addressed within this current moral framework. Iozzi, through the development of the EIT, makes an attempt to place human and environmental values in conflict as a moral dilemma.

Reliability and validity. Iozzi in his dissertation work tested the EIT's validity. The EIT was given to students in junior high, senior high, and college. Iozzi assumed that if the EIT was valid in distinguishing among groups at different moral maturity levels, it would be logical to expect the junior high students to score significantly lower than the senior high sample. Also, the scores of the senior high sample should be significantly lower than the score of the college sample. The

principled morality (P scores) for each group are presented in Table 4.

Louis Iozzi computed a one-way analysis of variance for the P Scores of each group on the EIT to determine if the differences in the means of the three groups were significant. The F value obtained indicated the groups differed significantly. The college mean was significantly higher than the senior high mean and the junior high mean was significantly lower than the other two groups tested.³⁴ Iozzi concluded the EIT was valid in distinguishing principled moral maturity between groups at different levels of moral maturity. Because the EIT was patterned almost identically after the DIT, Iozzi states the EIT is a valid test for measuring moral maturity and possesses face validity.³⁵

Description. The EIT, modeled after the short form DIT, involves moral dilemmas encompassing environmental issues. The EIT consists of three environmental dilemmas where the individual is asked to evaluate a set of twelve statements by indicating the importance of each statement in making a decision. The twelve statements for each of the three dilemmas are similar to those statements used in the Defining Issues Test.³⁶

Subjects in this study were given both the original long form, six-dilemma DIT, and the three-dilemma EIT as one test. The dilemmas were arranged so that the DIT dilemma that was similar to the EIT dilemma followed each other. The test entitled "Opinions about Social Problems" comprised nine dilemmas arranged in the following order:

- (1) D-1 Heinz and the Drug
- (2) E-1 Electricity
- (3) D-2 Escaped Prisoner

TABLE 4

A Presentation of the Means and Standard Deviations for Principled Morality (P Scores) on the Environmental Issues Test - College, High School and Junior High School Samples

Group	n	M	S.D.
College	115	50.433	17.062
High School	37	37.473	16.704
Junior High School	39	25.297	13.157

SOURCE: Louis Iozzi, "Moral Judgment, Verbal Ability, Logical Reasoning Ability, and Environmental Issues" (Ed.D. dissertation, The State University of New Jersey, 1976), pp. 80-81.

- (4) E-2 Concerned Citizen
- (5) D-3 Newspaper
- (6) E-3 Environmental Strike
- (7) D-4 Student Take-Over
- (8) D-5 Webster
- (9) D-6 Doctor's Dilemma

The DIT will be scored separately from the EIT and reported as two principled morality scores. The EIT, because of its modeling after the DIT, is assumed by Iozzi and this researcher to have the same internal consistency checks and is scored like the short form of the DIT. A copy of the EIT, combined with the DIT, is available in Appendix 13.

Biographical form. A questionnaire was developed for use in this study with both the experimental and control groups. The purpose of the questionnaire was to gather information about the subjects and to assist in establishing similarity between the control and experimental groups. The personal data collected included age, sex, community, father's and mother's level of education, type of school courses taking, number of siblings, and so on. A copy of the questionnaire entitled "Biographical Questionnaire" may be found in Appendix 14.

Self-evaluation form. All students who graduated from the Environmental II program in 1980 and 1981 were asked to supply information describing the program's affects on themselves. The responses are included in and discussed further in Chapter V of this study. Refer to Appendix 15 for a copy of the self-evaluation form.

Data Scoring

All tests administered to the experimental and control groups were hand-scored by the researcher. The scores and biographical information were coded and entered on computer summary sheets. None of the pretests or posttests were corrected until June 1981, when the students had completed the Environmental II program. The researcher was unaware of students' scores until June 1981. This reduced the researcher's chance of becoming aware of pretest data and thereby influencing the posttest results.

All tests were corrected twice to check for recording errors. Specific scoring directions for the Internal-External Scale, EAI, DIT, and EIT are presented in Appendices 16, 17 and 18. Directions for scoring the Tennessee Self-Concept Scale are available from William S. Fitts, Ph.D. in Manual Tennessee Self-Concept Scale published by Counselor Recordings and Tests, Box 6184, Acklen Station, Nashville, Tennessee 37217.

Tennessee Self-Concept Scale. The score sheet for the Counseling Form of the Tennessee Self-Concept Scale was used in this study for both the pretest and posttest data. All vertical columns and horizontal raw scores were added and checked. The scores of only the moral-ethical self, personal self, family self, and social self were recorded on the computer summary sheets. The self-criticism score (SC), total positive score (P), total variability score (V), and distribution score (D) were figured and recorded on the pretests and posttests. The score of most value in this study was the total P score. Other scores were recorded

on the computer sheets in case further information was needed by the researcher. Where blanks existed on students' answer sheets, the number was circled by the researcher, as advised by Fitts in the test scoring manual.³⁷

I-E Scale. Pretest and posttest answer sheets were corrected using the locus of control answer key developed by Julian B. Rotter. Students selected either A or B for each statement. Although there were twenty-nine items, only twenty-three of these affected the score which ranged from zero to twenty-three. The mean score, according to Rotter, for tenth to twelfth grade students usually ranges anywhere from 7.31 to 10.00. The higher the final score, the more externally-oriented an individual. Whereas, the lower the score, the more internally-oriented an individual.³⁸

Ecological Attitude Inventory. The short form of the Ecological Attitude Inventory required answers as true or false on three subscales. The knowledge subscale required an A, B, C, D, or E answer. An answer sheet provided by Maloney and Ward was used to correct the pretests and posttests. The highest possible score on the VC subscale (verbal commitment), the AC subscale (actual commitment), and the A subscale (affect) was ten and on the K subscale (knowledge) was fifteen. Although all four scores were recorded on the computer summary sheets, the AC score was of major concern in this study. The remaining subscale scores were used to assist in determining the similarity of the experimental and control groups.

Defining Issues Test and Environmental Issues Test. The most difficult and time consuming tests to correct were the DIT and EIT tests. Data sheets were prepared for both the DIT and EIT tests. A copy of the data sheets is available in Appendices 19 and 20. By looking at the first four checked ratings at the bottom of each test page, (most important to the fourth most important) and using the story chart provided by James Rest, the stage of each selected statement was recorded and weighted as either four, three, two or one.

After the stages had been figured for all stories on the DIT pretests, the procedure was repeated on the DIT posttests. The recorded weights for each stage column on the data charts were added and recorded under the raw stage scores. The raw stage scores were added together from five A, five B, and six, and the total was recorded as the P score on the chart. The A column and M column were added to make the A score and M score. Percentage of each raw score for stages two, three, four, five A, five B, and six, and the P score were calculated by dividing by six. The P percent ranged from zero to ninety-five instead of one hundred due to the fact that on three stories there is no fourth possible principle item to choose. This procedure was repeated on the posttests.

Prior to recording the stage scores, P score, A score and M score on the computer sheets, pretests and posttests were checked for any inconsistencies which would make the tests invalid. Tests were eliminated if the M score was eight or above. A high M score indicates the subject was probably checking off items according to whether they sounded complex. A consistency check eliminated tests that failed any one of three

parts: (1) No dilemma could have more than eight inconsistencies on any single story. (2) There could be no more than two stories in which there were any inconsistencies, and no more than one story could have more than nine statements rated the same. (3) When a subject rates a statement as of great importance but, in the final selection of the four most important statements, rates it as fourth, third, or second. Each statement recorded ahead of it in importance constitutes one inconsistency.³⁹ Only complete data sets were used. If a pretest was eliminated, the posttest was also eliminated and vice versa.

A similar procedure to the DIT was followed for the EIT, using a weight/stage chart developed by Iozzi based on James Rest's DIT. Because three stories were used in the EIT, according to Iozzi and Rest, the raw column scores for stages two, three, four, five A, five B, six, P, A, M were divided by .3. Before recording the scores a similar inconsistency test as used in the DIT was followed for the EIT. All tests having a M raw score above four were eliminated.⁴⁰ All correcting on the DIT pretests and posttests and on the EIT pretests and posttests was checked twice prior to recording the scores on the computer summary sheets.

Data Analysis

An additional concern of this research study involves the gathering of information that will enhance the development of citizen participation characteristics as identified in Chapters II and III of this study. The results will be used to make modifications in the 1981-1982 Environmental II program at Oakmont Regional High School.

To analyze the study's data, it was necessary to utilize several

perspectives. The perspective included descriptive statistics, employment of significance tests, comparison of experimental and control group data, comparison of individuals' raw data and gain scores, and an examination of students' written evaluations.

Data analysis for this study was done in five phases: In Phase I, Comparability of Sample, the control and experimental groups were compared for biographical similarities using frequencies and EAI subscale pretest scores. In Phase II, Descriptive Statistics, descriptive statistics including measures of central tendency (mean, median, mode), and variability (standard deviations, range) were determined for both the control group and experimental group on five variables. The five variables included: total self-concept, external-internal control, actual commitment to the environment, and principled reasoning scores in the human and environmental domains. In Phase III, Tests of Significance, significance tests for hypotheses one and two were run on a computer, and the null hypothesis forms analyzed. In Phase IV, Inspection of the Raw Data, the experimental group's raw scores were analyzed for any unusual changes not evident through statistical analysis. In Phase V, student evaluations, written evaluations completed by the experimental group at the end of the Environmental II program in 1981 were used to clarify the data interpretation made by the researcher. The written information was not statistically verified.

The researcher decided to use the following test of significance on Hypothesis I. The experimental group's pretest and posttest means for all five variables were compared. The significance between the means was determined by using a correlated two-tailed t test. The t

test of significance was selected for analysis of Hypotheses 1a, 1b, 1c, 1d, 1e because it is used by researchers most often to compare the means of two groups in a Nonequivalent Control Group Design. This study used a correlated t test rather than an independent t test because pretest and posttest data was obtained from the same group. A two-tailed t test was used due to its statistical sensitivity to mean score differences in either direction, positive or negative.⁴¹ The correlated t test was used to determine significance between test means on the following hypotheses:

Hypothesis I. Students, after participating in an Adolescent Apprenticeship Process (Environmental II) at Oakmont Regional High School, will show no significant difference between their:

- (a) Pretest and posttest mean scores on total self-concept as measured by the Tennessee Self-Concept Scale
- (b) Pretest and posttest mean scores on locus of control as measured by the Rotter Internal-External Scale
- (c) Pretest and posttest mean scores on actual commitment to the environment as measured by the subscale actual commitment of the Ecological Attitude Inventory
- (d) Pretest and posttest mean scores on principled moral reasoning as measured by the Defining Issues Test
- (e) Pretest and posttest mean scores on principled moral reasoning as measured by the Environmental Issues Test.

Due to the uneven sample sizes of the experimental and control groups, statistical analysis of Hypothesis II required a different form of significance test. A review of statistical and research procedures revealed several significance tools might be useful. According to Huck,

an independent two-tailed t test is appropriate if used when there is an unequal number of scores between the control and experimental groups. Additionally, Huck suggests that due to the lack of randomization of subjects in the control and experimental groups, assumptions associated with the statistical technique, Analysis of Covariance, may be violated. He also states that the Analysis of Covariance is less desirable for a Nonequivalent Control Group Design than for the pretest-posttest control group design.⁴² Therefore, the independent t test, two-tailed, was selected for use in analyzing Hypothesis II.

Another possible statistical tool for significant change involved the combining of the calculation of mean gain scores and the use of independent t tests. According to D. Kenny, it is the most common method of analysis used in a Nonequivalent Control Group Design.⁴³ Therefore, both a significance test using mean gain scores and independent two-tailed t test was utilized to assist in further analysis of Hypothesis II as stated in the null format:

Hypothesis II. Students after participating in the Adolescent Apprenticeship Process (Environmental II) at Oakmont Regional High School will show no significant difference in their:

(a) Total self-concept posttest means when compared to students who did not participate in the Environmental II

(b) Locus of control posttest means when compared to students who did not participate in the Environmental II

(c) Actual commitment to the environment posttest means when compared to students who did not participate in the Environmental II

(d) Principled moral reasoning posttest (DIT) means when compared

to students who did not participate in the Environmental II

(e) Principled moral reasoning posttest (EIT) means when compared to students who did not participate in the Environmental II.

Limitations of the Research

In examining the limitations of this study, it is important to recall its major purpose. The researcher's intent was two fold: to identify specific affective characteristics theorized as necessary for the enhancement of citizen participation in environmental issues, and to identify the effects of the Adolescent Apprenticeship process on Oakmont Environmental II students. The researcher, on the basis of the study's findings, will make recommendations concerning the future modification of the Adolescent Apprenticeship process at Oakmont. Therefore, this study serves principally to provide the researcher with base data concerning the theories presented, the test instruments, and the general effects of the process on participating students at Oakmont Regional. It possesses the characteristics of a pilot study and seeks to provide secondary environmental educators with practical information regarding an alternative, action-oriented technique designed for traditional high school systems.

Several of the limitations in this study are beyond the researcher's control due to its field-testing character, financial constraints, temporal characteristics and the involvement of local community environmental groups. The study involved, primarily, white, middle-class persons, ages seventeen to eighteen years from a rural community geographical setting. The sample lacked randomization within the control

and experimental groups which limited the statistical significance obtainable in the study. The size of the experimental group was especially sensitive to the responses of a single subject that could easily pull the test means to the extremes. However, the practical significance of this study for secondary environmental education outweighs any experimental limitations.

FOOTNOTES

¹Walter R. Borg and Meredith Damien Gall, Educational Research An Introduction (New York: Longman, Inc., 1979), p. 557.

²Ibid., p. 559.

³David A. Kenny, "A Quasi-Experimental Approach to Assessing Treatment Effects in the Nonequivalent Control Group Design," Psychological Bulletin 82 (1975): 346.

⁴Donald T. Campbell and Julian C. Stanley, Experimental and Quasi-Experimental Designs for Research (Chicago: Rand McNally College Publishing Company, 1963), p. 47.

⁵Borg, Educational, p. 427.

⁶Massachusetts, Monograph of Ashburnham and Westminster (Boston, Mass.: Massachusetts Department of Commerce and Development, 1978).

⁷William H. Fitts, Tennessee Self-Concept Scale Manual (Nashville, Tennessee: Counselor Recordings and Tests, 1965), p. 1.

⁸Ibid., p. 13.

⁹Ibid., p. 15.

¹⁰Ibid., p. 17.

¹¹Ibid., pp. 2-3.

¹²Ibid.

¹³Richard M. Ryckman, Theories of Personality (New York: D. Van Nostrand Company, 1978), p. 276.

¹⁴Julian B. Rotter, "Generalized Expectancies for Internal Versus External Control of Reinforcement," Psychological Monographs: General and Applied 609 (1966): 10.

¹⁵Ibid., p. 17.

- ¹⁶Robert N. Dorsett, "Experiential Education as a Locus of Control Change Technique," (Ed.D dissertation, The University of San Francisco, 1979), p. 61.
- ¹⁷Rotter, "Generalized," p. 10.
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- ²⁸Ibid., pp. 5.1-5.2.
- ²⁹Ibid., p. 6.1.
- ³⁰Ibid., p. 6.2.
- ³¹Ibid., p. 2.1.
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³³Ibid., p. 44.

³⁴Ibid., pp. 80-82.

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³⁶Ibid., p. 46.

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⁴⁰Iozzi, "Moral Judgment," p. 52.

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C H A P T E R V
PRESENTATION AND ANALYSIS OF THE DATA

Review of the Problem

The purpose of this study was to determine the effects of an Adolescent Apprenticeship process on the development of selected affective characteristics in participating students. An experimental group made up of ten students and a control group made up of twenty-nine students were pretested and posttested for five variables.

All data were obtained by different instruments and analyzed using a five-phase format. Phase I, Comparability of the Samples, explores the biographical and pretest similarities of the experimental and control groups. Phase II, Descriptive Statistics, provides information about both groups regarding the experimental variables. Areas of focus within this phase include measures of central tendency (mean, median, mode), and measures of variability (range, variance, standard deviation). Phase III, Tests of Significance, addresses the null hypothesis I and II, as stated in Chapter IV. Phase IV, Comparison of Raw Data, examines the gain scores of each variable for both the experimental and control groups. It also presents information concerning the development of individual experimental member's principled moral reasoning stages in human and environmental issues. Phase V, Student Evaluation, presents written comments by students regarding their development in the Environmental II program. A summary of the variables tested, instruments used to obtain the data, and analysis procedures are presented in Table 5. All data was coded, placed on computer cards, and compiled by the

TABLE 5
 A Summary of the Data Collection, Instrumentation and Analysis Procedures
 Used in the Adolescent Apprenticeship Field Study 1980-1981

Variables	Type of Data Analysis			
	Testing Instruments	Phase II Descriptive Statistics	Phase III Tests of Significance	Phase IV Comparison of Raw Data
Total Self-Concept	Tennessee Self Concept Scale (TSCS)		Hypotheses Ia, IIa Correlated <u>t</u> Test Independent <u>t</u> Test	
Locus of Control	Rotter Internal-External Scale (I-E Scale)		Hypotheses Ib, IIb Correlated <u>t</u> Test Independent <u>t</u> Test	Individual Stage Profiles Mean Gain Scores Independent <u>t</u> Test (Two-tailed)
Actual Commitment to Environment	Ecological Attitude Inventory (Subscale AC) (EAI - AC)	Central Tendency and Variability	Hypotheses Ic, IIc Correlated <u>t</u> Test Independent <u>t</u> Test	
Principled Morality (DIT) Human Issues	Defining Issues Test (DIT)		Hypotheses Id, II d Correlated <u>t</u> Test Independent <u>t</u> Test	
Principled Morality (EIT) Environmental Issues	Environmental Issues Test (EIT)		Hypotheses Ie, IIe Correlated <u>t</u> Test Independent <u>t</u> Test	

University of Massachusetts computer using the program entitled, Statistical Package for the Social Sciences (1971).

Phase I - Comparability of Samples

The experimental group was made up of all seniors, former Environmental I students, who elected to take Environmental II. All remaining former Environmental I students, who did not take Environmental II, comprised the control group. The researcher was unaware of which Environmental I students would eventually take the Environmental II program.

Biographical similarities. Table 6 presents descriptive biographical information regarding the age, sex, residence, family size, parental status, parents' political role in the community, and parents' educational background of both groups. It also provides information about students' plans after high school, involvement in extra curricular activities, and subjects taken while at Oakmont Regional.

In examining Table 6, 100 percent of the experimental group (N=10) were seventeen years or older, and 93.1 percent of the control group (N=29) were seventeen years or older. In the experimental group, 30 percent were male, and 70 percent were female. Similar counts existed in the control group where 37.9 percent were male and 62.1 percent were female. Residence in area communities was similar in both groups with 40 percent of the experimental group from Ashburnham and 60 percent from Westminster. The control group had 44.8 percent of its members from Ashburnham and 55.2 percent from Westminster.

Family size showed that 70 percent of the experimental group had

TABLE 6

A Summary of the Biographical Similarity of the
Experimental and Control Groups - Fall 1980

Variable	Experimental Group N=10 % Frequency		Control Group N=29 % Frequency	
	Age	Under 17	0	6.9
	17 or over	100	93.1	
Sex	Male	30	37.9	
	Female	70	62.1	
Residence	Ashburnham	40	44.8	
	Westminster	60	55.2	
Family Size (Number of Siblings)	2 or less	70	55.2	
	More than 2	30	44.8	
Parental Status	Married	80	72.4	
	Other ^a	20	27.5	
Parents are in Politics		20	20.7	
Parents Attend Town Meetings		90	79.2	
Father's Education	Elementary	0	10.3	
	High School	40	17.2	
	College	60	72.4	
Mother's Education	Elementary	0	6.9	
	High School	30	41.4	
	College	70	51.7	
Job after School		90	69	
Driver's License		90	93.1	
Plans after High School	Continue Schooling	100	89.7	
	Other ^b	0	10.2	
Member National Honor Society		20	20.7	
Involved Extra Curricula Activities		80	86.2	
Biology	Miss Griffin	40	55.2	
	Other	60	44.7	
Chemistry		90	86.2	
Biochemistry		30	27.6	
Physics		40	44.8	
Environmental I		100	100	

a = Divorced, separated, one or both parents dead

b = Military, work, marriage, etc.

two or less brothers and/or sisters, and 30 percent with more than two. In the control group, 55.2 percent came from families with two or less siblings, and 44.8 percent with more than two siblings. Regarding parental status, 80 percent of the experimental group had married parents, and 20 percent had either divorced parents, foster parents, or the death of one or both parents. In the control group, 72.4 percent of the students had married parents, and 27.5 percent had another type of parental status.

In the experimental group, 20 percent of the parents were involved in town politics, and 90 percent of the parents attended town meetings. In the control group, 20.7 percent of the parents were involved in town politics, and 79.2 percent of the parents attended town meetings. In the experimental group, 40 percent of the students' fathers terminated their education at the high school level, and 60 percent graduated from college. In the control group, 10.3 percent of its students' fathers terminated their education at the elementary school level, 17.2 percent at the high school level, and 72.4 percent graduated from college. The students in the experimental group had 30 percent of their mothers terminate their education after high school, and 70 percent completed college. In the control group, 6.9 percent of the mothers completed elementary school, 41.4 percent completed high school, and 51.7 percent completed college.

Students were similar in both groups for several factors. In the experimental group, 90 percent of the students had driver's licenses, and 93.1 percent of the control group had licenses. Data indicated that 100 percent of the students in the experimental group expressed

plans to continue their education after high school, while only 10.2 percent of the control group indicated they had other plans. Of all the students tested, 20 percent of the experimental group and 20.7 percent of the control group belonged to the National Honor Society. Regarding extra activities, 80 percent of the experimental group and 86.2 percent of the control group were involved. Of the courses taken while at Oakmont Regional, 90 percent of the experimental group had taken chemistry, 40 percent had taken physics, 100 percent had Environmental I, and 30 percent were taking biochemistry. In the control group, the numbers were similar: 86.2 percent had taken chemistry, 44.8 percent had taken physics, 100 percent had Environmental I, and 27.6 percent were taking biochemistry.

In concluding a biographical comparison between the groups, it is valid to state they were biographically similar on the variables analyzed with major differences observed only in family size, father's educational level, mother's educational level, student jobs after school, and Miss Griffin for biology.

Ecological Attitude Inventory (EAI). It was assumed by the researcher that because both groups as juniors had Environmental I with the same teacher, they should be similar on their verbal commitment (VC), actual commitment (AC), affect (A), and ecological knowledge (K). To verify this assumption, both groups were pretested using the four subscales of the Ecological Attitude Inventory (EAI). Table 7 presents the pretest means on the four subscales for both groups.

According to Table 7, the experimental group's mean for verbal

TABLE 7

A Summary of the Significance Between the Subscale Pretest Scores on the Ecological Attitude Inventory for the Experimental and Control Groups

EAI Subscale	Group	N	Pretest Mean	S.D.	Variance	S.E.	df	t Value ^a	Significant
Verbal Commitment (VC)	Experimental	10	7.8	1.31	1.71	.416	37	1.78	None
	Control	29	6.6	1.93	3.72	.359			
Actual Commitment (AC)	Experimental	10	3.9	1.66	2.75	.526	37	.66	None
	Control	29	3.4	2.27	5.15	.422			
Affect (A)	Experimental	10	7.4	2.12	4.49	.670	37	-.25	None
	Control	29	7.5	1.95	3.80	.363			
Knowledge (K)	Experimental	10	7.1	2.76	7.61	.875	37	.98	None
	Control	29	6.2	2.38	5.66	.442			

^aSignificant if t is the same as or greater than 2.021 (.05 level)

commitment was 7.8 out of a possible score of 10.0 with a standard deviation of 1.31. The control group for the same variable had a mean score of 6.6 with a standard deviation of 1.93. On actual commitment, the experimental group obtained a pretest mean score of 3.9 out of 10.0 with a standard deviation of 1.66. The control group for the AC variable had a pretest mean score of 3.4 and a standard deviation of 2.27.

In Affect, the experimental group had a pretest mean of 7.4 out of 10.0 with a standard deviation of 2.12. The control group had a pretest mean of 7.5 with a standard deviation of 1.95. On the final subscale, knowledge (K), the experimental group had a pretest mean of 7.1 out of 15.0 and a standard deviation of 2.76. The control group had a pretest mean of 6.2 with a standard deviation of 2.38.

In order to conclude that the experimental and control groups were similar on those variables in the EAI, an Independent Samples (two-tailed) t test was run for determination of any significant difference between the groups' pretest means. Table 7 provides a summary of the significance data for this variable. All t tests indicated that there were no significant differences between the pretest means for the groups' four subscale variables.

Pretest experimental dependent variables. It is assumed that there was no significant difference between the experimental and control groups' pretest mean scores. To verify this assumption, an Independent Samples t test (two-tailed) was run on the pretest mean scores for the five variables of each group. In examining Table 8, all t values are below the critical t value of 2.021. Therefore, a conclusion that no significant difference exists between the pretest means of the experimental

TABLE 8

A Summary of Significance Between the Five Dependent Variables' Pretest Scores for the Experimental and Control Groups

Variables	Group	N	Pretest Mean	S.D.	Variance	S.E.	df	t value ^a	Significant
Self Concept	Experimental	10	341.60	33.12	1096.93	10.47	37	1.80	No
	Control	29	322.10	28.36	804.28	5.26			
Locus of Control	Experimental	10	10.30	3.43	11.76	1.08	37	.84	No
	Control	29	9.13	3.86	14.89	.71			
Actual Commitment to Environment	Experimental	10	3.90	1.66	2.75	.52	37	.66	No
	Control	29	3.37	2.27	5.15	.42			
Principled Morality (DIT)	Experimental	10	17.60	8.74	76.38	2.76	33	.40	No
	Control	25	16.52	6.67	44.48	1.33			
Principled Morality (EIT)	Experimental	10	12.80	5.32	28.30	1.68	34	1.79	No
	Control	26	9.88	3.99	15.92	.783			

^aSignificant if t is the same or greater than 2.021 (0.5 level) (df 30 - 40)

and control groups is valid.

Summary. In examining the biographical data, the subscale pretest means of the Ecological Attitude Inventory, and the pretest means of the dependent experimental variables, it is valid to conclude that no significant difference existed between the experimental and control groups prior to the beginning of this study.

Phase II - Descriptive Statistics

The size of the experimental and control groups limits the effectiveness of significance tests in determining a change in participating students. Descriptive statistics provide an additional means of analyzing the data and determining change.

Central tendency. Measures of central tendency provide information regarding the average scores of a distribution. The mode is the most frequently occurring score and the median is the score which lies at the midpoint of the distribution. The mean is the sum of all the scores divided by the total number of scores. If the mean is above the median, the scores are positively skewed, and if the mean is below the median, the scores are negatively skewed. Skewedness indicates a few high or low scores may have altered the mean. Figure 23 represents skewed distributions. A normal distribution occurs when the mean, median, and mode are all equal. Figure 24 represents a normal distribution.

Self-concept. In examining Table 9, the experimental group had a pretest mean of 341.6, a mode of 354.0, and a median of 353.5. The distribution was negatively skewed, suggesting several low scores decreased

Figure 23

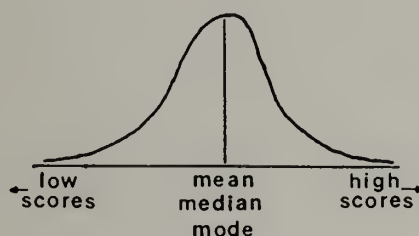
Measures of Central Tendency (Skewed Distribution)



SOURCE: Schuyler W. Huck, William H. Cormier and William G. Bounds, Jr., Reading Statistics and Research, (New York: Harper & Row Publishers, 1974), p. 25, Figure 2.2.

Figure 24

Measures of Central Tendency (Normal Distribution)



SOURCE: Schuyler W. Huck, William H. Cormier, and William G. Bounds, Jr., Reading Statistics and Research, (New York: Harper & Row Publishers, 1974), p. 24, Figure 2.1.

TABLE 9
A Summary of the Pretest and Posttest Central Tendency for Five Variables

Variable	Group	N	Mean		Median		Mode	
			Pre	Post	Pre	Post	Pre	Post
Self Concept (Total P Score)	Experimental	10	341.6	348	353.3	353.3	354	377
	Control	29	322.1	334.7	326	338	311	356
Locus of ^a Control	Experimental	10	10.3	11.0	9.0	9.5	8.0	7.0
	Control	29	9.1	10.0	9.0	8.4	9.0	8
Actual ^b Commitment to Environment (EAI - AC Subscale)	Experimental	10	3.9	5	4	4	3	4
	Control	29	3.4	4.0	2.9	3.9	2.0	4
DIT (P score)	Experimental	10	17.6	20.9	12.5	19.8	12.0	20
	Control	25	16.2	19.1	14.8	20	14	12
EIT (P score)	Experimental	10	12.8	12	11.5	12.5	5	10
	Control	26	9.8	10.9	9.0	10.14	8	10

^aLower scores on I-E Scale indicate an internal locus of control.
The scale ranges from 0 to 23.

^bThe highest possible score is 10.

the mean. The control group had a pretest mean of 322.1, a mode of 311.0, and a median of 326.0. The control group was negatively skewed. The experimental group had a pretest mean score 19.5 points higher than the control group.

On the posttest, the experimental group had a mean of 348.0, a mode of 377.0, and a median of 353.5. The distribution was still negatively skewed on the experimental group. The control group obtained a mean of 334.7, a mode of 356.0, and a median of 338.0. The distribution for the control group was negatively skewed. The control group was 13.3 points less than the experimental group's posttest mean.

In comparison between the pretests and posttests, the experimental group had an increase in mean and mode scores, however, the median remained the same. On both the pretests and posttests, the most frequently appearing score was above the mean suggesting a few low scores decreased the mean. In the control group, there was an increase in the mean, mode, and median scores. The control group moved from a positively to a negatively skewed distribution. The most frequent pretest score for the control group was below the mean, whereas on the posttest it was above the mean.

In conclusion, the experimental group remained higher than the control group on the pretest and posttest means, medians, and modes. However, both groups did show an increase in their posttest means and modes.

Locus of control. Table 9 shows the experimental group had a pretest mean of 10.3, a mode of 8.0, and a median of 9.0. The distribution was positively skewed. The control group had a mean of 9.1, a mode of 9.0, and a median of 9.0. The distribution was near normal. The

experimental group had a pretest mean 1.2 points higher than the control group, a median equal to the control group, and a mode 1.0 point less than the control group.

On the posttest, the experimental group had a mean of 11.0, a mode of 7.0, and a median of 9.5. The control group had a mean of 10.0, a mode of 8.0, and a median of 8.4. The distributions of both groups were positively skewed. The experimental group had a posttest mean 1.0 point higher than the control group.

In comparing the pretest and posttest scores, the experimental group increased its mean score, lowered its mode, and raised its median. On both the pretests and posttests, the most frequent score was below the mean. There was no change in distribution. The control group's mean score increased on the posttest, decreased in mode and median scores. The control group's most frequent score on the posttest dropped slightly and the distribution became positively skewed when compared to the near normal curve of the pretest.

In conclusion, the experimental group had higher posttest mean and median scores than the control group. The control group had a higher posttest mode score.

Actual commitment to environment. Table 9 presents the experimental group with a pretest mean of 3.9, a mode of 3.0 and a median of 4.0. The distribution is not extensively skewed. The control group had a pretest mean of 3.4, a mode of 2.0, and a median of 2.9. The distribution was positively skewed. The experimental group had a pretest mean 0.5 points higher than the control group.

On the posttests, the experimental group had a mean of 5.0, a mode

of 4.0, and a median of 4.0. The distribution was positively skewed, only slightly, and resembled a normal curve. The control group had a posttest mean of 4.0, a mode of 4.0, and a median of 3.9. The distribution was nearly normal. The experimental group had a posttest mean 1.0 point higher than the control group.

The pretest and posttest mean scores of the experimental group showed an increase, while the mode on the posttest increased, and the median remained the same. The distributions in both the pretests and posttests showed a slight positive skewedness. In the control group, there was a slight increase in mean score on the posttest and an increase in mode and median. The distribution went from positive skewness to a normal curve.

In conclusion, the experimental group's pretest and posttest mean, mode, and median were higher than the control group's. The distributions of the experimental group had a few high scores, whereas the posttest of the control group had scores clustered near the median.

Defining Issues Test (DIT) - principled morality. Table 9 shows that the experimental group had a pretest mean of 17.6, a mode of 12.0, and a median of 12.5. The distribution was skewed positively. The control group had a pretest mean of 16.2, a mode of 14.0, and a median of 14.8. The distribution was skewed slightly in a positive direction. The experimental group had a pretest mean 1.4 points higher than the control group.

Examining the posttests showed that the experimental group had a mean of 20.9, a mode of 20.0, and a median of 19.8. The distribution was nearly normal. The control group had a posttest mean of 19.1, a

mode of 12.0, and a median of 20.0. The distribution was skewed negatively. The experimental group had a posttest mean 1.8 points higher than the control group.

Comparison of the pretest and posttest scores for the experimental group showed the mean, mode, and median increased. In both pretests and posttests, the most frequent score was below the mean. The control group showed an increase in mean and median scores with a decrease in the mode. The distribution became more positively skewed on the posttest.

In conclusion, the pretest and posttest means of the experimental group and control group were nearly equal. The pretest and posttest median scores of the experimental group were lower than the control group. However, the experimental group had a higher posttest mode than the control group. The experimental group's distribution became more normal on the posttest, whereas the control group remained positively skewed.

Environmental Issues Test (EIT) - principled morality. Table 9 illustrates that the experimental group had a pretest mean of 12.8, a mode of 5.0, and a median of 11.5. The distribution was positively skewed. The control group had a pretest mean of 9.8, a mode of 8.0, and a median of 9.0. Although the distribution was slightly skewed to the right, it was nearly normal. The experimental group had a pretest mean 3.0 points higher than the control group.

The posttests revealed that the experimental group had a mean of 12.0, a mode of 10.0, and a median of 12.5. Although the distribution was skewed slightly to the left, it was nearer a normal curve

distribution. The control group distribution, being nearly normal, reflected a posttest mean of 10.9, a mode of 10.0, and a median of 10.4. The experimental group's posttest mean was 1.1 point higher than the control group's.

In comparing the experimental group's pretest and posttest scores, it was found that the mean dropped only slightly, and the median and mode increased. The posttest distribution changed from extreme positive skewness to nearly that of a normal curve. The control group increased on its posttest mean, mode and median scores. The distribution on the pretest was only slightly positive, whereas on the posttest it was nearly normal. In both groups, the most frequent score was below the mean on the pretests and posttests.

In conclusion, the experimental group had a higher pretest and posttest mean than the control group. Both groups increased their posttest mode and median, and obtained the same mode scores. The experimental and control groups moved from a positive skewed distribution towards a near normal distribution.

Variability. Variability is the measure of the degree of difference between scores. Similar scores reflect little variability and dispersion, and dissimilar scores reflect a high degree of variability. Variability may be measured using a range, variance, or standard deviation. Range may be stated as the highest and lowest scores or as one number, the difference between the extreme scores. The standard deviation tells how much the scores in a distribution deviate from the mean. Variance is the square of the standard deviation.

Self-concept. Table 10 shows that the experimental group had a

TABLE 10
A Summary of the Pretest and Posttest Variability for Five Variables

Variable	Group	N	Range		Variance		Standard Deviation		Mean	
			Pre	Post	Pre	Post	Pre	Post	Pre	Post
Self-Concept	Experimental	10	290-386 96	284-377 93	1097.2	820.2	33.1	28.6	341.6	348
	Control	29	265-379 114	270-380 110	804.3	773.1	28.4	27.8	322.1	334.7
Locus of Control ^a	Experimental	10	5-15 10	1-20 19	11.8	33.8	3.43	5.81	10.3	11.0
	Control	29	2-19 17	1-23 22	14.9	30.3	3.86	5.50	9.13	10.0
Actual Commitment to Environment ^b	Experimental	10	1-6 5	3-7 4	2.76	2.66	1.66	1.63	3.9	5
	Control	29	0-7 7	0-9 9	5.17	4.21	2.27	2.05	3.37	4.0
Defining Issues Test Principled Morality- Human Issues	Experimental	10	6-35 29	12-37 25	76.48	50.5	8.74	7.11	17.6	20.9
	Control	24	6-32 26	8-28 20	43.9	40.6	6.63	6.37	16.2	19.1
Environmental Issues Test Principled Morality- Environmental Issues	Experimental	10	5-20 15	4-22 18	28.4	25.55	5.33	5.05	12.8	12
	Control	26	3-18 15	4-25 21	16.6	20.96	4.06	4.57	9.84	10.96

^aLower scores equal internal, higher scores equal external. The I-E Scale scores range from 1 to 23.

^bHighest possible score = 10 on the Ecological Attitude Inventory (AC) actual commitment to environment.

pretest range of 290-386 or 96.0, a variance of 1097.2, and a standard deviation of 33.1. The control group had a pretest range of 265-379 or 114.0, a variance of 804.3, and a standard deviation of 28.4. The difference in variance between the experimental and control groups, 292.2 points, indicates that there were several students with extreme scores within the experimental group.

On the posttests, the experimental group had a range of 284-377 or 93.0, a variance of 820.2, and a standard deviation of 28.6. The control group had a range of 270-380 or 110.0, a variance of 773.1, and a standard deviation of 27.8. The scores showed a greater spread in the control group suggesting more extreme scores. The difference in variance between the experimental and control group was 47.1 points. Although the control group had a smaller deviation than the experimental group, there was not much difference in variance between the groups.

A comparison of the experimental group's pretest and posttest range suggests that they had less extreme scores on the posttest than the control group. In both groups the posttest scores clustered around the mean. Yet, there were individuals who attained extremely low and high scores in relation to the mean. The experimental group showed a 277.0 point drop in posttest variance from the pretest, whereas the control group showed a change of only 31.2 points. The standard deviation of the experimental group from pretest to posttest decreased 4.5 points, while the control group decreased 0.6 points.

In conclusion, the experimental group showed the greatest change in variability. Although the control group had the greatest mean score change, the experimental group had the higher mean and more of its

individual scores changed towards the mean.

Locus of control. Table 10 presents the following data. The experimental group's pretest had a range of 5-15 or 10.0, a variance of 11.8, and a standard deviation of 3.43. The control group had a range of 2-19 or 17.0, a variance of 14.9, and a standard deviation of 3.86. The control group had greater variability in its scores, and neither group clustered tightly around the mean.

The posttest data indicated that the experimental group had a range of 1-20 or 19.0, a variance of 33.8, and a standard deviation of 5.81. The control group had a range of 1-23 or 22.0, a variance of 30.3, and a standard deviation of 5.50. The control group seemed to have a greater spread in scores. The differences between the experimental and control groups' scores seemed inconsequential.

In conclusion, the variability of the experimental group almost doubled from the pretest to posttest, an increase of 22.0 points. The control group's variability only increased by 15.4 points. Reviewing standard deviation changes, the experimental group increased 2.28 points and the control group increased 1.64 points. Although the control group's scores increased in variability, the overall change in range was not as great as that observed in the experimental group.

Actual commitment to environment. Table 10 shows the experimental group had a pretest range of 1-6 or 5.0, a variance of 2.76, and a standard deviation of 1.66. The control group had a pretest range of 0-7 or 7.0, a variance of 5.17, and a standard deviation of 2.27. Greater variability was present in the pretest scores of the control group. Recalling that enrollment in the Environmental II program was

based on several factors including student volunteerism, it is not surprising to find a greater spread of scores within the control group and a standard deviation almost twice as great as the experimental group's.

Posttest data reveal the experimental group had a range of 3-7 or 4.0, a variance of 2.66, and a standard deviation of 1.63. The control group had a posttest range of 0-9 or 9.0, a variance of 4.21, and a standard deviation of 2.05. The experimental group had less posttest variance than the control group. Also, the experimental scores were more tightly clustered around the mean.

In conclusion, the experimental group's posttest mean scores clustered nearer the mean. Also, there was less variance and the range became tighter. The control group increased in range from the pretest to the posttest.

Defining Issues Test (DIT) - principled morality. Table 10 reveals that the pretest for the experimental group had a range of 6-35 or 29.0, a variance of 76.48 and a standard deviation of 8.74. The control group had a range of 6-32 or 26.0, a variance of 43.9 and a standard deviation of 6.63. Although the pretest range of the experimental and control groups were similar, the variability indicates that a majority of control group scores were more clustered around the mean than those in the experimental group. The standard deviation supports the control group's mean clustering.

The posttest data indicates that the experimental group had a range of 12-37 or 25.0, a variance of 50.5 and a standard deviation of 7.11. The control group had a range of 8-28 or 20.0, a variance of 40.6 and a standard deviation of 6.37. The control group's scores were clustered

closer to the mean. There were more extreme high scores in the experimental group and more low scores in the control group.

In conclusion, the experimental group maintained a similar upper range score on both pretests and posttests. However, the lower range scores improved noticeably on the posttests. The control group showed a decrease in extreme upper range scores. Data suggest there was a greater change in variability in the experimental group, a 25.98 point drop in variance and a 1.63 point decrease in standard deviation. The control group experienced only a 3.3 point decrease in variance on the posttest and a 0.26 point decrease in standard deviation.

Environmental Issues Test (EIT) - principled morality. Table 10 shows that the experimental group pretest scores had a range of 5-20 or 15.0, a variance of 28.4, and a standard deviation of 5.33. The control group had a pretest range of 3-18 or 15.0, a variance of 16.6 and a standard deviation of 4.06. The pretest data indicate that the experimental group had a greater spread of upper extreme scores, and the control group had a greater spread in lower extreme scores. The standard deviation of the experimental group being 1.27 points higher than the control group reveals the control group's scores were clustered nearer the mean than the experimental group's.

The posttest of the experimental group shows a range of 4-22 or 18.0, a variance of 25.55, and a standard deviation of 5.05. The control group had a range of 4-25 or 21.0, a variance of 20.96, and a standard deviation of 4.57. Although the range spread was greater in the control group, its variance was 4.59 points less than the experimental group, and the control group's standard deviation was less.

In conclusion, the experimental group increased in both upper and lower extreme scores. The control group increased mostly in upper extreme scores. The variance of the experimental group decreased 2.85 points, whereas the control group's variance increased 4.36 points. The standard deviation of the experimental group decreased 0.28 points, and the control group increased 0.51 points. Although there was a slight decrease in the experimental group's mean, 0.8 points, the decrease in variability suggests the overall scores were more stable than those found in the control group.

Summary. Although there seems to be no dramatic changes in the experimental group's pretest and posttest means when compared to the control group, some subtle information did emerge in Phase I. On all five variables, the experimental group had a higher pretest and posttest mean score than the control group. The major difference between the groups seemed to be in their general direction of distribution skewness. There were greater or lesser degrees of variability depending on the variable and the group.

On self-concept, the experimental group remained negatively skewed on both the pretest and posttest. The control group moved from a positive to negative distribution. Variability information showed that the experimental group had greater variance on the pretest and posttest self-concept than did the control group. However, there was a greater decrease in the amount of variability between scores in the experimental group than in the control group.

On Rotter's scale, the experimental group had the higher locus of

control score by one point and was technically more externally-oriented than the control group. However, a mean score of 11.0 based on a scale of one to twenty-three favors internality rather than externality.

The experimental group seems to have been more committed to environmental causes than the control group, both prior to and after participating in the Adolescent Apprenticeship process. The experimental group's posttest scores became positively skewed, whereas the control group's shifted to a normal distribution. The variability of scores for actual commitment remained almost the same in the experimental group's posttest.

Scores for principled morality (DIT) revealed the experimental group had higher pretest and posttest means than the control group, although both groups increased on the posttest. The experimental group's distribution became more normal and the control group became more positively skewed. Regarding variability, the experimental group was more variable than the control group on both the pretests and the posttests. However, the experimental group showed a greater decrease in variability between the pretests and the posttests due primarily to a decrease in lower range scores. This change was not evident in the control group.

The pretests and posttests of the principled morality (EIT) revealed that the experimental group had higher pretest and posttest mean scores than the control group. Both groups in posttesting moved towards a normal curve distribution. Variance revealed that there was more diversity in the experimental group's pretest and posttest scores than in the control group.

Although the overall influence of the Apprenticeship process on the

experimental group is not definite, data when compared to the control group support the statement that the process may have had some effect on individual scores and general attitudes of participating members. The program may have reinforced many of the participating students' environmental commitment and environmental morality. The effect on locus of control seemed slight, as did the effect on self-concept. However, overall variability seemed to be reduced in the experimental group. Whether these changes are significant will be the focus of the next section.

Phase III - Tests of Significance

Introduction. Significance is a statistical term used to retain or reject the null hypothesis. This study uses a significance level of .05. The null hypothesis is rejected when the calculated t value determined by comparing the means is equal or above the critical t value for a specific significance level. If the calculated t value is below the critical t value, the null hypothesis is retained. When the results are determined significant, changes in the means are most likely not due to chance, but rather to the independent variable or, in this study, participation in the Adolescent Apprenticeship process.

Researchers may use several specific significance tests. Each test is designed for a particular situation and carries with it a degree of accuracy and power. Where comparison of mean scores is desired in quasi-experimental Nonequivalent Control Group Designs, most references recommend the use of t tests. This study used two forms of the t test. The Independent Samples t test was used to compare two groups' scores

(experimental and control) having no logical relationship to each other. The Correlated Samples t test was used to compare the pretest and post-test means of either the experimental or control groups.

In addition, the significance tests used in this study incorporated a two-tailed test. Such a test is sensitive to any significant differences that may occur in either a positive or a negative direction. This enables the researcher to focus on the question--Do students participating in the Adolescent Apprenticeship process at Oakmont Regional High School score significantly higher or lower on a particular dependent variable?

Additionally, because of the sample's size and selection procedure, the reader must realize results should only be generalized to seniors at Oakmont Regional High School who have completed one year in the Environmental II program.

Hypothesis I. The Correlated Samples t test (two-tailed) was used to determine significance in the following null hypotheses.

Hypothesis Ia - self-concept. Students, after participating in an Adolescent Apprenticeship process (Environmental II) at Oakmont Regional High School, will show no significant difference between their pretest and posttest mean scores for total self-concept as measured by the Tennessee Self-Concept Scale.

Table 11 shows that the calculated t value for self-concept, -0.90, was below the necessary critical value of 2.262 or greater. A comparison of the experimental group's test means failed to show a significant change at the .05 level.

TABLE 11

A Summary of the Correlated *t* Test for Significant Change on Five Variables
(Experimental Group)

Variable	Score Mean	S.D.	S.E.	Difference Mean	df	<i>t</i> value ^a	P
Self Concept Score	pre	341.60	33.123	10.475			
	post	348.00	28.640	9.057	-6.4	9	-.90
Locus of Control	pre	10.30	3.433	1.086			
	post	11.00	5.812	1.838	-.70	9	-.37
Actual Commitment	pre	3.90	1.663	.526			
	post	5.0	1.633	.516	-1.10	9	-1.49
DIT PM Score	pre	17.60	8.74	2.766			
	post	20.90	7.10	2.248	-3.3	9	-2.72
EIT PM Score	pre	12.80	5.329	1.685			
	post	12.0	5.055	1.599	.80	9	.43

^a*t* must be 2.262 or greater for significance at the .05 level.

Hypothesis Ib - locus of control. Students, after participating in an Adolescent Apprenticeship process (Environmental II) at Oakmont Regional High School, will show no significant difference between their pretest and posttest mean scores for locus of control as measured by the Rotter Internal-External Scale.

Table 11 reveals that the calculated t value for locus of control, -0.37, was below the necessary critical value. A comparison of the experimental group's test means failed to show a significant change at the .05 level.

Hypothesis Ic - actual commitment to environment. Students, after participating in an Adolescent Apprenticeship process (Environmental II) at Oakmont Regional High School, will show no significant difference between their pretest and posttest mean scores for actual commitment to environment as measured by the subscale 'actual commitment' in the Ecological Attitude Inventory.

In Table 11, the experimental group's calculated t value for actual commitment, -1.49, was below the necessary critical value. A comparison of the pretest and posttest means failed to show a significant change at the pre-established .05 level. However, the increase in actual commitment score was significant at the .20 level.

Hypothesis Id - principled morality (DIT) - human issues. Students, after participating in an Adolescent Apprenticeship process (Environmental II) at Oakmont Regional High School, will show no significant difference between their pretest and posttest mean scores on principled moral reasoning as measured by the Defining Issues Test.

Table 11 shows that the calculated t value for principled morality

(DIT), -2.72, was above the necessary critical value. A comparison of the experimental group's test means showed a significant change did occur at the .05 level.

Hypothesis Ie - principled morality (EIT) - environmental issues.

Students, after participating in an Adolescent Apprenticeship process (Environmental II) at Oakmont Regional High School, will show no significant difference between their pretest and posttest mean scores on principled moral reasoning as measured by the Environmental Issues Test.

Table 11 shows that the calculated t value for principled morality (EIT), 0.43, was below the necessary critical value. A comparison of the test means failed to show a significant change at the pre-established .05 level.

Control group versus the experimental group. Table 12 shows that the control group experienced a significant change on the variables of self-concept and principled morality (DIT). Both variables' calculated t values were above the necessary critical t value at the .05 level. Although the experimental group's data change for DIT principled morality was significant, there is reason to believe, from examining the control group's significance on principled morality, that the Adolescent Apprenticeship process may not have been the only factor that could have influenced the experimental group's change.

Regarding the other dependent experimental variables, locus of control, actual commitment, and principled morality (EIT) environmental issues, the control group failed to show any significant change in the pretest and posttest means.

TABLE 12
 A Summary of the Correlated t Test for Significant Change
 on Five Variables (Control Group)

Variable	N	\bar{X}	S.D.	S.E.	Difference Mean	t Value ^a	Degrees of Freedom	P
Self Concept Total P Score	pre	322.10	28.36	5.26	-12.5862	-2.75	28	yes sign.
	post	334.69	27.80	5.163				
Locus of Control	pre	9.13	3.86	.717	-.8966	-1.16	28	NS
	post	10.03	5.50	1.023				
Actual Commitment EAI (AC)	pre	3.37	2.27	.422	-.6207	-1.42	28	NS
	post	4.00	2.05	.381				
Defining Issues Test PM	pre	16.20	6.63	1.35	-2.95	-2.22	23	yes sign.
	post	19.14	6.37	1.204				
Environ- mental Issues Test PM	pre	9.84	4.06	.814	-1.57	-1.48	25	NS
	post	10.96	4.57	.85				

^adf = 28 significant if equal to or greater than 2.048; df = 23 (2.069); df = 25 (2.060) .05 level

Hypothesis II. If the variability between the experimental and control groups described in Phase II was significant, a specific type of t test would need to be used in analyzing Hypothesis II. A test for the assumption of homogeneity of variance between the experimental and control groups on the five variables was completed. Table 13 shows that none of the F tests for each of the pretest and posttest variables were significant. Therefore, according to suggested research procedures, an Independent Samples t test (two-tailed) at a significance level of .05 was used to examine Hypotheses II.

Hypothesis IIa - self-concept. Students, after participating in an Adolescent Apprenticeship process (Environmental II) at Oakmont Regional High School, will show no significant difference in their total self-concept posttest mean scores when compared to students who did not participate in the Environmental II.

Table 14 shows that the calculated t value for self-concept, 1.30, was below the necessary critical t value of 2.027 or greater. A comparison of the posttest means of the experimental and control groups failed to show a significant difference at the .05 level.

Hypothesis IIb - locus of control. Students, after participating in an Adolescent Apprenticeship process (Environmental II) at Oakmont Regional High School, will show no significant difference in their locus of control posttest mean scores when compared to students who did not participate in the Environmental II.

Table 14 shows that the calculated t value for locus of control, 0.47, was below the necessary critical value. A comparison of the test mean scores of both groups failed to show a significant difference.

TABLE 13

A Summary of the Test for the Assumption of Homogeneity of Variance (Pretest and Posttest) Between the Experimental and Control Groups

Variable	Group	N	Variance		Standard Deviation		Standard Error		F Value		P	
			Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Self-Concept	Experimental	10	1097.2	820.24	33.1	28.64	10.475	9.057	1.364 ^c	1.06 ^c	NS	NS
	Control	29	804.3	772.84	28.4	27.80	5.266	5.163				
Locus of Control	Experimental	10	11.8	33.77	3.43	5.812	1.086	1.838	1.262 ^c	1.11 ^c	NS	NS
	Control	29	14.9	30.31	3.86	5.506	.717	1.023				
Actual Commitment to Environment	Experimental	10	2.76	2.66	1.66	1.633	.526	.516	1.873 ^c	1.58 ^c	NS	NS
	Control	29	5.17	4.214	2.27	2.053	.422	.381				
Principled Morality (DIT)	Experimental	10	76.48	50.53	8.74	7.109	2.766	2.248	1.742 ^d	1.25 ^c	NS	NS
	Control	24 ^a	43.9	40.57	6.63	6.370	1.354	1.204				
Principled Morality (EIT)	Experimental	10	28.4	25.55	5.33	5.055	1.685	1.599	1.71 ^e	1.22 ^c	NS	NS
	Control	25 ^b	16.6	20.88	4.06	4.579	.814	.850				

^a Posttest N = 28; ^b Posttest N = 29; ^c F .05 = 2.24 or greater for significance

^d F .05 = 2.32 or greater; ^e F .05 = 2.30 or greater

TABLE 14

A Summary of the Independent t Tests for Significant Difference on Five Variables (Experimental and Control Groups)

Variable	Group	N	Post Mean Score	S.D.	S.E.	Degrees of Freedom	t^a	Significant																																																				
Self-Concept (Total P Score)	Experimental	10	348.00	28.64	9.05	37	1.30	NS																																																				
	Control	29	334.69	27.80	5.16				Locus of Control Score	Experimental	10	11.00	5.81	1.83	37	.47	NS	Control	29	10.03	5.50	1.02	Actual Commitment Score	Experimental	10	5.0	1.63	.516	37	1.39	NS	Control	29	4.0	2.05	.381	Defining Issues Test PM Score	Experimental	10	20.90	7.10	2.24	36	.73	NS	Control	28	19.14	6.37	1.20	Environmental Issues Test PM Score	Experimental	10	12.00	5.05	1.59	37	.60	NS	Control
Locus of Control Score	Experimental	10	11.00	5.81	1.83	37	.47	NS																																																				
	Control	29	10.03	5.50	1.02				Actual Commitment Score	Experimental	10	5.0	1.63	.516	37	1.39	NS	Control	29	4.0	2.05	.381	Defining Issues Test PM Score	Experimental	10	20.90	7.10	2.24	36	.73	NS	Control	28	19.14	6.37	1.20	Environmental Issues Test PM Score	Experimental	10	12.00	5.05	1.59	37	.60	NS	Control	29	10.96	4.57	.85										
Actual Commitment Score	Experimental	10	5.0	1.63	.516	37	1.39	NS																																																				
	Control	29	4.0	2.05	.381				Defining Issues Test PM Score	Experimental	10	20.90	7.10	2.24	36	.73	NS	Control	28	19.14	6.37	1.20	Environmental Issues Test PM Score	Experimental	10	12.00	5.05	1.59	37	.60	NS	Control	29	10.96	4.57	.85																								
Defining Issues Test PM Score	Experimental	10	20.90	7.10	2.24	36	.73	NS																																																				
	Control	28	19.14	6.37	1.20				Environmental Issues Test PM Score	Experimental	10	12.00	5.05	1.59	37	.60	NS	Control	29	10.96	4.57	.85																																						
Environmental Issues Test PM Score	Experimental	10	12.00	5.05	1.59	37	.60	NS																																																				
	Control	29	10.96	4.57	.85																																																							

^a t must be 2.027 or greater for significance at the .05 level.

Hypothesis IIc - actual commitment to environment. Students, after participating in an Adolescent Apprenticeship process (Environmental II) at Oakmont Regional High School, will show no significant difference in their actual commitment to environment posttest mean scores when compared to students who did not participate in the Environmental II.

Table 14 shows that the calculated t value for actual commitment, 1.39, was below the necessary critical value. A comparison of the post-test mean scores of the experimental and control groups failed to show a significant difference.

Hypothesis IIId - principled morality (DIT) - human issues. Students, after participating in an Adolescent Apprenticeship process (Environmental II) at Oakmont Regional High School, will show no significant difference in their principled moral reasoning posttest DIT mean scores when compared to students who did not participate in the Environmental II.

Table 14 reveals that the calculated t value for principled morality (DIT), 0.73, was below the necessary critical value. A comparison of the mean scores of the groups failed to show a significant difference.

Hypothesis IIe - principled morality (EIT) - environmental issues. Students, after participating in an Adolescent Apprenticeship process (Environmental II) at Oakmont Regional High School, will show no significant difference in their principled moral reasoning posttest EIT mean scores when compared to students who did not participate in the Environmental II.

Table 14 shows that the calculated t value for EIT principled

morality, 0.60, was below the necessary critical value. A comparison of the mean scores of the experimental and control groups failed to show a significant difference at the .05 level.

Summary. In reviewing Hypothesis I, the data revealed a significant change for only Hypothesis Id--an increase in the experimental group's principled moral reasoning posttest mean. However, a significant change was also determined to have occurred in the control group. Data retained Hypothesis II suggesting, the Adolescent Apprenticeship process was not the only factor that influenced changes in the experimental group's means. The following, Phase IV, will analyze additional aspects of the experimental group's data in an attempt to determine if individual changes did occur from the pretest to the posttest.

Phase IV - Comparison of Raw Data

Introduction. Additional information concerning the effects of the Apprenticeship process on the experimental group was obtained by analyzing both groups' mean gain scores for each of the five variables.

The mean gain scores from the groups were calculated, and an Independent Samples t test applied to determine significance. Individual experimental group pretest and posttest scores were compared, and student profiles for the DIT and EIT principled morality tests were presented.

Gain scores of the experimental and control groups. Individual gain scores for each variable are determined by subtracting the pretest score from the posttest score. Although gain scores give the researcher

an idea of how much the individual changed from the pretest to the posttest, they do not carry a high degree of statistical weight.

Problems such as "ceiling effect" and "regression" towards the mean can influence the validity of using gain scores. The ceiling effect limits the potential gain of high scoring individuals on pretests. Regression implies a high scoring individual may have, by chance, attained the high score, and on a posttest migrated towards the mean. The same applies to an individual who, by chance, obtained a low score. Because the type of testing instruments used in this research are personality measures rather than cognitive measures, they are less likely to be influenced by regression. However, the ceiling effect presents a possible area of concern in this study.

Self-concept. Table 15 shows that in comparing the pretest and posttest individual scores of the experimental group, it was found that 50 percent of the group increased and 50 percent decreased. There were three out of five individuals (60 percent) who increased by more than 30.0 points, and the individuals who decreased did so by greater than 10.0 points.

Examining the control group's gain scores for self-concept, Table 16 shows that on the pretests and posttests, 76 percent of the control group increased in scores and 24 percent decreased. However, of the twenty-two who did show an increase between the pretest and posttest, only three (14 percent) decreased by more than 30.0 points. Of the seven who decreased, two (29 percent) did so with more than 10.0 points. In conclusion, more experimental students increased with a larger amount of points than in the control group.

TABLE 15

A Summary of Individual Self-Concept Change
in the Experimental Group

Student Number	Pre Score	Pre Score Mean	Post Score	Post Score Mean	Total (Pre-Post) Score Increase	Total (Pre-Post) Score Decrease
113	378	+36.4	365	-17		-13
129	290	-24.6	326	-22	+36	
130	293	-48.6	284	-64		-9
206	354	+12.4	362	+14	+8	
230	342	+.40	377	+29	+35	
407	355	+13.4	361	+13	+6	
614	353	+11.4	327	-21		-26
621	311	-30.6	348	0	+37	
629	386	+44.4	377	+29		-9
630	354	+12.4	353	+5		-1
TOTAL					5	5

50%

50%

TABLE 16
 A Summary of Individual Self-Concept Change
 in the Control Group

Student Number	Pre Score	Pre Mean Score 322.10	Post Score	Post Mean Score 334.69	Total (Pre-Post) Score Increase	Total (Pre-Post) Score Decrease
102	288	-34.1	293	-41.69	+5	
109	335	+12.9	358	+23.31	+23	
120	265	-57.1	356	+21.31	+91	
125	314	-8.1	311	-23.69		-3
126	334	+11.9	361	+26.31	+27	
201	345	+22.9	356	+21.31	+11	
207	300	-22.1	332	-2.69	+32	
208	379	+56.9	380	+45.31	+1	
211	269	-53.1	284	-50.69	+15	
213	338	+15.9	356	+21.31	+18	
222	306	-16.1	309	-25.69	+3	
401	311	-11.1	319	-15.69	+8	
408	358	+35.9	293	-71.69		-65
409	336	+13.9	327	-7.69		-9
414	326	+3.9	355	+20.31	+29	
415	331	+8.9	323	-11.69		-8
419	329	+6.9	358	+23.31	+29	
423	309	-13.1	337	+2.31	+30	
430	373	+50.9	367	+32.31		-6

continued

TABLE 16 - continued

Student Number	Score	Pre Mean Score 322.10	Score	Post Mean Score 334.69	Total (Pre-Post) Score Increase	Total (Pre-Post) Score Decrease
436	311	-11.1	329	-5.69	+18	
603	296	-26.1	338	+3.31	+42	
704	303	-19.1	322	-12.69	+19	
705	314	-8.1	330	-4.69	+16	
706	347	+24.9	355	+20.31	+8	
712	312	-10.1	301	-33.69		-11
715	278	-44.1	270	-64.69		-8
717	354	+31.9	359	+24.31	+5	
720	346	+23.9	360	+25.31	+14	
728	334	+11.9	347	+12.31	+13	
TOTAL					22	7
					76%	24%

Locus of control. Table 17 shows that on the Rotter I-E Scale, comparing the experimental group's pretest and posttest individual scores, 40 percent of the individuals decreased becoming more internally-oriented, and 60 percent increased becoming more externally-oriented. Of the four individuals who decreased, three (75 percent) dropped by more than 5.0 points, a large drop for a twenty-three point scale. Of the six individuals who increased, only one (17 percent) did so by more than 5.0 points.

The control group data, Table 18, shows that in a comparison of the pretest and posttest individual scores of the control group, 38 percent decreased becoming more internal, 52 percent increased becoming more externally-oriented, and 10 percent remained the same. These results were very similar to those observed in the experimental group. Of the eleven control individuals who did decrease, none did so by more than 5.0 points. Of the fifteen individuals who increased, only two (13 percent) did so by more than 5.0 points. In conclusion, the data suggest that more experimental group individuals showed a lowering of locus of control scores toward internal control.

Actual commitment to environment. According to the actual commitment subscale of the Ecological Attitude Inventory, the highest possible score is 10.0. Table 19 illustrates that when comparing individuals' pretest and posttest scores, 50 percent of the experimental individuals increased, 20 percent decreased and 30 percent remained the same. Of the five individuals who increased, only one (20 percent) increased by more than 3.0 points. Of the two who decreased, none did so by more than 3.0 points.

TABLE 17

A Summary of Individual Locus of Control
Change in the Experimental Group^a

Student Number	Pre Score	Pre Mean Score 10.30	Post Score	Post Mean Score 11.00	Internal	External
113	15	+4.7	9	-2.0	-6	
129	9	-1.3	13	+2		+4
130	8	-2.3	20	+9		+12
206	15	+4.7	16	+5		+1
230	8	-2.3	1	-10	-7	
407	8	-2.3	11	0		+3
614	13	+2.7	18	+7		+5
621	13	+2.7	7	-4	-6	
629	9	-1.3	7	-4	-2	
630	5	-5.3	8	-3		+3
TOTAL			4	6	40%	60%

^aIf the posttest score is less than the pretest score, the individual has become more internal.

TABLE 18

A Summary of Individual Locus of Control Change
in the Control Group^a

Student Number	Pre Score	Pre Mean Score 9.13	Post Score	Post Mean Score 10.03	Internal	External	Same
102	14	+4.87	16	+5.97		+2	
109	7	-2.13	8	-2.03		+1	
120	9	-.13	8	-2.03	-1		
125	10	+ .87	10	-.03			0
126	13	+3.87	13	+2.97			0
201	8	-1.13	3	-7.03	-5		
207	13	+3.87	17	+6.97		+4	
208	4	-5.13	1	-9.03	-3		
211	11	+1.87	13	+2.97		+2	
213	9	-.13	8	-2.03	-1		
222	8	-1.13	8	-2.03			0
401	6	-3.13	7	-3.03		+1	
408	4	-5.13	5	-5.03		+1	
409	10	+ .87	22	+11.97		+12	

continued

TABLE 18 - continued

Student Number	Pre Score	Pre Mean Score 9.13	Post Score	Post Mean Score 10.03	Internal	External	Same
414	10	+ .87	23	+12.97		+13	
415	9	- .13	8	-2.03	-1		
419	9	- .13	8	-2.03	-1		
423	11	+1.87	9	-1.03		+2	
430	15	+5.87	20	+9.97		+5	
436	5	-4.13	8	-2.03		+3	
603	19	+9.87	15	+4.97	-4		
704	6	-3.13	4	-6.03	-2		
705	6	-3.13	3	-7.03	-3		
706	2	-7.13	6	-4.03		+4	
712	13	+3.87	10	-.03	-3		
715	14	+4.87	10	-.03	-4		
717	5	-4.13	7	-3.03		+2	
720	6	-3.13	9	-1.03		+3	
728	9	- .13	12	+1.97		+3	
TOTAL					11	15	3
					38%	52%	10%

^aIf the posttest is less than the pretest score, the individual has become more internal.

TABLE 19

A Summary of Individual Actual Commitment
Change in the Experimental Group

Student Number	Pre Score	Pre Score Mean 3.9	Post Score	Post Score Mean 5.0	Total Score Increase	Total Score Decrease	Same
113	5.0	+1.0	3.0	-2.0		-2	
129	3.0	-.9	3.0	-2.0			0
130	1.0	-2.9	7.0	+2.0	+6		
206	4.0	+1	7.0	+2.0	+3		
230	5.0	+1.1	4.0	-1.0		-1	
407	2.0	-1.9	5.0	0.0	+3		
614	3.0	-.9	4.0	-1.0	+1		
621	4.0	+1	4.0	-1.0			0
629	6.0	+2.1	7.0	+2.0	+1		
630	6.0	+2.1	6.0	+1.0			0
TOTAL					5	2	3
					50%	20%	30%

The control group data, Table 20, indicate that a comparison of the control individuals' pretest and posttest scores show that 38 percent increased, 28 percent decreased, and 34 percent remained the same. Of the eleven who did increase, only five (45 percent) increased more than 3.0 points, and of the eight who decreased, none did so by more than 3.0 points.

In conclusion, it appears that the experimental group had a higher percentage of individuals who gained in actual commitment on the posttest. However, the control group had a larger increase in points gained per individual for actual commitment than the experimental group.

Principled morality (DIT) - human issues. Table 21 shows that when comparing the pretest and posttest experimental group's individual scores, 70 percent increased, 10 percent decreased, and 20 percent remained the same. Of the seven who did increase, four (57 percent) increased more than 3.0 points. The one who decreased did so by less than 3.0 points.

The control group, Table 22, shows that in a comparison of the pretest and posttest control group's individual scores, 75 percent increased and 25 percent decreased. Of the eighteen who increased, nine (50 percent) increased more than 3.0 points, while of the six who decreased, five (83 percent) decreased more than 3.0 points.

In conclusion, the experimental group appears to have had less individual increase in principled morality than in the control group. However, there was a larger point gain per individual and a lesser point decrease in the experimental group than in the control group.

Principled morality (EIT) - environmental issues. Table 23 shows

TABLE 20
A Summary of Individual Actual Commitment Change
in the Control Group

Student Number	Pre Score	Pre Score Mean 3.37	Post Score	Post Score Mean 4.0	Total Score Increase	Total Score Decrease	Same
102	1.0	-2.37	5.0	+1.00	+4		
109	5.0	+1.63	4.0	0		-1	
120	0.0	-3.37	3.0	-1.00	+3		
125	1.0	-2.37	1.0	-3.00			0
126	7.0	+3.63	7.0	+3.00			0
201	3.0	-.37	4.0	0	+1		
207	0.0	-3.37	0.0	-4.0			0
208	3.0	-.37	4.0	0	+1		
211	2.0	-1.37	3.0	-1.00	+1		
213	4.0	+.63	2.0	-2.00		-2	
222	2.0	-1.37	6.0	+2.00	+4		
401	5.0	+1.63	2.0	-2.00		-3	
408	0.0	-3.37	5.0	+1.00	+5		
409	6.0	+2.63	3.0	-1.00		-3	
414	2.0	-1.37	1.0	-3.00		-1	
415	6.0	+2.63	5.0	+1.00		-1	

continued

TABLE 20 - continued

Student Number	Pre Score	Pre Score Mean 3.37	Post Score	Post Score Mean 4.0	Total Score Increase	Total Score Decrease	Same
419	2.0	-1.37	2.0	-2.00			0
423	4.0	+.63	9.0	+5.00	+5		
430	3.0	-.37	3.0	-1.00			0
436	6.0	+2.63	6.0	+2.00			0
603	2.0	-1.37	6.0	+2.00	+4		
704	6.0	+2.63	6.0	+2.00			0
705	2.0	-1.37	5.0	+1.00	+3		
706	2.0	-1.37	2.0	-2.0			0
712	7.0	+3.63	4.0	0		-3	
715	3.0	-.37	3.0	-1.0			0
717	1.0	-2.37	4.0	0	+3		
720	7.0	+3.63	7.0	+3.0			0
728	6.0	+2.63	4.0	0		-2	
TOTAL					11	8	10
					38%	28%	34%

TABLE 21

A Summary of Individual DIT Principled Morality
Change in the Experimental Group

Student Number	Pre Score	Pre Score Mean	Post Score	Post Score Mean	Increase	Decrease	Same
113	12.0	-5.6	12.0	-8.9			0
129	18.0	+4	20.0	-.9	+2		
130	21.0	+3.4	19.0	-1.9		-2	
206	12.0	-5.6	20.0	-.9	+8		
230	35.0	+17.4	37.0	+16.10	+2		
407	12.0	-5.6	16.0	-4.9	+4		
614	28.0	+10.40	28.0	+7.1			0
621	12.0	-5.6	20.0	-.9	+8		
629	6.0	-11.6	15.0	-5.9	+9		
630	20.0	+2.40	22.0	+1.10	+2		
TOTAL					7	1	2
					70%	10%	20%

TABLE 22
A Summary of Individual DIT Principled Morality
in the Control Group

Student Number	Pre Score	Pre Score Mean	Post Score	Post Score Mean	Total Score Increase	Total Score Decrease	Same
102	-	-	24.0	19.14	- Invalid	-	
109	14.0	-2.2	26.0	+6.86	+12		
120	25.0	+8.8	26.0	+6.86	+1		
125	10.0	-6.2	18.0	-1.14	+8		
126	9.0	-	-	-	- Invalid	-	
201	6.0	-10.2	13.0	-6.14	+7		
207	11.0	-5.2	19.0	-0.14	+8		
208	22.0	+5.8	25.0	+5.86	+3		
211	12.0	-4.2	24.0	+4.86	+12		
213	22.0	+5.8	23.0	+3.86	+1		
222	9.0	-7.2	12.0	-7.14	+3		
401	-	-	12.0	-	- Invalid	-	
408	14.0	-2.2	11.0	-8.14		-3	
409	15.0	-1.2	16.0	-3.14	+1		
414	15.0	-1.2	8.0	-11.14		-7	

continued

TABLE 22 - continued

Student Number	Pre Score	Pre Score Mean 16.20	Post Score	Post Score Mean 19.14	Total Score Increase	Total Score Decrease	Same
415	10.0	-6.2	20.0	+0.86	+10		
419	-	-	13.0		- Invalid		
423	-	-	12.0		- Invalid		
430	16.0	-0.2	27.0	+7.86	+11		
436	11.0	-5.2	13.0	-6.14	+2		
603	27.0	+10.8	17.0	-2.14		-10	
704	24.0	+7.8	28.0	+8.86	+4		
705	15.0	-1.2	8.0	-11.14		-7	
706	27.0	+10.8	21.0	+1.86		-6	
712	17.0	+8	21.0	+1.86	+4		
715	32.0	+15.8	28.0	+8.86		-4	
717	17.0	+0.8	20.0	+0.86	+3		
720	14.0	-2.2	26.0	+6.86	+12		
728	19.0	+2.8	25.0	+5.86	+6		
TOTAL					18	6	0
					75%	25%	0%

TABLE 23
 A Summary of Individual EIT Principled Morality
 Change in the Experimental Group

Student Number	Pre Score	Pre Score Mean 12.8	Post Score	Post Score Mean 12.0	Increase	Decrease	Same
113	5.0	-7.8	4.0	-8		-1	
129	6.0	-6.8	13.0	+1	+7		
130	17.0	+4.2	6.0	-6		-11	
206	19.0	+6.2	13.0	+1		-6	
230	20.0	+7.2	22.0	+10	+2		
407	11.0	-1.8	14.0	+2	+3		
614	15.0	+2.2	12.0	0		-3	
621	9.0	-3.8	16.0	+4	+7		
629	10.0	-2.8	10.0	-2			-0
630	16.0	+3.2	10.0	-2		-6	
TOTAL					4	5	1

40% 50% 10%

that a comparison of the pretest and posttest individual scores reveal that 40 percent of the individuals increased in principled morality regarding environmental issues, 50 percent decreased, and 10 percent remained the same. Of the four who increased, two (50 percent) did so by more than 3.0 points, and of the five who decreased, three (60 percent) did so by more than 3.0 points.

Table 24 illustrates that when comparing the pretest and posttest individual scores of the control group, 54 percent of its members' scores increased from the pretest to posttest, 31 percent of its scores decreased, and 15 percent remained the same. Of the fourteen who increased, ten (71 percent) increased by more than 3.0 points and of the eight who decreased, four (50 percent) did so by more than 3.0 points. In conclusion, more individuals in the control group showed an increase in principled morality in environmental issues than did those in the experimental group.

Conclusion. In reviewing the self-concept, there was a greater point increase per individual in the experimental group than in the control group. The control group individuals showed a greater point decrease when compared to the experimental group's posttest self-concept.

Regarding locus of control in the experimental group, more experimental members had a larger point gain per individual than in the control group. In actual commitment, the experimental group had fewer individuals who showed a decrease in actual commitment. However, the control group had a high percentage of individuals who attained scores with greater than 3.0 points.

In principled moral reasoning, less experimental group individuals

TABLE 24
A Summary of Individual EIT Principled Morality
Change in the Control Group

Student Number	Pre Score	Pre Score Mean 9.84	Post Score	Post Score Mean 10.96	Total Score Increase	Total Score Decrease	Same
102	8.0	-1.84	8.0	-2.96			0
109	8.0	-1.84	10.0	-0.96	+2		
120	12.0	+2.16	13.0	+2.04	+1		
125	4.0	-5.84	15.0	+4.04	+11		
126	10.0	+0.16	10.0	-0.96			0
201	8.0	-1.84	12.0	+1.04	+4		
207	4.0	-5.84	11.0	+0.04	+7		
208	9.0	-0.84	10.0	-0.96	+1		
211	9.0	-0.84	7.0	-3.96		-2	
213	12.0	+2.16	10.0	-0.96		-2	
222	13.0	+3.16	9.0	-1.96		-4	
401			4.0		- Invalid	-	
408	12.0	+2.16	10.0	-0.96		-2	
409	6.0	-3.84	16.0	+5.04	+10		
414	7.0	-2.84	8.0	-2.96	+1		

Continued

TABLE 24 - continued

Student Number	Pre Score	Pre Score Mean 9.84	Post Score	Post Score Mean 10.96	Total Score Increase	Total Score Decrease	Same
415	3.0	-6.84	10.0	-0.96	+7		
419			11.0		- Invalid		
423			5.0		- Invalid		
430	13.0	+3.16	8.0	-2.96		-5	0
436	7.0	-2.84	7.0	-3.96			
603	11.0	+1.16	9.0	-1.96		-2	
704	9.0	-.84	15.0	+4.04	+6		
705	15.0	+5.16	4.0	-6.96		-11	
706	14.0	+4.16	21.0	+10.04	+7		
712	13.0	+3.16	13.0	+2.04			0
715	18.0	+8.16	25.0	+14.04	+7		
717	6.0	-3.84	12.0	+1.04	+6		
720	18.0	+8.16	10.0	-0.96		-8	
728	8.0	-1.84	15.0	+4.04	+7		
TOTAL					14	8	4
					54%	31%	15%

increased in principled morality than observed in the control group individuals. However, experimental group members had a larger point gain per individual than recorded in the control group. Finally, the EIT principled morality revealed that more control group individuals increased in principled moral reasoning regarding environmental issues.

In the variables of self-concept, locus of control, and principled morality (human issues), it seems possible to suggest that the Adolescent Apprenticeship may have had a positive influence or reinforcing effect on individuals in the experimental group. However, it is also equally likely that chance or psychometric flaws accounted for the results.

The data also suggest that the Adolescent Apprenticeship may have had a negative effect on the experimental group regarding principled morality in environmental issues. This is, however, not totally unexpected. According to theoretical predictions presented earlier, practical experience may influence idealistic choices often favored by adolescents. Those students exposed to real environmental decisions within the community through the Apprenticeship process may have been influenced toward supporting a human morality rather than the classroom idealism of environmental morality. Even though there was a decrease in principled morality regarding environmental issues, experimental students did maintain their principled morality when confronting human moral issues.

Mean gain scores and their significance. Although greater change using gain scores was observed to have occurred within individuals in the

experimental group, a statistical statement supporting the Adolescent Apprenticeship process as a probable cause must be verified with a test of significance. Therefore, a comparison of the mean gain scores of the two groups, using an Independent Samples t test, was conducted. As was necessary in Hypothesis II, a test for the assumption of the existence of equal variances between the experimental and control groups was made. Table 25 shows that only one of the F tests for the five variables was significant.

Table 26 indicates that there was no significant difference between the mean gain scores of self-concept, locus of control, actual commitment to environment, and principled morality (EIT) for the experimental and control groups. Table 26 reveals that there was no significant difference between the experimental and control groups' scores regarding principled morality (human issues). But the result of a significance test for principled morality is not valid because the test for homogeneity of variances was found to be significant. The original scores of the experimental and control groups have too great a variance to permit comparison with the statistical methods used in this study. In conclusion, none of the increases or decreases in the experimental group's mean gain scores could be statistically attributed to the Adolescent Apprenticeship, but the data does indicate posttest differences existed between the two groups.

Individual morality profiles - experimental group. An examination of principled morality data revealed some individuals in the experimental group showed changes in their specific moral development not visible in

TABLE 25

A Summary of the Test for Assumption of Homogeneity of Variance for Mean Gain Scores Between the Experimental and Control Groups

Variable	Group	N	Variance	S.D.	S.E.	F Value	Signif.
Self-Concept	Experimental	10	509.81	22.57	7.14	1.19 ^a	NS
	Control	29	608.65	24.67	4.58		
Locus of Control	Experimental	10	36	6.00	1.89	2.08 ^a	NS
	Control	29	17.30	4.16	0.77		
Actual Commitment	Experimental	10	5.43	2.33	0.73	1.02 ^a	NS
	Control	29	5.52	2.35	0.43		
Principled Morality (DIT)	Experimental	10	14.66	3.83	1.21	2.91 ^b	YES
	Control	24	42.64	6.53	1.33		
Principled Morality (EIT)	Experimental	10	34.10	5.84	1.84	1.16 ^c	NS
	Control	26	29.48	5.43	1.06		

^aF .05 = 2.24 or greater for significance

^bF .05 = 2.32 or greater for significance

^cF .05 = 2.28 or greater for significance

TABLE 26

A Summary of the Independent t Test for Significance of Mean Gain Scores on Five Variables (Experimental and Control Groups)

Variable	Group	N	Post Mean Gain Score	S.D.	S.E.	df	t^a	Signif.
Self- Concept	Experimental	10	+6.40	22.57	7.14	37	-0.70	NS
	Control	29	+12.58	24.67	4.58			
Locus of Control	Experimental	10	+0.70	6.00	1.89	37	-0.11	NS
	Control	29	+0.89	4.16	0.77			
Actual Commitment	Experimental	10	+1.10	2.33	0.737	37	0.56	NS
	Control	29	+0.620	2.35	0.437			
Principled Morality (DIT)	Experimental	10	+3.30	3.83	1.21	32	0.15	NS
	Control	24	+2.95	6.53	1.33			
Principled Morality (EIT)	Experimental	10	-0.80	5.84	1.84	34	-1.15	NS
	Control	26	+1.57	5.43	1.06			

^aSignificant at .05 level, must be 2.042 or greater

previous data analysis. The following examines this in order to further determine the effects of an Adolescent Apprenticeship process on participating students.

Conventional and principled morality (DIT) (EIT). The Environmental Issues Test by Iozzi, modeled after the DIT, employs environmental issues rather than human issues to determine an individual's moral development. It was found, as stated in Chapter II, that individuals may reason on one moral level for a specific type of issue and reason differently on other types of issues. The major concern in administering the EIT to the experimental group was to observe the effect of the Adolescent Apprenticeship process on the students' level of morality regarding issues written in an environmental context.

If you recall, the experimental group seemed to respond to moral issues on the pretest with more awareness of environmental problems. The fact that they were in a special environmental program may have influenced their responses. Table 27 presents individual DIT and EIT morality shifts.

Student 113 decreased in principled morality on the post EIT and stayed the same in conventional morality. On the post DIT, the student stayed the same in principled morality and decreased in conventional morality. In conclusion, the student shifted on the posttest towards more principled reasoning in human issues and shifted towards conventional reasoning in environmental issues. However, the majority of the student's actual reasoning in environmental and human issues was on the conventional level.

Student 129 increased in EIT principled morality and decreased in

TABLE 27
 A Summary of the Shifts in Moral Reasoning on the DIT
 and EIT for Experimental Individuals

Student Number	Conventional Morality		Principled Morality	
	DIT	EIT	DIT	EIT
113	65% - 63% Decrease	67% - 67% Same	20% - 20% Same	17% - 13% Decrease
129	48% - 47% Decrease	53% - 33% Decrease	30% - 33% Increase	20% - 43% Increase
130	48% - 63% Increase	37% - 50% Increase	35% - 32% Decrease	57% - 20% Decrease
206	67% - 47% Decrease	13% - 30% Increase	20% - 33% Increase	63% - 43% Decrease
230	28% - 23% Decrease	23% - 13% Decrease	58% - 62% Increase	67% - 73% Increase
407	75% - 58% Decrease	33% - 40% Increase	20% - 27% Increase	37% - 47% Increase
614	47% - 42% Decrease	30% - 40% Increase	47% - 47% Same	50% - 40% Decrease

continued

TABLE 27 - continued

Student Number	Conventional Morality		Principled Morality	
	DIT	EIT	DIT	EIT
621	53% - 53% Same	50% - 33% Decrease	20% - 33% Increase	30% - 53% Increase
629	68% - 55% Decrease	50% - 60% Increase	10% - 25% Increase	33% - 33% Same
630	57% - 47% Decrease	37% - 50% Increase	33% - 37% Increase	53% - 33% Decrease

conventional morality. In conclusion, the student shifted on the posttest towards more principled reasoning in both human and environmental issues. However, the majority of the student's actual reasoning on environmental issues was principled and conventional on human issues.

Student 130 decreased in principled morality on the EIT and increased in conventional morality. On the DIT, the student showed a shift on the posttest towards conventional reasoning in both human and environmental issues. However, the majority of the reasoning used by the student on environmental issues and human issues was at the conventional level.

Student 206 decreased on the EIT in principled morality and increased in conventional morality. On the DIT, the student showed an increase in principled morality and a decrease in conventional morality. In conclusion, the student's trend in reasoning seemed to remain principled on human issues, but shifted on the posttest toward conventional reasoning on environmental issues. However, the majority of the reasoning used by the student on environmental issues was nearer principled reasoning and on human issues was conventional.

Student 230 increased in EIT principled morality and decreased in conventional morality. On the DIT posttest, the student showed the same shifts in morality. In conclusion, the student showed a shift on the posttest towards a more principled reasoning when confronting both human and environmental issues. The majority of reasoning on environmental and human issues was principled.

Student 407 increased in EIT principled morality and also increased in conventional morality. On the DIT posttest, the student increased in

principled morality and decreased in conventional morality. In conclusion, the student seemed to shift from a conventional to principled level of reasoning regarding human issues. The majority of reasoning used in environmental issues seemed to be between conventional and principled morality. Conventional morality predominated in human issues.

Student 614 decreased in EIT principled morality and increased in conventional morality. On the DIT posttest, the student stayed the same as the pretest on principled morality and decreased in conventional morality. In conclusion, the student seemed to be shifting to a conventional form of moral reasoning when confronting environmental issues and to a more principled reasoning on human issues. The student did seem to be in a transitional period between conventional and principled morality concerning environmental issues.

Student 621 increased in EIT principled morality and decreased in conventional morality. On the DIT posttest, the student increased in principled morality and stayed the same in conventional morality. In conclusion, the student seemed to be shifting from conventional to principled moral reasoning regarding environmental issues and maintained a principled moral reasoning concerning human issues. The majority of the reasoning used by the student regarding environmental issues was principled and regarding human issues was conventional.

Student 629 stayed the same for EIT principled morality and increased in conventional morality. On the DIT posttest, the student increased in principled morality and decreased in conventional morality. In conclusion, the student seemed to be shifting to a conventional level of reasoning regarding environmental issues and to a more principled

level regarding human issues. The majority of the student's reasoning on environmental issues and on human issues was at the conventional level.

Student 630 decreased in EIT principled morality and increased in conventional moral reasoning. On the DIT posttest, the student increased in principled morality and decreased in conventional morality. In conclusion, the student seemed to be shifting to a conventional moral level of reasoning regarding human issues. The student was apparently in a transitional period between conventional and principled moral reasoning concerning environmental issues, because of the high posttest anti-establishment score and an increase in stage two reasoning. However, the majority of the student's reasoning on environmental issues and on human issues was at the conventional level.

Conclusion. In conclusion, by examining increases in DIT posttest scores, nine of the ten students seemed to be shifting towards the support of principled reasoning on human issues, while one student was shifting towards conventional reasoning. Regarding the EIT posttest and the reasoning favored in environmental issues, three students were shifting towards support of principled reasoning and seven towards conventional reasoning.

In examining the majority of reasoning actually used on the posttests for both the DIT and the EIT, it was found that eight students preferred conventional moral reasoning, one preferred principled moral reasoning, and one student was in a transitional period between conventional and principled reasoning regarding human issues. In environmental issues, four students preferred principled moral reasoning, four

students preferred conventional reasoning, and two students were in a transitional period between conventional and principled. A higher percentage of students preferred principled morality on environmental issues than on human issues.

Although more students showed evidence of shifting towards principled on human issues, there was evidence on the EIT posttests of a student shift in reasoning preference from principled to conventional. This was not unexpected since exposure to real environmental dilemmas through the Apprenticeship and involvement with these may have helped to dissolve some of the adolescence idealism regarding environmental dilemmas.

Overall, the experimental group seemed to support the maintenance of laws for the protection of the environment rather than the idealistic notion of the rights of the environment. Therefore, the Apprenticeship process may have had an effect on individual moral development regarding both human and environmental issues.

Phase V - Student Evaluations

There is valid evidence to indicate the instruments used in this study may not have been sensitive enough to record the changes that occurred within the experimental group. In addition, the experimental focus of the Adolescent Apprenticeship process and the size of the sample also handicapped the validity of the statistical information presented in this study. These factors influenced the researcher to use a questionnaire as a follow-up tool.

The questionnaire was given to 1979-1980 and 1980-1981 participants

in the Environmental II programs, six to twelve months after their graduation from Oakmont. Appearing first are the follow-up comments of the participating students in the 1979-1980 program which motivated the pilot study described in this dissertation. Comments from the study's experimental group appear second. The researcher's comments will follow the presentation of the student evaluations.

Student evaluations (1979-1980).

Question one. In looking back since your graduation from Oakmont and your experiences in the everyday world, what effect, positive and/or negative, has the Environmental II program had on you?

The Environmental II program made me not afraid of speaking when I had something to say concerning an issue at school or in my community. Environmental gave me confidence in myself in facing the world after high school.

Positive. It has made me be more aware of incidents and also made me always check both sides of incidents.

The effect Environmental II has left on me, is I am able to understand and can relate to issues talked about in college or news, because of my previous knowledge. I am more concerned with the environment, its destruction (litter, waste, pollution, development).

The biggest effect the Environmental II class had on me was positive. Ever since the Environmental II class, I have gained more confidence in myself and what I can do. I think by gaining more confidence in myself, it helped me to become less shy.

I feel I am much more informed about what's going on in the world than most people. I have acquired many skills for dealing with adults and people in general from the Environmental II course.

The Environmental II class, I feel, had a very positive effect. I find that it's a lot easier for me to work with adults and to voice my opinion to them, whereas before I was afraid to do that. I think it helped me to be able to handle situations better by thinking them out more thoroughly and weighing all the alternatives.

It has made me more 'environmental aware' than most people my age. It has made me much more political.

I can honestly say that the program had no negative effects on me at all. I have gained knowledge, understanding, self-confidence, and a positive attitude about the environment.

It has made me more aware of the environment around me so that I can help in anyway I know how.

Environmental Survival II had a positive effect on me in the sense that it expanded my knowledge of environmental issues, gave me confidence to deal with adults on a one-to-one basis, and also let me speak in public with poise and self-assurance. I feel the program was a necessary part of my college preparation and also my social development.

Question two. How did your participation in the program influence or effect your attitude about the environment?

I had always been concerned with the environment, but never took any steps in helping to protect it. The Environmental program made me aware of problems and how to deal with them legally. It helped me to understand why the environment is manipulated and about the people that help protect or help destroy it, and how to deal with them.

It made me more paranoid of man in the environment.

My participation on the slide/tape show influenced my attitude more to the protection of the environment, particularly water--our most vital substance.

The Environmental II program helped me become more aware of the environmental problems. My attitude changed by becoming more aware, so I wanted to do something about the problems.

I now have a positive regard for the environment.

When I was in the program, I understood more about environmental problems--some that I didn't even know existed. I had always felt very strongly about the environment, but it did feel good to do something about it.

I am much more conscious of what goes on around me and how it effects the environment.

I have always loved the outdoors, nature, and have been amazed at how simple it seems to be, but how complex it really is. The program has strengthened my love for the environment and my interest in it. I would never litter and discourage my family and

friends from doing so. I would never purchase a real fur coat. I have become more interested in reading articles, newspaper clippings, listening to the news, etc., when it is concerned with the environment. In personal conversations, I defend the environment and its issues.

My attitude has been strengthened. I've always been environmentally conscious, but now that I know facts, it helps me understand the issues.

I have always had a strong love for the environment, since I was a child. However, I feel the program strengthened this feeling and sharpened my sense towards the further destruction of the environment.

Question three. How has the Environmental II program affected your participation in local environmental issues either in your community, college campus, where you work, or other?

Environmental Survival II gave me a base to work in a group project on a contamination issue of a reservoir in Auburn last semester. I was able to use the skills I had learned working in a group in Environmental II (telephoning, dealing with adults, etc.) to put together a large poster board discussing the issue and naming key components of the issue. I hope to do more work in this area.

I've found it easy to say things about the environment.

I am very much involved in the community as related to the environment, through boards, and departments in the area.

Since Environmental II has never been over, I feel that I can speak my opinion more openly. I'm always getting into arguments over environmental issues at work during our break. I did get involved at school with the Biology Club, before I left.

I find myself drawn to classes which stress a positive regard for the environment.

I have not participated in any environmental issues but try to keep informed about issues that are going on in this area.

I have been aware of the local environmental issues but have not participated in any yet.

I have listened more carefully but have not really participated in any yet.

I am not afraid to join and get involved where I feel I am needed.

Question four. What elements of the program do you feel were most valuable to you? Why?

The education sessions where we had to compile a lesson to teach adults. It takes a lot for adults to consider listening to us. It brought the two different generations together. We acted like adults and were treated like adults.

The elements of the program most valuable to me were the awareness of problems in the environment, and the experience of working on an environmental issue.

The most valuable element to me was working together. This was helpful to me because I became able to talk more freely around groups of people.

The most valuable experiences for me were, phone contact, contact with adults on an adult level, and community exposure.

Relating with adults and getting involved with them, trying to push an idea through and fighting for something you believed in, I thought were very valuable.

The book-work where we learned of many very different things was most valuable. Example--town government, environmental issues, and man in relation to his environment.

I think the knowledge we gained from participating in the Environmental II program has helped me in understanding occurrences in everyday life. For example, when the water table level dropped in Florida and caused those large sink holes, I understood how and why it happened, and was even able to explain it to my brother and sister. Also, I am more aware of the environment--I respect it.

The adult teaching sessions and group work, because they gave me a chance to speak in public and learn how to get along well in a group, and how to deal with others in general.

Most valuable to me was the learning about how the environment works, and how we as individuals effect it.

Question five. How did your participation in the Environmental II program and your contact with adults effect your confidence in confronting adults when you graduated?

It's made me a little more confident about my ideas and opinions. I know more about the environment than some adults.

As I have previously mentioned, I have no qualms in dealing with adults now after completing the program. Previously, I may have had an uneasy feeling about this, but not any longer.

I feel more confident now when dealing with adults. At my job I am constantly dealing with people--especially adults, and I think the teaching sessions helped me in that I feel very comfortable with them now.

I found that I was very nervous when put in the position of a leading role. But I also learned how to cope with that same nervousness.

I was less tense around adults and I didn't see myself as being something less than an adult. At work it really helped me because if I have an idea or feeling about something I don't hesitate to say something. I feel equal to adults, whereas before I didn't.

I have had great success in dealing with adults since the program. In everything from job applications and interviews to consumer problems--the Environmental II program has helped in my dealings with adults.

By getting involved with the program, it made me have more confidence in my opinion enabling me to talk more freely to adults.

My contact with adults was limited, but what contact I had helped me a lot with talking to adults when I need help and making phone calls. If I had participated more, I'm sure I would have an even greater self-confidence.

It made me a lot more confident and I realized that all adults are human and make mistakes.

It improved 100 percent. I felt more confident of myself and what I had to say.

Question six. Do you feel your experience in the Environmental II program helped you in your after high school activities, either in college, work or elsewhere? How?

The experiences have helped me with understanding of the world I live in--widened my perspective.

I think that the Environmental II program helped me in college and at work by giving me more confidence in what I think or do. Before the Environmental II class, I was very shy and would not talk much around groups of people, but now I talk more freely around people.

The many reports that were required from written to oral have helped in the reports that are required in college.

Yes, as I said before, I feel less inferior to adults. I feel I can speak my opinion and that it's worth something. I relate to adults better and have a lot more confidence in myself.

Definitely. In college I took classes that were related and that fact gave me an unbelievable head start on the other students.

I think the experience in general has helped me. I have not really had the opportunity to use my knowledge of the environment, but by my just being aware of issues and the environment, I can relate better to new developments, etc.

It naturally helped in my college environmental class. I found I was much farther ahead than many of the other students. Most of the things we were doing I had already done (which helped a great deal). On the broader level, I think it had helped me decide that that's what I want to do most--work on broadcasting environmentally related issues.

It helps me deal with the effects I and people around me have on the environment. I can speak confidently about some aspects of ecology.

Question seven. In looking back at the adult teaching sessions, what did you gain from this experience?

So many people know nothing about the environment. Everyone should know how we all affect it and how we can help.

Self-assurance, clarity in conversation, independence, ableness to get ideas across clearly and concisely.

I learned that you don't have to feel inferior to adults, that you have just as much of a brain in your head as they do. You can reason with people and make them listen if you handle yourself the right way.

The ability and confidence that I gained in my teaching ability helped me to do well in a job I had teaching sailing.

The teaching sessions helped me to be able to talk more freely around adults.

I gained insights into types of people; how people act and speak, and how to get around them or handle them when they try to corner you.

That in order to convince an adult of something, it has to be done very carefully and slowly. Not to insult the adults.

I gained more confidence in myself and speaking to adults.

Question eight. How would you say participation in the Environmental II program has effected your feelings toward environmental issues and concerns now?

I'm 100 percent more aware and more apt to do something about issues. I'm not afraid to get involved.

It has made me more aware of both sides of environmental matters, but has not really changed my feelings, only strengthened them.

Environmental II has given me a greater understanding and concern of environmental issues and the difficulties, but I have not been active in any of the issues yet.

The Environmental II class made me more aware of the issues and concerns about the environment. Even now that I don't get involved with any issues, I like to keep aware of what is happening.

I am much more aware of the environment and the circle of life on the Earth. The issues concerning the environment are always on my mind. I still believe the environmental ethic is what is needed or many flora and fauna will perish. Since everything is related, this will effect man as well. My feelings toward the environment and its issues are still the same.

When there is an issue on T.V. or in the paper, I will take the time to read about it or listen to it. Seeing people throw rubbish out of their windows still infuriates me to no end, and I will tell them. I am very interested in environmental issues and I am concerned.

I am much more of an activist than I could have ever imagined before I was given the privilege to take the course.

I have become much more interested in them and concerned about them. Although I tend to back the environmentalist side. I am for the environment and I don't stand for criticism about the environment. I am very much against nuclear power, killing of the Harp seals and concerned with protecting wildlife and the whales, pollution, etc.

I am now more aware that the environment is as important to the human population as is breathing. With it, our capacities have no limits; without it there will be no life. I can only hope any

minor contribution, I may make in this field will not go unnoticed, but further promote the welfare and well-being of the environment.

I'm still very concerned and I've enrolled in an Environmental Ethics course as one of my electives. I feel it is something everyone should be more concerned about especially now. If we all cared a little more everything could be a little better.

Additional voluntary comments.

I hope I have helped you some. I was very happy to answer these questions for you. As I was reading and answering these questions, I felt guilty because of how little, really, I had become involved in the community concerning the environment. I have always felt that your classes (especially Environmental II) was the most rewarding for me, and the one I enjoyed the most. I have always planned to use what I learned from them even after I got out of school. I would like to get more involved in the town and its environment, but I guess what I don't have right now is much time. If you ever need help with anything, I would be more than happy to help if I can. Also--I would like to chaperone any field trips you go on, if I could. Thank you.

I feel that if it were possible I'd like to see the Environmental program as a required class for high school students. I, myself, learned more from the Environmental program than any other class I took.

Student evaluations (1980-1981). The following evaluations are responses from students who comprised the study's experimental sample. Student code numbers were used in order to permit referral to original test scores on the five variables. The experimental group students were mailed the same questionnaire as the 1979-1980 group, six months after graduation from Oakmont Regional. The reader should remember there is a year's difference between the groups' responses. The 1979-1980 group was entering their first semester sophomore year of college when they responded to the evaluation sheet. The 1980-1981 group was in the middle of their first semester freshmen year of college. Basic personality differences between the groups, differences in the program's format, and

how these may have effected the overall outcomes of the pilot study will be discussed in Chapter VI.

Question one. In looking back since your graduation from Oakmont, and your experience in the everyday world, what affect, positive and/or negative has the Environmental II program had on you?

Student 113 - It has had altogether a positive effect on me. Since I'm now receiving National Audubon, I am becoming more aware of nature and how it affects me.

Student 129 - Positive, I had many learning experiences in Environmental and you always benefit from what you learn.

Student 130 - It helped me to work effectively in a group.

Student 206 - I think the most important way the program has affected me is that I'm interested in going into some field of biology, such as oceanography. Something dealing with plants and animals or the environment.

Student 230 - It has given me better information about our environment, and man's effect on it. If someone else is talking about the environment, or I read about environmental issues, I understand what they are talking about.

Student 407 - It has had a most positive effect on my life since graduation. I have put my knowledge into effect in another state. I've had the chance to use my class training in college. The Environmental II class was far from easy. It was a challenge and in this way, it prepared me for the challenges and goals called life. I only encountered one negative reaction in college. I found people react in many different ways when they find you are an environmentalist.

Student 621 - Positive, I found that I could teach people what I had learned. I am not one to argue because I have a paranoia for losing an argument even when I know I am right. Teaching people builds an extra confidence.

Student 629 - I feel that the Environmental II program has had a positive effect on me. I am more aware of environmental issues happening around us. I have even pointed them out to some people.

Student 630 - I can only say that Environmental II has provided me with only positive effects. From dealing with adults and environmental officials in the Environmental II class, I am no longer afraid to "be" with them at their level and I demand a say in what

goes on in society. I have much more confidence in myself and in public speaking.

Question two. How did your participation in the program influence or effect your attitude about the environment?

Student 113 - I look at our environment with much more insight than I ever have before. When I see someone litter, it really bothers me since sometimes there may be nothing I can do about it.

Student 129 - It affected me a great deal. After two years of the class, I have something positive to base my decisions and attitudes on.

Student 130 - It definitely made me more aware of environmental concerns and problems.

Student 206 - It influenced my feelings towards littering and pollution the most. I can't stand going to McDonald's for lunch and having my friends dump out their bag of trash while I'm driving down the road; or having them throw their gum wrappers out. There is no need for that kind of pollution.

Student 230 - I have more respect for our environment, and understand why we have to save our natural wonders and resources.

Student 407 - I knew somewhat about the environment before, but after having taken the course, I became even more aware of the problems effecting the environment and how man plays a major role in the cause of the problems. I also learned that some people are not totally ignoring these problems, they are trying to help correct these and make others aware of the subject, cause, and possible solution.

Student 621 - It increased my awareness of pollution. It made me realize how close man and nature really are; how each is a part of each other.

Student 629 - Before the program, I wasn't really aware of what was happening to our environment. But now if I hear something on the news, I stop to listen and I often ask myself how the problem could be solved.

Student 630 - I can now say that my attitude towards nature and the environment has improved since taking the course. I am more aware of what goes on in the world and its effect on the environment.

Question three. How has the Environmental II program affected your participation in local environmental issues either in your community, college campus, where you work, or other?

Student 113 - I work at a fast food restaurant and all the time I see litter strewn everywhere.

Student 129 - It hasn't affected me at all yet, but I hope later on I will be able to participate in some kind of group or club.

Student 130 - Very little. My work and outside interests predominate.

Student 206 - The program hasn't really affected my participation in any environmental issues, not because I'm not interested, but because I haven't had a chance to get involved with working and going to college.

Student 230 - I haven't gotten involved in any issues, but now since I'm aware of things that are going on, I will be more likely to get involved with issues that are close to me.

Student 407 - I still receive National and International Wildlife and keeping up on the international and national problems. I also keep up with state problems of Maine and Massachusetts. Being a Forestry major, I went to some different meetings and learned about different issues. One was spruce budworm and another was the water pollution and air pollution caused by the large paper mills.

Student 621 - On campus, I ask friends to pick up beer cans or bottles after they have dumped them on the ground.

Student 629 - Because I have been away in the service, I have not had the time to participate in such issues. But now that I will be settling down, I hope to participate in issues and some environmental groups.

Student 630 - I am much more confident in asserting myself in college campus clubs and organizations. I am more likely to participate in environmental issues because of my background obtained through Environmental II.

Question four. What elements of the program do you feel were most valuable to you? Why?

Student 113 - I felt the most important part of the program was getting involved with the community events, such as town meetings.

I felt it was a great advantage learning this, not only because I became more knowledgeable, but because the community as well noticed my involvement. This was important to me.

Student 129 - Going on the various field trips, we were able to experience a great many more things than any other trips at Oakmont. Also in the teaching sessions, we were able to display our knowledge to others. Also, I realize how much preparation it takes if you want to teach. We were teaching adults, so it must be harder with kids, who can be very uncooperative at times.

Student 130 - The term paper projects, I enjoyed researching and doing.

Student 206 - I think the Florida trip was quite valuable because, it showed things in real life which we had learned about through the year, like ecosystems (everglades). Also, the teaching sessions were valuable because it was an experience teaching to adults. It seemed to make us, the students, feel more mature and more confident in getting involved in adult matters and issues.

Student 230 - I think the teaching sessions were the most valuable to me. I also think planning the farmer's building, and drawing maps was also very important. That should help me a lot because I'm going to have to do similar things next year in college (my major is recreation management).

Student 407 - I enjoyed working with others on a project for the community. It gave us experiences in the managing of land and materials. It showed us responsibility and how to adjust and deal with those who have a hard time accepting change.

Student 621 - Teaching and community involvement were the best programs--they showed, if you went after something, you could get it.

Student 629 - I feel that learning about our watershed was important because I learned how poisons and chemicals can affect it and eventually hurt us. I also feel that discussing environmental issues in class was important. You learn more about it if you discuss it than just if you were to read it.

Student 630 - I believe the teaching sessions were much more valuable to me than anything else. It gave me self-confidence, both in myself and in public speaking.

Question five. How did your participation in the Environmental II program and your contact with adults effect your confidence in confronting adults when you graduated?

Student 113 - I felt my confidence was strengthened. I learned that there are all types of people in this world; each one is unique and all have to be treated differently.

Student 129 - The teaching sessions helped me. I am usually shy when confronting adults, but I think I can handle myself a lot better than before--I am not just saying this either, I truly mean it.

Student 130 - Working with adults was probably the best thing about the course. I became alot more confident.

Student 206 - I'm not sure if it was our contact with adults or not, but ever since I graduated from high school, I have felt much older and its been much easier confronting adults and talking to them. It's such a big change going from high school to college. You are on your own so much more than before that you learn quickly to move up to an adult level.

Student 230 - It helped a lot. I have always been able to talk to adults easily, but that was as a child to an adult, now I'm better able to talk to adults, as an adult.

Student 407 - I found it hard during the program to confront and talk to adults about ideas because they thought of you as a child and it didn't boost confidence. But at the end you gained more confidence and by having more confidence in yourself they were not so skeptical. Now I have no shyness in expressing my ideas. I can talk to adults and do it with confidence, and they listen to what I say.

Student 621 - It didn't really effect me. I am not bothered by adults.

Student 629 - I feel that I was able to confront adults with the feeling that they would listen to us and not think of us as "kids" but instead young adults. The teaching sessions were really helpful in building up your confidence in regards to adults.

Student 630 - Yes. I can meet adults on their own level and be confident.

Question six. Do you feel your experience in the Environmental II program helped you in your after high school activities, either in college, work or elsewhere? How?

Student 113 - I am a member of student government at my college. The way the Environmental II program helped me was by helping me to work with a group of people, knowing how to work as a team.

Student 129 - Yes. I feel a lot better off and I am glad I took Environmental I and II. Students who didn't take these classes, no matter what their interests, are missing a great challenge and learning experience.

Student 130 - My senior year was terrible for me--personal (not school) related.

Student 206 - The Environmental II program gave me certain beliefs and ways of looking at the life around me, but I don't think it has helped me in any activities academically (work at school) or any of my activities at work.

Student 230 - Also it helped me to decide to become a recreation management major. It taught me to love the land so I want to work closely with the land.

Student 407 - Yes it has helped. I have already told you it has boosted my confidence. I now have better goals to look forward to. Responsibility is, in my opinion, a major factor. I learned to share and do my best because others depended on it--to do my best and get the most out of it.

Student 621 - Yes. In college Zoology, the biological and ecological knowledge that is taught often was previously taught in Environmental II.

Student 629 - Originally upon entering the Coast Guard I wanted to enter into the Marine Science Technician Field, but because there was such a long waiting list (two years), they cancelled the school. I feel I never would have selected this field, if it weren't for my participation in Environmental I and II.

Student 630 - It has helped a lot in my confidence. I have a stronger tendency to get involved with activities and I am not afraid to carryout responsibilities.

Question seven. In looking back at the adult teaching sessions, what did you gain from this experience?

Student 113 - Not only knowledge about the environment, but how to deal with people. It gave me a chance to express myself to others in an adult and orderly fashion.

Student 129 - More self-confidence and pride knowing that adults were interested in listening to a bunch of "kids". It's a good feeling to have grown-ups asking questions, it makes me feel very competent.

Student 130 - It was a good learning experience--built confidence.

It was a new experience to be the center of the attention of adults.

Student 206 - As I stated in question four, the adult teaching sessions were an experience that made me feel more mature and more confident when talking to adults about anything.

Student 230 - Besides learning about the watershed systems and hazardous wastes, I also learned how to talk in front of people, and to talk to adults, on their level.

Student 407 - That some people do care and are willing to be open-minded and learn of the problems and solutions. Many still are not willing to care or even listen. I learned that we still have a long ways to go before adults and others will accept our ideas and help in teaching society the answers to the problems.

Student 621 - Mostly confidence.

Student 629 - I really enjoyed the teaching sessions. I gained alot of confidence in dealing with people and speaking to them about controversial issues. I was disappointed with the number of people who attended. I feel that with an issue like "Hazardous Wastes" which is now popping up everywhere, more people should have shown up.

Student 630 - It was a fantastic experience. Being able to talk on an intelligent level on a subject adults had no knowledge of was a thrill. Working as a team was also important. A bond of teamwork developed through the sessions.

Question eight. How would you say participation in the Environmental II program has affected your feelings toward environmental issues and concerns now?

Student 113 - My feelings towards the environmental issues of today are much more positive than what they used to be. Before taking that program, I didn't really concern myself with the problems of the environment. Now I try to take an active part in trying to resolve issues of our environment.

Student 129 - It has greatly enhanced my feelings towards environmental concerns and issues. I always have been interested in the environment, and after two years of environmental science, it has brought out the concern and worry that I didn't really know I had.

Student 130 - My awareness has definitely carried over and my feelings toward the environment are still of respect and concern.

Student 206 - I think it has affected my feelings alot towards the environment. I can't stand littering. Many times I find myself wondering about how much longer things will go on before there is a deadly population explosion, or there is a nuclear war, or a whole area is wiped out from toxic chemicals, etc. There are so many harmful things going on around us which interfere with the ways of nature that something has to go wrong. The Environmental II program has opened my eyes to the serious problems around me--those which I never knew existed.

Student 230 - I'm more concerned with many issues now. Before nuclear power and hazardous waste meant almost nothing to me. Now I read more about the issues. I'm more concerned, and I'm more likely to get involved because of this concern. The course has also made me more confident in talking about environmental issues, so when I talk to someone about them, I can say what my position on that issue is, and why I have that issue.

Student 407 - I am more aware of problems and the issues than before. I have learned that to deal with a problem, you must know something of the issues. I have become more concerned with what happens to the environment. I care more for nature than before.

Student 621 - It stimulated a type of anti-governmental (the parts of the government that were anti-environment) feeling. Now, I am protective and pro-environment in typical issues due to Environmental II.

Student 630 - Awareness of the world and its effect on the environment.

Additional voluntary comments.

Student 129 - I feel in the future I will be more involved. Environmental Survival in the last two years has affected the way I think on issues, topics, and how life should be in general.

Student 230 - I feel there are many good and bad aspects of the Environmental II class. The bad is the excess of work. I believe at least one of our projects should have been cut. Otherwise, I thought it was a good class. The teaching sessions were especially good. I also think the Florida trip is really good. I wrote a paper on it for English this year, and it made me think about it a lot. It reminded me of all that I learned, saw, enjoyed during the trip. Also, it made me appreciate our natural wonders more and realized that we have to do more to protect areas like it.

Student 407 - The Environmental II program was very important to me. It gave me a very good outlook on life. I learned to strive

for what I want and to help in areas that concern me like environmental issues. I've learned to discipline myself so that things I start I will get finished by the deadline that I set for myself. Responsibility, getting things done and done right, and keeping myself going because of a trust with others relying on me to get it done. It was one of my more important and worthwhile classes. Environmental II meant alot to me. Before you can possibly try to get through to adults and change problems, you must start with the kids. Inform them on issues and problems. They are the adults of the future.

Student 630 - It was a totally enriching experience. True, the workload was a bit too much and the responsibilities were tough to handle, but I feel it has helped me to develop much more as a person and has helped to show me just how much I can do. The more I learned about the environment, how it works and affects our lives, the more I learned how to love it. I can honestly say that I feel that I have really benefited from the program. I feel that the program could never work unless it had an instructor like you. You motivate your students to do the work and develop kinship in the process. Without this essential aspect, the Environmental Survival II program would not have been successful.

Conclusion. In summarizing students' comments, three features are outstanding. First, most of the participants stressed a noticeable change in their overall self-confidence. Second, most emphasized the apparent development of an ease in working and communicating with adults. Third, many stressed that the teaching experiences with adults were crucial in developing self-confidence and provided for a smoother transition to adulthood. Additional comments indicated students gained a better understanding of the importance of individual responsibility in group undertakings. Also, continuously students re-emphasized their concern over environmental issues, their desire to become involved, and where possible, they had become involved. In general, as students had more contact with the world outside, their immediate communities, more interplay with adults, and met a diversity of personalities, they valued their

Environmental II experiences more. The Environmental II (Adolescent Apprenticeship), based on written student evaluations, provides a practical foundation through in-community political experiences for entrance into adulthood and environmental involvement.

Although the data analyzed is not statistically significant, it does reveal that the Adolescent Apprenticeship may have several positive effects on the development of specific affective characteristics in participating students. The follow-up evaluation supports students' development of positive self-concepts, internal locus of control, and actual commitment to environment as a result of the Adolescent Apprenticeship process.

C H A P T E R V I

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This study analyzed the effects of an action-oriented environmental education program, Adolescent Apprenticeship, on the development of selected characteristics in participating high school seniors. The overall purpose of this study was twofold involving a theoretical and a field research component:

(1) To document through an examination of selected theories and available literature, those cognitive, affective, and personality factors most likely to enhance students' motivation and commitment to act on environmental issues

(2) To determine through field-testing, the effects of the Adolescent Apprenticeship process on the development of self-concept, locus of control, actual environmental commitment, and principled moral reasoning in high school seniors at Oakmont Regional High School in South Ashburnham, Massachusetts.

Summary of the Study

Chapter I suggested that many United States environmental education programs support the goal proposed by the Belgrade Charter. The Charter urges the need for educators to develop citizens who are knowledgeable regarding environmental problems, have the critical thinking skills and attitudes necessary to comprehend and analyze environmental issues, and are internally motivated and committed to act for the environment.

Therefore, Chapter I concluded that the goal of environmental education involves cognitive, affective, and participatory components.

Chapter I reports that, according to trends within American public secondary schools, many educators have limited their focus primarily to the cognitive component. Thus, if the development of involved citizens is a valid goal of environmental education, then there is need to provide practitioners with theories for developing all the components.

Therefore, Chapter I identified five objectives of this study: to analyze specific educational theories, to review citizen participation research, to examine adolescent characteristics, to review existing experiential environmental education programs, and to determine the effects of the Apprenticeship process on students.

Chapter II discussed the meaning of citizen participation and concluded that the development of environmental citizens was dependent on the encouragement of a specific citizen type. According to Sigel and Hoskin, such a citizen type, rational activist, is developed affectively and cognitively regarding both the political and natural system and is motivated to participate.

Through an examination of Bloom and Piaget, it was concluded that students need cognitive development that reflects proficiency in the intellectual skills and abilities of comprehension, application, analysis, synthesis, and evaluation. In addition, students should have evolved to at least Piaget's Concrete Operational level and, ideally, to a Formal Operational level.

The affective characteristics necessary for environmental citizen participation included Krathwohl's upper levels of valuing, organization,

and characterization. Individuals need to have developed an internalized ethical framework characterized by Krathwohl's upper affective level and that incorporates principled morality and upper cognitive development. A study of the cognitive moral developmental theories proposed by Dewey, Piaget, and Kohlberg suggested that participating environmental citizens need to demonstrate a morality that reflects Dewey's Autonomy level, Piaget's Autonomous stage (equity phase), and/or Kohlberg's Post Conventional level.

However, the morality stages presented by Dewey, Piaget, and Kohlberg were limited to a community-concept of human species. Thus, individuals may have difficulty addressing values conflicts between immediate human gain and long-term environmental effects. Therefore, the development of environmental citizen participation also requires the enhancement of an individual's environmental morality.

The pyramid scheme of Roderick Nash and the works of Leopold and Krutch were explored, and three broad types of environmental morality were suggested: Pioneerism, Conservationism, and Environmentalism. Each type of environmental morality is characterized by a particular cognitive perspective of the human relationship to the environment. Each morality reflects specific attitudes and values regarding the environment. Pioneerism and Conservationism, in general, reflect a concern with human morality, whereas Environmentalism reflects a concern with ecological morality.

The development of specific cognitive and affective characteristics are not sufficient by themselves for the enhancement of citizen participation in environmental issues. Chapter III, through an examination of

recent research, identified several personality factors necessary for the development of students' participation in environmental issues. Those personality factors are: a positive self-concept, an internal locus of control, a high political efficacy, and reasoning reflecting principled morality.

Chapter III, after exploring research, concluded that adolescence was an ideal time to begin the development of those cognitive, affective, and personality factors necessary for citizen participation. Affectively, most adolescents were beyond Kohlberg's Pre-Conventional human morality level. The development of human principled morality (Post-Conventional level) and the development of an environmental morality of Conservationism or Environmentalism during the adolescent period were found to be valid possibilities. The adolescent's self-concept and locus of control are easily influenced by appropriate social experiences, and his/her political thought is evolving due to his/her increasing cognitive capacities.

Chapter III also identified several environmental education programs designed to stimulate adolescents' positive self-concepts, internal locus of control, political efficacy, and principled morality. Chapter III revealed that action-oriented programs involving students in local community projects were more effective than awareness-oriented programs in stimulating development of citizen participation characteristics.

The Adolescent Apprenticeship process, designed and taught by this researcher incorporated the cognitive theories of Bloom and Piaget, the affective theories of Krathwohl, Dewey, Piaget, and Kohlberg, and the

environmental morality concepts of Nash, Leopold, and Krutch. It synthesized several of the successful experiential approaches in developing adolescents' self-concepts, internal locus of control, and principled morality. Chapter III described the Adolescent Apprenticeship process as a model suitable for use in traditional schools.

Chapter IV presented this study's research methodology. The experimental group comprised of students participating in the Apprenticeship, 1980-1981 and a control group were pretested and posttested for a specific group of variables. The results of the field study were compared and analyzed. The data was presented and discussed in Chapter V. Conclusions concerning this data and teacher observations are presented in the following sections. A discussion of the implications of this study and recommendations for future study follows.

Summary of the Research Findings

Total self-concept was measured by the Tennessee Self-Concept Scale; locus of control by the Rotter Internal-External Scale; actual commitment to environment by a subscale of the Ecological Attitude Inventory; principled morality (human issues) by the Defining Issues Test; and principled morality (environmental issues) by the Environmental Issues Test.

Research question one. Do students, after participating in an Adolescent Apprenticeship process (Environmental II) at Oakmont Regional High School, show an increase in their total self-concept, internal locus of control, actual commitment to the environment, and principled moral reasoning on human and environmental issues?

The data for question one were analyzed using descriptive statistics, comparison of raw data, analysis of students' written evaluations of the Environmental II program, and the use of significance tests. The findings for each variable in question one are discussed separately.

Self-concept. The experimental group when compared to its pretest data had a higher posttest mean, maintained a higher posttest mode score, and showed less variability in its scores. There was no significant difference between their pretest and posttest scores.

Students in the 1980-1981 Environmental II program reported an increase in their self-confidence as a result of their participation in the program. The evaluations unanimously supported this increase. However, a correlated samples t test (two-tailed) found no significant differences (.05 level) between the pretest and posttest scores of the experimental group.

Locus of control. The experimental group had a higher posttest I-E score. However, the increase was slight and participants in general maintained their internal orientation. Regarding student evaluations of the Environmental II program, students were asked to comment on how the program affected their relationship with adults. It was assumed by the researcher that externally-oriented adolescents would feel more threatened, unequal, and insecure when in the presence of adults, whereas an internally-oriented adolescent would feel the opposite. The evaluation forms indicated most participating students felt the Environmental II program had improved their ability to relate to adults. Most expressed feelings of equality with adults and a decrease in their feelings of adult intimidation.

Students on the whole expressed feelings and characteristics typical of individuals migrating toward an internal orientation. In comparing the experimental pretest and posttest I-E scores, no significant difference was found between the scores.

Actual commitment to environment. The experimental group had a higher posttest than pretest AC score. In addition, their pretest score was higher than that observed in the control group. The higher pretest mean in the experimental group was expected since enrollment in the Environmental II was dependent on students volunteering. The experimental group was more committed in the beginning than the control group, yet the descriptive data suggested the experimental group was able, even after experiencing realistic problems, to maintain their level of commitment.

Data indicated that the experimental group's posttest scores were positively skewed, suggesting several individuals may have become more highly committed after participation in the Adolescent Apprenticeship process. However, data also reveal some individuals became less committed.

Regarding student evaluations, many did not indicate any outstanding commitment to the environment in the form of actual activism. However, students did stress a more serious concern for the environment. Several indicated they had joined environmental organizations and were giving their attention to environmental problems. Many expressed feelings of guilt in not becoming involved and indicated they were intending to do so in the near future.

Nearly all respondents of both the 1980-1981 experimental group and

the 1979-1980 Environmental II class who were enrolled in environmental programs were still in those majors. Several indicated they had taken environmental course electives or were minoring in an environmental field. Actual commitment to the environment was reflected in these behaviors. A comparison of the experimental group's pretest and posttest scores did not demonstrate a significant increase.

Principled morality (DIT - human issues). The experimental group had a higher mean score for principled morality on the posttest than on the pretest. A comparison of individual pretest and posttest selections showed that 90 percent had increased in their preference for principled morality and 10 percent had maintained their preference for conventional morality. None of the student evaluations indicated development of individual principled morality.

In comparing the DIT pretest and posttest scores of the experimental group, it was found that a significant difference (.05 level) existed. The change was in a positive direction. However, an additional statistical analysis, using the control group's pretest and posttest principled morality mean scores on the Defining Issues Test, revealed that the control group also showed a significant increase in post mean scores at the .05 level.

Principled morality (EIT - environmental issues). The experimental group showed a slight decrease of .8 points on the EIT posttest mean score. In comparing individual pretest and posttest scores, the majority of experimental members decreased in principled morality regarding environmental issues and increased in their use of conventional morality.

On the Environmental Issues Test, 40 percent of the experimental

group preferred the use of principled moral reasoning when confronting moral dilemmas that involved environmental issues. In the group, 40 percent preferred conventional moral reasoning and 20 percent indicated they were in a transitional stage between conventional and principled morality. Referring to the DIT preferences, more individuals in the experimental group preferred principled morality on environmental issues than on human issues.

None of the student evaluations indicated a change in principled morality regarding environmental issues as due to the Adolescent Apprenticeship process. A comparison of the pretest and posttest mean scores of the experimental group did not reveal a significant difference.

Research question two. Do students who have participated in an Adolescent Apprenticeship process (Environmental II) at Oakmont Regional High School show an increase in their total self-concept, internal locus of control, actual commitment to the environment, and principled moral reasoning when compared with students who have not participated in the Environmental II program?

The data for question two were analyzed using descriptive statistics, comparison of mean gain scores, and the use of significance tests.

Self-concept. The experimental group's scores showed more pretest variability and less posttest variability than the control group's scores. More experimental group members increased in their posttest scores than in the control group. An independent samples t test (two-tailed) revealed that there was no significant difference (.05 level)

between the experimental group's and the control group's posttest means. Also no significant difference existed between the experimental and control group's mean gain scores.

Locus of control. In comparing the posttest I-E scores, it was observed that the experimental group did not show positive skewedness as was observed in the control group. More individuals in the experimental group seemed to cluster near the mean. More members of the experimental group showed a lowering of their posttest I-E scores, suggesting more internally-oriented individuals.

A comparison of the posttest mean and gain scores indicated there was no significant difference between the groups.

Actual commitment to environment. A comparison of individual posttest scores revealed that more individuals in the experimental group increased in actual commitment to environment than in the control group. There was no significant difference between the posttest mean scores of the control and experimental groups. Although the experimental group individuals had a higher posttest mean gain score than the control group, an independent samples t test revealed that there was no significant difference (.05 level) between the groups.

Principled morality (DIT - human issues). A comparison between the experimental group's individual pre and posttest DIT principled morality scores indicated there was a greater individual point gain in the experimental group posttests than in the control group. No significant difference existed between the control and experimental groups posttest mean scores.

The higher posttest mean gain for the experimental group, when

compared to the control group's posttest mean gain, showed a significant difference, utilizing an independent sample t test at a .05 level. However, tests for homogeneity of variability between the two groups was significant. Therefore, no definite conclusions should be made from these tests unless additional statistical tools are employed.

Principled morality (EIT - environmental issues). A comparison of the EIT posttest mean scores indicated the control group increased in principled morality while the experimental group showed a .8 point decrease. An independent samples t test (two-tailed) indicated there was no significant difference between the posttest mean scores or gain scores of the control and experimental groups.

General conclusions of the research. On the basis of the data presented in Chapter V and the student evaluation forms, the following conclusions were made:

(1) No significant changes between the pretest and posttest mean scores were observed to have occurred in the experimental group for four of the five variables tested

(2) A significant difference between the pretest and posttest mean scores did occur in the experimental group for principled morality on the DIT (human issues)

(3) There was no significant difference between the experimental group's and the control group's posttest mean scores on the five variables examined

(4) Individuals in the experimental group did show changes in their pretest and posttest variable scores. Several individuals showed an

increase in their self-concept, actual commitment to environment, principled moral reasoning (human issues), a shift towards a more conventional morality regarding environmental issues, and a more internal locus of control

(5) Written evaluations, submitted by the experimental group, support the hypothesis that individual variable changes (self-concept, internal locus of control, and actual commitment to environment) were due to the student's participation in the Environmental II program (Adolescent Apprenticeship process)

(6) The written evaluations of the experimental group indicated that the Adolescent Apprenticeship process was effective in increasing self-concept, self-confidence, and improving the individual's ability to communicate with adults

(7) The most valuable experience in the program was identified by the student evaluations as the adolescent-adult teaching sessions.

Interpretation of the Research Findings

The variance in group sample sizes limited the validity of the significance tests. In addition, several of the testing instruments had reliabilities below .95. Research procedures suggested that test reliabilities below .95, when used in small group samples, enhanced variance and increased the possibility of drawing false conclusions.¹

In examining the data for evidence of a change in the experimental group, it was noted by the researcher that individual scores for the pretests and posttests showed indications of possible influence by the Adolescent Apprenticeship process. Analysis of participating individuals

and their written evaluations of experiences in the Environmental II program further supported these findings. The following sections provide specific interpretations for the research findings.

Self-concept. Experimental group individuals may have been affected by their participation in the Apprenticeship process. Several displayed stableness in their self-concept as shown by their posttest scores. However, the descriptive data were not outstanding for total self-concept.

The Adolescent Apprenticeship process may have influenced a larger point gain in some participating individuals' scores, suggesting a positive effect on specific individuals. However, the statistical evidence did not support that observed changes in the experimental group's mean gain scores were due to their participation in the Apprenticeship process. Other factors, including chance, may have been responsible for the observed outcomes.

Locus of control. Data suggested that the Adolescent Apprenticeship may have influenced individual scores of the experimental group towards internal control. However, this cannot be statistically verified in this study, although written student evaluations supported this claim.

Actual commitment to environment. The Adolescent Apprenticeship process may have influenced some individuals' posttest scores, while it reinforced the commitment level of others. The researcher, in her initial expectations, had hoped for a larger and more dramatic increase in the experimental group's individual gain scores. However, recalling observations made by this researcher, involvement in community environmental

issues, if not properly designed and controlled, may produce serious negative effects on participating individuals. The data suggested that the Adolescent Apprenticeship process may have stimulated negativeness in some cases. A small percentage of experimental group members decreased in actual commitment when compared to the control group. However, those who decreased in the experimental group did so by only a few points.

Student evaluations indicated that their concern for the environment and their reading regarding environmental issues increased due to the Apprenticeship process. Students, throughout the process, seemed to develop those characteristics typical of Krathwohl's upper affective levels--forming a conscience, internalizing values. Given a few years, when the students are on their own and are free to choose their own life style, it will be interesting to determine if any have joined environmental organizations and/or have become actively involved.

Principled morality (DIT - human issues). The Adolescent Apprenticeship process may have had a positive and normalizing effect on individuals' principled reasoning regarding human issues. The data indicated that a shift occurred towards principled morality, and certainly raises concern as to how much this shift was influenced by the Apprenticeship process.

Principled morality (EIT - environmental issues). The higher experimental pretest mean when compared to the posttest mean was not unexpected. Students who voluntarily enrolled in an action-oriented Environmental II program were expected to favor those choices that supported the environment. Regardless, the experimental group when compared to the

control group maintained its higher mean scores on the posttest, suggesting the group's participation in an Apprenticeship process did not negatively influence their mean moral reasoning scores.

Because the experimental group volunteered for participation in the Environmental II program, they most likely had higher pretest ideals and concerns for the environment. A logical reason for the observed decrease in the experimental group's post principled morality on environmental issues might be based on theoretical information presented in Chapter II. Perhaps the experimental group had an unrealistic view on how to solve dilemmas regarding environmental issues. Therefore, their experience in community environmental problems brought their environmental perspectives into focus with reality.

The increase in the control group's post principled morality may not be unusual either. Because they lacked experience in real environmental decision making, they drew their perspective from idealistic readings and other secondary sources.

The Apprenticeship process seemed to have brought students' environmental perspectives into reality with their human perspectives. Also, the environmental ethics, reflected by the support of conventional morality in environmental issues, are more on a Conservationist level rather than an Environmentalist level. The development of authentic Environmentalists is impossible without continuous exposure to environmental problems in realistic situations, individual reflection, and the reinforcement of environmental values that stimulate the development of an ecological conscience.

Teacher Observations

Conclusions. Throughout the year, major changes were observed to have occurred in students participating in the Adolescent Apprenticeship process. Students indicated in their evaluations that personal changes occurred. Although the paper instruments used in this study were limited in their ability to record a diversity of individual behavior changes, the researcher noticed individual changes more specifically within those cognitive and affective areas defined by Bloom and Krathwohl.

Observations indicated that the Adolescent Apprenticeship process was successful in stimulating major cognitive and affective changes within participating students. Through the designing of adult environmental lessons, students' demonstrated their proficiency in the intellectual skills and abilities of application, analysis, synthesis, and evaluation. Students prepared lesson plans, organized ecological principles, developed persuasive techniques, organized ideas into a major plan, and translated several abstract concepts into concrete examples.

Affectively, observations indicated many of the students progressed to a level of valuing and some into the organization level. Through debates and situations where students were required to present their reasoning, basic ethical frameworks were observed to be forming.

Discussion. Although the research conclusions and additional findings were not statistically significant, the data suggested positive student changes may have been enhanced by participation in an Adolescent Apprenticeship process.

Throughout the theoretical phase of this research, it was suggested that development of those characteristics identified as necessary for participation in environmental issues was dependent on experiential type programs. When reviewing the student activities in the Environmental II program for 1980-1981 at Oakmont Regional High School and comparing them with the 1979-1980 program, it was found that a major element was limited. The element was the amount of time the students actually spent in educating and working with adults on local environmental issues.

Students, during 1980-1981, had only three brief teaching encounters with adults. The first encounter in Westminster placed students in a role as teachers and adults as students for about one hour. In the second encounter, students assisted the staff of the Nashua River Watershed Association in the presentation of hazardous waste information. The third experience in Shirley, Massachusetts involved the students in a teaching situation with a small group of adults.

In the previous year in Ashburnham, 1979-1980, where the greatest student changes were observed to have occurred, the Environmental II students were involved in three sessions each running three hours. Students, at all times, were the teachers and were totally responsible for the lessons, all presentations, and visual aids. It was the students' verbal feedback regarding their changes that prompted this pilot study involving the 1980-1981 program.

The researcher believes the development of the characteristics necessary for citizen participation and those variables tested in this study are dependent on students' exposure to specific adult situations

and roles that demand student responsibility. Thus, it can be hypothesized from this study that a critical element of citizen participation development is dependent on student involvement in adult teaching sessions and their work with adults.

It is believed that the limited exposure of the 1980-1981 students with adult teaching is one possible reason why the pretest and posttest mean variable scores were not significantly different. The researcher's hypothesis is further supported when the 1980-1981 students identified the teaching experience as most valuable and wished they had had more such experiences.

An additional factor that may have reduced the effectiveness of the experiential element of the program involved the local conservation commission and its overall attitude and approach toward the students. Because the Oakmont Regional High School encompasses two towns, politically, it seemed wiser to share the student resources with both communities, alternating each year. The 1979-1980 Environmental II students, who experienced the greatest overall change, were apprenticed to the Ashburnham Conservation Commission. The 1980-1981 students (experimental group) were apprenticed to the Westminster Conservation Commission. The Ashburnham Conservation Commission was freer and more accepting of the students. They shared their meetings with student representatives, asking for student input and treated them as young adults. They also were anxious to initiate student suggested projects and strategies. They employed a more democratic atmosphere with the students.

An example illustrates this cooperative atmosphere. The Ashburnham

Conservation Commission had, on several occasions, attempted to obtain approval of a soil survey at the annual town meeting and always failed. The students expressed a desire to attempt the article again and promised to handle all community education efforts on the topic. The commission, although somewhat hesitant, agreed to let the students try. It was this decision that placed the major responsibility of passage or failure in the hands of the 1979-1980 students. Although they had some difficult experiences, the students were able to develop a knowledgeable group of voters through the education sessions and obtained passage of the soil survey article with an appropriation of eight thousand dollars. The success of the experiential element of the 1979-1980 Environmental II program was most definitely influenced by the faith that the Ashburnham Conservation Commission had in the students. Their attitude motivated the students and stimulated a true apprenticeship situation.

In 1981-1982, the Environmental II students will once again be working with the Ashburnham Conservation Commission. Because of the data obtained in this study, students will be involved in more educational experiences through several adult teaching sessions. It is hoped the combined positive attitude of the Ashburnham Conservation Commission and the increased experiential opportunities will provide some revealing data.

Implications of the Study

This study has implications for secondary and environmental education. A discussion of these implications follows:

Theoretical implications. Chapters II and III identified an environmental citizen as possessing abstract reasoning skills, conventional or principled morality, and an environmental ethic of Conservationism or Environmentalism. An examination of specific educational theory suggested that the role of secondary public schools was crucial in the development of environmental citizens who have participation characteristics.

It is absurd to expect young people, never exposed to the American democratic system, to eagerly become involved in or concerned about community decision making upon their graduation from high school. To be a participating citizen in the American democratic structure, the development of specific characteristics and skills, and the individual's membership in the community need to be initiated during the high school years.

Research reviewed previously revealed passive book learning is not sufficient for the development of active American citizens. An environmental education program without an action component handicaps and frustrates its participants. Students need to be placed in situations where they are expected to perform as adults, are given adult responsibilities, and where they can reap the accompanying positive and/or negative consequences of their actions. The Adolescent Apprenticeship process, theoretically, when applied to environmental education should provide adolescents with opportunities to be young adults, to assist local conservation commissions, and to improve voter environmental education.

Based on the theoretical findings of this research, secondary education should be fostering specific characteristics in students necessary

for developing citizen participation. The combining of environmental education and citizen education through an Adolescent Apprenticeship process is a possible approach.

Research implications. The field research suggested that individual changes occurred in subjects participating in the Adolescent Apprenticeship process at Oakmont Regional High School. It implied that the program's experiential element of adolescents teaching adults about environmental concerns within the community should be broadened in order to enhance these changes. In addition, the Apprenticeship process was influenced by the attitudes, actions, and general behaviors of the political group involved in the program. It implied future programs should carefully weigh the attitudes of the involved political group when designing a final program format. Experiential characteristics of the Adolescent Apprenticeship process were most vital in stimulating the development of participation characteristics in students. Therefore, environmental education should benefit from student involvement in local community problems and issues.

Recommendations for Future Studies

The field study because of its limited sample and exploratory nature should be considered a pilot study designed principally to identify testing instruments and to permit modification of the 1981-1982 Environmental II program at Oakmont Regional. From this research, three major recommendations for future study emerged: those pertaining directly to the 1981-1982 Environmental II program, those pertaining to

secondary environmental education, and those that suggested long-range future study.

Environmental II program 1981-1982. After examining the data and student follow-up evaluations obtained from the 1980-1981 study, and recalling the experiences in the 1979-1980 Environmental II, the following recommendations were made for the 1981-1982 Environmental II program at Oakmont:

(1) Students should be exposed to a longer adult teaching program either by increasing the number of sessions over a three-week period and/or by contacting more adult organizations in the community

(2) Students need to maintain contact with major ongoing environmental issues. Students in the 1980-1981 program expressed concern over their lack of detailed knowledge regarding acid rains, nuclear power, and current political environmental issues. Often the amount of time involved with local issues prevented opportunities to become aware of regional and national environmental concerns. A possible solution may be to provide students with the option of debating key issues or participating in monthly student-centered seminar discussions

(3) There is a critical need to review lawmaking procedures and make actual contacts with governmental representatives in incorporating these with current environmental issues. During the Environmental II 1980-1981, it was found that students had almost no knowledge of actual governmental workings. Although all had taken United States history, few actually could understand the lawmaking procedures at either the national, state, or local levels. How to contact representatives,

legislators, or senators was totally alien to them. A possible suggestion might be to follow and become involved with current issues, such as the Clean Air Act or Massachusetts Bottle Bill

(4) Very few students understood the difference between argumentation and expository writing. Many of the students could not read or be critical of arguments pertaining to environmental issues. Any hope of developing environmental citizens who will be effective in decision making requires that they be able to write logically and construct arguments based on valid reasoning and be able to recognize invalid reasoning. Students need strengthening in their critical thinking skills

(5) Although the students had a knowledge of environmental ethics (Pioneerism, Conservationism, Environmentalism), they were unable to apply environmental ethics in developing arguments to enhance support for one position over another. Students need practice in writing and presenting arguments, utilizing specific ethical positions

(6) The 1980-1981 students showed a dependence on the teacher in making decisions. A solution to this dilemma, and an opportunity to reduce adult constraint in the 1981-1982 program is to instruct students in Robert's Rules of Order. Once learned, it is proposed that decisions pertaining to the program should be made using this procedure. An additional element should be added to help students become familiar with town meeting procedures. A possible suggestion would be to have students post warrants with articles and conduct meetings modeled after town meeting format. Such an approach should theoretically enhance self-concept, reduce shyness, build personal efficacy, and give students an opportunity to use their argumentative skills in an atmosphere of

controlled democracy

(7) Additional data that would be of value in future Environmental II programs is to determine students' level of cognitive reasoning upon entrance into the program and determine the post program's effects on cognitive development. If a necessary aspect of principled morality is Formal reasoning, it seems valid to measure the influence of the program in developing Formal reasoning

(8) An area identified as critical to the actual display of participatory behaviors in environmental issues involves a person's political and personal efficacy. Any future programs should pretest and posttest students for political efficacy. It is assumed, because the Apprenticeship is politically-oriented, that the posttest results should show signs of significant development, positive or negative, in political efficacy

(9) The 1980-1981 experimental group was noticeably egocentric, a factor that seemed to remain constant throughout the year. This researcher believes that the egocentricity of these students was a limiting factor in the development of their locus of control and principled morality. Greater efforts need to be taken in future classes to reduce this characteristic. The best method to be used is undecided at this writing. However, the problem is serious and can retard developmental growth. A possible addition to the program might be to have the class continuously participate in some group survival exercises or trust experiences, either at the school or on an extended day or overnight field trip.

Secondary environmental education.

(1) Environmental education at the secondary level needs to give serious consideration to incorporating citizen education into its curricula. Such incorporation can be carried out within the environmental education program or combined with a social studies class

(2) Action-oriented environmental education programs need to begin monitoring their participants for changes in self-concept, locus of control, cognitive reasoning, principled morality, environmental morality, and political and personal efficacy

(3) There is a need to develop experiential curricula that can mesh comfortably with traditional school ideas and schedules. The idea that involvement programs must incorporate extensive funding and large staffs needs to be eradicated

(4) Educational programs need to determine the relationship, if any, between locus of control and principled morality

(5) Research needs to be conducted which more clearly identifies those experiences that enhance internal locus of control development, principled morality, and positive self-concept

(6) There is a need to determine the relationship between political activity and an individual's internal locus of control

(7) Educators need to begin identifying the positive community effects of promoting an Adolescent Apprenticeship in a variety of curricula areas.

Additional areas of study.

(1) Efforts should be made to evaluate the effects of the Environmental II (Adolescent Apprenticeship) at Oakmont Regional High School

on the participating communities

(2) There is a need to determine the effect of the Apprenticeship on participating students' general educational attitudes

(3) There is a need to conduct long-term evaluations on the effects of the Apprenticeship on graduates of the Environmental II program regarding their participation in environmental issues or membership in activists' groups.

Epilogue

Experiences at Oakmont Regional High School continue to revitalize this researcher's hope in American youth. Through an inter-meshing of major educational theories and environmental concepts, a recognition of adolescent potentials, and the acknowledgment of local governmental and community needs, the Adolescent Apprenticeship process is valuable for developing environmental citizen participation characteristics.

It is hoped that this study has stimulated readers to view adolescents as precious resources, capable of providing valuable community assistance in exchange for experience and opportunities for personal development. American education has for too long constrained the adolescent, rather than turning them on to and making them a part of the democratic mainstream. Perhaps environmental education through the application of an Adolescent Apprenticeship-type process can turn the trend and tap the immense treasures of the high school student.

FOOTNOTES

¹Walter R. Borg and Meredith Damien Gall, Educational Research An Introduction (New York: Longman, Inc., 1979), p. 197.

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APPENDIX I

Massachusetts General Law 40/8C

15.01 CONSERVATION COMMISSION ACT — G. L. CH. 40, §8C

A city or a town which accepts this section may establish a conservation commission, hereinafter called the commission, for the promotion and development of the natural resources and for the protection of watershed resources of said city or town. Such commission shall conduct researches into its local land areas and shall seek to coordinate the activities of unofficial bodies organized for similar purposes, and may advertise, prepare, print and distribute books, maps, charts, plans and pamphlets which in its judgment it deems necessary for its work. Among such plans may be a conservation and passive outdoor recreation plan which shall be, as far as possible, consistent with the town master plan and with any regional plans relating to the area. The commission may, from time to time, amend such plan. Such plan shall show open areas including marsh land, swamps and other wetlands, and shall show which areas are subject to restrictions or wetland zoning provisions and any other matters which may be shown on a plat index under section thirty-three of chapter one hundred and eighty-four. Acquisitions of interests in land under this section and other municipal open lands shall be shown thereon as well as lands owned by other entities kept open through any legal requirement. Such plan shall show other areas which public necessity requires to be retained for conservation and passive recreation use. It shall keep accurate records of its meetings and actions and shall file an annual report which shall be printed in the case of towns in the annual town report. The commission may appoint a director, clerks, consultants and other employees, and may contract for materials and services within available funds insofar as the same are not supplied by other departments. The commission shall consist of not less than three nor more than seven members. In cities the members shall be appointed by the mayor, subject to the provisions of the city charter, except that in cities having or operating under a Plan D or Plan E form of city charter, said appointments shall be by the city manager, subject to the provisions of the charter, and in towns they shall be appointed by the selectmen, excepting towns having a manager form of government, in which towns appointments shall be made by the town manager, subject to the approval of the selectmen. When a commission is first established, the terms of the members shall be for one, two or three years, and

so arranged that the terms of approximately one third of the members will expire each year, and their successors shall be appointed for terms of three years each. Any member of a commission so appointed may, after a public hearing, if requested, be removed for cause by the appointing authority. A vacancy occurring otherwise than by expiration of a term shall in a city or town be filled by the unexpired term in the same manner as an original appointment. Said commission may receive gifts, bequests or devises of personal property or interests in real property of the kinds mentioned below in the name of the city or town, subject to the approval of the city council in a city or of the selectmen in a town. It may purchase interests in such land with sums available to it, if insufficient funds are available or other reasons so require, a city council or a town meeting may raise or transfer funds so that the commission may acquire in the name of the city or town by option, purchase, lease or otherwise the fee in such land or water rights, conservation restrictions, easements or other contractual rights including conveyances on conditions or with limitations or reversions, as may be necessary to acquire, maintain, improve, protect, limit the future use of or otherwise conserve and properly utilize open spaces in land and water areas within its city or town, and it shall manage and control the same. For the purposes of this section a city or town may, upon the written request of the commission, take by eminent domain under chapter seventy-nine, the fee or any lesser interest in any land or waters located in such city or town, provided such taking has first been approved by a two-thirds vote of the city council or a two-thirds vote of an annual or special town meeting, which land and waters shall thereupon be under the jurisdiction and control of the commission. Upon a like vote, a city or town may expend moneys in the fund, if any, established under the provisions of clause (5) of section five for the purpose of paying, in whole or in part, any damages for which such city or town may be liable by reason of any such taking. The commission may adopt rules and regulations governing the use of land and waters under its control, and prescribe penalties, not exceeding a fine of one hundred dollars, for any violation thereof. No action taken under this section shall affect the powers and duties of the state reclamation board or any mosquito control or other project operating under or authorized by chapter two hundred and fifty-two, or restrict any established public access. Lands used for farming or agriculture, as defined in section one A of chapter one hundred and twenty-eight, shall not be taken by eminent domain under the authority of this section.

SOURCE: Alexandra D. Dawson, J.D., and Norton H. Nickerson, Ph.D., Environmental Handbook for Conservation Commissioners, Fourth Ed. (Medford, Massachusetts: Massachusetts Association of Conservation Commissions, Lincoln Filene Center, Tufts University, 1978), p. 57.

APPENDIX 2
Outline Environmental I Program

Environmental Survival Program
Environmental I

(Awareness-oriented)

Students are presented a diversity of knowledge in order to develop an awareness of the environmental crisis on the local, regional, state and national level. They are encouraged to develop an ecological perspective, ecological thinking, and an environmental ethic based on an examination of the human historical relationship with nature.

Students are given opportunities to further develop their understanding of key environmental issues: water pollution, air pollution, land-use, population problems, and natural resources through a variety of experiences with films, speakers, lectures, readings, labs, and field trips.

Students are encouraged to develop skills that will enable them to participate in community environmental issues.

Course Topics

Basic Ecology (Biotic components, Abiotic components, Ecosystem dynamics, and Interrelationships)

Human Estrangement from Nature (Human/nature relationship, Naturalists, Environmental ethics, Evolution theories, Biological relationships)

Environmental Crisis (Causes, Population, Water pollution, Air pollution, Land pollution, Natural resources, Environmental law, Environmental quality)

Environmental Action (Environmental education and Environmental issues)

APPENDIX 3

Accomplishments of the Environmental II Program

1979-1981

Environmental II Accomplishments
(A Summary)

1977-1978: Shirley, Massachusetts

Group: League of Women Voters
Planning Board, Conservation
Commission, and Shirley Village
Water District

Focus: Watershed, Wetlands, Flood Plains,
Water Supply

Results: Slide/tape show on Shirley's
watershed, Booklet on value of
wetlands, Neighborhood meetings,
Presented zoning proposal for
flood plain/wetland protection,
Town meeting approved Ground
Water Flow Study.

1978-1979: Westminister, Massachusetts

Group: Conservation Commission

Focus: Watershed, Water Supply, Wetlands

Results: Slide/tape show on Westminister's
wetlands, Booklet on the value of
wetlands, Composite maps on the
local watershed, Education sessions,
Assessor's ownership map of wetlands.

1979-1980: Ashburnham, Massachusetts

Group: Conservation Commission

Focus: Watershed, Water Supply, Sewage
problems

Results: Slide/tape show of Ashburnham's
watershed, Watershed maps, Soil
Survey approved, Soil Survey pro/
con display, Water Supply handout.

1980-1981: Westminister, Massachusetts

Group: Conservation Commission

Focus: Hazardous Wastes and Danger
to Water Supply

Results: Education sessions for citizens,
Conservation Plan for Farmer's
Building property, Nature Trail
Construction.

APPENDIX 4

Selection Criteria List/Faculty Evaluation Sheet
for the Environmental II

Environmental II Selection Criteria

Selection for the Environmental II program will be based on three major areas:

- (1) Ten to twenty teachers will be asked to evaluate each candidate on specific criteria (attached). Each applicant will select five of the teachers.
- (2) Each student applicant will be expected to complete a general questionnaire and tell why he/she would like to be in the Environmental II program.
- (3) Each student applicant will be evaluated by Miss Griffin based on his/her overall performance in the Environmental I program.

Specific criteria for selection

- (1) Students must have a class average of C or better in the Environmental I program.
- (2) Students must complete a year project and demonstrate quality work during the Environmental I program.
- (3) Students must have demonstrated team cooperation during class assignments and while on field trips in the Environmental I program.
- (4) Students should demonstrate a positive attitude toward environmental issues and concerns.
- (5) Students should demonstrate an interest in the environment.
- (6) Students must have shown participation in the Environmental I class.
- (7) Students should have good attendance in school and on Environmental I field trips.
- (8) Students should show evidence of coming to class on time, and being able to meet assignment deadlines.
- (9) Students should submit Environmental I homework on time.

- (10) Students should demonstrate respect for others in the Environmental I class and outside.
- (11) Students should be able to follow directions, and not hesitate to ask questions if confused.
- (12) Students should demonstrate respect for authority.
- (13) Students should have a positive attitude regarding individual criticism.
- (14) Students should obtain a positive evaluation from Miss Griffin and the teachers participating in the evaluation process.
- (15) Students should demonstrate maturity.
- (16) Students must submit a completed questionnaire regarding the Environmental II program.
- (17) Students should demonstrate a willingness to undertake responsibility.
- (18) Students should identify their skills and/or talents that would enhance the Environmental II program and its goals.
- (19) Students should demonstrate basic altruistic behaviors during their participation in the Environmental I program.
- (20) Students should be in good standing with the school administration.

(All of the above items refer to behaviors demonstrated by the applying individuals during their participation in the Environmental I program, and their previous years at Oakmont Regional High School.)

APPENDIX 5

Draft Letter to Teachers for Testing Program

TO: Oakmont Teachers
FROM: Miss Griffin
SUBJECT: Pre-Testing Program for Seniors

With the Administration's approval, Seniors will be involved in a testing program beginning this week and ending next week. Students will be tested two days this week (Wednesday, Thursday) and two days next week (Tuesday, Friday). All testing will take place during the students' study hall periods, reducing the impact on subject classes.

Students have been pre-assigned to take tests during certain study hall periods during the day based on their schedules in the main office. It is critical that students report at the time scheduled and in the assigned room.

Because the number of students taking a test at any one time was limited to 30, some students may be missing gym or choir, etc., that normally meets during study hall periods. Where possible students were assigned from other study hall times, but this may not have been possible. Both the Physical Education Department and the Music Department are aware of the problem. If students have any serious problems with the assigned testing times, they should see Miss Griffin. Otherwise, students are expected to report to the testing room at the assigned time.

Most of the tests will take only 20 minutes. After the test is completed, students will be allowed to return to their study halls. STUDENTS ARE TO REPORT TO THE TESTING ROOM FIRST.

PURPOSE OF TESTING: Senior students will be pre-tested this fall and posttested this spring. The testing data will be used to evaluate the Environmental Program at Oakmont. The tests are not timed, and will deal with attitude formation and personality development. None of the testing data will be used to place students in certain grade classifications. The data will not influence careers, jobs, college entrance, etc.

STUDENTS INVOLVED: A list of all students involved in the testing program is attached.

Thank you,
Miss Griffin

APPENDIX 6

Purpose of the Testing Program

(Please read to students prior to
beginning testing)

PURPOSE OF THE PROGRAM

The purpose of the testing program is to evaluate the affects of the Environmental Program at Oakmont. In order to accomplish this goal, it is necessary to test all the seniors at Oakmont. Other methods will be used throughout the year to gather additional data. You will most likely not be involved in these. Students will be pre-tested in the fall (now) and again posttested in the spring.

Because the tests are standardized and used across the country in both colleges and high schools, only qualified people are allowed to give the tests. Qualified people must be certified in guidance and have had training in testing. For this reason the guidance department at Oakmont will be administering the tests. The guidance department, however, will not see the test data.

All testing data (individual tests) are confidential. The only individual to see the tests will be Miss Griffin. Once the over-all data has been interpreted, and general conclusions made, all individual tests will be destroyed. Students are not to put their names on the tests. A number code will be placed on each test. The code will be used to formulate experimental, and control groups. NO NAMES WILL BE USED IN THE DATA COLLECTION PROCESS OR SUMMARIZATION OF THE FINAL TEST RESULTS.

I only ask that you be completely honest in your answers. Some of the questions will seem difficult, or perhaps too elementary, but all questions should be taken seriously and answered frankly. Each test deals with some aspect of the individual's attitudes. There are no right or wrong answers in these tests. Most of the tests will be short and are not timed. The test you are taking today, the Self Concept Test will probably be one of the longest.

I appreciate your help, thank you.

Miss Griffin

APPENDIX 7

Purchase Information for the Tennessee Self-Concept Scale

COUNSELOR RECORDINGS AND TESTS

Box 6184 • Acklen Station
Nashville, Tennessee 37212
(615) 292-5201

CATALOGUE

NOTE: *When ordering, please use order form*

A NOTE ON QUALIFICATIONS FOR USE OF MATERIALS

We have a responsibility to assure that our materials will be used by qualified persons. Accordingly:

When ordering, please give us your institutional affiliation and your professional title. If you are a graduate student, please include a brief note from your advisor indicating that he or she is supervising your work.

OUR PAYMENT POLICY

All orders must be accompanied by prepayment or by an institutional order number until credit is established. Credit is established after completed transactions totalling \$40 or more.

THE TENNESSEE SELF CONCEPT SCALE

The TSCS consists of 100 self description statements which persons use to portray their own picture of themselves. The Scale can be used with persons 12 years or older, having at least a sixth grade reading level. Research indicates its utility for all ranges of personal adjustment. Most people complete the Scale in 10 to 22 minutes

Please note carefully the following forms of the Scale:

1. *The Regular Form*. This form may be either hand scored or computer scored. For this form you will need *reusable test booklets* and *non-reusable combination packets*. Each combination packet consists of an answer sheet, a score sheet, and a profile sheet.

Since the Scale has a variety of uses, there are two different scoring and profiling systems available. *Both forms use exactly the same test booklet*. The only difference is in the particular combination packet which you must order, as follows:

a. *The Counseling Form (Form C)*. This form is most appropriate if you wish to use the Scale directly with a counselee and share the results. This form contains fewer variables and omits the diagnostic scales, which may be threatening to the person. You do *not* need scoring keys with this form.

b. *The Clinical and Research Form (Form C&R)*. This form includes more variables and is quite useful for research and clinical application. You will need a set of scoring keys for this form

Either of the above forms may be hand scored or sent to us for computer scoring.

When using the Regular Form, you will need *test booklets and combination packets*. WE MUST KNOW WHETHER YOU WANT *FORM C* OR *FORM C&R*. You will save time and grief if you tell us.

2. *The Computer Form*. This form cannot be hand scored but must be sent to us for computer scoring. When using this form you need order only these non-reusable test booklets. No combination packets are needed.

We computer-score either the Regular Form or the Computer Form. We provide a 29-variable printout, along with punched IBM cards which permit further computer analysis on your site.

Please note: *Do not intermingle the Computer Form and Regular Form*

NOTE: Prices subject to change on the basis of our own rising costs

APPENDIX 8
Internal-External Scale

ANSWER SHEET FOR I-E SCALE

Name : _____ Grade : _____

Date : _____ Age : _____

- | | | | | | |
|-----|----|----|-----|----|----|
| 1. | A. | B. | 19. | A. | B. |
| 2. | A. | B. | 20. | A. | B. |
| 3. | A. | B. | 21. | A. | B. |
| 4. | A. | B. | 22. | A. | B. |
| 5. | A. | B. | 23. | A. | B. |
| 6. | A. | B. | 24. | A. | B. |
| 7. | A. | B. | 25. | A. | B. |
| 8. | A. | B. | 26. | A. | B. |
| 9. | A. | B. | 27. | A. | B. |
| 10. | A. | B. | 28. | A. | B. |
| 11. | A. | B. | 29. | A. | B. |
| 12. | A. | B. | | | |
| 13. | A. | B. | | | |
| 14. | A. | B. | | | |
| 15. | A. | B. | | | |
| 16. | A. | B. | | | |
| 17. | A. | B. | | | |
| 18. | A. | B. | | | |

I-E SCALE TEST BOOKLET

Do Not Write in this Booklet

INSTRUCTIONS FOR I-E SCALE

This is a questionnaire to find out the way in which certain events in our society affect different people. Each item consists of a pair of alternatives lettered A or B. Please select the one statement of each pair (AND ONLY ONE) which you more strongly believe to be the case as far as you are concerned. Be sure to select the one you actually BELIEVE to be more true rather than the one you think you should choose or the one you would like to be true. This is a matter of personal belief; there are no right or wrong answers.

Your answers are to be recorded on the separate answer sheet in this booklet. REMOVE THIS ANSWER SHEET NOW. Print your name and the other information requested. Do not open the booklet until you are told to do so.

Please answer the questions CAREFULLY, but do not spend too much time on any one item. Be sure to find an answer for every choice. Find the number of the item on the answer sheet and circle the letter A or B for the statement you choose as the most true for you. In some instances you may discover that you believe both statements or neither one. In such cases, be sure to select the ONE you more strongly believe to be the case as far as you are concerned. Also try to respond to each item INDEPENDENTLY, when making your choice; do not be influenced by previous choices.

I-E SCALE (page 1)

1. A. Children get into trouble because their parents punish them too much.
B. The trouble with most children nowadays is that their parents are too easy with them.
2. A. Many of the unhappy things in people's lives are partly due to bad luck.
B. People's misfortunes result from the mistakes they make.
3. A. One of the major reasons why we have wars is because people don't take enough interest in politics.
B. There will always be wars, no matter how hard people try to prevent them.
4. A. In the long run people get the respect they deserve in this world.
B. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.
5. A. The idea that teachers are unfair to students is nonsense.
B. Most students don't realize the extent to which their grades are influenced by accidental happenings.
6. A. Without the right breaks one cannot be an effective leader.
B. Capable people who fail to become leaders have not taken advantage of their opportunities.

I-E SCALE (page 2)

7. A. No matter how hard you try some people just don't like you.
B. People who can't get others to like them don't understand how to get along with others.
8. A. Heredity plays the major role in determining one's personality.
B. It is one's experiences in life which determine what they're like.
9. A. I have often found that what is going to happen will happen.
B. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.
10. A. In the case of the well prepared student there is rarely if ever such a thing as an unfair test.
B. Many times exam questions tend to be so unrelated to course work that studying is really useless.
11. A. Becoming a success is a matter of hard work, luck has little or nothing to do with it.
B. Getting a good job depends mainly on being in the right place at the right time.
12. A. The average citizen can have an influence in government decisions.
B. This world is run by the few people in power, and there is not much the little guy can do about it.

I-E SCALE (page 3)

13. A. When I make plans, I am almost certain that I can make them work.
B. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.
14. A. There are certain people who are just no good.
B. There is some good in everybody.
15. A. In my case getting what I want has little or nothing to do with luck.
B. Many times we might just as well decide what to do by flipping a coin.
16. A. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
B. Getting people to do the right thing depends upon ability, luck has little or nothing to do with it.
17. A. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.
B. By taking an active part in political and social affairs the people can control world events.
18. A. Most people don't realize the extent to which their lives are controlled by accidental happenings.
B. There really is no such thing as "luck."

I-E SCALE (page 4)

19. A. One should always be willing to admit mistakes.
B. It is usually best to cover up one's mistakes.
20. A. It is hard to know whether or not a person really likes you.
B. How many friends you have depends upon how nice a person you are.
21. A. In the long run the bad things that happen to us are balanced by the good ones.
B. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.
22. A. With enough effort we can wipe out political corruption.
B. It is difficult for people to have much control over the things politicians do in office.
23. A. Sometimes I can't understand how teachers arrive at the grades they give.
B. There is a direct connection between how hard I study and the grades I get.
24. A. A good leader expects people to decide for themselves what they should do.
B. A good leader makes it clear to everybody what their jobs are.

I-E SCALE (Page 5)

25. A. Many times I feel that I have little influence over the things that happen to me.
B. It is impossible for me to believe that chance or luck plays an important role in my life.
26. A. People are lonely because they don't try to be friendly.
B. There's not much use in trying too hard to please people, if they like you, they like you.
27. A. There is too much emphasis on athletics in high school.
B. Team sports are an excellent way to build character.
28. A. What happens to me is my own doing.
B. Sometimes I feel that I don't have enough control over the direction my life is taking.
29. A. Most of the time I can't understand why politicians behave the way they do.
B. In the long run the people are responsible for bad government on a national as well as on a local level.

APPENDIX 9

Letter of Permission from Dr. Rotter (I-E Scale)

The
University
of
Connecticut

STORRS, CONNECTICUT 06268

THE COLLEGE OF
LIBERAL ARTS AND SCIENCES
Department of Psychology

August 11, 1981

Shirley L. Griffin
Program Director
Oakmont Regional High School
South Ashburnham
Massachusetts 01466

Dear Ms. Griffin:

You have my permission to reproduce the I-E Scale
for your dissertation research.

Very truly yours,

Julian B. Rottler

Julian B. Rottler
Professor of Psychology

JBR/isw
Encl.

APPENDIX 10
Ecological Attitude Inventory (EAI)

ECOLOGICAL ATTITUDE INVENTORY - Answer Sheet

Sub-Scale: A

- 1. T F
- 2. T F
- 3. T F
- 4. T F
- 5. T F
- 6. T F
- 7. T F
- 8. T F
- 9. T F
- 10. T F

Sub-Scale: C

- 21. T F
- 22. T F
- 23. T F
- 24. T F
- 25. T F
- 26. T F
- 27. T F
- 28. T F
- 29. T F
- 30. T F

Sub-Scale: B

- 11. T F
- 12. T F
- 13. T F
- 14. T F
- 15. T F
- 16. T F
- 17. T F
- 18. T F
- 19. T F
- 20. T F

Sub-Scale: D

- 31. A B C D E
- 32. A B C D E
- 33. A B C D E
- 34. A B C D E
- 35. A B C D E
- 36. A B C D E
- 37. A B C D E
- 38. A B C D E
- 39. A B C D E
- 40. A B C D E
- 41. A B C D E
- 42. A B C D E
- 43. A B C D E
- 44. A B C D E
- 45. A B C D E

Name: _____
 Date: _____
 Age: _____
 Sex: Male Female
 Grade: _____

ECOLOGICAL ATTITUDE INVENTORY - Test Booklet

Do not write in Test Booklet

ECOLOGICAL ATTITUDE INVENTORY

DO NOT MAKE ANY MARKS IN THE TEST BOOKLET.

Directions:

1. Sub-scales A,B,C.

In Sub-scales A,B,C, read each question carefully. After reading the statement, decide if the statement is true or false for you. On your answer sheet, circle the answer - T if the statement is true for you, and F if the statement is false for you. There are no correct answers to these sub-scales.

2. Sub-scale D

Read each question in Sub-scale D and select the best answer. In each case, there is only one correct answer. Circle the letter of the correct answer on your answer sheet, A,B,C,D,E. Circle only one letter answer for each question.

If you make a mistake, either erase your error, or place an XXX over the circled letter that is WRONG, and you wished cancelled out.

Sub-Scale: A

1. I'd be willing to ride a bicycle or take the bus to work in order to reduce air pollution.
2. I would probably never join a group or club which is concerned solely with ecological issues.
3. I would be willing to use a rapid transit (subway) system to help reduce air pollution.
4. I'm not willing to give up driving on a weekend due to a smog alert.
5. I'm really not willing to go out of my way to do much about ecology since that's the government's job.
6. I would donate a day's pay to a foundation to help improve the environment.
7. I would be willing to stop buying products from companies guilty of polluting the environment, even though it might be inconvenient.
8. I'd be willing to write my congressman weekly concerning ecological problems.
9. I probably wouldn't go house to house to distribute literature on the environment.
10. I would not be willing to pay a pollution tax even if it would considerably decrease the smog problem.

Sub-scale: B

11. I guess I've never actually bought a product because it had a lower polluting effect.
12. I keep track of my congressman and senator's voting records on environmental issues.
13. I have never written a congressman concerning the pollution problems.
14. I have contacted a community agency to find out what I can do about pollution.
15. I don't make a special effort to buy products in recyclable containers.
16. I have attended a meeting of an organization specifically concerned with bettering the environment.
17. I have switched products for ecological reasons.
18. I have never joined a cleanup drive.
19. I have never attended a meeting related to ecology.
20. I subscribe to ecological publications.

Sub-Scale: C

21. I feel people worry too much about pesticides on food products.
22. It frightens me to think that much of the food I eat is contaminated with pesticides.
23. It genuinely infuriates me to think that the government doesn't do more to help control pollution of the environment.
24. I feel fairly indifferent to the statement: "The world will be dead in 40 years if we don't remake the environment."
25. I become incensed when I think about the harm being done to plant and animal life by pollution.
26. I'm usually not bothered by so-called "noise pollution".
27. I get depressed on smoggy days.
28. When I think of the ways industries are polluting, I get frustrated and angry.
29. The whole pollution issue has never upset me too much since I feel it's somewhat overrated.
30. I rarely ever worry about the effects of smog on myself and family.

Sub-Scale: D

31. Soil pollution is generally due to: (A) sparse rains, (B) improper farming methods, (C) poisonous metals, (D) over-fertilization, (E) poor crop rotation.
32. Most smog in our big cities comes from: (A) Automobiles, (B) Supersonic jets, (C) Industrial plants, (D) Large trucks, (E) Refuse disposal.
33. High concentrates of chlorinated hydrocarbon residues: (A) cause sheep to die, (B) are found in large amounts in our atmosphere, (C) accumulate in flesh-eating birds and upset breeding behavior, (D) are no longer legal in pesticides, (E) are readily biodegradable.
34. Mercury has been found at unacceptable levels in: (A) fruit, (B) vegetables, (C) seafood, (D) beef, (E) soft drinks.
35. Which of the following does not appreciably reduce the pollution by automobiles? (A) properly tuned engines, (B) high octane gas, (C) low lead gas, (D) smog control devices, (E) propane engines.
36. The most common pollutants of water are: (A) arsenic, silver nitrates, (B) hydrocarbons, (C) carbon monoxide, (D) sulphur, calcium, (E) nitrates, phosphates.
37. Ecology is best described as the study of: (A) the relationship between man and the environment, (B) the relationship between organisms and the environment, (C) pollution and its control, (D) the environment, (E) recycling of products.
38. Which of the following materials usually takes longest to decompose? (A) tin, (B) iron, (C) copper, (D) aluminum, (E) steel.

39. Birds and fish are being poisoned by: (A) iron, (B) mercury, (C) silver, (D) lead, (E) magnesium.
40. All but one of the following decompose in ocean water:
(A) sewage, (B) garbage, (C) tin cans, (D) plastic bags,
(E) chemical fertilizer.
41. What is the harmful effect of phosphates on marine life?
(A) causes cancer, (B) renders fish sterile, (C) induces nervous reactions in fish, (D) makes water cloudy, (E) feeds algae which suffocates fish.
42. Which of the following well-known groups is primarily interested in conservation issues? (A) Boy Scouts of America, (B) The Sierra Club, (C) Kiwanis, (D) 4-H Club, (E) the Ecology Association.
43. Practically all of the lead in our atmosphere is caused by:
(A) cars, (B) industrial plants, (C) airplanes, (D) burning refuse, (E) cigarettes.
44. DDT takes how long to deteriorate into harmless chemicals?
(A) it never does, (B) 10-20 months depending on the weather, (C) about 200 years, (D) about 400 years, (E) anywhere from several days to several years.
45. Ecology assumes that man is: a(an) _____ part of nature.
(A) differential, (B) integral, (C) inconsequential,
(D) superior, (E) original.

APPENDIX 11

Letter of Permission from Michael Maloney (EAI)



OAKMONT REGIONAL HIGH SCHOOL
SOUTH ASHBURNHAM
MASSACHUSETTS 01466

BLAIR ARSENAULT, JR., Principal
KENNETH F. KEOUGH, Vice Principal

Area Code 617
827-5907

Environmental Survival Program
Environmental II
August 5, 1981

Dr. Michael P. Maloney
SCHOOL OF MEDICINE
Department of Psychiatry and the Behavioral Sciences
University of Southern California
1934 Hospital Place
Los Angeles, California 90033

Dear Dr. Maloney:

During the 1980-1981 school year, the Environmental II program at Oakmont Regional High School collected pre-post data concerning students' scores on the sub-scales of the ECOLOGICAL ATTITUDE INVENTORY.

As program director, I would appreciate it if you would give me permission to use the pre-post test data in a dissertation study being completed through the School of Education at the University of Massachusetts in Amherst. My dissertation is entitled: "The Effects of an Adolescent Apprenticeship Process in Environmental Education on the Development of Citizen Participation Characteristics in High School Seniors." I will forward you and your staff a copy of the data including all statistical tabulations. Thank you for your assistance in this matter.

Sincerely,

Shirley L. Griffin
Shirley L. Griffin
Program Director

*Incl. copy of letter -
sent 9/29/81*

*you're quite welcome to
use the results + data
I would appreciate to
hear of your results
M.P. Maloney
10/21/81*

APPENDIX 12

Letter of Permission from James Rest
(Defining Issues Test)

UNIVERSITY OF *Minnesota*

COLLEGE OF EDUCATION
DEPARTMENT OF EDUCATIONAL PSYCHOLOGY
MINNEAPOLIS, MINNESOTA 55455

September 23, 1980

Shirley L. Griffin
Program Director
Oakmont Regional High School
South Ashburnham MA 01466

Dear Ms. Griffin,

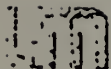
Thanks for your recent letter. Please note that researchers are asked to duplicate copies of the DIT for their use from the specimen given in the Manual. Feel free to use whatever duplicating process is convenient for you--mimeograph, xerox, offset, etc. There is no charge for use of the test. Other details regarding administration, scoring, interpretation, etc. are given in the manual.

Thanks for your interest in our research.

Cordially,

Jim Root

College of Education

UNIVERSITY OF MINNESOTA
TWIN CITIESDepartment of Social, Psychological, and Philosophical
Foundations of Education
330 Burton Hall
178 Pillsbury Drive S.E.
Minneapolis, Minnesota 55455*August 17, 1981**Dr. Griffin*
Dear Colleague:

I am pleased to give you permission to use the Defining Issues Test for your project. Please include the following credit line on the front page of all copies of the test when you are duplicating them: Copyright James Rest, 1972, all rights reserved.

Best wishes for success in your work. I do appreciate hearing of your progress and please send me a copy of your report.

Sincerely,

A handwritten signature in cursive script, appearing to read "James R. Rest".

James R. Rest
Professor

JRR; jac

APPENDIX 13

"Opinions About Social Problems"

(A Copy of the Environmental Issues Test and the
Defining Issues Test as used in this Study)

CODE NUMBER: _____AGE: _____SEX: _____GRADE: _____OPINIONS ABOUT SOCIAL PROBLEMS

Test Booklet/Answers

Copyright:

James Rest, 1972
All rights reserved

-1

OPINIONS ABOUT SOCIAL PROBLEMSDirections:

This questionnaire is aimed at understanding how people think about social problems. Different people often have different opinions about questions of right and wrong. There are no "right" answers in the way that there are right answers to math problems. We would like you to tell us what you think about several problem stories.

In this questionnaire you will be asked to give your opinion about several stories. Here is a story as an example.

(Sample)

Frank Jones has been thinking about buying a car. He is married, has two small children and earns an average income. The car he buys will be his family's only car. It will be used mostly to get to work and drive around town, but sometimes for vacation trips also. In trying to decide what car to buy, Frank Jones realized that there were a lot of questions to consider.

If you were Frank Jones, how important would each of these questions be in deciding what car to buy?

Instructions for Part A: On the left hand side of the page check one of the spaces by each question that could be considered.

G = Great ImportanceL = Little ImportanceM = Much ImportanceN = No Importance (None)S = Some Importance

Great	Much	Some	Little	None	
_____	_____	_____	_____	<u>✓</u>	1. Whether the car dealer was in the same block as where Frank lives.
<u>✓</u>	_____	_____	_____	_____	2. Would a <u>used</u> car be more economical in the long run than a <u>new</u> car.
_____	_____	<u>✓</u>	_____	_____	3. Whether the color was green, Frank's favorite color.
_____	_____	_____	_____	<u>✓</u>	4. Whether the cubic inch displacement was at least 200.

-2-

Great	Much	Some	Little	None	
✓	_____	_____	_____	_____	5. Would a large, roomy car be better than a compact car?
_____	_____	_____	_____	✓	6. Whether the front connibilities were dirferential.

Notes on answers above:

- Ques. #1 = In this sample, the person taking the questionnaire did not think this was important in making a decision.
- Ques. #2 = A check was put in the far left space to indicate the opinion that this is an important issue in making a decision about buying a car.
- Ques. #3 = The person taking the questionnaire saw this as having some importance.
- Ques. #4 = If you are unsure about what "cubic inch displacement" means, then mark it "no - none - importance".
- Ques. #5 = The person taking the questionnaire saw this as having great importance.
- Ques. #6 = If a statement sounds like gibberish or nonsense to you, mark it "none or no importance".

Instructions for Part B: From the list of questions above, select the most important one of the whole group. Put the number of the most important question on the top line below. Do likewise for your second, third and fourth most important choices. (NOTE: that the top choices in this case will come from the statements that were checked on the far left-hand side --statements #2 and #5 were thought to be very important. In deciding what is the most important, a person would re-read #2 and #5, and then pick one of them as the most important, then put the other one as "second most important," and so on.)

Most Important	<u>5</u>
Second Most Important	<u>2</u>
Third Most Important	<u>3</u>
Fourth Most Important	<u>1</u>

-3-

There is no time limit on this test, however you should finish it in one period. Write all your answers in the test booklet. Only your age and sex should be recorded on the front page of this booklet. The booklet will also contain a code number to assist in selecting control and experimental groups. Be sure you have the same code number you have been using in all previous testing sessions.

REMEMBER:

1. Every story will have 12 items. You are to rate the importance of each item. You will then consider all 12 items and determine the 4 most important in making a decision.
2. Any items you do not understand, or that sound like gibberish should be marked of no importance = NONE. They are throughout the test, you should rate these low.
3. If you do not understand a word in a story, you may ask the teacher for help. If the word is in the item, you may not ask for help. If you donot know what the word means in the item, rate it low.
4. You should be rating and ranking in terms of how important an item is in making a moral decision. (Which is the crucial question that a person should focus on in making a decision?)
5. Answer all questions based on what you think.

IF THERE ARE NO QUESTIONS, YOU MAY BEGIN.

(James Rest - all rights reserved)

D1

HEINZ AND THE DRUG

In Europe a woman was near death from a special kind of cancer. There was one drug that the doctors thought might save her: It was a form of radium that a druggist in the same town had recently discovered. The drug was expensive to make, but the druggist was charging ten times what the drug cost to make. He paid \$200 for the radium and charged \$2000 for a small dose of the drug. The sick woman's husband, Heinz, went to everyone he knew to borrow the money, but he could only get together about \$1000, which is half of what it cost. He told the druggist that his wife was dying, and asked him to sell it cheaper or let him pay later. But the druggist said, "No, I discovered the drug and I'm going to make money from it." So Heinz got desperate and began to think about breaking into the man's store to steal the drug for his wife.

Should Heinz steal the drug? (Check one)

- Should steal it
 Can't decide
 Should not steal it

Importance:

Great	Much	Some	Little	None	
_____	_____	_____	_____	_____	1. Whether a community's laws are going to be upheld.
_____	_____	_____	_____	_____	2. Isn't it only natural for a loving husband to care so much for his wife that he'd steal?
_____	_____	_____	_____	_____	3. Is Heinz willing to risk getting shot as a burglar or going to jail for the chance that stealing the drug might help?
_____	_____	_____	_____	_____	4. Whether Heinz is a professional wrestler, or has considerable influence with professional wrestlers.
_____	_____	_____	_____	_____	5. Whether Heinz is stealing for himself or doing this solely to help someone else.
_____	_____	_____	_____	_____	6. Whether the druggist's rights to his invention have to be respected.
_____	_____	_____	_____	_____	7. Whether the essence of living is more encompassing than the termination of dying, socially and individually.

D1

Great	Much	Some	Little	None	
_____	_____	_____	_____	_____	8. What values are going to be the basis for governing how people act towards each other.
_____	_____	_____	_____	_____	9. Whether the druggist is going to be allowed to hide behind a worthless law which only protects the rich anyhow.
_____	_____	_____	_____	_____	10. Whether the law in this case is getting in the way of the most basic claim of any member of society.
_____	_____	_____	_____	_____	11. Whether the druggist deserves to be robbed for being so greedy and cruel.
_____	_____	_____	_____	_____	12. Would stealing in such a case bring about more total good for the whole society or not.

From the list of questions above, select the four most important:

Most Important _____

Second Most Important _____

Third Most Important _____

Fourth Most Important _____

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E1

ENVIRONMENTAL STRIKE

The heating plant and incinerator at Central High School are very old. Each time they are used large amounts of smoke and air pollutants are produced. The faculty at Central High is very concerned about pollution and the environment. They feel that this pollution is harmful to the health of their students and everyone in the community. The faculty demanded that the Board of Education do something to stop this pollution.

At the next meeting of the Board of Education, the Superintendent of schools informed the board of the faculty demands. However, the board felt that air pollution was not a serious matter. The board also said that this was not a faculty problem and refused their demands.

When word of the board's decision got back to the faculty, the teachers became quite upset. A vote was taken and the faculty went on strike and refused to let anyone enter the school building. The teachers knew that striking was illegal but they also felt that this action was necessary to protect the environment.

Should the teachers have gone on strike? (Check one)

- Yes, they should go on strike
- Can't decide
- No, they should not go on strike

Importance:

Great Much Some Little None

- | | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. Is the faculty doing this to really help the environment or are they doing it just for kicks? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2. Does the faculty have any right to take over property that does not belong to them? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3. Does the faculty realize that they might be arrested and fined, and even lose their jobs? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 4. Would striking in the long run benefit more people to a greater extent? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 5. Whether the board of education stayed within the limits of it's authority in ignoring the faculty demands. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 6. Will the strike anger the public and give all environmentalists and teachers a bad name? |

E1

Great	Much	Some	Little	None	
_____	_____	_____	_____	_____	7. Is striking consistent with principles of justice?
_____	_____	_____	_____	_____	8. Would allowing one strike encourage many other teacher strikes?
_____	_____	_____	_____	_____	9. Did the board bring this misunderstanding on themselves by being so unreasonable and uncooperative?
_____	_____	_____	_____	_____	10. Whether operating the schools ought to be in the hands of a few administrators or in the hands of all the people.
_____	_____	_____	_____	_____	11. Is the faculty following the principles which they believe are above the law?
_____	_____	_____	_____	_____	12. Whether or not the board of education's decisions should be respected by the faculty.

From the list of above questions, select the four most important:

Most Important _____

Second Most Important _____

Third Most Important _____

Fourth Most Important _____

(Not required)

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D2

STUDENT TAKE-OVER

At Harvard University a group of students, called the Students for a Democratic Society (SDS), believe that the University should not have an army ROTC program. SDS students are against the war in Viet Nam, and the army training program helps send men to fight in Viet Nam. The SDS students demanded that Harvard end the army ROTC training program as a university course. This would mean that Harvard students could not get army training as part of their regular course work and not get credit for it towards their degrees.

Agreeing with the SDS students, the Harvard professors voted to end the ROTC program as a university course. But the President of the University stated that he wanted to keep the army program on campus as a course. The SDS students felt that the President was not going to pay attention to the faculty vote or to their demands.

So, one day last April, two hundred SDS students walked into the university's administration building, and told everyone else to get out. They said they were doing this to force Harvard to get rid of the army training program as a course.

Should the students have taken over the administration building? (Check one)

- Yes, they should take it over
- Can't decide
- No, they shouldn't take it over

Importance:

Great Much Some Little None

- | | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. Are the students doing this to really help other people or are they doing it just for kicks? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2. Do the students have any right to take over property that doesn't belong to them? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3. Do the students realize that they might be arrested and fined, and even expelled from school? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 4. Would taking over the building in the long run benefit more people to a greater extent? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 5. Whether the president stayed within the limits of his authority in ignoring the faculty vote. |

D2

Great	Much	Some	Little	None	
_____	_____	_____	_____	_____	6. Will the takeover anger the public, and give all students a bad name?
_____	_____	_____	_____	_____	7. Is taking over a building consistent with principles of justice?
_____	_____	_____	_____	_____	8. Would allowing one student takeover encourage many other student take-overs?
_____	_____	_____	_____	_____	9. Did the president bring this misunderstanding on himself by being so unreasonable and uncooperative?
_____	_____	_____	_____	_____	10. Whether running the university ought to be in the hands of a few administrators or in the hands of all the people.
_____	_____	_____	_____	_____	11. Are the students following principles which they believe are above the law?
_____	_____	_____	_____	_____	12. Whether or not university decisions ought to be respected by students.

From the list of questions above, select the four most important:

Most Important _____

Second Most Important _____

Third Most Important _____

Fourth Most Important _____

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Ez

CONCERNED CITIZENS

Mr. Peters was greatly concerned about the fact that several paper mills in the area were polluting the streams and rivers in his state. The state's drinking water was being poisoned and great numbers of fish were being killed daily.

For more than a year, Mr. Peters had tried to get state officials to do something about the problem. All of his efforts were unsuccessful. He felt, however, that if all of the town's citizens were made aware of the problem many of them would assist him in forcing the government to take action. He then had several thousand leaflets printed at his own expense explaining the water pollution problem. Mr. Peters then had thousands of leaflets dropped from a helicopter in local shopping centers and business areas in the town.

Mrs. Jones noticed that the leaflets littered many parts of town. She also knew that the town had a very strict anti-litter ordinance which carried very harsh penalties-- including prison sentences. Mrs. Jones felt that Mr. Peters was breaking the law.

Should Mrs. Jones report Mr. Peters to the police? (Check one)

- She should report him
- Can't decide
- She should not report him

Importance:

Great Much Some Little None

- | | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. Isn't the work that Mr. Peters is doing enough to prove that he isn't a bad person? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2. Every time someone escapes punishment for a crime, doesn't that just encourage more crime? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3. Wouldn't we be better off without prisons and the oppression of our legal system? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 4. Is Mr. Peters paying a debt to society? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 5. Whether society is failing to do something that Mr. Peters has a right to expect. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 6. What benefit would prisons and penalties be apart from society, especially for a charitable man? |

E2

Great	Much	Some	Little	None	
_____	_____	_____	_____	_____	7. How could anyone be so cruel and heartless as to send Mr. Peters to prison?
_____	_____	_____	_____	_____	8. Would it be fair to all other people who have broken the anti-litter law and who were punished if Mr. Peters was let off?
_____	_____	_____	_____	_____	9. Was Mr. Peters a good friend of Mrs. Jones?
_____	_____	_____	_____	_____	10. Wouldn't it be a citizen's duty to report a lawbreaker, regardless of the circumstances?
_____	_____	_____	_____	_____	11. How would the will of the people and the public good best be served?
_____	_____	_____	_____	_____	12. Would being fined and possibly going to prison do any good for Mr. Peters or protect anybody?

From the list of questions above, select the four most important:

Most Important _____

Second Most Important _____

Third Most Important _____

Fourth Most Important _____

(James Rest - All rights reserved)

D3

ESCAPED PRISONER

A man had been sentenced to prison for 10 years. After one year, however, he escaped from prison, moved to a new area of the country, and took on the name of Thompson. For 8 years he worked hard, and gradually he saved enough money to buy his own business. He was fair to his customers, gave his employees top wages, and gave most of his own profits to charity. Then one day, Mrs. Jones, an old neighbor, recognized him as the man who had escaped from prison 8 years before, and whom the police had been looking for.

Should Mrs. Jones report Mr. Thompson to the police and have him sent back to prison? (Check one)

- _____ Should report him
 _____ Can't decide
 _____ Should not report him

Importance:

Great Much Some Little None

- | Great | Much | Some | Little | None | |
|-------|-------|-------|--------|-------|---|
| _____ | _____ | _____ | _____ | _____ | 1. Hasn't Mr. Thompson been good enough for such a long time to prove he isn't a bad person? |
| _____ | _____ | _____ | _____ | _____ | 2. Everytime someone escapes punishment for a crime, doesn't that just encourage more crime? |
| _____ | _____ | _____ | _____ | _____ | 3. Wouldn't we be better off without prisons and the oppression of our legal systems? |
| _____ | _____ | _____ | _____ | _____ | 4. Has Mr. Thompson really paid his debt to society? |
| _____ | _____ | _____ | _____ | _____ | 5. Would society be failing what Mr. Thompson should fairly expect? |
| _____ | _____ | _____ | _____ | _____ | 6. What benefits would prisons be apart from society, especially for a charitable man? |
| _____ | _____ | _____ | _____ | _____ | 7. How could anyone be so cruel and heartless as to send Mr. Thompson to prison? |
| _____ | _____ | _____ | _____ | _____ | 8. Would it be fair to all the prisoners who had to serve out their full sentences if Mr. Thompson was let off? |

D3

- | Great | Much | Some | Little | None | |
|-------|-------|-------|--------|-------|---|
| _____ | _____ | _____ | _____ | _____ | 9. Was Mrs. Jones a good friend of Mr. Thompson? |
| _____ | _____ | _____ | _____ | _____ | 10. Wouldn't it be a citizen's duty to report an escaped criminal, regardless of the circumstances? |
| _____ | _____ | _____ | _____ | _____ | 11. How would the will of the people and the public good best be served? |
| _____ | _____ | _____ | _____ | _____ | 12. Would going to prison do any good for Mr. Thompson or protect anybody? |

From the list of questions above, select the four most important:

- Most Important _____
- Second Most Important _____
- Third Most Important _____
- Fourth Most Important _____

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E3

ELECTRICITY

A large piece of land in the Southwest was bought from an Indian tribe by the Southern Electric Company. The land was bought so that six large coal burning generators could be built. The electricity produced by these stations was to be sent to several large cities in southern California. This land was chosen because it contained great amounts of coal that would be burned to produce power. It was also close enough to California so that power could be transmitted easily and cheaply."

Two generating stations were built. After they were put into operation, a group of young Indians met with the power company and the government. They complained about the great amount of smoke produced by the generators. They said the smoke was blackening the skies and endangering the lives of everyone for hundreds of miles. They were also angered because mining the coal was scarring the landscape and destroying sacred Indian grounds. They said that the older Indian leaders didn't really understand what the land was to be used for when they sold it to the power company. They also felt that they were forced into an unfair agreement. The Indians demanded that the power stations be closed and the land returned.

The power company refused. The company said it was their land and that they could do what they wanted with it. The government said that the sale was legal and that nothing could be done about it. The Indians became desperate and began to make plans to blow up the power stations. They felt this would force the company to close.

Should the Indians blow up the power stations? (Check one) . . .

- Yes, they should blow up the stations
- Can't decide
- No, they should not blow up the stations

Importance:

Great Much Some Little None

- | | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. Whether laws are going to be upheld. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2. Isn't it only natural for Indians to care so much for their land and their people that they would blow up the power stations? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3. Are the Indians willing to risk getting shot or going to jail for the chance that blowing up the power stations might help? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 4. Whether the Indians are professional wrestlers, or have considerable influence with professional wrestlers. |

E3

Great	Much	Some	Little	None	
_____	_____	_____	_____	_____	5. Whether the Indians are blowing up the power stations for themselves or doing this solely to help others.
_____	_____	_____	_____	_____	6. Whether the power company's rights of ownership have to be respected.
_____	_____	_____	_____	_____	7. Whether the essence of living is more encompassing than the termination of dying, socially and individually.
_____	_____	_____	_____	_____	8. What values are going to be the basis for governing how people act towards each other?
_____	_____	_____	_____	_____	9. Whether the power company is going to be allowed to hide behind a worthless law which only protects the rich anyhow.
_____	_____	_____	_____	_____	10. Whether the law in this case is getting in the way of the most basic claim of any member of society.
_____	_____	_____	_____	_____	11. Whether the power company deserves to be blown up for being so greedy and cruel.
_____	_____	_____	_____	_____	12. Would blowing up the power company in such a case bring about more total good for the society or not?

From the list of questions above, select the four most important:

Most Important _____

Second Most Important _____

Third Most Important _____

Fourth Most Important _____

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D4

DOCTOR'S DILEMMA

A lady was dying of cancer which could not be cured and she had only about six months to live. She was in terrible pain, but she was so weak that a good dose of pain-killer like morphine would make her die sooner. She was delirious and almost crazy with pain, and in her calm periods, she would ask the doctor to give her enough morphine to kill her. She said she couldn't stand the pain and that she was going to die in a few months anyway.

What should the doctor do? (Check one)

- _____ He should give the lady an overdose that will make her die
- _____ Can't decide
- _____ Should not give the overdose

Importance:

Great	Much	Some	Little	None	
_____	_____	_____	_____	_____	1. Whether the woman's family is in favor of giving her the overdose or not.
_____	_____	_____	_____	_____	2. Is the doctor obligated by the same laws as everybody else if giving her an overdose would be the same as killing her.
_____	_____	_____	_____	_____	3. Whether people would be much better off without society regimenting their lives and even their deaths.
_____	_____	_____	_____	_____	4. Whether the doctor could make it appear like an accident.
_____	_____	_____	_____	_____	5. Does the state have the right to force continued existence on those who don't want to live.
_____	_____	_____	_____	_____	6. What is the value of death prior to society's perspective on personal values?
_____	_____	_____	_____	_____	7. Whether the doctor has sympathy for the woman's suffering or cares more about what society might think.
_____	_____	_____	_____	_____	8. Is helping to end another's life ever a responsible act of cooperation.

D4

Great	Much	Some	Little	None	
_____	_____	_____	_____	_____	9. Whether only God should decide when a person's life should end.
_____	_____	_____	_____	_____	10. What values the doctor has set for himself in his own personal code of behavior.
_____	_____	_____	_____	_____	11. Can society afford to let everybody end their lives when they want to.
_____	_____	_____	_____	_____	12. Can society allow suicides or mercy killing and still protect the lives of individuals who want to live.

From the list of questions above, select the four most important:

Most Important _____

Second Most Important _____

Third Most Important _____

Fourth Most Important _____

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D5

WEBSTER

Mr. Webster was the owner and manager of a gas station. He wanted to hire another mechanic to help him, but good mechanics were hard to find. The only person he found who seemed to be a good mechanic was Mr. Lee, but he was Chinese. While Mr. Webster himself didn't have anything against Orientals, he was afraid to hire Mr. Lee because many of his customers didn't like Orientals. His customers might take their business elsewhere if Mr. Lee was working in the gas station.

When Mr. Lee asked Mr. Webster if he could have the job, Mr. Webster said that he had already hired somebody else. But Mr. Webster really had not hired anybody, because he could not find anybody who was a good mechanic besides Mr. Lee.

What should Mr. Webster have done? (Check one)

- Should have hired Mr. Lee
- Can't decide
- Should not have hired him

Importance:

Great	Much	Some	Little	None	
_____	_____	_____	_____	_____	1. Does the owner of a business have the right to make his own business decisions or not?
_____	_____	_____	_____	_____	2. Whether there is a law that forbids racial discrimination in hiring for jobs.
_____	_____	_____	_____	_____	3. Whether Mr. Webster is prejudiced against orientals himself or whether he means nothing personal in refusing the job.
_____	_____	_____	_____	_____	4. Whether hiring a good mechanic or paying attention to his customers' wishes would be best for his business.
_____	_____	_____	_____	_____	5. What individual differences ought to be relevant in deciding how society's roles are filled?
_____	_____	_____	_____	_____	6. whether the greedy and competitive capitalistic system ought to be completely abandoned.

D5

Great	Much	Some	Little	None	
_____	_____	_____	_____	_____	7. Do a majority of people in Mr. Webster's society feel like his customers or are a majority against prejudice?
_____	_____	_____	_____	_____	8. Whether hiring capable men like Mr. Lee would use talents that would otherwise be lost to society.
_____	_____	_____	_____	_____	9. Would refusing the job to Mr. Lee be consistent with Mr. Webster's own moral beliefs?
_____	_____	_____	_____	_____	10. Could Mr. Webster be so hard-hearted as to refuse the job, knowing how much it means to Mr. Lee?
_____	_____	_____	_____	_____	11. Whether the Christian commandment to love your fellow man applies in this case.
_____	_____	_____	_____	_____	12. If someone's in need, shouldn't he be helped regardless of what you get back from him?

From the list of questions above, select the four most important:

Most Important _____

Second Most Important _____

Third Most Important _____

Fourth Most Important _____

(James Rest - All rest reserved)

D6

NEWSPAPER

Fred, a senior in high school, wanted to publish a mimeographed newspaper for students so that he could express many of his opinions. He wanted to speak out against the war in Viet Nam and to speak out against some of the school's rules, like the rule forbidding boys to wear long hair.

When Fred started his newspaper, he asked his principal for permission. The principal said it would be all right if before every publication Fred would turn in all his articles for the principal's approval. Fred agreed and turned in several articles for approval. The principal approved all of them and Fred published two issues of the paper in the next two weeks.

But the principal had not expected that Fred's newspaper would receive so much attention. Students were so excited by the paper that they began to organize protests against the hair regulation and other school rules. Angry parents objected to Fred's opinions. They phoned the principal telling him that the newspaper was unpatriotic and should not be published. As a result of the rising excitement, the principal ordered Fred to stop publishing. He gave as a reason that Fred's activities were disruptive to the operation of the school.

Should the principal stop the newspaper? (Check one)

- Should stop it
- Can't decide
- Should not stop it

Importance:

Great	Much	Some	Little	None	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. Is the principal more responsible to students or to the parents?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Did the principal give his word that the newspaper could be published for a long time, or did he just promise to approve the newspaper one issue at a time?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Would the students start protesting even more if the principal stopped the newspaper?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. When the welfare of the school is threatened, does the principal have the right to give orders to students?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Does the principal have the freedom of speech to say "no" in this case?

D6

Great	Much	Some	Little	None	
_____	_____	_____	_____	_____	6. If the principal stopped the newspaper would he be preventing full discussion of important problems?
_____	_____	_____	_____	_____	7. Whether the principal's order would make Fred lose faith in the principal.
_____	_____	_____	_____	_____	8. Whether Fred was really loyal to his school and patriotic to his country.
_____	_____	_____	_____	_____	9. What effect would stopping the paper have on the student's education in critical thinking and judgments?
_____	_____	_____	_____	_____	10. Whether Fred was in any way violating the rights of others in publishing his own opinions.
_____	_____	_____	_____	_____	11. Whether the principal should be influenced by some angry parents when it is the principal that knows best what is going on in the school.
_____	_____	_____	_____	_____	12. Whether Fred was using the newspaper to stir up hatred and discontent.

From the list of questions above, select the four most important: -

- Most Important _____
- Second Most Important _____
- Third Most Important _____
- Fourth Most Important _____

APPENDIX 14
Biographical Questionnaire

Biographical Questionnaire
Oakmont Regional High School

Name: _____ Circle the answer number that
is true for you. 1. 2. 3.

4. What is your Age?

1. 16

2. 17

3. 18

5. What is your Sex?

1. Female

2. Male

6. What is your Residence?

1. Ashburnham

2. South Ashburnham

3. Westminster

7. Tell the number of brothers
and sisters in your family.

1. 2 or less

2. 3 or more

8. What is the status of
your parents?

1. Divorced

2. Separated

3. Death of one or both parents

4. Foster

5. Married

9. Have your parents ever been
elected or appointed to a
town position? (selectmen,
moderator, assessor, police, etc.)

1. Yes

2. No

10. Do your parents attend town
meetings?

1 Never

2 Rarely

3 Sometime

4 Often

5 Don't Know

11. What is the educational
background of your father?

	1 Elementary
	2 High School
	3 College
	4 Beyond College
12. What is the educational background of your mother?	1 Elementary
	2 High School
	3 College
	4 Beyond College
13. Do you have your own room?	1 Yes
	2 No
14. Do you have a job?	1 Yes
	2 No
15. Do you have a driver's license	1 Yes
	2 No
16. Do you have your own car?	1 Yes
	2 No
17. What Elementary school did you attend?	1 Briggs
	2 Westminster
	3 Other
	4 Both
18. Where have you learned the most about the environment?	1 School
	2 Parents
	3 Media
	4 Reading
	5 School, Media, and Reading
19. What are your plans after high school?	1 Junior College
	2 Trade School
	3 College
	4 Military
	5 Work
	6 Other

20. Have you ever held a class office while at Oakmont (include your senior year)?

- 1 Yes
2 No

21. What outside school activities have you belonged to?

- 1 girl scouts/boyscouts
2 4-H
3 boy scouts or girl scouts and 4-H
4 other
5 none
6 boy scouts or girl scouts and other
7 4-H and other
8 boy scouts or girl scouts, 4-H, other

Please, tell what extra curricula activities you have been involved with prior to your senior year.

22. Yearbook Staff

- 1 Yes
2 No

23. National Honor Society

- 1 Yes
2 No

24. Basketball

- 1 Yes
2 No

25. Football

- 1 Yes
2 No

26. Track

- 1 Yes
2 No

27. Softball/Baseball

- 1 Yes
2 No

28. Field Hockey

- 1 Yes
2 No

29. Cheering

- 1 Yes
2 No

30. Chorus

- 1 Yes
2 No

31. Band	1 Yes
	2 No
32. Central District	1 Yes
	2 No
33. Who did you have for Biology?	1 Griffin
	2 Lawrence
	3 Philbin
	4 Parageotes
	5 None
	6 Other
34. Who did you have for Chemistry?	1 Chabot
	2 Lawrence
	3 Other
	4 None
35. Who did you have for Earth Science?	1 Panageotes
	2 Kaisalng
	3 Von Deck
	4 None
	5 Other
Please tell if you have had or are now taking any of the following subjects below	
36. Environmental I	1 Yes
	2 No
37. Advanced Science	1 Yes
	2 No
38. Biochemistry	1 Yes
	2 No
39. Physics	1 Yes
	2 No
40. Environmental II	1 Yes
	2 No

APPENDIX 15
Student Evaluation Form

EVALUATION OF THE ENVIRONMENTAL II PROGRAMRETURN

Purpose: To gather additional data from former Environmental II students regarding the overall effectiveness of the Environmental II program in accomplishing specific goals.

Directions: Please answer all questions sincerely, seriously and only after careful thought. If you would like to provide additional comments about the program, please feel free to do so at the end of the evaluation.

I am interested in obtaining your feelings about the effectiveness of the program, after you have been away from it for a year or more. Often, after real experience in the every-day world, experiences in high school take on different meanings.

.....

1. In looking back since your graduation from Oakmont, and your experiences in the everyday world, what effect, positive and/or negative has the environmental II program had on you?

2. How did your participation in the program influence or effect your attitude about the environment?

3. How has the Environmental II program affected your participation in local environmental issues either in your community, college campus, where you work, or other?

4. What elements of the program do you feel were most valuable to you? Why?

5. How did your participation in the Environmental II program and your contact with adults effect your confidence in confronting adults when you graduated?

6. Do you feel your experience in the Environmental II program helped you in your after high school activities, either in college, work or elsewhere? How?

7. In looking back at the adult teaching sessions, what did you gain from this experience?

8. How would you say participation in the Environmental II program has effected your feelings toward environmental issues and concerns now?

APPENDIX 16

Scoring Instructions for the Internal-External Scale

SCORING INSTRUCTIONS FOR THE
I-E SCALE

The circled letter before each question number indicates the external choice. The score is the total number of external choices selected. A high score indicates an external-orientation and a low score indicates an internal-orientation. Those questions that do not have any correct answers, are filler questions designed to mask the purpose of the test. The scores will range from 1 to 23.

- | | |
|---------|---------|
| 1. A B | 16. A B |
| 2. A B | 17. A B |
| 3. A B | 18. A B |
| 4. A B | 19. A B |
| 5. A B | 20. A B |
| 6. A B | 21. A B |
| 7. A B | 22. A B |
| 8. A B | 23. A B |
| 9. A B | 24. A B |
| 10. A B | 25. A B |
| 11. A B | 26. A B |
| 12. A B | 27. A B |
| 13. A B | 28. A B |
| 14. A B | 29. A B |

SOURCE: Julian B. Rotter, "Generalized Expectancies for Internal Versus External Control of Reinforcement," Psychological Monographs: General and Applied 609 (1966): Table 1.

APPENDIX 17

Scoring Instructions for the Ecological Attitude Inventory (EAI)

ECOLOGICAL ATTITUDE INVENTORY SCORING DIRECTIONS

(The correct answers are shown next to the question number. The highest possible score for verbal commitment, actual commitment, and affect is 10. For knowledge it is 15.)

Response

Item

VERBAL COMMITMENT

- T 1. I'd be willing to ride a bicycle or take the bus to work in order to reduce air pollution.
- F 2. I would probably never join a group or club which is concerned solely with ecological issues.
- T 3. I would be willing to use a rapid transit system to help reduce air pollution.
- F 4. I'm not willing to give up driving on a weekend due to a smog alert.
- F 5. I'm really not willing to go out of my way to do much about ecology since that's the government's job.
- T 6. I would donate a day's pay to a foundation to help improve the environment.
- T 7. I would be willing to stop buying products from companies guilty of polluting the environment, even though it might be inconvenient.
- T 8. I'd be willing to write my congressman weekly concerning ecological problems.
- F 9. I probably wouldn't go home to house to distribute literature on the environment.
- F 10. I would not be willing to pay a pollution tax even if it would considerably decrease the smog problem.

ACTUAL COMMITMENT

- F 1. I guess I've never actually bought a product because it had a lower polluting effect.
- T 2. I keep track of my congressman and senator's voting records on environmental issues.

- F T F T T F F T
3. I have never written a congressman concerning the pollution problems.
 4. I have contacted a community agency to find out what I can do about pollution.
 5. I don't make a special effort to buy products in recyclable containers.
 6. I have attended a meeting of an organization specifically concerned with bettering the environment.
 7. I have switched products for ecological reasons.
 8. I have never joined a cleanup drive.
 9. I have never attended a meeting related to ecology.
 10. I subscribe to ecological publications.

AFFECT

- F T T F T F T T F F
1. I feel people worry too much about pesticides on food products.
 2. It frightens me to think that much of the food I eat is contaminated with pesticides.
 3. It genuinely infuriates me to think that the government doesn't do more to help control pollution of the environment.
 4. I feel fairly indifferent to the statement: "The world will be dead in 40 years if we don't remake the environment."
 5. I become incensed when I think about the harm being done to plant and animal life by pollution.
 6. I'm usually not bothered by so-called "noise pollution."
 7. I get depressed on smoggy days.
 8. When I think of the ways industries are polluting, I get frustrated and angry.
 9. The whole pollution issue has never upset me too much since I feel it's somewhat overrated.
 10. I rarely ever worry about the effects of smog on myself and family.

KNOWLEDGE

- C
1. Soil pollution is generally due to: A) sparse rains, B) improper farming methods, C) poisonous metals, D) over-fertilization, E) poor crop rotation.

- A 2. Most smog in our big cities comes from: A) supersonic jets, C) industrial plants, D) large trucks, E) refuse disposal.
- C 3. High concentrations of chlorinated hydrocarbon residues: A) cause sheep to die, B) are found in large amounts in our atmosphere, C) accumulate in flesh-eating birds and upset breeding behavior, D) are no longer legal in pesticides, E) are readily biodegradable.
- C 4. Mercury has been found at unacceptable levels in: A) fruit, B) vegetables, C) seafood, D) beef, E) soft drinks.
- B 5. Which of the following does not appreciably reduce the pollution by automobiles? A) properly tuned engine, B) high octane gas, C) low lead gas, D) smog control devices, E) propane engines.
- E 6. The most common pollutants of water are: A) arsenic, silver nitrates, B) hydrocarbons, C) carbon monoxide, D) sulphur calcium, E) nitrates, phosphates.
- B 7. Ecology is best described as the study of: A) the relationship between man and the environment, B) the relationship between organisms and the environment, C) pollution and its control, D) the environment, E) recycling of products.
- D 8. Which of the following materials usually takes longest to decompose? A) tin, B) iron, C) copper, D) aluminum, E) steel.
- B 9. Birds and fish are being poisoned by: A) iron, B) mercury, C) silver, D) lead, E) magnesium.
- D 10. All but one of the following decompose in ocean water: A) sewage, B) garbage, C) tin cans, D) plastic bags, E) chemical fertilizer.
- E 11. What is the harmful effect of phosphates on marine life? A) causes cancer, B) renders fish sterile, C) induces nervous reactions in fish, D) makes water cloudy, E) feeds algae which suffocates fish.
- B 12. Which of the following well-known groups is primarily interested in conservation issues? A) Boy Scouts of America, B) the Sierra Club, C) Kiwanis, D) 4-H Club, E) the Ecology Association.
- A 13. Practically all of the lead in our atmosphere is caused by: A) cars, B) industrial plants, C) airplanes, D) burning refuse, E) cigarettes.

- C 14. DDT takes how long to deteriorate into harmless chemicals?
 A) it never does, B) 10-20 months depending on the weather, C) about 200 years, D) about 400 years, E) Anywhere from several days to several years.
- B 15. Ecology assumes that man is: a(an) _____ part of nature. A) differential, B) integral, C) inconsequential, D) superior, E) original.

SOURCE: Michael P. Maloney, Michael P. Ward, and G. Nicholas Brauch, "A Revised Scale for the Measurement of Ecological Attitudes and Knowledge," American Psychologist 30 (July 1975): 788-790

APPENDIX 18

Scoring Instructions for the Defining Issues Test (DIT)
and the Environmental Issues Test (EIT)

Scoring for the DIT and EIT

(1) See the Revised Manual for the Defining Issues Test by James R. Rest for the scoring procedures on the DIT.

Available from:

Minneapolis: Minnesota Moral Research Projects,
University of Minnesota, 1979.

Pages 3.1 to 3.5

(2) See the Revised Manual for the Defining Issues Test by James Rest for the scoring procedures on the EIT. For the EIT refer to the section titled "Scoring for Short Form" on page 3.3.

APPENDIX 19

Data Sheet for the Defining Issues Test
(DIT)

APPENDIX 20

Data Sheet for the Environmental Issues Test
(EIT)

APPENDIX 21

Newspaper Accounts of the Environmental II

1979-1981

Ashburnham

Trip To Glades

ASHBURNHAM — Ten students in Oakmont School's Environmental Survival II class flew to Florida with their instructor, Miss Shirley Griffin, and spent the vacation week at Flamingo in the Everglades National Park. The purpose of this trip was to allow the students, who have been doing studies in local wetland problems, to learn about flood control and drainage patterns in a completely different environment than that of Massachusetts.

Students who made the trip were: Rene Scapparone, Ann Marie Shortsleeves, Susan Powers, Debra Fortin, Michelle Maynard, Randy Parenteau, Timothy Douglas, Matthew Nyman, Terry Dopkant and Dean Dinsmore. In addition to Miss Griffin, they were accompanied by these adults: Mrs. Anita Shortsleeves of Westminster; Mr. and Mrs. Fred Gray of Shirley; Gary Kastal of the Oakmont English Department; and Timothy Hatch of Shirley.

The students planned all the meals prior to their departure, flew to Miami and rented two vans for the drive into the park. Food stuffs for meals were purchased in Homestead with funds that the students had earned through a variety of means. The group stayed in four cottages which were available near the camping area of Flamingo, which is located at the southern tip of Everglades Park on Florida Bay.

Flood Control

With the park rangers, they learned about flood control in the area and how man is upsetting drainage patterns there. They also heard ranger talks on "Extinction," "Alligators," "Butterflies" and "Snakes Alive!" They walked miles of nature trails, learned about trees, plants, wildlife and birds in the park. They were fortunate to see Roseate Spoonbills, numerous varieties of heron, a bald eagle on the nest, egrets, anhinga, polican and, of course, alligators.

They also were able to visit the Corkscrew Swamp Sanctuary, which is an Audubon-operated area and a Seminole Indian Village, reached by a thrilling ride in an air boat.

The last night of this fascinating week, the group drove to the Florida Keys and camped at Big Pine Key in Pennkamp Coral Reef State Park.

Miss Griffin stated that the experience was a most valuable

one for the students, and provided a fine balance for the work they have been doing this year on wetlands inventory in the town of Westminster. The class is preparing a slide show on Westminster's wetlands and also a booklet, and has been working in co-operation with the Westminster Conservation Commission.

The students have also done a survey on environmental problems in Ashburnham for that town's Conservation Commission and, next year, plan to direct the class efforts to Ashburnham and its wetlands problems.

Miss Griffin said that the Westminster Lions Club sponsored a breakfast to help with funds for this trip.

Page 2 THE PILOT Thursday, February 1, 1979

Survey on environment

ASHBURNHAM - Voters at the annual town meeting will be asked to indicate what they believe are the fundamental environmental concerns of the town. Students in Oakmont's Environmental II class will conduct the survey as part of a project involving the Ashburnham Conservation Commission.

Although plans are still in the formulative stage, such concerns as lake management, forestry administration and a soil survey are being considered for the questionnaire which will be distributed. Results will be turned over to the Conservation Commission.

The Conservation Commission will hold its next meeting February 14 at the town hall.

Oakmont class to share environment study

ASHBURNHAM - Shirley L. Griffin, teacher of the Environmental survival program at Oakmont Regional High School has sent the following letter to the Board of Selectmen and to the Conservation Commission.

"The Environmental II (Environmental Survival Program) at Oakmont Regional High School is continuing its second year of student community involvement. Working with the Westminster Conservation Commission, we have designed an environmental education program for town boards and interested citizens of Westminster. Beginning on Wednesday, March 14, 1979, the students, high school seniors, will conduct three one night sessions focusing on watershed issues important to Westminster. Students involved in the program will act as teachers and educate participating adults about the value and role of wetlands in water supply. The students will prepare their own lessons and develop methods of conveying the material in a fun and exciting way. They will teach for the first 45 minutes and a movie or slides will be shown the

second half of the program. Refreshments will be provided by the students.

"To enhance the program's success, we extend a special invitation to the Board of Selectmen. We would be honored if the Board would participate in the education program as "students" and encourage other town boards to do so. The information to be presented by the Oakmont students will be general, easy to understand, and enable the voter to better grasp land-use practices and environmental issues pertinent to the community of Westminster.

"The Environmental II program is unique and provides the students with an opportunity to participate in a positive and active way within their local community. Students are given an opportunity to apply knowledge learned during their junior year in the program and to perfect basic intellectual skills learned in their other classes at Oakmont. We are proud and excited about the program, and we look forward to the Board's participation. If you have any additional questions, please feel free to contact us."

Westminster

Conservation

WESTMINSTER - In its Annual Report, the Conservation Commission reports on the continued stimulation of public awareness of the importance of wetlands. Three public seminars were presented by the Oakmont Environmental Survival Classes. The students also co-operated with the commission in categorizing our wetlands. From this information, a slide-tape show was constructed. The commission wishes to especially thank Mrs. Griffin and her students for their diligent work.

Work continues on the Westminster Co-operative Farmer's Building. The bulk of the work was directed at landscaping. Donald Grahn provided the expertise and the commission, a CETA crew, and friends, provided the labor. Wood chips were spread, the poison ivy eradicated, stumps removed, and trees and bushes planted.

The annual seedling sale again was success and the fourth graders at the Westminster Elementary School received seedlings.

The "Self Help" matching grant of \$3,250 was received from the state Department of Environmental Affairs toward the purchase of the Smith property. The tract has been incorporated into the Muddy Pond Conservation Area. The commission cut a new trail which links the parking area to Muddy Pond through the Smith lot. Oakmont students planted seedlings in the area and a CETA crew performed trail maintenance.

Seven public hearings were held for building projects on or near wetland areas. One hearing involved the new Route 140; another, a treatment system upgrade at a local business; and the rest, new construction of single family homes.

The commission also worked on and supported an unsuccessful attempt to have the state pick Wyman's Pond for a Water Quality demonstration project. Dufresne and Henry Engineering Corporation provided the engineering expertise.

The year 1980 promises to again be a busy year: more wetlands hearings, finishing the landscape work at the Co-operative Farmer's Building, continued trail maintenance at the Muddy Pond Conservation Area, and publication of the updated Conservation-Recreation Plan.

Marble is making the plans for dinner and any member planning to attend who did not make arrangements should contact her before June 1.

Other committees reported on trips to Wilbraham, the State House in Boston and a house tour in Milton. Information was obtained on residential restoration, old fashion gardens and house tours.

The book "Homestead Heritage" is at the publishers and anyone wishing to reserve a copy should contact Mrs. Constance Rivard, treasurer.

Sentinel-Enterprise, Fitchburg, Mass., Monday, March 12, 1979 - 13

Westminster

Public Education Sessions

Judy Loesch
874-2681

WESTMINSTER — Oakmont's Environmental II Class will present the first of three public education sessions on Wednesday in the Town Hall.

The first session will run from 7:30 to 9 p.m. and is entitled "Water Cycle, Watershed and Wetlands Vegetation." Movies and slides will be shown and refreshments served.

Session 2 will be held on Wednesday, March 28 on "The Geology of Watershed and Wetlands." Session 3 will be held Wednesday, April 11 on "Water Supply, Problems and Local Issues."

The sessions are specifically tailored to environmental issues facing the town.

According to Michael W. Breckon, secretary of the Conservation Commission, these programs should prove very informative "in light of continuing concern over coliform bacteria in the drinking water reservoir, purification of Wyman Pond, and an in-progress sewerage study."

Everyone is invited to the three sessions, all to be held in the Town Hall. Breckon said that a large turnout "will be the town's way of thanking the students for their interest in community affairs."

The three sessions are part of a community education program entitled "The Role and Value of a Community's Watershed." The program is presented by the Oakmont Environmental II Class, taught by Miss Shirley Griffin.

Fitchburg Sentinel Feb. 2, 1979

Westminster

Environmental Program

By JUDY LOESCHER
874-2681

WESTMINSTER — An Environmental Education Program will be conducted by students from Oakmont Regional High School at the Town Hall beginning on Wednesday, March 14.

Under the direction of their teacher, Shirley L. Griffin, the high school seniors have been working with the Westminster Conservation Commission and have designed an environmental program for town boards and interested citizens of Westminster.

The students will conduct three one-night sessions focusing on watershed issues important to the town.

Students involved in the program will act as teachers and educate participating adults about the value and role of wetlands in water supply. The students will prepare their own lessons and develop methods of conveying the material in a fun and exciting way.

They will teach for the first 45 minutes and a movie or slides will be shown the second half of the program. Refreshments will be provided by the students.

The information to be presented by the Oakmont students will be general, easy to understand, and enable the voter to better grasp land-use practices and environmental issues pertinent to the community of Westminster.

Second Year

The Environmental Survival Program at Oakmont is continuing its second year of student-community involvement. The Environmental II program is unique and provides the students with an opportunity to participate in a positive and active way within their local community. Students are given an opportunity to apply knowledge learned during

their junior year in the program and to perfect basic intellectual skills learned in their other classes at Oakmont.

In a letter to the Board of Selectmen, Griffin extended an invitation to the board to participate in the education program as "students" and to encourage other town boards to do so.

The first session of March 14 will be on the subject of "Water Cycle, Watershed and Wetlands Vegetation." The second session will be held on March 28 entitled "The Geology of Watershed and Wetlands." The third session will be held April 11 and will be on "Water Supply, Problems and Local Issues."

All sessions will be held at the Town Hall from 7:30 to 9 p.m.

Students in Environmental II are: Debbie Fortin, Pat Bourgeois, Susan Powers, Matthew Nyman, Terry Dopkant, Dean Dinsmore, Randy Parenteau, Debbie Conant, Ann Marie Short-sleeves, Renee Scaparrone and Timothy Douglas.

Thursday, September 6, 1979

School Committee O.K.'s alternate education programs at Oakmont

ASHBURNHAM-The Oakmont Regional School Committee has approved an Alternate Education Program to be implemented this year at Oakmont. This program is for seniors who have earned 15 credits at the school and wish to enter college during their senior year in lieu of attending Oakmont.

Guidance Director Richard Mackey believes that, under special circumstances and for a few students, this alternative program might be recommended by his department if the parents of the students desire to make use of it. The School Committee has approved the granting of an Oakmont diploma if the college of choice has accepted the senior involved and if the tuition fees are paid.

The senior must successfully complete his freshman year at the college by June of the year his high school class is to graduate and must earn an equal amount of credit to that expected of seniors at Oakmont.

The student must take and pass the equivalent of a full year of English and no less than the equivalent of three full year courses in elective areas. No student will be granted an Oakmont diploma who has not met the minimum requirements set forth in the school's graduation requirements policy.

The student may attend Oakmont class functions, will receive recognition in the senior year book and may participate in graduation week exercises. Should the student fail to complete the freshman year successfully, he would have to apply for an Equivalency Diploma through the State Department of Education or return to Oakmont and complete the senior year.

In another course credit arrangement with Fitchburg State Adult Education program, a student having completed the junior year at Oakmont and needing only a few credits for graduation, may opt to take needed courses at Fitchburg State at night during the senior year while working full time during the day.

Under this plan, the student need not attend Oakmont during the senior year and could graduate provided sufficient credits were earned at the college.

Further curriculum changes include the incorporation of the Environmental Science II course at Oakmont into the regular class day meeting five times a week.

Students heretofore have been earning credits in the class but it has not been in the regular schedule and was meeting three days a week during study hours. This year the course, taught by Miss Shirley Griffin, will concentrate on Community Action in environmental problems while working with the Ashburnham Conservation Commission.

A survey made last year by the students in the course of environmental problems in Ashburnham will be presented to the Commission this month to enable members to select an area or two for student focus.

Students will conduct adult environmental classes with concerned adults of the community and Conservation Commission members in an attempt to set up an action plan addressed to the problem under study.

Last year the students conducted a study of the value of the wetlands in Westminster, working with the Westminster Conservation Commission. They prepared an illustrated booklet at the end of the year summarizing the study they had made which will be presented to the Commission and residents of Westminster this fall.

16—The Gardner News, Tuesday, January 29, 1980



ENVIRONMENTAL PROGRAM — Cheryl Harbron points to a map of the area, as she participates in the environmental education program held last week Jan. 23 in Ashburnham Town Hall.

Oakmont Students Speak On Environment

Approximately 100 Ashburnham residents turned out for the community Environmental Education program presented this week in the drop-in center of the town hall by the Environmental II Oakmont Regional High School students, instructor, Shirley Griffin and members of the Ashburnham Conservation Commission.

The subject for discussion was "Understanding the Watershed of Ashburnham (flood plains, wetlands, surface waters and recharge areas)."

Residents were seated around small tables, ten at each table, with one or two Oakmont students. Each student gave a talk on the subject of the program to the group at his table. Questions were answered.

Miss Griffin stated she was pleased with the turnout of residents, a greater number than had attended last year when the class worked with Westminster

residents.

She introduced the Conservation Commission members Arthur Johanningsmeier, chairman; Mrs. Kaino Waltari, Edson Ferrell, Mr. and Mrs. David Sargent and Selectman Leo P. Collette, Jr., Board of Health chairman, Dr. Robert E. Farand and Appeals Board chairman, Richard J. Coswell.

Oakmont Environmental II students included Cheryl Harbron, Robin Doane, Kyle Winslow, Jody Kennedy, Diane Bedard, Val Knight, Lisa Nadeau, Cindy Esposito, Sandi Boisse, Dian Behringer, Lisa Zbikowski and Robert Landry.

The last of three programs in this Environmental Program will be held on Thursday, Feb. 7 from 7.30 to 9 p.m. in the town hall. The topic for discussion will be "Your Water Supply, Water Quality and Costs." A panel of experts will be present to answer questions.

Gardner News 4-14-80

Ashburnham

Soil Survey

ASHBURNHAM — Voters will be asked at the annual Town Meeting on Wednesday to approve, under Article 18, an appropriation of \$8,600 to fund a Soil Survey of the entire community. The proposal originated with the Ashburnham Conservation Commission.

Informational meetings have been conducted jointly over the past months by the Conservation Commission and Environmental 11 students from Oakmont Regional High School under the leadership of their instructor, Miss Shirley Griffin.

The most recent forum was held on Tuesday in the Town Hall. At the forums Environmental students and members of the commission explained and illustrated their proposal with a slide show showing the procedure of conducting a soil survey. Of the 24,000 acres in Ashburnham about 20,000 would be involved in the study with an assessment made of soil types on every three to 10 acres in the community.

The soil scientist makes the study by walking a given area, making five foot core samples that are one inch thick with the aid of a soil sugar and noting the texture, structure, color and thickness of each layer. He also measures slope, water flow and characteristics that cannot be observed from the surface.

When the study is completed, an interpretive map is presented to the town showing specific limitations for different types of land use such as waste disposal, road construction, sewerage and home or industrial construction. Also provided is an interpretive report indicating how the map may be used. These materials may be used by all agencies and are available to individuals interested in building homes or considering locating business or small industry in the community.

The total cost of the Soil Survey is \$17,200. To date 188 Massachusetts communities have completed such studies with one half of the cost supported by the federal government. The effect on Ashburnham's tax rate this year would be approximately 20 cents per \$1,000 valuation. Proponents stressed that the 20 cent figure is for one year only and the value of the survey would be valuable for as long as a century.

Ashburnham

Conservation Meeting

Oakmont School students in the Environmental II course, and their instructor, Miss Shirley Griffin, have meetings planned with the Ashburnham Conservation Commission this month and next to which the public is invited.

About 40 residents attended the first meeting, which was held in the Town Hall. It was on the subject, "The Water Cycle in Ashburnham." During the evening a film was shown on "Fresh Water Wetlands and their Values."

The next meeting is scheduled for Wednesday, Jan. 23, from 7:30 to 9 p.m. in the Town Hall and all interested residents are invited. The subject for discussion at this time will be: "Understanding the watershed of Ashburnham" (flood, plains, wetlands, surface waters, recharge areas). During the program a film, "Pollution of Lakes and Ponds," will be shown.

The third meeting will take place on Thursday, Feb. 7, from 7:30 to 9 p.m., in the Town Hall and will be on the subject: "Your Water Supply, Water Quality and Costs." A panel of experts from various agencies will be present to answer questions.

The Oakmont students are working with the Ashburnham Conservation Commission in this community environmental education series of meetings to help residents learn about the water supply, sewage problems and their effect on taxes.

Members of the Ashburnham Conservation Commission include Arthur Johanningsmeier,

chairman; Edson Ferrell, Mrs. Kaino Waltari, Mr. and Mrs. David Sargent.

Members of the Oakmont Environmental II course include: educational team, Cheryl Harbron, Robin Doane, Kyle Winslow, Jody Kennedy, Diane Bedard, Val Knight and Lisa Nadeau; field team, Cindy Esposito, Sandi Boisse, Diane Behringer, Lisa Zbikowski and Robert Landry.

Last year the Environmental II students directed their attention to Westminster, and worked on similar projects with the Conservation Commission of that town.

"Water Cycle in Ashburnham." During the evening a film was shown on "Fresh Water Methods and Their Values."

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The Oakmont students are working with the Ashburnham Conservation Commission in this environmental education series to help residents to learn about our water supply, sewage problems and their effect on taxes.

Members of the Ashburnham Conservation Commission include: Arthur Johanningsmeier, chairman; Edson Ferrell, Mrs. Kaino Waltari and Mr. and Mrs. David Sargent.

Members of the Oakmont Environmental II course include: Educational Team - Cheryl Harbron, Robin Doane, Kyle Winslow, Jody Kennedy, Diane Bedard, Val Knight and Lisa Nadeau; Field Team - Cindy Esposito, Sandi Boisse, Diane Behringer, Lisa Zbikowski and Robert Landry.

Last year the Environmental II students directed their attention to the town of Westminster and worked on similar projects with the Conservation Commission of that town.

Environment

ASHBURNHAM — Oakmont Regional School students in the Environmental II course and their instructor, Miss Shirley Griffin, have meetings planned with the Ashburnham Conservation Commission this winter to which the public is invited.

About 40 residents attended the first meeting held in the Town Hall on the subject "The

10-Sentinel-Enterprise, Fitchburg, Mass., Friday, March 6, 1981

Westminster

Hazardous Waste

WESTMINSTER — Hazardous Waste, the number one environmental problem in the United States, will be the subject of a Citizens Forum to be held at the Westminster Town Hall on Tuesday and Thursday, March 19 from 7:30 to 9:30 p.m..

The two-session forum will be presented by the Conservation Commission, the Nashua River Watershed Association and the Oakmont Regional High School Environmental II Class. The purpose of the sessions is to inform the public about this major environmental problem, the threat it presents to surface and groundwater, and the need for local action to protect water supplies.

The first evening's session (Tuesday, March 10) will provide a background of information about the water cycle and how supplies can become contaminated. The second session (Thursday, March 19) will focus on the specific issue of hazardous waste and the steps communities can take to strengthen local control over development impacting water supplies.

All interested citizens are urged to attend these meetings to learn what they can do to protect local water supplies. The need for protection is vital: A supply once contaminated is generally considered to be permanently lost.

Oakmont students participating in the forum, under the direction of

teacher Shirley Griffin, include: Tammi Cummings, Heather Waugh, Tracey Harris, Michael Wagg, Suzanne Spellman, Brenda Boudreau, John Murphy Jr., Lee Ann Lockhart, Gail Janhunen, Michael Short-sleeves and Janet Powers.

16-Sentinel-Enterprise, Fitchburg, Mass., Wednesday, March 11, 1981

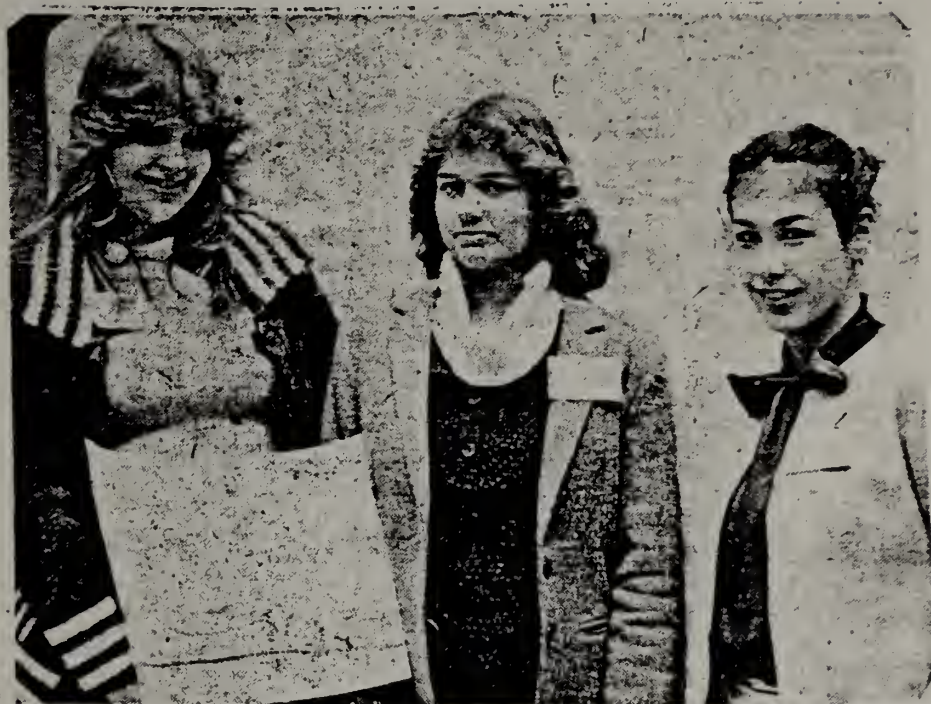
Forum

WESTMINSTER — On Thursday of this week and again on Thursday, March 19, the Environmental Survival II class from Oakmont Regional High School will present a "A Citizens' Forum on Hazardous Wastes" at the Town Hall from 7:30 to 9:30 p.m.

Sponsored by the Westminster Conservation Commission, the students themselves will be teaching basic hydrology and how it can be affected by hazardous wastes.

Representatives from the Nashua River Watershed Association will also be present to aid the students in their effort to make local residents aware of the dangers of hazardous wastes.

20—Sentinel-Enterprise, Fitchburg, Mass., Tuesday, March 24, 1981



HAZARDOUS WASTE
Forum participants in
Westminster included the
above-pictured students
from Oakmont Regional
High School: left to right,
Lee Ann Lockhart, Brenda

Boudreau and Suzanne
Spellman. They were among
the Oakmont students of
teacher Shirley Griffin who
took part in the forum,
sponsored by the Nashoba

River Watershed
Association, the Westminster
Conservation Commission
and the Oakmont Regional
Environmental II Class.
(Sentinel-Enterprise photo).

Sentinel-Enterprise, Fitchburg, Mass., Wednesday, February 25, 1981 - 15

Westminster

Conservation Report

WESTMINSTER — The Westminster Conservation Commission has submitted its report to the Board of Selectmen on commission activities for 1980.

As in previous years, implementation of the Wetlands Protection Act was the commission's most time-consuming activity. Wetlands hearings were held, numerous requests for determination of the act's applicability processed and on-site inspections were routine.

Three of the hearings concerned new dwelling construction, one for a water main extension, another for construction of a trout pond and the last for filling of a wet area.

Three of the Orders of Conditions for the projects were appealed to the State Department of Environmental Quality Engineering. Of these, one was upheld, another altered and the construction approved and the third is still pending.

The annual Spring Seedling Sale was very successful. Continuing a commission tradition, the fourth-graders of the elementary school each received a Balsam seedling.

Work continues on the Muddy Pond Conservation Area and the Co-operative Farmers' Building. Labor is provided by commission members, volunteers and the Oakmont High School Environment II students. Some cord wood from the area was donated to the Westminster Jaycees.

Oakmont students presented the results of their "Environmental Concerns" questionnaire, distributed to voters exiting the polls. The new class is working on developing a nature trail at the Co-operative Farmers' Building.

The commission was saddened by the passing of Howard Winter, chairman. "His tireless civic service will be greatly missed by the town and especially by this

commission. Members are determined to carry on the traditions he established." Commission members are: Michael Breckon, Charles Caron, Ahti Lahtinen, Peter Romano, Scott Ryder and Philip Schenck.

Sentinel-Enterprise, Fitchburg, Mass., Wednesday, June 3, 1981 - 11

Nature Center

WESTMINSTER — Since last September, the Environmental II class of Oakmont Regional High School, serving the towns of Ashburnham and Westminster, has been working on the conversion of the Farmers' Co-operative Building in this town into a community nature center.

Under the direction of their teacher, Miss Shirley Griffin, and in co-operation with the Westminster Conservation Commission, the students have completed various maps of the site, a scale model, a nature trail, a small picnic area, bird houses, feeders and a sign.

The graduating Environmental II class of Brenda Boudreau, Tammi Cummings, Tracey Harris, Janet Powers, Lee Ann Lockhart, John Murphy, Michael Wagg, Suzanne Spellman, Michael Short-sleeves and Heather Waugh will leave plans for Phase II of the project for next year's class to complete. "Phase II" includes the installation of a craft center and an arboretum.

Any local citizen who would be interested in helping out with the project, either now or in the fall, is requested to contact Griffin, program director, in care of Oakmont Regional High School, or Michael Breckon, chairman of the Westminster Conservation Commission.

Any help, whether it be in time or much needed building materials, will be appreciated.

Sentinel-Enterprise, Fitchburg, Mass., Tuesday, May 8, 1979—13

Ashburnham

Special Projects

ASHBURNHAM — Six students in the Environmental Survival I class at Oakmont Regional High School are working on special projects under the direction of their instructor, Miss Shirley Griffin. Some of these projects are being done in co-operation with the Westminster Conservation Commission. All six Oakmont students are members of the Junior Class.

Debby Mackey researched wood ducks and their nesting habits. During March she constructed and erected nesting boxes at Muddy Pond in Westminster and she hopes that the boxes will be accepted by a family of wood ducks. Debby is the daughter of Mr. and Mrs. Richard Mackey, Kendall Court, Westminster.

Lisa Nadeau is working to improve Muddy Pond as a wildlife habitat by planting tree seedlings which will provide food and homes for many small animals and various kinds of birds. Lisa is the daughter of Mr. and Mrs. Enol Nadeau, 91 Davis Road, Westminster.

Craig Grimes and Scott Phillips have worked together to construct a topographic-relief map of the Town of Westminster. With the help of the Westminster Conservation Commission, the map was

displayed to residents during the annual Town Meeting in Westminster. It will be presented to the town of Westminster. Craig is the son of Mr. and Mrs. Jerald A. Grimes, 12 Minott Road, Westminster, and Scott is the son of Mr. and Mrs. Bruce A. Phillips, 14 Howard St., Westminster.

Cheryl Harbron and Kyle Winslow, who have been working with the Ashburnham Conservation Commission, will complete the Blue Field Nature Trail in Ashburnham, using numbered posts and corresponding booklets. This trail was started several years ago by Oakmont students working with the Conservation Commission.

Kyle is the daughter of Mr. and Mrs. Charles Winslow, 74 Depot Road, Westminster, and Cheryl is the daughter of Mr. and Mrs. Edwin O. Harbron, 230 South Ashburnham Road, Westminster.

All six students have put in many out-of-school hours on these special environmental projects, and gained a great deal from their independent studies.



PROJECTS ON ENVIRONMENT are being engaged in by students of the Environmental Survival I Class

at Oakmont Regional High School in Ashburnham. The above-pictured six students (all from Westminster) are among

those involved in various projects: left to right, Scott Phillips, Craig Grimes, Lisa Nadeau, Debby Mackey, Cheryl

Harbron and Kyle Winslow. (Sentinel and Enterprise Photos by Robert Jollimore).

