ENVIRONMENTAL LITERACY TRAINING
FOR CITIZEN GROUPS

by

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ABSTRACT

An Environmental Literacy Training (ELT) model was developed through the use of existing literature, contacts with numerous professionals and the experience of the writer. The goals of the ELT model were to identify goals, guidelines and procedures for an adult environmental education program model which would facilitate the development of environmentally literate citizens and to provide a framework through which a citizen group could develop an ELT program that is consistent with its own goals and needs.

The ELT model was designed to facilitate the development of environmental literacy by providing a framework through which citizen groups could design, implement and evaluate a community environmental action project. The components of this program model are:

1. Identification of a local environmental issue.
2. Investigation of the issue.
3. Selection of an action project.
4. Design of an action strategy.
5. Design of learning experiences.
    A. Diagnosis of learning needs.
    B. Preparation of learning objectives.
    C. Selection of specific learning experiences.
    D. Development of learning evaluation procedures.
6. Integration of the action strategy and learning experiences.
7. Implementation of the ELT program.
8. Evaluation of the overall program.

It is hoped that through the use of this program model, citizens could gain the skills and motivation necessary to influence societal decisions to achieve or maintain a high level of environmental quality.

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CHAPTER I

INTRODUCTION

General Rationale

The concept of the environment encompasses everything that affects life on earth. Air, water, minerals, the sun, the moon and all living things have interacted for untold eons to develop intricate interrelationships. The global ecosystem is constantly changing as some components enhance or disturb other components. With the ability to change the course of rivers, move mountains, transform deserts to croplands and harness the energy of atoms the human race has become one of the earth's most influential components. This power has given humans dominion over the earth, but some people question the ways in which this tremendous power is being used.

Is nuclear generation the answer to an uncertain energy future? Will environmental regulations strangle the economy? What is to be done with the ever growing mountain of solid waste? Should endangered wildlife take precedence over economic development? The answers to these questions are extremely complex. By their very nature, environmental problems affect all areas of human life. Public health, employment, inflation, aesthetics, energy and natural resources are a few examples of concerns that must be addressed when resolving environmental issues. Traditionally, decisions of this magnitude have been made by state and federal governments or within the business/industrial sector.

Recently, private citizens have demanded a greater voice in the social, economic and environmental decisions that affect their lives (Bultena, Rogers and Conner, 1977). Stapp (1970) has declared that "...we must assist our young people and adults to aquire the experiences, knowledge and concern necessary for making informed decisions." (p.35). Iozzi and Cheu (1978) reiterated this when they said environmental education (EE) should assist citizens in becoming more effective, wise and responsible decision-makers. Environmental educators are confronted with the challenge of designing a strategy that will facilitate the development of such a citizenry.

EE efforts have only recently been focused on this challenge. One step toward meeting this challenge was to determine the subject areas being addressed and the effectiveness of current efforts. After collecting and analyzing information on existing programs, the Wisconsin Environmental Education Council (WEEC) recognized important deficiencies in EE efforts in the areas of social and economic considerations. Similarly, few efforts have been made to focus on environmental issue areas. Instead, the WEEC found that most programs emphasize basic scientific information. The Wisconsin Environmental Education Plan (WEEC, 1974) proposed an expansion of the scope of EE programs to include issue evaluation and recognition of the need to develop solutions to environmental problems.

In 1977, this problem-oriented approach was also proposed at the UNESCO sponsored international conference on EE in

Tbilisi, USSR. At the conference, a framework for international EE programs was developed which emphasizes the goal of producing an "environmentally literate citizenry" (UNESCO, 1977). Five areas of endeavor were determined to be necessary to meet this goal. They were:

1. Basic knowledge and concern for the environment.
2. Awareness of problems and their implications.
3. Skills to develop and cope with solutions to environmental problems.
4. Motivation and commitment to sound environmental management.
5. Participation in activities which affect the quality of the environment.

In addition to this general philosophical framework, the participants in the Tbilisi conference suggested that the process of developing an environmentally literate citizenry be "experience-based, pragmatically-focused and problem-oriented" (UNESCO, 1977). With this in mind some environmental educators set themselves to the task of translating the recommendations made at the Tbilisi conference into a conceptual framework that could be used to guide specific EE efforts.

Such a conceptual framework was proposed by Hungerford, Peyton and Wilke (1980) in "The Goals for Curriclum Development in Environmental Education." These were general goals and specific subgoals based on the intent of the Tbilisi Declaration. Four hierarchical goal levels were developed using a superordinate goal for EE as a basis. This superordinate goal was adapted from Harvey (1976):

> ... to aid citizens in becoming environmentally knowledgeable and, above all, skilled and dedicated citizens who are willing to work, individually and collectively, toward achieving and/or maintaining a dynamic equilibrium between the quality of life and the quality of the environment.

The four hierarchical goal levels developed by Hungerford, Peyton and Wilke (1980) are:

Level I. Ecological Foundations Level
This level seeks to provide receivers with sufficient ecological foundations knowledge to permit him/her to eventually make ecologically sound decisions with respect to environmental issues.

Level II. Conceptual Awareness - Issues and Values
This level seeks to guide the conceptual awareness of how individual and collective actions may influence the relationship between the quality of life and the quality of the environment and, also how these actions result in environmental issues which must be resolved through investigation, evaluation, values clarification, decision-making and, finally, citizenship action.

Level III. Investigation and Evaluation Level
This level provides for the development of the knowledge and skills necessary to permit receivers to investigate environmental issues and evaluate alternative solutions for remediating these issues. Similarly, values are clarified with respect to these issues and alternative solutions.

Level IV. Environmental Action Skills Level - Training and Application
This level seeks to guide the development of those skills necessary for receivers to take positive environmental action for the purpose of achieving and/or maintaining a dynamic equilibrium between the quality of life and the quality of the environment.

Specific subgoals under each level provide definite direction for EE curriculum development. A categorization of current EE efforts would indicate that many programs focus on Levels I and II. However, an environmentally literate citizen must also have knowledge and skills that fall within Levels III and IV. Therefore, this Environmental Literacy Training program model will focus on the development of issue investigation and action skills.

Significance

Efforts to implement EE within traditional educational institutions are numerous. However, the next ten years will undoubtedly be a critical period for environmental quality. The current school-age child will not be involved in many of the important decisions during this period. Thus, it is critical to educate adult citizens who are not taking part in traditional educational activities (Emmelin, 1977; Mergen, 1973). The decision-makers of today must be included in the EE effort if national changes in direction are to be accomplished (Hibbs, 1973; Schmidt, 1973). The need for adult EE is also evident when one considers the changing age structure in the general and academic populations (Johnson, Champeau and Newhouse, 1980). Other, more general justifications for adult EE also appear in the literature (UNESCO, 1977; Van Meter, 1973; WEEC, 1974). The result of today's decisions will be evident in the state of environmental quality in the future. Because degradation may be irreversible, it is crucial that today's decisions be made with full knowledge of any trade-offs between the standard of living and the quality of the environment.

Environmental quality will not be the only beneficiary of EE programs geared toward adults. Because of its problem oriented, multi-discplinary nature, programs focusing on issues can provide a stimulating educational experience for adults (Roth, 1975). Education is a process, not a product: it teaches "how to think, not what to think" (Swan, 1974). It follows that participating in a well designed program can benefit adult learners by giving them problem-solving skills that can be used in many situations (Dale, 1979). One such situation might be community planning. Emmelin (1977) stated that participating in the planning process can have important educational and environmental benefits. This writer suggests that the benefits of citizen participation may be even greater when applied to a broad range of issues in the context of a democracy.

The need for environmentally literate citizens who are capable of participating in the decision-making process is amplified by a democratic society's need for productive citizen input. Eley (1979) stated that government agencies can benefit in two ways from public participation. First, agencies' policies will generally come closer to fulfilling public needs. Second, implementation of those policies should proceed more smoothly. Citizens have demanded a more active role in decision-making (Bultena, et al, 1977). In response to these demands and to realize the above mentioned benefits, federal agencies " encourage, provide, assist, set requirements for" or in some fashion mandate citizen participation (U.S. Environmental Protection Agency, 1978; U.S.E.P.A. 1979; Council on Environmental Quality, 1979).

While opportunities for input with regard to public decisions do exist, Eley (1979) laments that education regarding effective participation is lagging behind. It is unfortunate that few EE programs go beyond awareness of environmental issues and into action skills training (Hungerford & Peyton, 1976; Stapp, 1975). The result of this situation is a citizenry which does not have the skills to effectively influence decisions that impinge on environmental quality (Peyton, 1977). Therefore, society is not receiving the benefits of a more representative public involvment.

The burden of citizens wishing to become involved in societal decisions may grow heavier as the issues become more complex. Caldwell (1980) sees environmental activism moving into a new phase that will require all sectors of society, e.g., industry, government and environmentalist, to look at problems holistically. Developing a perspective that encompasses all the social, economic, political and environmental implications " imposes a burden of learning, communicating and of evaluating alternatives" that many environmentally concerned individuals will find difficult to bear (Caldwell, 1980). This writer believes that the broad perspective necessary to make the potentially monumental decision that lie ahead can be developed through citizen EE.

Reaching adult citizens can be done effectively through existing citizen organizations. Emmelin (1977) reported that most adult education efforts in industrialized nations are aimed at such groups. Organizations with broad purposes, e.g., garden clubs and chambers of commerce, may indentify a particular environmental issue with which to work. New organizations, e.g., Greenpeace and The Clamshell Alliance, may develop primarily to address a specific issue. In either case these types of organizations are effective vehicles for adult EE (Van Meter, 1973). This is due in part ot the commitment that group members may already have to being involved in community affairs (Johnson, et al, 1980). Dale (1979) stated that almost every citizen group can aquire the capabilities it needs through a program of training.

Developing an environmentally literate citizenry through existing citizen organizations will require educational processes that consider the character of adult learners and the prerequisites of environmental literacy in the current social, economic and political contexts. Since it is impossible to develop processes that are applicable to all situations, Tow (1973) recommended that an adult EE curriculum be as simple, direct and unrestrictive as possible. Therefore, these processes should be useable by members of citizen groups of all kinds, and with a wide array of environmental issues.

Goals

The intent of this thesis is to develop an adult EE program model which can be used by any interested group to provide its members with the knowledge and skills needed to be environmentally literate citizens. The goals of this program model are:

1. to identify overall goals, guidelines and procedures for a program model which will facilitate the development of environmentally literate citizens.
2. to provide a framework through which a citizen group can develop its own specific Environmental Literacy Training (ELT) program that is consistent with its own goals and needs.
3. to illustrate how this program model can be applied to a specific local environmental issue.

It is hoped that this program model will be an important contribution toward bridging the gap between concern for the environment and active participation in deciding its fate.

Assumptions

The writer assumes that the behavioral outcomes of these educational processes are in part a result of the interest and motivation of the individual learner. Furthermore, persons facilitating these processes must possess basic organizational and communication skills.

Limitations

Due to the nature of this research, the program model has been developed through the use of the existing body of literature, contacts with numerous professionals and the personal experience of the writer.

Definitions of Terms

Environmental Action

Individual behavior intended to remediate an identified environmental problem (Smith, 1979). Environmental actions can be classified into one or more of the following categories (Hungerford & Peyton, 1976):

1. Persuasion
2. Consumerism
3. Political Action
4. Legal Action
5. Ecomanagement

Environmental Education

That aspect of a person's education that deals with culturally-imposed, ecologically-related problems in the human environment...futher, the aquisition and application of human values as related to the cultural use and misuse of biotic and abiotic resources (Hungerford & Peyton, 1976).

Environmentally Literate Citizen

A person who has a basic knowledge of ecological principles and environmental issues, an awareness of the implications of human values regarding environmental issues along with the basic skills and motivation needed to fully investigate, develop alternative solutions and take productive action to resolve environmental issues.

CHAPTER II

REVIEW OF RELATED LITERATURE

The development of an Environmental Literacy Training (ELT) program for citizen groups requires an examination of adult education philosophy, environmental education philosophy and models that can integrate these philosophies. This chapter begins with an overview of adult EE efforts. The next section presents the knowledge, skill and motivational aspects that should be contained in an adult EE program. A number of considerations for adult learning appear in the third section. In the final section of this chapter, two models for adult EE are described.

Past and Present Adult Environmental Education Porgrams and Their Goals

Past and present adult EE efforts can be placed into four categories using content as the major criterion. These categories are natural science, general environmental issues, specific environmental issues and environmental action. Due to space and time limitations, a comprehensive description of adult EE programs cannot be provided. However, this section will present representative programs for each of the above mentioned categories.

Natural Science Programs

These programs provide participants with knowledge of the boitic and abiotic components of the environment. Their focuses range from identification of organisms to investigating techniques of natural resource management.

An early effort to interest the general public in natural history was begun in approximately 1898 by the Audubon Naturalist Society of the Central Atlantic States. This effort has grown to become the United States Department of Agriculture Graduate School Program of Natural History Field Studies offering twenty-five continuing courses (Mergen, 1973).

A unique opportunity for adults to obtain natural science knowledge is provided by Audubon Camps in Connecticut, Maine, Wisconsin and Wyoming. While the emphasis of the Wisconsin camp is the examination of freshwater communities, terrestrial communities are also explored and studied. One and two week programs are offered and university credit is available. Morning and afternoon field trips provide first hand observation. Evening seminars emphasize unifying themes in nature (National Audubon Society, 1980).

The Environmental Resources Unit of the University of Wisconsin - Extension utilizes resource specialists as instructors for environmental workshops throughout Wisconsin. Subject matter includes ornithology, aquatic ecology, communication and natural resource management topics. Most of the twenty-three programs listed in the 1981-82 schedule emphasize field studies and university credit is available for all.

Specific goals vary among individual programs, but background information on natural history and natural resources is stressed throughout (Environmental Resources Unit, 1981).

General Environmental Issue Programs

General environmental issue programs may incorporate natural science subject matter as a foundation for understanding environmental issues. They present a number of issues that may or may not occur locally.

A program targeted for junior college and community audiences was developed by the Miami-Dade Junior College. Thirty multi-media television modules were developed around general issue topics, such as ecology, values, population dynamics, pollution, politics, media and wildlife. Student objectives and suggested strategies for achieving these objectives indicated that this program was intended to increase awareness of environmental problems and potential solutions (Miami-Dade Junior College, 1972).

Local public officials participated in a conference and a series of workshops coordinated by the Indiana University Northwest. A steering committee composed of participants designed the program with the assistance of the IUN staff. A lecture and discussion format failed and was replaced by a process approach which encouraged participant involvement. The project staff reported success in achieving their goal of increasing awareness among key public decision-makers regarding the impact of their decision on environmental quality. An interesting product of this program was legislation written by the steering committee to form a regional solid waste management body in Norhtwestern Indiana. However, the bill was not passed by the Indiana Legislature (Reshkin, 1973).

Another unique program was developed by the University of Wisconsin - Milwaukee. Four, two-part television programs were broadcast in the Milwaukee area. Four thousand persons were enrolled in the course which involved viewing the broadcasts in small groups and using printed material provided by the project. Discussions at each viewing post were led by trained facilitators. An additional 100,000 people were estimated to have viewed the broadcasts, In general, each evening's schedule was as follows:

7:30 - 8:00	Socializing
8:00 - 8:30	Viewing Part 1 of Broadcast
8:30 - 9:00	Discussing Part 1
9:00 - 9:30	Viewing Part 2 of Broadcast
9:30 - 10:00	Discussing Part 2

The purposes of this EE effort were to help participants obtain accurate information, think through the implication of the issues presented, examine their own values regarding these issues, change their own values and behavior and to take more effective citizen action to bring about improvements in their own communities. An opinionaire was used to evaluate the effectiveness of the program. Based on the results the authors claimed that the project achieved its purposes. While 95% of the participants indicated that they intended to take some sort of action, the authors did not attempt to measure the extent to which actions were actually taken (University of Wisconsin - Milwaukee, 1970).

Specific Environmental Issue Programs

Specific environmental issue programs are detailed treatments of an individual issue concerning a particular community or region. Nowak (1970) published an independent study course on water resources designed to help adult learners "...develop an awareness and an understanding of environmental problems in their local community and region and an understanding of how they can participate in helping to find solutions to these problems" (p. 86). Course materials included a text, community survey activities and an interview activity. Also included was a synthesis excercise which provided the learner with the opportunity to express personal concerns and propose solutions to water resource problems.

Air quality was the focus of community EE programs in Stuebenville, Ohio and Wierton, West Virginia. The objective of these programs was to provide area citizens with an opportunity to gain an objective understanding of factors associated with the air quality problem. Pre-planning work was done through meetings with local officials, industry representatives and citizens. Questionnaires were distributed to citizens who had been identified as being interested in the issue. A one day conference and four half-day sessions were held. The general format was lecture followed by a question and answer session. The program was aimed primarily at giving information to the public (Force, Seliga & Swain, 1975).

Gaining information from the public was one goal of the Bellingham 2000 community planning project. Everitt (1978) saw a great need for obtaining citizen opinions on community land-use planning. However, the primary goal of the project was to encourage the development of civic literacy on an individual level. Everitt defined civic literacy as a competence in identifying a community problem, systematically analyzing the problem and constructing political or organizational options for attacking the problem. This program involved an advisory committee representing a cross-section of the community which assisted in program planning. Task forces comprised of thirty to forty representative citizens were chosen by the advisory committee and trained to lead neighborhood workshops. Fifty-five workshops were implemented which generated 400 goals, objectives and other statements. Policy teams made up of volunteer citizens used the products of these workshops to develop a preliminary document which was submitted to the advisory committee and the County Planning and Development Commission (Everitt, 1975).

Many government agencies undertake citizen involvement efforts similar to the Bellingham 2000 project. These efforts, most often called citizen participation programs, generally operate with two major objectives: first, to provide the public with information regarding certain activities of the agency and second, to provide opportunities for citizens to express their views on those activities (Borton & Warner, 1974; U.S.E.P.A., 1979). Citizen participation techniques are numerous and vary according to purpose. The list of techniques presented here is intended to be illustrative rather than exhaustive. Information giving techniques are used when an agency wishes to alert the public to its concerns, activities or services. Examples of information giving techniques are: newsletters, pamphlets, bulletin boards, audio-visual programs and speeches. Agencies are often concerned with incorporating citizen's views into their decision-making processes. Some information gaining techniques are: hearings, listening sessions, telephone hot-lines, surveys and response forms. Under some circumstances agencies may seek to develop an open dialogue with citizens. Examples of techniques suited to this purpose are: charettes, workshops and public forums (U.S.D.A. Forest Service, 1980; U.S.E.P.A., 1979).

Citizen participation programs can greatly enhance the public image of the agency (U.S.D.A. Forest Service, 1980). They can also result in agencies taking actions that come closer to fulfilling public needs (Eley, 1979). However, their effectiveness is dependent on the skills dedication and motivation of agency personnel and citizens. It may be difficult to find all of these characteristics in every program.

Environmental Action Skills Training Programs

Recognizing the limitations of the above mentioned efforts, some programs have been designed to develop in citizens the skills necessary to influence societal decisions. The Sierra

Club designed one such program which focuses on toxic substances. The purpose of this course was to make it possible for citizens to gain knowledge about a toxic substance issue and the skills needed to take effective action to resolve the issue. The course involves one meeting per week for twelve weeks and a subsequent action project. Highlights of this program are sessions on community research, scientific considerations, regulatory considerations and planning the citizen action project. Participation in the program requires a major time commitment for class attendance, outside activities and reading. The total commitment is expected to range between four and six hours per week (Kunofsky, 1981).

Educational programs offered by the Center for Public Representation (CPR), a Madison, Wisconsin, based public interest law firm, are not nearly as demanding as the Sierra Club program. While their efforts are not specifically directed toward environmental issues, they do stress skills that are applicable. CPR training programs strive to develop political and legal advocacy skills under such topic headings as: Understanding Administrative Agencies/Rulemaking, Media and Advocacy, Legislative Processes and Lobbying. Techniques used are primarily factual presentations and demonstrations. Active involvement is encouraged through discussion as well as application of facts and techniques to problems of interest to the group. The CPR staff views citizen training as an extension of their direct advocacy of underrepresented segments of the Wisconsin population (Brubaker, 1981).

While stimulating the development of skills needed to remove citizens from the ranks of the underrepresented is at least an inferred goal of many adult EE programs, it is questionable whether that goal is being realized. Johnson, Champeau and Newhouse (1980) used a review of adult EE programs as a basis for the statement that these efforts are generally unsuccessful. The primary reason for this failure has been an inability to attract and maintain an audience (Johnson, et al, 1980). One requirement of adult education is that it satisfy the learners' immediate needs (Knowles, 1973; Tough, 1971). Is the apparent failure of adult EE linked to the omission of components that participants feel they need?

Based on the expressed goals of the majority of adult EE programs, it can be inferred that many educators have perceived the needs of adults as being an awareness of environmental problems and possible solutions (Borton & Warner, 1974; Everitt, 1978; Force, et al, 1975; Johnson, et al, 1980; Miami-Dade Junior College, 1972; Nowak, 1970; Reshkin, 1973; University of Wisconsin-Milwaukee, 1970). Many efforts to develop awareness have identified the importance of differing human values and their roles in resolving these issues. However, Winston (1974) indicated that programs aimed at awareness will stimulate awareness alone. This limited focus on environmental awareness was also noted by Stapp (1976). Hungerford and Peyton (1976) went a step further to suggest that environmental educators have been "remiss" in not incorporating action skills training in their programs. The omission of action skills training seems to indicate that environmental educators may be pursuing ill-defined or incomplete goals.

Broad agreement exists that the desired final outcome of adult EE should be environmentally responsible behavior, or similarly, an environmentally literate citizenry. A review of the goals of EE efforts brings repeated reference to these items:

1. Knowledge of ecological principles and environmental issues (Hungerford, et al, 1980; Smith, 1972; U.S.D.A. Forest Srevice, 1978; WEEC, 1974).
2. The integral relationship between human values and environmental issues(Crowfoot & Bryant, 1980; Hungerford, et al, 1980; Iozzi & Cheu, 1978; Smith, 1979; Swan, 1973).
3. The need to develop the skills necessary to investigate issues and evaluate information regarding issues (Hungerford, et al, 1980; Offutt, 1974; Verduin, et al, 1977; Wellford, 1970).
4. The need to develop the skills necessary to take action to resolve issues (Dale, 1979; Hungerford, et al, 1980; Peyton, 1977; UNESCO, 1977; Vande Visse & Stapp, 1975).

All EE programs address some subset of these goals. However, the most effective approach to attaining environmental literacy among citizens should include each of these goals.

Goals for Environmental Education

Perhaps the most comprehensive statement of content for EE was developed by Hungerford, Peyton and Wilke (1980) as the "Goals for Curriculum Development in Environmental Education." As described in Chapter I, these goals begin with a superordinate goal and include four goal levels each having specific subgoals. In this section the content of adult EE will be presented within the framework of the four goal levels.

Superordinate Goal

> ... to aid citizens in becoming environmentally knowledgeable and, above all skilled and dedicated citizens who are willing to work, individually and collectively, toward achieving and/or maintaining a dynamic equilibrium between the quality of life and the quality of the environment (Harvey, 1976).

Level I. Ecological Foundations

> This level seeks to provide receivers with sufficient ecological foundations knowledge to permit him/her to eventually make ecologically sound decisions with respect to environmental issues(Hungerford, et al, 1980, p.43).

The necessity for examining ecological principles lies in the impact that social, political and economic decisions have on natural systems (Smith, 1972). Making these decisions becomes easier if citizens understand the composition of the environment and the ways in which humans affect it (U.S.D.A. Forest Service, 1978). Therefore, a knowledge of ecological principles is a vital component of environmental literacy (Hungerford, et al, 1976).

Hungerford, et al (1980, p. 43) stated that the ecological concepts comprising this component of environmental literacy would minimally include:

1. Individuals and populations.
2. Interactions and interdependence.
3. Environmental influences and limiting factors.
4. Energy flow and materials cycling (biogeochemical cycling).
5. The community and ecosystem concepts.
6. Homeostasis.
7. Succession.
8. Man as an ecosystem component.
9. The ecological implications of man's activities and his communities.

A solid understanding of these scientific concepts provides a firm foundation for choosing personal behaviors. Basing actions on values consistent with ecological principles is one requirement for developing an environmental ethic (WEEC, 1974).

Level II. Conceptual Awareness - Issues and Values

> This level seeks to guide the development of a conceptual awareness of how individual and collective actions may influence the relationship between quality of life and the quality of the environment and, also, how these actions result in environmental issues which must be resolved through investigation, evaluation, values clarification, decision-making and finally, citizenship action (Hungerford, et al, 1980, p.44).

By definition EE addresses "...culturally-imposed, ecologically-related problems..." (Hungerford and Peyton,1976). Content in this level examines the cultural aspects of environmental issues, or more specifically, the ways in which human behaviors within the societal framework affect environmental quality. Etheridge (1974) stated that social norms direct behavior only after they have been fully incorporated into the individual's value system. Changing individual behaviors and, ultimately, social norms requires a change in basic human values (Fellenz, 1974). The fundamental causes of and potential solutions to environmental issues are intimately tied to values (Iozzi & Cheu, 1978; Swan, 1974).

Referring to the nuclear power controversy, Iozzi and Cheu (1978) provided poignant testimony of the nature of environmental issues: "...no scientific principle can guide the choice between some number of kilowatt hours and some number of cases of thyroid cancer..." (p. 225). In order to compare economic production to human health, a common denominator must be found. Human values play a central role in one's search for this common denominator.

Values are general guides to behavior and have been defined as a result of the process of valuing. This process contains seven criteria (Raths, Harmin & Simon, 1966):

1. Choosing freely. Values must be freely selected if they are to guide one's life. Coercion influences behavior only as long as it is present in the life of the individual.
2. Choosing from among alternatives. There cannot be free choice without alternatives from which to choose. The act of eating is not a value, because it is a basic necessity and one cannot abstain from eating without dying. However, one can choose a type of food and thus value french cuisine.

3. Choosing after thoughtful consideration of the consequences. An intellegent and meaningful guide to one's life results only from understanding the consequences of various alternatives. This understanding forms the basis for choices and, ultimately, values.
4. Prizing and cherishing. Values are the outcome of choices with which one is glad. People are happy with their values. They prize, cherish and respect them.
5. Affirming. After meeting the above criteria, one is quite likely to affrim that choice publicly Being ashamed of a choice makes it something other than a value
6. Acting upon choices. For a choice to be a value it must affect one's life. Values affect friendships, finances, hobbies and every aspect of human life. Values give direction to actions. Talk without action is not based on values.
7. Repeating. Values are persistent patterns in life. They influence behavior at different times and in different situations in one's life.

Choices that fulfill all of these criteria are values that form the foundation of an individual's pattern of behavior. One important step in resolving environmental issues is an examination of personal values to determine their consistency with environmental quality.

Numerous values clarification techniques have been developed to help people examine their values. These methods stress the critical analysis of personal values to determine their consistency with one's actions. Values clarification elicits the learner's own judgement rather than allowing the imposition of the values of an authority figure (Simon, Howe & Kirschenbaum, 1972). However, Kohlberg (1975) has stated that this method stresses ethical relativity and may lead learners to believe that no morally right value position exists. Moral education, in which some form of values examination may be the first step, has been proposed as an approach with the more definite aim of instilling a sense of social or moral justice (Kohlberg, 1975).

Achieving this sense of moral justice is a long-term process linked to individual maturation in which there is a rather deliberate progress toward broader more flexible ways of viewing moral problems (Harshman, 1978). Kohlberg (1975) described this moral development process as progressing through six stages:

> Stage 1. The punishment-and-obedience orientation. The physical consequences of action determine its goodness or badness, regardless of the human meaning or value of these consequences. Avoidance of punishment or unquestioning deference to power are valued in their own right...
>
> Stage 2. The instrumental-relativist orientation. Right action consists of that which instrumentally satisfies one's own needs and occasionally the needs of others... Elements of fairness, of reciprocity, and of equal sharing are present, but are always interpreted in a physical, pragmatic way. Reciprocity is a matter of "you

scratch my back and I'll scratch yours," not of loyalty, gratitude or justice...

Stage 3. The interpersonal concordance... orientation. Good behavior is that which pleases or helps others and is approved by them. There is much conformity to stereotypical images of what is majority or "natural" behavior...

Stage 4. The law and order orientation. There is orientation toward authority, fixed rules, and the maintainance of the social order. Right behavior consists of doing one's duty, showing respect for authority, and maintaining the given social order for its own sake...

Stage 5. The social-contract, legalistic orientation, generally with utilitarian overtones. Right action tends to be defined in terms of general individual rights and standards which have been critically examined and agreed upon by the whole society. Aside from what is constitutionally and democratically agreed upon, the right is a matter of personal "values" and " opinion." The result is an emphasis on the "legal point of view," but with an emphasis on the possiblity of changing law in terms of rational considerations of social unity... This is the "official" morality of the American government and constitution.

Stage 6. The universal-ethical-principle orientation. Right is defined by decisions of conscience in accord with self-chosen ethical principles appealing to logical comprehensiveness, universality, and consistency... At heart, these are the universal principles of justice, of the reciprocity and equality of human rights, and of respect for the dignity of human beings as individual persons (p. 674).

Kohlberg (1975) stresses that these stages represent a structure upon which decisions are made and do not imply what the content of the judgement should be.

This structure is appropriate for both moral and civic education, in that they are "education for the analytical understanding, value principles and motivation necessary for a citizen in a democracy, if democracy is to be an effective process" (Kohlberg, 1975, p. 675). The application of this model lies in stimulating the learner's movement to higher stages of moral reasoning for the purposes of making decisions and taking action (Harshman, 1978; Iozzi & Cheu, 1978). However, reasoning at a higher level does not guarantee consistent action at that level. Situational pressures, an individual's will power and emotions all play a part in determining moral action. Given these considerations, moral education may best be approached in an eclectic manner (Kohlberg, 1978).

Level III. Investigation and Evaluation

> This level provides for the knowledge and skills necessary to permit receivers to investigate environmental issues and evaluate alternative solutions for remediating these issues. Similarly, values are clarified with respect to these issues and alternative solutions (Hungerford, et al, 1978, p. 44).

The importance of citizen's right to know was eloquently stated by James Madison in 1822:

> Knowledge will forever govern ignorance. And a people who mean to be their own governors must arm themselves with the power knowledge gives. A popular government, without popular information or a means of aquiring it, is but the prologue to a farce or tragedy (Ebbin & Kasper, 1974, p. i).

Partial responsibility for avoiding this farce or tragedy lies with the citizens themselves. Filling this responsibility in terms of environmental quality requires skills for gaining and evaluating information. Investigation is used to analyze issues regarding their ecological and cultural impacts. In addition, individuals must possess the skills to identify the value positions which underlie environmental issues and to clarify their own values relative to these issues (Hungerford, et al, 1980).

Several justifications exist for including investigation as a component of EE. Verduin, Miller and Greer (1977) stated that direct inquiry is an excellent means for examining social problems and identifying possible solutions. Investigation also provides a basis for making choices among divergent interests and attitudes. Wellford (1970) and Love (1971) indicated that it helps identify human and institutional targets for environmental action strategies. Finally, through inquiry life-long learning and problem-solving skills can be gained (Verduin, et al, 1977).

Skilled use of the investigation process requires an understanding of its components. The first is accurate problem identification (Dale & Mitiguy, 1978; Cichon, 1980; Hungerford, et al,1978; Verduin, et al, 1977; Volk, 1980). Defining a specific and acheivable research question is the next step. Based on the question(s), appropriate research methods can be chosen. These methods could address primary sources, secondary sources or a combination of these (Hungerford, et al, 1978). Primary sources can be examined using surveys, questionnaires, or opinionaires. Personal interviews can also be important sources of information (Kunofsky, 1981). Swan (1974) adds that scientific methodologies can be an important tool, if citizens wish to do their own environmental monitoring. Some examples of secondary sources are books, periodicals, newsletters and technical reports. These can be obtained from libraries, government agencies, local resource persons as well as citizen, business and industry organizations.

One important factor to take into account is the potential bias of the source. Identifying the value positions represented in these primary and secondary sources can be done by exploring many sources (Hungerford, et al, 1978). Once the information has been collected it must be synthesized into concise statements that address the research question.

Three types of statements can be made: conclusions, inferences and recommendations. Conclusions are statements of the final result and must not go beyond the data collected. Inferences are assumptions or judgments based on the data or conclusions. Recommendations are pieces of advice regarding a particular course of action that can be taken or suggestions for areas that require further study (Hungerford, et al, 1978). The data, conclusions, inferences and recommendations generated from autonomous investigation form an important part of the foundation of productive environmental action.

Level IV. Environmental Action Skills - Training and Application

> This level seeks to guide the development of those skills necessary for receivers to take positive environmental action for the purpose of achieving and/or maintaining a dynamic equilibrium between quality of life and the quality of the environment (Hungerford, et al, 1980, p.44).

Content within this level represents the ultimate goal of EE: productive environmental action. The productivity of action efforts is often related to what Hungerford and Peyton (1980) term the "level of action," which refers to a continuum from individual efforts to those of large international organizations. With notable exceptions, individuals are not as effective as groups of people and smaller groups are not as effective as larger ones. Some reasons for this relationship are: groups have existing networks for information dissemination, larger groups encompass a larger geographical area and the financial resources of groups support strategies that are beyond the scope of indivduals (Hungerford & Peyton, 1980). Individuals who have banded together, whether for a specific purpose or for more general reasons, increase their effectiveness in taking environmental actions.

Regardless of size, citizen groups must possess the skills needed to be effective. Hungerford and Peyton (1980) have categorized these skills under headings which describe types of environmental action (see Appendix A for detailed descriptions of these categories). They are:

1. Persuasion activities are those directed toward changing human values and, ultimately, behaviors to be more consistent with a high level of

environmental quality.

2. Consumerism describes citizens' behaviors in the marketplace that are intended to ameliorate the negative impacts of selected consumer products or commercial activities on the environment.
3. Political action refers to activities that bring pressure to bear on political organizations, governmental units or individuals within these units in order to influence them to take positive environmental action.
4. Legal action encompasses all efforts to preserve or enhance environmental quality that involve the use or threat of court action.
5. Ecomanagement activities are direct physical actions that enhance or maintain some aspect of the environment.

These environmental action categories are not mutually exclusive. Many actions fall into two or more categories. For example, an effort to enact legislation (political action) to require a mandatory deposit on all beverage containers is intended to stimulate the use of refillable bottles (consumerism) and encourage the recycling of throwaways (ecomanagement). Accomplishing this requires that a great deal of public support (persuasion) be mobilized. Although environmental actions may not be pigeon-holed, these five categories provide a convenient and comprehensive framework for its conceptualization.

Once an individual or group has selected a specific method of action, it should be scrutinized to determine its chances for success. Hungerford and Peyton (1980, p. 152) developed the Action Analysis Criteria to aid in the evaluation of a proposed environmental action. These criteria follow:

1. Is there SUFFICIENT EVIDENCE to warrant action on this issue?
2. Are there ALTERNATIVE ACTIONS available for us to use? What are they?
3. Is the action chosen the MOST EFFECTIVE one available?
4. Will there be LEGAL CONSEQUENCES of this action? If so, what are they?
5. Will there be POLITICAL CONSEQUENCES of this action? If so, what are they?
6. Will there be SOCIAL CONSEQUENCES of this action? If so, what are they?
7. Will there be ECONOMIC CONSEQUENCES of this action? If so, what are they?
8. Do my PERSONAL VALUES support this action?
9. Do I understand the PROCEDURES necessary to take this action?
10. Do I have the SKILLS needed to take this action?
11. Do I have the COURAGE to take this action?
12. Do I have the TIME needed to take this action?
13. Do I have all of the OTHER RESOURCES (other than the above) needed to make this action effective?
14. What are the ECOLOGICAL CONSEQUENCES of this action?

"To ignore one or more of these criteria could be disastrous" (Hungerford & Peyton, 1980, p. 152).

The development of environmental action skills must be built on a foundation of ecological knowledge, a conceptual awareness of environmental issues and human values as well as the skills needed to investigate and evaluate environmental issues. An educational program designed to assist citizens in gaining the knowledge and skills needed to take an active role in resolving environmental problems must be based on a holistic superstructure. It is the writer's opinion that the Goals for Curriculum Development in Environmental Education do provide a sound superstructure for the content of this ELT program.

Environmental Behavior

Peyton and Miller (1980) have developed an Anatomy of an Environmental Behavior (see Figure 1) which encompasses the knowledge and skills described within the Goals for Curriculum Development in Environmental Education. The knowledge and skills which individuals have gained impinge on their frames of reference. The frame of reference represents the human value system which evolves as it assimilates and accommodates new knowledge and experiences. From this frame of reference, attitudes concerning the importance of the issue and perceptions of one's ability to change the situation are formed. Only when one has a strong attitude concerning the importance of the issue and confidence in one's ability to change the situation, will there be a high probability that action will be taken. Thus, the Anatomy of an Environmental Behavior is a schematic representation of the relationships between the different components of the Goals for Curriculum Development in Environmental Education. In addition, it includes one concept that is very pertinent to environmental action.

This is the concept of one's perception of their ability to control events through personal action, which is termed locus of control (Rosen & Salling, 1971; Smith, 1979). An

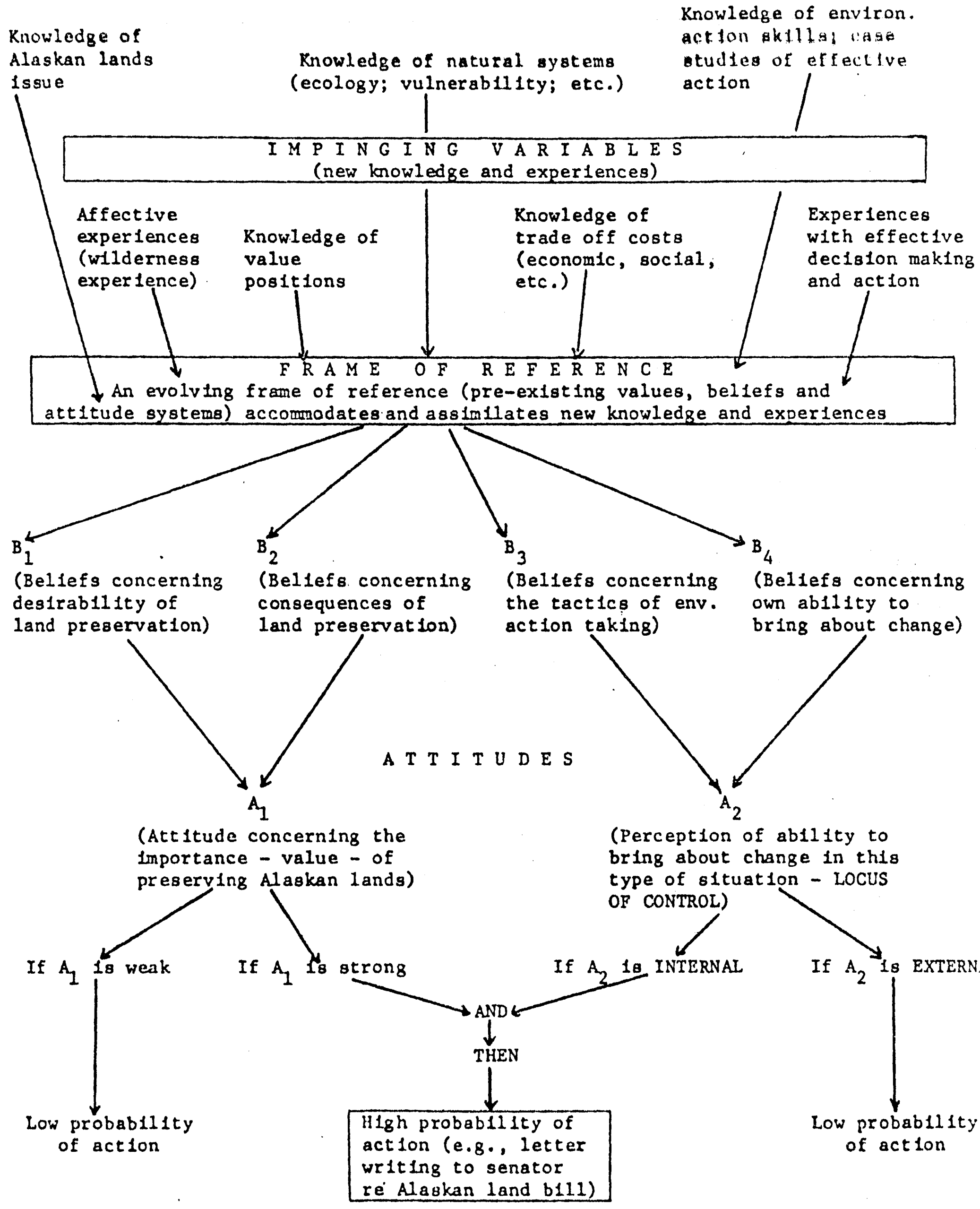

Figure 1. Anatomy of an Environmental Behavior (Peytor & Miller, 1980,p.184)

internal locus of control indicates that one perceives the outcome of events as a result of personal action. An individual with an external locus of control is characterized as one who believes that fate or other factors beyond personal influence determine the outcome of events. The degree to which a person is internal or external is believed to be specific to a task or set of circumstances (Smith, 1979). For example, one may exhibit an internal orientation in performing work related tasks, but an external orientation regarding politics. This concept of locus of control has important implications regarding environmental action taking.

As the Anatomy of an Environmental Behavior indicates, locus of control is one factor which influences one's probability for taking environmental action. Phares, Ritchie and Davis (1968) stated that internals "...are superior to externals in actively seeking information relevant to problem solution... (and)... are more likely to engage in behaviors that will confront a problem directly" (p. 402). Internals are also more likely to become involved in efforts to affect social or political change (Phares, et al, 1968; Rosen & Salling, 1971). Thus, encouraging the development of internality among citizens should increase the probability of them taking action.

Smith (1979) suggested that training in investigation and action skills could result in the development of a more internal orientation. This inference is supported by research which indicates that pre-professional environmental educators are more internal regarding environmental issues than either other college students or in-service elementary school teachers (Smith, 1979). With this in mind, an ELT program should have the added benefit of stimulating in the learners the feeling that their actions can influence societal changes which may result in a sustained or improved level of environmental quality.

Considerations for Adult Learning

A key consideration in designing an educational program is developing a philosophy of learning. Learning is not merely the accumulation of knowledge, although knowledge is extremely important. It is a process through which individuals develop the capabilities to think and solve problems. The essence of learning is contained in these basic concepts:

1. Learning occurs in the student. Although stimuli may originate externally, the sense of discovery and the process of comprehension lie within the learner (Bryant,1974; Knowles, 1973).
2. Learning addresses both the cognitive and affective aspects of the individual (Bryant,1974; Knowles, 1973).
3. Learning is the discovery of personal relevance (Bryant, 1974).
4. Learning occurs when meaning has been built into the entire experience (Knowles, 1973).
5. Learning is the result of personal involvement and experience (Bryant,1974; Knowles,1973).
6. Learning is evaluated by individuals in terms of

the degree to which their personal needs have been fulfilled (Knowles, 1973).

7. Learning results in a change in behavior (Knowles, 1973; Van Meter, 1973; Verduin, et al, 1977).

The concept of change is central, because learning enables the individual to make personal and social adjustments (Knowles, 1973). Since learning relates to the dynamic process of growth, there can never be a final destination, only landmarks along the path.

Assumptions of Andragogy

Knowles (1973) distinguished between traditional education, which is often called "pedagogy," and a learner-centered approach, which he terms "andragogy." Before a learner-centered approach can be used, a thorough understanding of the characteristics of adults as learners is necessary. Knowles (1973) based the theory of andragogy on four sets of interrelated assumptions:

1. Changes in self-concept.
2. The role of experience.
3. Readiness to learn.
4. Orientation to learning.

This framework will be used to delineate the characteristics of adults as learners.

Changes in self-concept. As a person "...matures his self-concept moves from one of total dependency to one of increasing self-directedness" (Knowles, 1973, p. 45). Adults are conditioned to being active and having some control over situations (Fellenz, 1974). Neglecting to consider the importance of the learner's self-image may interfere with learning.

When a person's self-concept is not respected, resentment and resistance may develop (Knowles, 1973). Adults may respond to such a threat by screening out offensive aspects of the learning experience (Etheridge, 1974). In the past, this situation was mistakenly identified as the inability of adults to learn (Johnson, et al, 1980). However, most educators now believe that adults' learning abilities are not significantly less than those of young people (Fellenz, 1974; Johnson, et al, 1980; Van Meter, 1973). With this in mind, adult educators may wish to take special precautions when involving adults in self-directed learning.

Ironically, programs based on self-directed learning may threaten individuals who perceive education as the passive reception of information (Ehteridge,1974; Fellenz, 1974; Knowles, 1973). The shock of the first exposure to self-directed learning may be lessened by incorporating a "learn-how-to-learn" activity (Knowles, 1973). Preserving or enhancing the learners' self-concept allows their learning ablilities to be fully utilized.

<u>The role of experience</u>. As people mature, they accumulate a wide range of experiences that can be incorporated into the learning situation (Knowles, 1973; Van Meter, 1973). Indeed, the learners themselves can be some of the richest resources for learning (Bryant, 1974). Tapping past experiences and

involving the learner in analyzing them is one way of enhancing learning (Knowles, 1973).

Another way is by providing new experiences. The use of task-oriented, hands-on activities is well recognized as a method of increasing the meaning of learning (Emmelin, 1977; Verduin,et al, 1977). An important consideration for this type of experiential learning is that learners must suceed at tasks to get their full benefit (Etheridge, 1974; Verduin, et al, 1977). Shifting the emphasis from transmittal techniques, e.g., lectures and readings, to experiential techniques, e.g., discussions, simulations and projects, enhances adult learning by simultaneously incorporating past experiences and providing new ones (Knowles, 1973).

Readiness to learn. Adults engage in learning activities as a response to changes in themselves and their environment (Etheridge,1974; Tough, 1971). Physiological, mental and emotional changes are important factors (Etheridge, 1974). In addition, the evolution of one's social roles involves the performance of new tasks (Knowles, 1973). Readiness to learn is the willingness to accept behavioral changes in light of one's needs (Etheridge, 1974).

This concept was supported by a study of attendees at five wetlands preservation educational programs. Entine (1980) reported that 95% of the citizens and 97% of the professionals in attendance had visited a wetland at least occasionally within the previous five years. From this it was inferred that the strongest motivation existed for those directly affected by wetland destruction. 30% of all attendees did not consider themselves very active in the wetlands issue. Entine speculated that these people were seeking ways to become more active. This reinforces the concept that adults will learn about environmental issues only when they feel that this learning fulfills their personal needs.

A.H. Maslow categorized human needs into seven hierarchical levels (see Figure 2). The foundational needs must be met before needs at the next level can exert influence on one's behavior (Verduin, et al, 1977). Physiological needs are the necessities of life, e.g., food and water, and are always met first. The second level, safety, focuses on maintaining the security and stability of the physiological needs. Next, one's acceptance in interpersonal relationships becomes important. The fourth level encompasses the need to achieve social and professional status. The need for self-actualization, i.e., greater personal growth for its own sake, constitutes the fifth level (Johnson, et al, 1980; Verduin, et al, 1977). Next one experiences the desire to know and understand. The hierarchy culminates in aesthetic needs (Biehler, 1974).

Maslow's Hierarchy of Needs has been used in virtually every description of adults' motivation to learn (Johnson, et al, 1980). After fundamental needs have been met, people are motivated to educate themselves in response to higher needs (Etheridge, 1974; Tough, 1971).

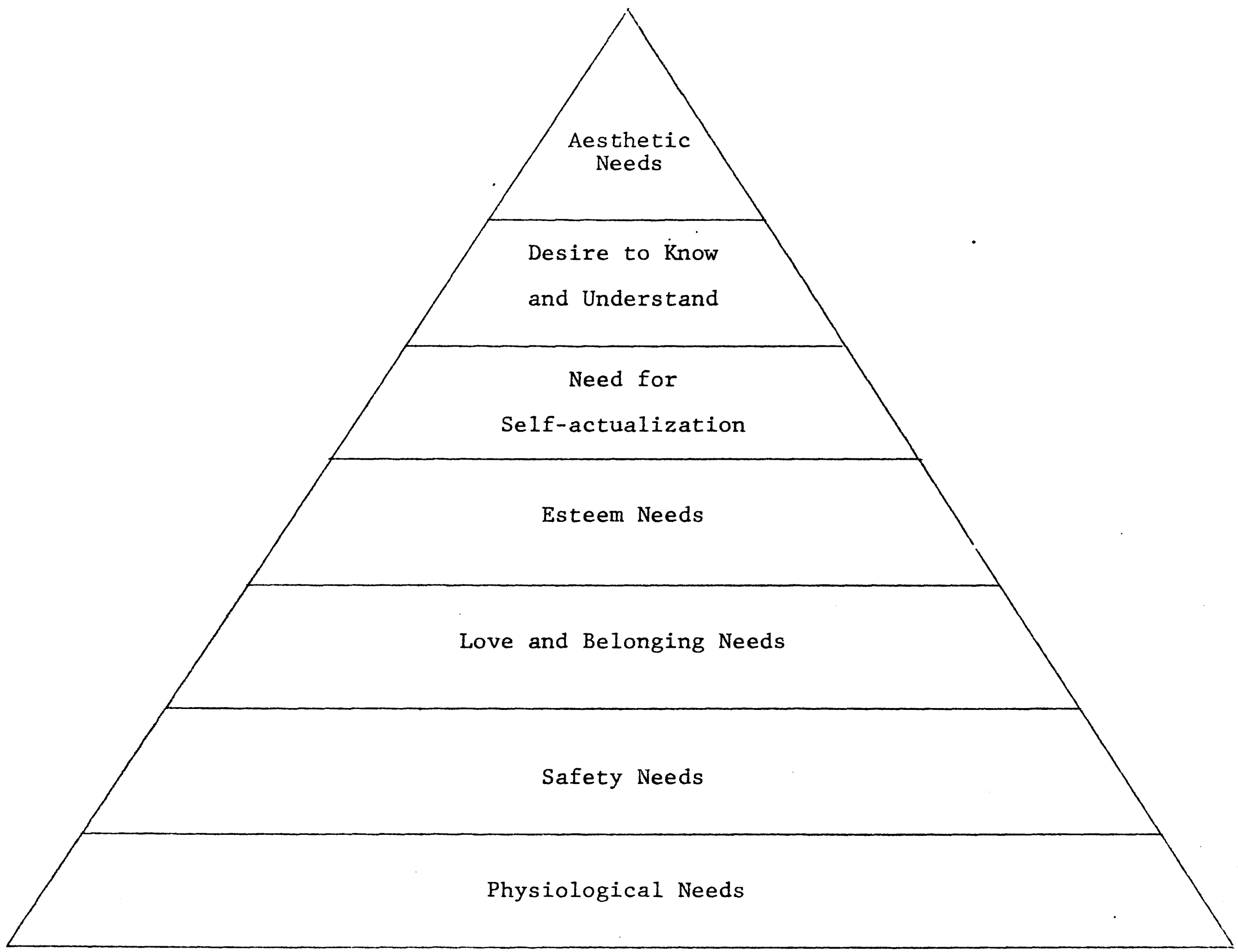

Figure 2. Maslow's Hierarchy of Needs (Biehler, 1974, p. 414).

Assisting learners in identfying their needs and employing strategies to meet those needs are important attributes of a successful educational program. It is imperative that the educational experience be relevant to the learner (Emmelin, 1977; Fellenz, 1974; Knowles, 1973; Verduin, et al, 1977). A critical component of relevance is timing. Learning is most effective when an immediate need is felt (Wasinger, 1974). Therefore, learning experiences should be timed to coincide with the tasks which are creating the need (Knowles, 1973).

Orientation to learning. Adults tend to have a problem oriented approach to learning (Knowles, 1973). They see the knowledge and skills gained in an educational experience as beneficial if it is applicable to a real-life problem (Dale, 1979; Tough, 1971). Involving oneself in real-life problems can have four significant outcomes. First, knowledge of the particular problem is gained. Secondly, the learner gains insight into the problem-solving process in general. Third, success in solving one problem increases the learner's confidence in solving subsequent problems (Dale, 1979). Finally, it is an effective means of stimulating changes in behavior (Verduin, et al, 1977). Problem-solving is truly a learner centered approach.

Learing Projects

Adults have been applying the principles of self-directed learning to their own informal education for many years. One way they have done this is through learning projects. Tough (1971) studied adults' efforts to learn and developed a general picture of the way in which adults educate themselves. A learning project is a sustained, "... highly deliberate effort to gain certain knowledge and skill" (Tough, 1971, p. 1). It was quite common for a person to spend 700 hours per year involved in learning projects. 70% of these projects were planned by the learners themselves (Tough, 1971).

A learning project is defined as a series of related episodes, adding up to at least seven hours. An episode is a period of time which is devoted to an uninterrupted series of related activities. The intent or purpose of these activities is clear, definite and remains the same throughout the episode. An episode has a definite beginning and ending. Normal daily activities fall naturally into episodes. For example, the episode of driving from one's home to the workplace may begin upon exiting the house and end upon entering the office. Some examples of the distinct, but related activities performed during the episode are: opening the car door, turning the key and applying the brakes. Using episodes as a basic unit, provides an appropriate psychological foundation for the construction of learning projects (Tough, 1971). Combining problem-oriented learning with a project framework could provide an educational experience that is uniquely suited to adult learners.

Because it is problem-centered and multi-disciplinary, an EE program focusing on issues could provide a truly productive learning experience for adults (Emmelin, 1977; Schmidt, 1973). Environmental issues of some kind are present in nearly every community. The study of these issues is often very relevant to learners (Schmidt,1973). Community problems are also more easily solved by citizens than state or national ones (Janke, 1973). A short-term project intended to resolve a local issue can provide the orientation, motivation, relevance and the quality of personal involvement necessary to meet the educational needs of citizens. The task of the environmental educator is to develop a process that facilitates the successful completion of a community level, issue-oriented, problem-solving project that encompasses all these considerations for adult learning.

Adult Environmental Education Program Design

Environmental issues vary greatly in focus, scope and severity. Extreme variation is also found in the knowledge and skills of citizens seeking to resolve these issues. For these reasons it is virtually impossible to develop a specific program that is applicable to all adult EE situations. Therefore, the most productive approach would be simple, direct and as unrestrictive as possible (Tow, 1973). Citizens must determine their own needs and design a program that meets those needs (Dale, 1979). However, citizens with little background in education or environmental action may find it difficult to assume the role of instructors who facilitate the design of an effective program. Basic guidelines are needed to help citizens assume their roles as instructors (Verduin, et al, 1977). These basic principles must revolve around the various roles that must be fulfilled in the training program, be based on the characteristics of adults as learners and address the problematic nature of environmental issues.

Roles in the Traning Program

Dale (1979) recognized that everyone is an educator, i.e., everyone helps others learn in some manner. Parents, employers and friends may informally direct others through new experiences or model new behaviors. However, the magnitude and complexity of environmental issues demands a more efficient approach. Dividing the responsibilities for overseeing program development and implementation can increase efficiency by lessening the burden on individuals. Aside from the learners, whose role is active participation in the program, the three principle staff roles are coordinator, facilitator and resource person (Dale, 1979; Kunofsky, 1981). An individual may assume more than one role depending on the complexity and duration of the program. The individuals filling these roles are vital to the success of the program (Kunofsky, 1981).

Coordinator. The coordinator's role focuses on logistics (Dale, 1979; Kunofsky, 1981). Locations, dates and times must be appropriate to the learning experience and convenient for the participants. Providing a physical climate that is conducive to learning is especially important. Maintaining an adequate supply of materials, e.g., newsprint and markers, is essential. Generating sufficient attendance is another responsibility (Kunofsky, 1981). Making a checklist of items which are needed for each session can be very helpful (U.S..D.A. Forest Service, 1980; Kunofsky, 1981). It may be beneficial for the same person to act as coordinator for the duration of the training program (Dale, 1979). Members of citizen groups are often familiar with the behind-the-scenes work necessary for meetings. The logistics of learning experiences are only slightly different from those of meetings. However, it is advisable for the coordinator to work closely with the facilitator regarding the special needs of particular learning experiences.

Facilitator. The facilitator guides participants through the learning experience and may be responsible for specific aspects of it, e.g., preparing handouts and arranging presentations by resource persons. The role of the facilitator is that of a neutral discussion leader, who attempts to involve all participants in the activity (Biagi, 1978). A facilitator should follow these basic guidlines (Biagi, 1978; U.S.D.A. Forest Service, 1980):

1. Set the mood of the session by clearly explaining the facilitator's role,the procedures to be followed and the reasons for the session.

2. Keep the discussion on track by restating the topic when digressions occur.
3. Summarize and synthesize ideas.
4. Identify participants who have been interrupted and ask them to reiterate their statements.
5. Accept feelings along with information.
6. State the problem in a constructive way, not in a way that accuses a person or organization.
7. Pose problems and questions, do not supply answers.
8. Suggest a procedure or problem-solving approach.
9. Summarize the accomplishments of the session and and restate the final outcomes.

It must be emphasized that in order to retain a high level of credibility with the group, the facilitator should remain neutral. Statements of personal opinion should be avoided. Judgments and decisions should be made only with the approval of the group (Biagi, 1978). By following these basic guidelines any member of the group can act as facilitator.

However, acting is not often enough to fulfill a role as crucial to the success of the program as this. Because many people may be accustomed to a teacher-centered approach, it may be difficult for them to guide a learner-centered process. For this reason, some form of facilitator training may be necessary (Knowles, 1973). One form of training is observing and assisting a skilled facilitator (U.S.D.A. Forest Service, 1980). Another is to assign each group member to lead one session. This rotating facilitator approach not only helps individuals learn facilitating skills, but also sensitizes them to the educational process and encourages them to be better group members (Dale, 1979).

Resource persons. The technical expertise of the program can be supplied by one or more resource persons. Knowledgable individuals from outside the group may provide new perspectives along with new information (Schmidt, 1973). Janke (1973) indicates that professionals and resource specialists can assist citizens in identifying community issues and are the ones most qualified to explain alternative solutions which are available. Clausen and Iverson (1973) and Gordon (1961) also highly recommend the use of technical experts. Outside sources of expertise may also be found in other citizen groups. Organizations with similar goals may join together to form a coalition. Even if the member groups of a coalition do not have similar goals, they may each possess certain skills that can be shared (Dale, 1979). It is not always necessary to look for outside expertise, if group members already possess the needed skills. Dale (1979) suggests listing the strengths of each member in a "skills bank" for easy reference. Outside professionals, other citizen organizations and current group members can be valuable sources of information and skills. These resources should be used to the fullest.

Andragogical Model

Based on the assumptions of andragogy, which describe adults' learning characteristics, Knowles (1973) developed an eclectic model for adult education. This model incorporated principles from various learning theories, while still maintaining its own integrity. It is a process model "...concerned with providing procedures ...for helping learners aquire information and skills" (Knowles, 1973, p. 102). The components of this model are:

1. Establishing a climate conducive to learning.
2. Creating a mechanism for mutual planning.
3. Diagnosing the needs for learning.
4. Formulating program objectives that will meet these needs.
5. Designing a pattern of learning experiences.
6. Conducting these learning experiences with suitable techniques and materials.
7. Evaluating the learning outcomes and rediagnosing learning needs (Knowles, 1973 p. 102).

The Andragogical Model will be used here as a framework to organize the work of other adult educators which tends to be less comprehensive or less concise.

Creating a climate conducive to learning. Wasinger (1974) described the learning environment as the sum total of social, cultural, emotional, intellectual and physical aspects which impinge on each individual. An effort to create a productive learning climate must address each of these aspects and is perhaps the most crucial element of the Andragogical Model (Knowles, 1973). For the purposes of presentation, three categories have been identified: physical, organizational and interpersonal. The manipualtion of these aspects to create a climate conducive for learning has a great deal of influence on the success of the learning experience.

The learning climate must provide for physical comforts (Knowles, 1973). Convenience in terms of time, date, location and parking are a must (Johnson, et al, 1980; Wasinger, 1974). Temperature, lighting, ventilation and anything that affects the five senses should be made as comfortable as possible (Knowles, 1973; Wasinger, 1974). Facilities, e.g., size of rooms, equipment and seating arrangements, should be compatible with the goal of the learning experience (Knowles, 1973; Wasinger, 1974; U.S.D.A. Forest Service, 1980). For example, an auditorium with 200 fixed seats would be inappropriate for an informal discussion group of ten people. Arrangements for a pleasing physical climate should be completed by the training coordinator.

Arranging or rearranging the organizational climate requires an effort by the entire group and is a task that may not be easy. Knowles (1973) stated that hierarchically structured organizations provide less motivation for self-improvement and more blocks to learning than organizations with a team structure. Similarly, meetings conducted according to parliamentary procedures inhibit productive problem-solving. This is caused primarily by the tendency of formal motions to focus on solutions before the problem has been truly identified (Biagi, 1978). Another aspect of the organizational climate is the richness and accessibility of human and material resources (Knowles, 1973).

Members of the group possessing some resource must be accessible to others who may be seeking it. Formal hierarchical organizations can inhibit learning by virtue of their rigid procedures and generally impersonal nature.

Providing a conducive interpersonal climate revolves around protecting the individual's self-image (Etheridge, 1974). When a person's self-image is threatened, one tends to construct a mental barrier that will inhibit the process of meaningful learning. Ironically, meaningful learning is often threatening, because it focuses on changing behavior, which is an integral part of one's self-image. Overcoming these threats requires a supportive atmosphere in which self-improvement is encouraged. Clearly defined goals and careful explanation of expectations can help to create this kind of atmosphere. Interpersonal relationships which are safe, caring, respectful, accepting, trusting and which focus on collaboration rather than competition are essential (Knowles, 1973). Reducing threats can open people to new perceptions and allow them to rethink their values (Verduin, et al, 1977). Both of these are essential to changing behavior. This atmosphere must prevail throughout the group, but the facilitator can be instrumental in constructing and maintaining it. Overcoming defensiveness can be accomplished in large measure by a friendly, informal and empathetic demeanor on the part of the facilitator (Wasinger, 1974). Combining this supportive interpersonal atmosphere with a comfortable physical setting and a team-oriented organization will provide the climate necessary for meaningful learning.

<u>Creating a mechanism for mutual planning</u>. Planning is an essential component of educational program development. Dale and Mitiguy (1978) described planning as a series of steps or a method of achieving a goal. The planning process consists of assessing the educational needs of the learners, developing objectives and designing learning experiences. These elements of planning are described in detail in the following three components of the Andragogical Model.

Planning activities or educational programs for citizen groups involves an extremely important consideration: the inclusion of group members in the planning process (Dale & Mitiguy, 1978; Van Meter, 1973). Knowles (1973) provided this rationale for mutual planning: "People tend to feel committed to a decision or activity in direct proportion to their participation or influence on its planning and decision-making" (p.109). Dale and Mitiguy (1978) added that mutual planning will increase involvement, because group members are subject to pressure from peers who identify strongly with the plan. Because involving each individual in the total process may not be the most efficient method of mutual planning, a subset of a group has often been used. An advisory group consisting of representative individuals may be used to assist in planning the entire program (Clausen & Iverson, 1973; Schmidt, 1973). Davis and Surls (1975) reported success in working with a separate advisory group for each topic area. Combining an overall planning body with one for each learning experience has also resulted in some very potent programs (Knowles, 1973). These approaches to mutual planning have been successful in the past and can be expected to yield similar results in the future.

Another consideration for planning is the time orientation of adults. Short units give participants a feeling of progress (Wasinger, 1974). Therefore, the greatest adult learning potential can be achieved through "... one shot, evening, half day or day long experiences" (Johnson, et al, 1980, p. 24). Schmidt (1974) applied this idea to an adult EE program by developing a series of short units each focusing on a distinct topic. By incorporating these considerations into the planning process, the effectiveness of the program may be greatly enhanced.

Diagnosing the needs for learning. One of the most crucial components of the Andragogical Model is determining the learner's needs. The function of this element is to indicate to the learners and the program planners the strengths and weaknesses of the group members (Bryant, 1974). Identifying interests and needs will help the planners design a program that fulfills group needs and EE goals (Johnson, et al, 1980). Bryant (1974) characterized a learning need as being :

1. Necessary for desired outcome.
2. Lacking or deficient in the learner.
3. Attainable through a means of learning.

Therefore, needs diagnosis begins with identifying the desired outcomes.

Knowles (1973) stated that the first step is to contruct a model of desired behavior, performance or competencies. Data for building this model may come from the individual, the organization or society. The next step is to assess the discrepancies between the learner's current level of competence and items specified in the model. This can take the form of a self-assessment, but the learner must be given the tools and procedures for completing the task. This process can threaten one's self-concept. Providing a safe and supportive atmosphere is essential to overcome perceived threats in order to diagnose real needs (Knowles, 1973).

Assessing the discrepancies between desired outcomes and current competencies can be done through observation of the group in action (Bryant, 1974). Program planners can identify problems, record them and discuss them with the group (Dale, 1979). Since group problems may be the result of personal needs, discussions with individuals may also be used to assess needs (Bryant, 1974; Van Meter, 1973). Verbal methods, such as observation and discussion, represent one approach to diagnosing learning needs.

Another approach is the written pre-test. The instrument should not be so extensive as to be threatening. A one or two page questionnaire may be sufficient. Bryant (1974) indicated that a pre-test should be designed to provide information regarding the:

1. Terminal competencies expected of the learner.
2. Learner's experience, skill, knowledge or attitudes that will have a bearing on the learning experience.

3. Expectations or objectives of the learner. These written or verbal approaches may be used independently or in conjunction.

Whether a written or verbal approach is used, learners may feel reluctant to reveal real needs (Van Meter, 1973). One of the first activities in the educational program should be designed to discover the objectives and expectations of the individual learners. It is important that the learners and program planners fully understand these objectives and expectations (Bryant, 1974).

Regardless of the method, mutually diagnosing needs for learning is a vital element of adult education. The program planners, e.g., facilitator, coordinator or advisory committee, must assist learners in clarifying their needs and setting realistic goals (Verduin, et al, 1977). Rediagnosing needs periodically is also advisable (Bryant, 1974). Continual feedback can help to maintain the focus of the program on meaningful learning.

Formulating program objectives. Before training methods can be designed to fulfill the group's learning needs, program objectives should be developed (Dale, 1979). Objectives provide specific direction for all of the participants in the training program. Because the learners know what is expected of them, they are encouraged to be more efficient. Objectives also provide a basis for evaluation of the program (Verduin, et al, 1977). In order to achieve these benefits, objectives must be carefully prepared.

One significant consideration is the learner's relationship with the objectives. According to the Andragogical Model, objectives that are not developed by the learners will be resisted unless they are freely chosen as being relevant to their self diagnosed needs (Knowles, 1973). Involving learners in the preparation of program objectives can increase relevance and acceptability (Knowles, 1973; Verduin, et al, 1977). Since most learners have little, if any, experience in preparing program objectives, they should be made aware of some basic principles.

Learning objectives are statements of behaviors that the learner is expected to exhibit upon completion of a learning experience. Objectives should satisfy these conditions:

1. They should be stated from the learner's point of view (Verduin, et al, 1977).
2. They should indicate a terminal behavior or competence (Dale & Mitiguy, 1978; Knowles, 1973).
3. They should provide specific and measurable criteria of achievement (Bryant, 1974; Dale & Mitiguy, 1978; Knowles, 1973; Verduin, et al, 1977).
4. They should describe the context in which the behavior is expected to occur (Bryant, 1974; Knowles, 1973).
5. They should be reasonable and achievable (Dale & Mitiguy, 1978; Knowles, 1973).

Properly prepared objectives provide a foundation for designing specific learning experiences and the overall educational program.

Designing a pattern of learning experiences. Learning experiences should be designed to fulfill the needs of learners as described in the program objectives. This process involves choosing techniques, selecting materials and preparing a sequence for each learning session. In each of these components the principle guiding every choice should be "form follows function" (Dale,1979). In other words, the design of the experience should be appropriate for the knowledge and skill being learned.

To facilitate the choice of an appropriate learning technique, it is helpful to identify several possible activities e.g., discussion, problem-solving and lecture, before choosing one. (See Appendix B for a detailed description of selected learning experiences.) Dale (1979) listed five considerations for choosing learning experiences:

1. Many ready made activities are available which provide detailed instructions for their use.
2. Resource persons can be asked to share their knowledge or skill with the group. This contribution may involve subject matter or the learning process itself.
3. The learning efforts of individuals can be encouraged and the fruits of their learning can be reported back to the group.

4. It is possible for group members to modify existing techniques to meet their needs.
5. Techniques which allow learner involvement should be used whenever possible.

Choosing appropriate techniques has a significant impact on the outcomes of learning.

Instructional materials, e.g., books and audio-visual programs, can be a valuable supplement to active learning techniques (Dale, 1979). Sellen (1974) offers these guidlines for selecting instructional materials:

1. Allow for varied backgrounds.
2. Respect adult maturity.
3. Provide for initial success.
4. Provide a stimulating first impression
5. Provide variety.
6. Look for an attractive format and readable style.
7. Consider an appropriate sequence of increasing difficulty.

Instructional materials are available from many sources. Industries, government bodies, citizen groups and public libraries are examples of more common sources. Given the polarized nature of many materials which address environmental issues, it would be prudent to select items that represent a range of values. The use of carefully selected instructional materials in conjunction with appropriate learning activities can offer the adult learner a genuine opportunity for self directed learning.

Using even the most carefully selected techniques and materials in a haphazard fashion could detract measurably from their effectiveness. The learning session, whether it is an hour, a day or a weekend, should be designed to maximize the the effect of its components. The opening of each session should set the stage by describing the rationale for the upcoming activities, the specific topics and tasks, the schedule of events and a description of how the learners are to be involved. An agenda is useful for visualizing the session and can be displayed in a poster-like fashion (U.S.D.A. Forest Service, 1980). Agendas which are prepared as handouts have the additional advantage of take-home value. After the learning activities themselves have been completed, a summary should be given which includes a review of the session's purpose, the session's accomplishments and future happenings (U.S.D.A. Forest Service, 1980). Setting the stage and summarizing help to define each session as a conceptual whole. They establish the definite beginning and ending required to be a learning episode.

Conducting the learning experiences. Given proper preparation, the execution of the learning experiences should proceed smoothly. The coordinator, facilitator and resource persons are prepared to fulfill their responsibilites. The techniques and materials have been chosen to meet the self-diagnosed needs of the group. The session can be implemented as planned and evaluated for its effectiveness in fulfilling program objectives.

Each session not only provides opportunities to learn subject matter, but also provides experience for group members in self-education.

Evaluating the learning outcomes and rediagnosing needs. Evaluation is intrinsic to the learning process (Knowles, 1973). It is used to modify curriculum, to monitor learners' progress and to enhance learners' motivation (Verduin, et al, 1977). However, the primary goal of evaluation must be to improve the program (Knowles,1973). In essence, evaluations determine the extent to which program objectives have been met (Van Meter, 1973; Verduin, et al, 1977). Since clearly stated objectives already describe the criteria for attainment, the major task is to devise a method of assessment (Van Meter, 1973). Because the intent of evaluation is to improve the quality of the educational program, it is essential that evaluation results be considered when modifying the existing program or when developing subsequent programs (Passineau, 1975).

Devising appropriate evaluation methods is primarily common sense. Passineau (1975) described the Question Model of evaluation that is simple, yet all encompassing. Using this model involves answering six questions:

1. Why is evaluation being done? The answer to this question is the foundation of evaluation and will influence the answers to subsequent questions. The importance of this question is so great that it should be asked continually (Passineau, 1975).

2. What is being evaluated? Participants are not the real targets of evaluation, instead it is the educational program. Soliciting responses from participants is the method used to assess various programatic factors, such as program goals, learning experiences, subject matter, facilities, quality of instruction and so on. (Passineau, 1975).
3. Who should be evaluated? Given that the goal of evaluation is the improvement of the overall program, it follows that everyone involved with the program should be evaluated. For example, the participants are assessed in terms of the knowledge and skills which have been gained. The facilitator, coordinator and resource persons are evaluated with regard to their success in sharing their knowledge and skills with participants. (Passineau, 1975)
4. When should evaluation occur? It should occur throughout the program. A formative evaluation is one that is conducted at intermediate stages in the program. The results of this type of evaluation serve to guide alterations of the program as it progresses. A summative or terminal evaluation is conducted at the end of the program. The data received from this type of evaluation are used to make decisions regarding the support of the program, e.g., political and financial, or its

adoption by other groups (Passineau, 1975). Verduin, Miller and Greer (1977) stated that the results of summative evaluations must also be considered when developing future programs.

5. Where should evaluation occur? The exact physical location at which evaluation takes place depends on the type of program or the aspect of the program being evaluated. Assessing participants' skills in testing water quality should be done at a natural water body. Evaluating participants' aquisition of subject matter should be done indoors (Passineau, 1975).
6. How should evaluation be done? This question refers to the selection of specific evaluation methods based on the answers to the previous questions. These methods range from the simple to the sophisticated (Passineau, 1975).

By considering these questions, program developers can devise an evaluation approach which is appropriate for the participants and the learning experiences.

Learning techniques designed to change attitudes may require a different evaluation approach from those focusing on changing behavior. Reaction evaluations indicate the affective responses of learners to the program. Positive and negative feelings can be solicited using reaction forms, interviews or group discussions. Behaviorial evaluations collect data regarding changes in the learners' actions. Diaries, questionnaires, interviews, observers, and self-rating scales can be useful for this purpose (Knowles, 1973). Changes in attitudes and behavior generally occur over long periods of time and are often difficult to evaluate.

The attainment of facts, concepts and skills are more immediate outcomes of learning experiences. Techniques used to develop these outcomes can be appraised with learning evaluations. The aquisition of knowledge can be indicated by administering information recall tests. Performance tests can be used for skills (Knowles, 1973). One type of performance test requires a checklist which describes steps or components of a task. As the learner completes each step or component, it is indicated on the checklist. A rating scale can add the quantitative dimension to performance tests (Verduin, et al, 1977). Assessing the aquisition of knowledge and skills through evaluations can be done after each learning experience.

Because adult education strives to be learner-centered, evaluating learning outcomes should also focus on the learner. For this reason, self-appraisal should be used with adults (Van Meter, 1973). Learners can use the appropriate evaluation methods and interpret the results themselves (Fellenz, 1974). This allows them to compare their own progress with program objectives (Van Meter, 1974). Self-appraisal encourages a re-examination of the model of desired competencies, along with a reassessment of the discrepancies between the model and the learners' newly developed competencies. This is, in effect, a rediagnosis of learning needs (Knowles, 1973). The results of this rediagnosis can be used to improve a current program or as a springboard for individual learning.

In addition to evaluating learning outcomes, it is important for groups to appraise the efficiency with which they execute tasks. Group self-observation is one method for determining ways to improve efficiency. This method requires one or more group members to remove themselves from participating. These observers record three types of actions. Task-oriented actions are those which are intended to accomplish the task, e.g., initiating actions, keeping things moving, providing information and summarizing. Maintenance-oriented actions help the group work more effectively, e.g., mediating disagreements, adding humor and compromising. Self-oriented actions are those which satisfy individual needs, rather than helping the group complete the task, e.g., not listening, dominating discussion and being aggressive. For each type of action the observer records the name of the person, the specific action and the effect of the action. At the end of the session, the observations are presented and discussed (Biagi, 1978). This type of process evaluation may be especially valuable for groups that are involved in projects.

Some method of evaluation is essential for improving the effectiveness of educational programs. The methods presented in this component of the Andragogical Model can and should be combined, when appropriate. Adult EE must provide holistic programs, which incorporate attitudes, behavior, knowledge, skills and efficient group interaction. As such, they require evaluation methods which assess all these aspects. However, holistic evaluation does not mean voluminous written instruments, rather an integrated approach, which uses methods appropriate to the task. Evaluation need not be burdensome to be effective. (See Appendix C for sample evaluations and references to futher information regarding educational evaluation.)

The Andragogical Model is based on a synthesis of several learning theories and is composed of elements that should be included in adult education programs (Knowles, 1973). As the preceding discussion indicates, the concepts contained in this model are firmly substantiated by the literature. Because the Andragogical Model is an educational process, rather than specific subject matter, it may be applied to a wide variety of situations and issues. In this writer's opinion, the application of the Andragogical Model to adult EE efforts would maximize the potential for meaningful learning.

The Problem-Solving Project Model

It has been stated frequently in this thesis that EE should take a problem-oriented approach and that this approach is well suited to adult education. The need presented by a problem situation can be a major motivation for adults to learn (Dale, 1979; Tough, 1971). Two benefits of this learning method are an increase in knowledge of the problem itself and of the problem-solving process, in general (Dale, 1979). Tough (1971) indicated that the majority of adults in his study learned through self-planned projects and that many of these were initiated in response to some problem in their lives.

Therefore, learning projects with a problem orientation may be applicable to adult EE.

The importance of carefully planning these learning projects cannot be overstated. Plans should include the tasks that must be completed and the sequence in which they must be done. Motivation is provided, if members know the purpose and significance of each task in relation to the total project. The chances of success are increased by anticipating or avoiding difficulties (Dale & Mitiguy, 1978). Planning for such learning projects should follow a problem-solving scheme. While specific applications differ slightly, the basic problem-solving approach involves these steps:

1. Defining the apparent problem (Cichon, 1980; Dale & Mitiguy, 1978; Thompson, 1977).
2. Investigating and analyzing the problem (Cichon, 1980; Dale & Mitiguy, 1978; Thompson, 1977).
3. Redefining the problem (Cichon, 1980; Dale & Mitiguy, 1978).
4. Generating alternative solutions (Cichon, 1980; Dale & Mitiguy, 1978; Kunofsky, 1981; Thompson, 1977).
5. Analyzing alternatives and selecting a project (Cichon, 1980; Dale & Mitiguy, 1978; Kunofsky, 1981; Thompson, 1977).
6. Designing an implementation strategy (Dale & Mitiguy, 1978; Kunofsky, 1981).

7. Implementing the project (Dale & Mitiguy, 1978; Thompson, 1977).
8. Evaluating the project (Dale & Mitiguy, 1978).

The result of following this planning approach will be a project with a high potential for success, educationally and environmentally.

Defining the apparent problem. A problem well-defined is half solved. Problem identification is inherent in the problem-solving process (Volk, 1980). Learners must clearly state and fully understand the problem before work can begin (Thompson, 1977). Without a clear definition, irrelevant discussion will ensue and solutions will be difficult to generate (Kunofsky, 1981). Because the definition is the foundation of the process, it has a tremendous influence on the action strategy selected (Dale & Mitiguy, 1978). Attacking a symptom of the problem will lead to superficial solutions with limited effectiveness.

Determining the root causes of problems can be done by asking several questions. What is the problem? Why is it a problem? This question should be repeated until fundamental problems begin to surface. Who or what causes the problem (Dale & Mitiguy, 1978)? How would someone else look at this problem (Cichon, 1980)? This last question explores one fundamental aspect of environmental problems: the role of human values (Hungerford, et al, 1978). After discussing the problem in terms of these questions the group should generate a concise definition of the problem they wish to pursue.

Investigating and analyzing the problem. The purpose of investigation and analysis is to yield information that may be useful in subsequent steps in the problem-solving process. The basic components of this investigation are transforming the problem statement into a research question designing a research strategy using either primary or secondary sources, collecting the data and drawing conclusions from the results (Hungerford, et al, 1978). Although it is especially important in this stage of the process, some form of investigation should be continued throughout the project.

Once a sufficient body of data has been amassed, the information should be analyzed. Is there enough information? Is it valid? Is it fact or opinion? Next, the data should be placed into appropriate categories, e.g., economics or health. Finally, relationships between specific bits of information should be sought (Cichon, 1980). The accuracy of data and the validity of conclusions drawn from it will greatly influence later steps in the problem-solving process and the ultimate success of the proposed solution.

Redefining the problem. Because proper problem definition is crucial to the problem-solving process, information gained through investigation should be used to redefine the problem (Cichon, 1980; Dale & Mitiguy, 1978). Essentially, this is a reiteration of the problem definition process already described.

If the previous definition was symptomatic, the newly gained information should help reveal the root causes of the problem. In contrast, a problem that has been properly defined will be supported by the results of the investigation. In either case, the group should now have a concise definition in the form of a question with which to plan the action project.

Generating alternative solutions. Effective solutions are often the result of creative thinking that goes beyond commonly used methods. In this case the solution is a project that the group will undertake. Listing all possible and sometimes seemingly impractical solutions is the essence of this step in the problem-solving process (Cichon, 1980; Dale & Mitiguy, 1978; Thompson, 1977). The brainstorming method is frequently used for this purpose (Procedures for brainstorming appear in Appendix B). Kunofsky (1981) states emphatically that it is the only method that should be used.

Gordon (1961) developed a creative problem-solving process called "synectics" which goes beyond the free-flowing concept of brainstorming. The foundation of this process is the joining together of apparently different and seemingly irrelevant elements. It discourages the use of preconceived notions of the problem and the potential solutions by "making the familiar strange." This is done by using three types of analogy. Imagining oneself as the problem, a potential solution or any component thereof is termed "personal analogy." For example, one may become a machine whose duty it is to perform a task for which no machine has yet been developed. Using "direct analogy" involves applying the facts, theories or techniques of one discipline to another discipline. An example of this would be applying a mathematical theory to a biological problem. "Symbolic analogy" is the use of unique and unrelated images to describe the problem or potential solution. These images are generally esthetically satisfying, but technically incorrect. Describing a human circulatory system as a river of blood is an example of symbolic analogy. Generating truly novel solutions through the use of these mechanisms is the goal of the synectics process (Gordon, 1961).

Analyzing alternatives and selecting a project. After generating as many alternatives as possible, several of the more promising ones should be selected for analysis (Dale & Mitiguy, 1978). This must be done carefully, because the one selected may become the group project. Analysis is essentially an assessment of the pros and cons of each alternative (Cichon, 1980). In addition, the selection should be consistent with the goals of the group. The resources of the group, e.g., time, money, personnel and expertise, and the consequences of the action should also be considered (Love, 1971). Three approaches to analysis have been developed which encompass these considerations and more.

Hungerford and Peyton (1980) developed an Action Analysis Criteria to assist in the selection of an action project.

These fourteen criteria are:

1. Is there SUFFICIENT EVIDENCE to warrant action on this issue?
2. Are there ALTERNATIVE ACTIONS available for use? What are they?
3. Is the action chosen the MOST EFFECTIVE one available?
4. Are there LEGAL CONSEQUENCES of this action? If so, what are they?
5. Will there be POLITICAL CONSEQUENCES of this action? If so, what are they?
6. Will there be SOCIAL CONSEQUENCES of this action? If so, what are they?
7. Will there be ECONOMIC CONSEQUENCES of this action? If so, what are they?
8. Do my PERSONAL VALUES support this action?
9. Do I understand the PROCEDURES necessary to take this action?
10. Do I have the SKILLS needed to take this action?
11. Do I have the COURAGE to take this action?
12. Do I have the TIME needed to complete this action?
13. Do I have all of the OTHER RESOURCES (other than the above) needed to make this action effective?
14. What are the ECOLOGICAL CONSEQUENCES of this action?

Answering these questions for each alternative will help the group decide which alternative they wish to pursue.

A similar list of criteria was formulated by Kunofsky (1981). These criteria are:

1. Control: Does the group have the ability to control the result? For example, influencing the entire U.S. Congress is much less practical than influencing one legislator.
2. Accessibility: Can the group get to the heart of the problem, the source of information or the locus of decision-making?

3. Immediacy: Is the goal important to us now? Is there a sense of urgency in reaching this goal?
4. Visibility: Do other people recognize the problem, or is it too esoteric?
5. Group Interest: Is the group willing to spend its time on this project?
6. Achievability: Does the group have a reasonable chance of success with its available resources?
7. Definite End: Can a time be identified when the project will be completed, win or lose?
8. Singularity: Does the project have only one goal? While a strategy may have many tactics, it should have only one goal.
9. Specificity: Is the goal stated clearly enough to tell the group whether or not it accomplished the goal?
10. General Interest: Will a broad segment of the community also have an interest in reaching this goal? Will others be willing to work with the group?
11. Personal Danger: Will there be any personal danger to those who work on the project?
12. Handles: Does the group have the ability to influence a discretionary decision? For example, could the group influence the decision of a state agency to renew a permit?

These criteria are suggestions and the group is encouraged to add any that they feel would be of value (Kunofsky, 1981).

Another useful approach is Force Field Analysis. The first step is stating the purpose or goal of the alternative. Next, the forces that would support the success of the potential solution are listed along with the forces that would hinder its success. These forces could be public opinion, statuatory requirements or the influence of special interest groups. The third step is listing methods of eliminating the hindering forces and strengthening the supporting forces. Finally, participants list the resources at their disposal for implementing these methods. Force Field Analysis helps members decide which alternatives would be more likely to succeed (Dale & Mitiguy, 1978).

These three methods of analyzing alternatives will help the group to fully conceptualize the scope, requirements and consequences of each alternative. Some aspects of the analysis may be perceived as being more important than other aspects. For example, short term projects, are often preferable to lengthy ones (Johnson, et al, 1980; Kunofsky, 1981). Ultimately, the choice of an action project is a judgement based on the data gathered through investigation and synthesized through analysis. The choice is crucial, because success breeds confidence for future projects, while failure tends to breed resignation.

Once the group has selected a project a specific goal should be stated (Dale & Mitiguy, 1978). Kunofsky (1981) suggests that a project goal should:

1. State only one goal, because more would essentially involve more than one project.
2. Define specific criteria for success.
3. Be achievable.
4. Identify a definite ending date for the project.

These suggestions highlight Kunofsky's project selection criteria list, but the importance of a specifically stated goal warrants their reiteration.

Designing an implementation strategy. Once the group has selected an action project, it will be necessary to develop a method of achieving its goal. This method or strategy must include specific tasks, allocation of responsibilities and a timeline. Including the entire group in the planning process has three distinct benefits. First, everyone has an understanding of the project as a whole. Second, everyone has a say in the allocation of responsibilities and the setting of deadlines. Finally, peer pressure often ensures that responsibilities are fulfilled and deadlines are met (Dale & Mitiguy, 1978). Proper planning is vitally important to the success of the action project. Because involving the entire group in planning may get confusing, a structured procedure is necessary.

One such procedure is the Program Evaluation and Review Technique (PERT). Dale and Mitiguy (1978) adapted this approach for use with citizens groups as follows:

1. Brainstorm the specific tasks involved in the project. When all of the tasks have been identified, write them on small slips of paper.
2. Draw a timeline on a large sheet of newsprint. Divide it into appropriate units of time, e.g., days, weeks or months. Ample space for the task slips should be provided.
3. Categorize the task slips by type, e.g., publicity, fund raising and lobbying. These categories will be "tracks" on the timeline.
4. Arrange the tasks in the appropriate sequence. Make a note of how long each task will take on the task slip and place them on the timeline in "tracks", e.g. all publicity tasks in one line. The easiest procedure is to begin with the last task and work backwards.
5. Determine how each track relates to the others. Connect task slips with arrows whenever one task requires a product of or information from another task.
6. Stand back and review the PERT timeline. Add or delete tasks or connections as necessary.
7. This timeline is basically a draft and can be polished by the group members as they plan the details of each task.

The PERT approach to planning outlines the tasks and timeline of the project (see Figure 3). The only remaining factor is the allocation of responsibilities among group members.

Matching people with tasks is the next step in planning the action project. Skills and interest are important factors to consider when making task assignments. Determining the skills and interest of group members can be done by developing a simple form. This information can be used to match people with tasks and can be stored in a "skills bank" for future reference. Appropriate matches are very important, because they provide satisfaction for group members (Dale & Mitiguy, 1978). Teams of individuals with skills or interest in a particular area, e.g., publicity, can be formed to implement one track of the action project. Each team should select a leader who coordinates its activities. Finally, the entire group should select a Project Coordinator to oversee all of the teams (Kunofsky, 1981).

Implementing the project. The culmination of learning in the problem-solving approach is the implementation of the solution (Gordon, 1961). Active participation leads "...to the greatest commitment to solving environmental problems, the most thorough comprehension of subject matter and the greatest long range effectiveness" (Kunofsky, 1981, p.7). Hopefully, improvements in environmental quality will accompany these educational benefits. Diligent execution of the action project according to plan is the essence of this step and will greatly enhance its chances for success.

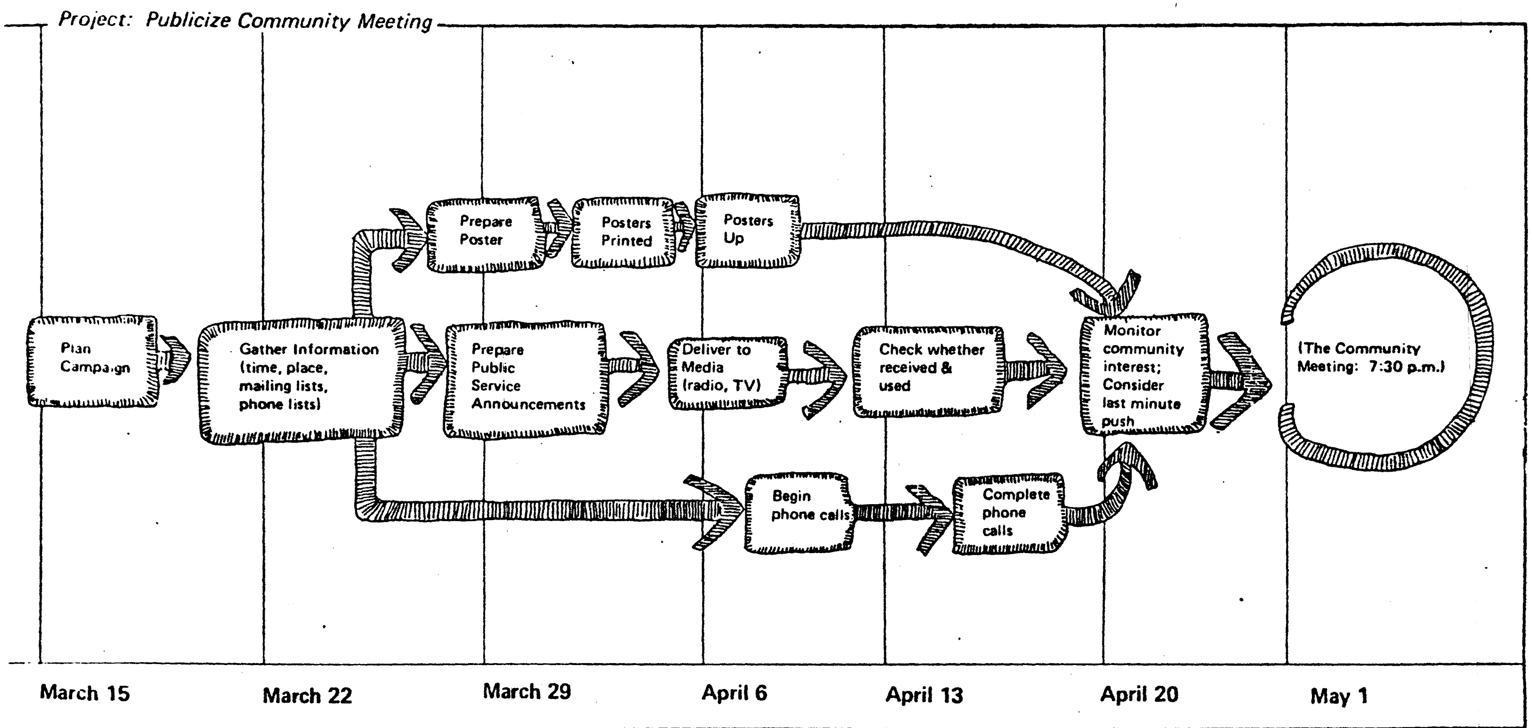

Figure 3. Program Evaluation and Review (PERT) Timeline (Dale & Mitiguy, 1978, p.69).

However, regardless of the final outcome, the educational benefits will be retained by the group.

<u>Evaluating the project.</u> Evaluation of the project is essential. Dale and Mitiguy (1978) stated that good evaluations can pinpoint activities that need improvement and aid in planning future projects. Evaluating the project's success is essentially assessing the degree to which the project has achieved its goal. Criteria for success should have been specified in the project goal (Kunofsky, 1981). The successful outcome of the project itself can be determined by assessing which criteria have been fulfilled. The educational outcomes of the project may be assessed by using one or more of the evaluation methods described in the Andragogical Model (see pp. 60-65 and Appendix C).

Providing citizens with an opportunity to gain the knowledge and skill needed to be environmentally literate should be firmly based on the foundations of environmental education and adult education philosophies. The "Goals for Curriculum Development in Environmental Education" proposed by Hungerford, Peyton and Wilke (1980) provide this foundation in terms of the content of an environmental literacy training program. Knowles (1973) has developed the "Andragogical Model" which is based on the characteristics of adult learners as presented in the "Assumptions of Andragogy". Because EE is by definition a problem-oriented endeavor, a "Problem-Solving

Project Model" has also been presented. These basic educational models and philosophies have been supported by the literature. This writer's task is to blend these philosophies and models into an eclectic EE program model that can be used by citizen groups to train themselves to be environmentally literate.

CHAPTER III

ENVIRONMENTAL LITERACY TRAINING

The urgency and immediacy of environmental issues require that the decision-making citizens of today become environmentally literate (Hibbs, 1973; Schmidt, 1973). The diversity of issues and the citizens involved in them preclude the development of a single all encompassing EE program. Further complicating the matter is the tendency of adults to engage in most learning experiences only when an immeadiate need is felt (Emmelin, 1977; Entine, 1980; Knowles, 1973). The intent of the Environmental Literacy Training (ELT) model is to provide an educational process that allows citizens to actively participate in an issue-oriented, community environmental action project that fulfills their self-determined needs.

The components of this model have been consolidated from four primary sources. The general structure is based on a problem-solving approach which relies on the work of Dale and Mitiguy (1978) and Kunofsky (1981). Incorporated into this framework are components of the Andragogical Model developed by Knowles (1973) and principles of group training outlined by Dale (1979). Aspects of the ELT model which address the development of environmental investigation skills have been gleaned from Hungerford, et al (1978).

In this chapter, the roles that must be filled and the sequential components of the training program are delineated. When appropriate, a detailed procedure is included that may be followed to complete the component. This eclectic program model provides a flexible guide to learning through active participation in the resolution of local environmental issues.

Roles In The Training Program

A variety of tasks are involved in the ELT model. It is conceivable that one person could perform a number of these tasks. However, this writer believes that the program would proceed more smoothly if the responsibilities were shared. The responsibilities for executing the training program are as follows:

1. Training Coordinator
2. Facilitator
3. Planning Committee
4. Team Leaders
5. Project Coordinator
6. Resource Persons
7. Participants

While an individual may fill more than one role, one must be careful not to accept more responsibility than can be realistically fulfilled.

Training Coordinator

This role focuses primarily on logistics. Arranging for adequate meeting facilities is one task. These facilities must be appropriate to the learning experience and the physical atmosphere must be conducive to learning. (A detailed description of such a climate begins on page 50.) Another task is to obtain the necessary materials for each session. The logistical aspects of field trips, e.g., transportation and meals, would also fall within the responsibilities of this role. Because the logistical needs of each session will vary greatly, it is advisable for the training coordinator to work closely with the facilitator.

Facilitator

An underlying principle of the ELT model is that all participants are actively involved. The task of the facilitator is to guide the participants through the program in a way that is consistent with this principle. To do this a facilitator should follow these basic guidelines:

1. Set the mood of the session by clearly explaining the facilitator's role, the procedures to be followed and the reasons for the session.
2. Keep the discussion on track by restating the topic when digressions occur.
3. Summarize and synthesize ideas.
4. Solicit comments from less active participants.

5. Identify people that have been interrupted and ask them to reiterate their statements.
6. Accept feelings along with information.
7. State the problem in a constructive way, not in an accusing way.
8. Avoid statements of personal opinion.
9. Pose problems and questions, not answers.
10. Suggest a procedure or problem-solving approach when the group becomes bogged down.
11. Summarize the accomplishments of the session and restate the final outcomes.

Essentially, the facilitator is a neutral discussion leader. Retaining one's credibility is critical to fulfilling this very important role in the ELT program. The major responsibility for creating and maintaining a productive interpersonal learning climate falls to the facilitator. (A detailed description of such a learning climate begins on page 52.)

The facilitator is primarily responsible for executing the procedure for each component of the ELT program, except the implementation of the action project. While the objectives of each learning experience are developed by the planning committee, the actual construction and execution are left to the facilitator. These responsibilities involve thoroughly understanding the procedures in advance, collecting the necessary reading materials, arranging presentations by resource persons and cooperating on other logistical aspects with the training coordinator. The group may choose to have more than one facilitator. This would divide the work load and allow more participants access to this valuable experience. The choice of facilitator(s) is extremely important, because this role is the cornerstone of the ELT program.

Planning Committee

The members of the planning committee perform tasks that are necessary, but may be too tedious for the entire group. These tasks are preparing learning objectives, selecting learning experiences, developing evaluation procedures and integrating the learning experiences with the action strategy. The product of each task, e.g., a list of learning objectives, should be presented to the entire group for approval. This is desirable for achieving meaningful learning, because participants must accept the learning experiences as being relevant to their needs. The training coordinator, facilitator and project coordinator should serve on the planning committee. Other members may include team leaders or participants at large. In selecting its priorities, the planning committee should always place the needs of the group first.

Team Leaders

After the group selects a project and designs an action strategy, teams are formed to implement various parts of the strategy, e.g., finance and publicity. Each team must select a leader who coordinates its activities and acts as a liasion with other teams. The team leader may assume a facilitative demeanor in order to perpetuate a cooperative spirit among team members. This person also has organizational responsibilities, such as enforcing deadlines and obtaining the necessary materials. Team leaders must insure that the basic details of the action strategy for which their team is responsible are completed.

Project Coordinator

Shortly after team leaders are selected, the group also chooses a project coordinator. This role involves harmonizing the activities of the teams and assisting them when necessary. However, the project coordinator should not perform tasks for which the teams are responsible, e.g., holding press conferences, preparing brochures or keeping the budget. Instead, this person should facilitate communication among the teams and insure that the action strategy timeline is followed. The selection of a capable person to fill this role can be critical to the success of the project.

Resource Persons

This role may be filled by a member of the citizen group or by an individual from outside the group. Outside resource persons can be found by contacting government agencies, businesses, industries, consulting firms, universities or other citizen groups. These individuals can supply the subject matter or expertise for specific learning experiences. It may be advisable to include a number of resource persons who can present particular aspects of complex topics or the differing value positions on controversial issues. Drawing on the knowledge and expertise of well-informed individuals may add significant meaning and credibility to the learning experiences.

Participants

The role of participants is more than simply being present at the learning experiences. They should be actively involved in program planning and implementation. Some participants may choose to assume one or more of the roles described above. In this writer's opinion, the success of any training program based on this model is largely dependent on the commitment of the group members.

Environmental Literacy Training Model

The intent of the ELT model is to provide citizens with a process that can be used to facilitate meaningful learning. Because all communities, citizen groups and environmental issues are at least slightly different, an effort has been made to keep the model general and flexible. The group selects an issue that is of interest to them and investigates it. They choose a project and develop a strategy to meet that project's goal. Training needs are determined by the group and they design learning experiences to fulfill those needs. This training model focuses on the development of an environmental action project as a means of stimulating environmental literacy.

The components of the ELT model are sequential steps that lead up to the implementation and evaluation of an action project. The components are:

1. Indentification of a local environmental issue.
2. Investigation of the issue.
3. Selection of an action project.
4. Design of an action strategy.
5. Design of the learning experiences.
    A. Diagnosis of learning needs.
    B. Preparation of learning objectives.
    C. Selection of specific learning experiences.
    D. Development of learning evaluation procedures.
6. Integration of the action strategy and learning experiences.
7. Implementation of the ELT program.
8. Evaluation of the overall ELT program.

When appropriate, a procedure for the facilitator to use in guiding the group through a particular component is included.

Identification of a Local Environmental Issue

Some citizen groups may already have an interest in a particular environmental issue. Indeed, some groups may have formed specifically to address a single issue. Other groups may have a more general interest in environmental quality. Regardless of their orientation, all groups should complete this component in order to focus their attention on a manageable topic. The primary reason for this focusing component is to avoid diluting the group's human, financial, material and time resources. In essence, the group is defining the problem with which it will work. The issue chosen in this component will be the topic of an investigation and may eventually be the target of an environmental action project.

Environmental Issue Identification (adapted from Dale,1979; Kunofsky, 1981)

Goals:

To facilitate the indentification of a local environmental issue which the group can investigate.

To identify the origins of the issue.

Group Size:

Up to fifty

Time Required:

Thirty to forty-five minutes

Materials:

Easel

Newsprint

Markers

Physical Setting:

Seating is arranged in a series of concentric semi-circles facing the easel. This arrangement generally increases the interaction among the participants.

Process:

1. The facilitator leads a brainstroming session (see Appendix B) to generate a list of local environmental issues. This list is written on newsprint and posted for all to see.
2. Each participant votes for three issues that they would like to pursue. The votes are tallied on the issues list. The three issues which receive the most votes will be the topics of discussion. It should be emphsized that one of these issues will be the focus of the group investigation and, perhaps, the action project.
3. Each of the three issues selected is discussed individually. The purpose of this discussion is to explore the true origins of the issues. The facilitator asks the following questions for each issue and records key phrases of the responses on newsprint.
   A. What are the environmental, social and economic problems associated with this issue?
   B. Why do these problems exist? (This question should be repeated until fundamental aspects of the issue are described.)

C. Who or what is the cause of the issue?

D. How would someone else view this issue? (The facilitator should help the group identify all of the value positions associated with the issue.)

4. The facilitator asks the group to develop a concise description of the fundamental problem in the form of a question. This question is written on newsprint in wording that is acceptable to the majority of the group. The facilitator explains that environmental issues often have many potential solutions and that the question format is an appropriate way to indicate this characteristic. Furthermore, formulating a question is the first step in issue investigation. Describing the issue in question form is a bridge to the next component in the ELT program. Steps 3 and 4 are repeated for each of the two remaining issues.
5. After all three issues have been processed in this manner, the final issue questions are displayed. The facilitator explains that the time has come for the group to choose the one issue which it will investigate. The group should strive to agree on one issue. A majority vote may be necessary, but should be used only as a last resort. The final wording of the issue question may be modified slightly, if it makes the selection process easier.

Investigation of the Issue

Accurate information is essential to environmental literacy. The controversial nature of many environmental issues often results in citizens being exposed to conflicting information. Autonomous investigation is one way to obtain reliable information. In this component, the participants will plan an investigation of the issue question selected in the previous component.

Because the entire investigation hinges on the issue question, it is extremely important that it be stated properly. For example, the group's issue question may be, "What are the health affects of asbestos?" Answering this question would be a monumental effort. A more specific question would be, "To what degree do asbestos containing water mains threaten the health of the residents of Robinson, Wisconsin?" To answer this, even more specific sub-questions may be asked. "How many people use water that flows through water mains containing asbestos?" "What is the concentration of asbestos in their water?" "What are the health affects of this concentration over various periods of time, e.g., five, ten and twenty years?" A properly stated issue question with very specific sub-questions will provide a firm foundation for an environmental issue investigation.

The information gathered in this investigation can be used in selecting an action project and in identifying a target for the project, e.g., an individual or institution. It can also be of value to the group when it is designing an action strategy. The proposed solution to the issue must be practical and the method of implementing the solution must be appropriate, if the group's project is to succeed. Accurate information is critical to productive environmental action and autonomous investigation is one good way of obtaining it.

Designing an Environmental Issue Investigation (adapted from Hungerford, et al, 1978).

Goal:

To identify and develop a research strategy for answering the issue question.

Group Size:

Up to fifty

Time Required:

Sixty to ninety minutes

Materials:

Easel

Newsprint

Markers

Physical Setting:

Movable seats are arranged in concentric semi-circles. The room should be large enough to accommodate at least five small discussion groups.

Process:

1. The facilitator displays the issue question agreed upon at the end of the previous component and explains that the group will soon design a strategy for answering this question. However, first the group must look closely at the issue question. Is it specific enough? Does it describe the limits of the research, e.g., target populations and geographical area? The facilitator may deem it necessary to ask the group to refine its question.
2. Refining the issue question may have brought out certain sub-questions. The facilitator leads a brainstorming session to generate a complete list of sub-questions. These are recorded on newsprint. After brainstorming, the group discusses these questions. Inappropriate ones may be eliminated, if there is no opposition among the group. The participants categorize the remaining questions by subject, e.g., biological, social, economic and political. This categorized list is posted for later use.
3. The facilitator explains that there are three types of information sources that may be useful in answering these questions:
   A. Primary sources are those which provide first hand data. Examples of primary sources are laboratory tests, surveys and questionnaires.

B. Secondary sources are those which provide information that has already been compiled by someone else. Examples of secondary sources are periodicals, books, newspapers and government documents.

C. Resource persons are those that are knowledgeable of a specific topic. In many cases, they are familiar with primary and secondary sources. For this reason, it may be advisable for participants to begin their research by contacting resource persons, such as public officials, industry representatives, university faculty and members of other citizen groups.

The facilitator leads another brainstorming session to generate a list of information sources that may be used in this investigation. This list is also posted for later use.

4. In controversial issues, information sources frequently contradict one another. The facilitator should caution the participants to be aware of bias. It is important to record bibliographic information for secondary sources, e.g., author, title, date and publisher. For primary sources, the date, time and location the information was collected should be recorded. The name, title, organizational affiliation, address and date should be noted for resource persons. Referring to the sources of information can increase the credibility of an action campaign.

5. The facilitator reviews what has been accomplished and explains that the investigation will be done in teams. Each team will explore one category of sub-questions listed earlier, e.g., biological, social, economic and political. To do this the team must decide precisely what information they are seeking, exactly which sources to use and the specific methods of information collection. Before the end of the session, each team member should have a specific research assignment, including questions and potential sources of information. The results of the two brainstorming sessions, which are posted, should provide an effective starting point. The facilitator also explains that upon completion of the investigation, each team will give a five minute oral presentation to the entire group. In addition, a description of their results should be written, including source citations. This written description should be kept on file, because it may be of value at a later date.
6. The facilitator asks the group to agree on a date when the investigation results must be presented. This deadline should be realistic and firm. The participants choose a category which they would like to investigate, join the appropriate team and develop their strategies.

Variation:

If the group is completely unfamiliar with community investigation, resource persons may be invited to talk with them about information sources in the community and methods of collection. This should be done before the teams are formed.

Selection of an Action Project

After completing their environmental issue investigation, the group must decide whether citizen action is necessary and, if so, what kind of action to take. The investigation may have produced a number of possibilities for action projects. It must be emphasized that the project need not be the most important and challenging one possible. Group interest and chances for success are serious considerations in choosing a project. Succeeding in less involved projects can positively reinforce learning and can strengthen the group's credibility in the community. The duration of the project should also be considered. The group's first experience with community environmental action should be rather short. Once action skills have been gained, longer more significant projects may be undertaken with greater chances for success.

Of critical importance to the success of the project is a properly stated goal. Pursuing a vague goal may result in wasted effort and considerable frustration. The group should develop only one goal, because pursuing more than one goal would be undertaking more than one project. Specific criteria for success should be explicitly stated in the goal. Finally, the goal should be achievable. In this component, the group will select a project that is defined by a specific and achievable goal.

<u>Project Selection Criteria.</u> In choosing an environmental action project, the group should consider the following questions. By selecting a project that satisfies as many of these criteria as possible, the group is increasing its chances for success.

1. Control: Does the group have the ability to control the result? For example, influencing the entire U.S. Congress is much less practical than influencing one legislator.
2. Accessibility: Can the group get to the heart of the problem, the source of information or the locus of decision-making?
3. Immediacy: Is the goal important to us now? Is there a sense of urgency in reaching the goal?
4. Visibility: Do other people recognize the problem or is it too esoteric?
5. Group Interest: Is the group willing to spend its time on this project?
6. Achievability: Does the group have a reasonable chance of success with its available resources?
7. Definite End: Can a time be identified when the project will be completed whether it is successful or not?
8. Singularity: Does the project have only one goal? While a strategy may have many tactics, it should have only one goal.

9. Specificity: Is the goal stated clearly enough to tell the group whether or not it has been accomplished?
10. General Interest: Will a broad segment of the community also have an interest in reaching this goal? Will others be willing to work with the group?
11. Personal Danger: Will there be any personal danger to those working on the project?
12. Handles: Does the group have the ability to influence a discretionary decision? For example, could the group influence the decision of a state agency to issue a permit?

Selecting an Action Project (adapted from Kunofsky, 1981)

Goal:

To select an environmental action project that has a specific and achievable goal.

Group Size:

Up to fifty

Time Required:

Sixty to ninety minutes

Materials:

Easel

Newsprint

Markers

Poster of the Project Selection Criteria

Physical Setting:

Movable seats are arranged in concentric semi-circles facing the easel.

Process:

1. The facilitator reviews the group's progress to date. The group has selected an environmental issue in their community and they have investigated it. The next step is to select a project concerning that issue. The first question is, "Must the group take action on this issue at all?" If not, the group may wish to choose another issue.
2. The facilitator posts and explains the Project Selection Criteria. The participants may add any other items to this list. The project that is chosen should meet all of these criteria, although some may be considered more important than others.
3. The facilitator asks each participant to write down a specific goal statement for the project that is consistent with the Project Selection Criteria. All participants state their suggestions in turn. All

the suggested goals are recorded on newsprint. If a suggestion is repeated, a check is placed on the list next to the original statement. No discussion should take place at this time.

4. After all of the suggestions have been recorded, the facilitator assists the group in narrowing the field of possible goals. The Project Selection Criteria are applied to each suggested goal. Those that do not satisfy the criteria are eliminated immediately. If more than one suggested goal remains, the facilitator asks the proponents of each to restate their suggestion very clearly and list reasons why they believe it is best. This list of reasons should refer to the Project Selection Criteria.
5. The facilitator emphasizes that the group may have trouble achieving any goal unless at least 75% of the participants support it. Compromise is encouraged, but may lead to a goal that is too broad.
6. When the group appears to be leaning toward agreement on one goal, the facilitator should call for a vote. The suggested goal that receives the most votes is the choice of the group. The final wording of the project goal should include the target of the action, criteria for success and a dealine for completion. The project is written on newsprint in its final form and saved for future use.

<u>Design of an Action Strategy</u>

In this component the group will develop a method of achieving its project goal. This strategy is the specific tasks that must be accomplished and a timeline for their completion. To aid in the development of the action strategy, the group may briefly review the categories of Environmental Action, i.e., persuasion, consumerism, political action, legal action and ecomanagement (see Appendix A for a detailed description of environmental action). After specific tasks have been identified, the group should apply the Action Analysis Criteria to each task. Doing this will encourage participants to thoroughly examine their willingness to undertake the task, the resources available for undertaking the task and the various consequences of the task.

In addition, participants are asked to join a team that will work on a particular category of tasks e.g., publicity or finance. Each team selects a leader and the entire group chooses a project coordinator. At this point the participants do not need the expertise to accomplish each task. In the next component, learning experiences will be designed to meet the project related needs of the group.

The structure of this component involves the participants in the overall planning of the project. This involvement has definite benefits. Group members will have a feeling of the project as a whole. Therefore, they will better understand their individual roles in relation to the project goal. Participants have a choice regarding the types of tasks in which they will become involved and may match their skills with these tasks. Mutual planning tends to enhance the motivation and commitment of group members to the project. Following the basic structure of this component should result in a citizen group that is committed to a well-planned project.

Categories of Environmental Action. Citizen efforts to achieve and/or maintain a high level of environmental quality may fall into one or more of the following categories (Hungerford & Peyton, 1980):

1. Persuasion activities are those directed toward changing human values and, ultimately, behaviors toward being consistent with a high level of environmental quality.
2. Consumerism describes citizens' behaviors in the marketplace that are intended to ameliorate the negative impacts of selected consumer products or commercial activities on the environment.
3. Political Action refers to activities that bring pressure on political organizations, governmental bodies or individuals within these units in order to influence them to take positive environmental action.
4. Legal Action encompasses all efforts to preserve or enhance environmental quality that involve the use or threat of court action.

5. Ecomanagement activities are direct physical actions that enhance or maintain some aspect of the environment.

Action Analysis Criteria. Before the final decision is made on including a tactic in the action strategy, that tactic should be analyzed using these critera delineated by Hungerford and Peyton (1980):

1. Is there SUFFICIENT EVIDENCE to warrant action on this issue?
2. Are there ALTERNATIVE ACTIONS available for use? What are they?
3. Is the action chosen the MOST EFFECTIVE one available?
4. Are there LEGAL CONSEQUENCES of this action? If so, what are they?
5. Will there be POLITICAL CONSEQUENCES of this action? If so, what are they?
6. Will there be SOCIAL CONSEQUENCES of this action? If so, what are they?
7. Will there be ECONOMIC CONSEQUENCES of this action? If so, what are they?
8. Do my PERSONAL VALUES support this action?
9. Do I understand the PROCEDURES necessary to take this action?
10. Do I have the SKILLS needed to take this action?
11. Do I have the COURAGE to take this action?
12. Do I have the TIME needed to complete this action?
13. Do I have all of the OTHER RESOURCES (other than the above) needed to make this action effective?
14. What are the ECOLOGICAL CONSEQUENCES of this action?

Designing an Action Strategy (adapted from Dale & Mitiguy, 1978; Kunofsky, 1981)

Goals:

To plan a strategy for reaching the project goal.

To involve participants in the project planning process.

Time Required:

Ninety minutes

Group Size:

Up to fifty

Materials:

For the entire group:

- Easel
- Newsprint
- Markers
- Four by six index cards
- Poster of the Categories of Action

For each team:

- Newsprint
- Markers
- Four by six index cards
- Handout listing the Action Analysis Criteria

Physical Setting:

Movable chairs are arranged in concentric semi-circles facing the easel. The room is large enough to accommodate at least five team discussions.

Process:

1. The facilitator posts the project goal and the Categories of Action for all to see. The facilitator briefly discusses options for environmental action with the group. The group brainstorms all of the tasks that must be done to accomplish this goal. These are recorded on newsprint. The facilitator asks for a volunteer to transfer each task onto a four by six card as the brainstorming proceeds. It may be helpful to work backwards from the goal by identifying the last task and moving toward the first.
2. The facilitator explains that the group must categorize the task cards by type, e.g., publicity, finance and lobbying. These categories will be "tracks" on the timeline. The facilitator reads each task and asks the group to decide in which category it belongs.
3. The group must now divide itself into teams. Each team is responsible for one category of tasks. To help the participants decide, the facilitator may briefly read the tasks within each category. The facilitator explains that each team will review the

task cards and add new ones as necessary. Before a final decision is made to include a tactic in the strategy, the team should discuss that tactic using the Action Analysis Criteria. They will also construct a preliminary timeline. This may be done by taping sheets of newsprint together and dividing it into the appropriate units of time, e.g., days, weeks or months. A note is written on each task card indicating the duration of that task. The task cards are arranged on the timeline in sequence. The facilitator reminds the participants of the project's deadline and that it is often easier to develop the timeline by working backwards from the deadline. Finally, the facilitator describes the role of team leader and indicates that each team should choose one.

4. When the preliminary timelines have been completed, the entire group meets to consolidate these into an overall action strategy timeline (see Figure 4). This may involve changing the preliminary timelines. One important consideration is the connections between "tracks" or categories, e.g., the publicity team may need funds for printing from the finance team by a certain date. Arrows are drawn directly on the timelines to indicate these connections.
5. The facilitator congratulates the group on completing a very difficult job and asks for a volunteer to copy the action strategy timeline in neat and

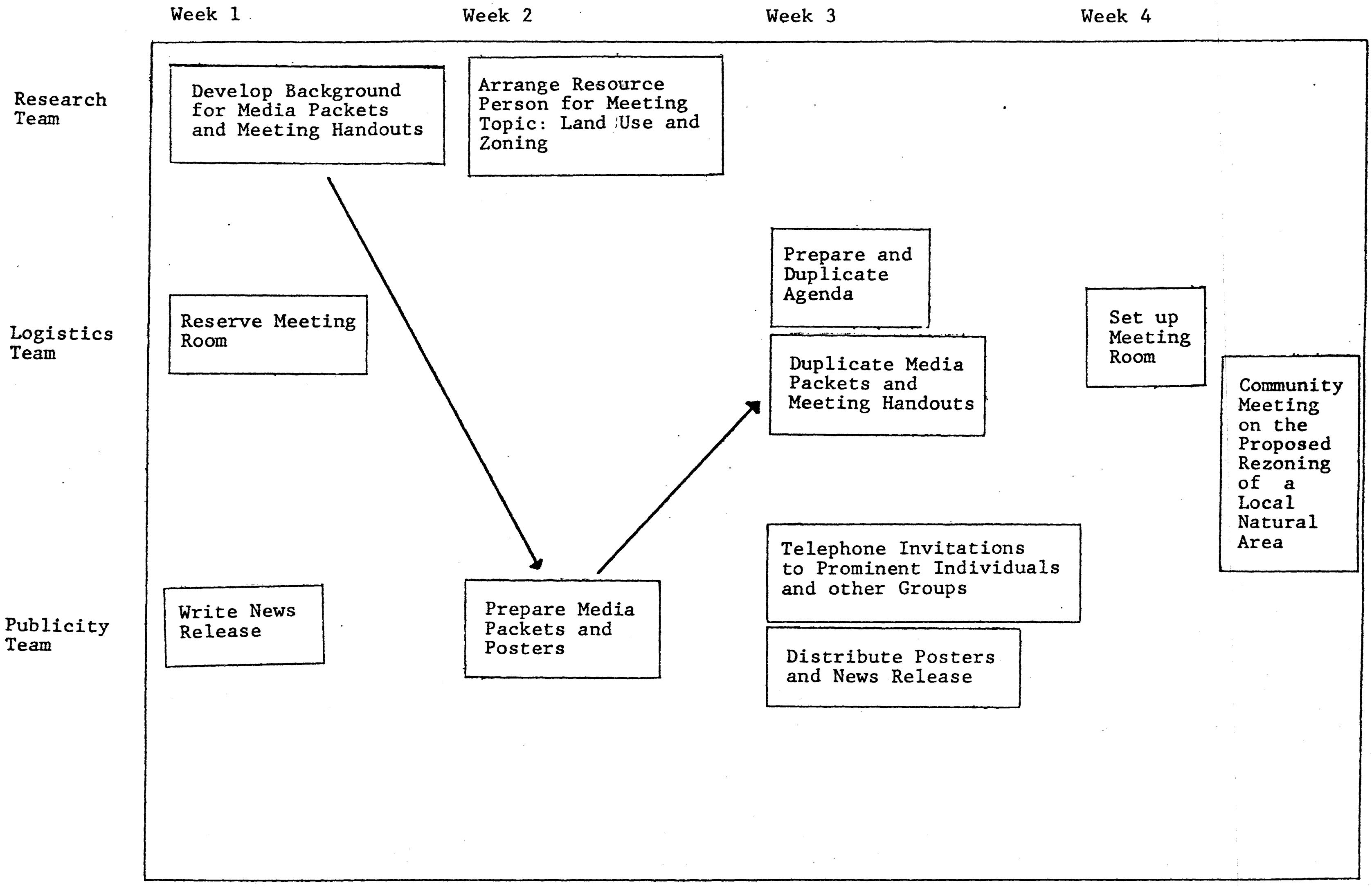

Figure 4. Action Strategy Timeline: Community Meeting on the Proposed Rezoning of a Local Natural Area.

comprehensible form. This schematic representation of the action strategy will be used in later components.

6. The final task in this component is the selection of a project coordinator. The facilitator describes this role emphasizing its importance to the success of the project. It may be helpful for the group to briefly brainstorm the characteristics that the project coordinator must possess. Nominations are taken and each candidate is given the opportunity to say a few words. The group votes by a show of hands or by secret ballot.

Variation:

Nominations for project coordinator may be made at the end of this session and the actual vote taken at the beginning of the next.

Design of the Learning Experiences

The importance of this component varies with the goal of the action project and the past experience of the citizen group. Some groups may rely heavily on training to develop their environmental action skills. Others may feel that they already possess the necessary skills. It may be beneficial for the latter to participate in an abbreviated version of this component to double check their competence in the specific tasks outlined in the action strategy timeline.

This component is divided into four steps:

1. Diagnosis of learning needs.
2. Preparation of learning objectives.
3. Selection of specific learning experiences.
4. Development of learning evaluation procedures.

Because involving the entire group in the details of this component may become tedious, it is suggested that a planning committee be formed to synthesize input from group members. The core of this committee is the training coordinator, the project coordinator and the facilitator. Team leaders or other group members may also become involved, but care should be taken to avoid a planning committee that is too large. One task of the planning committee is to develop learning objectives based on the self-diagnosed needs of the participants. Also, the committee selects learning experiences that fill these objectives and that are consistent with the learning style of the group. Finally, evaluation procedures for these learning experinces are developed by the committee. The results of each step should be presented to the group for their comments.

Diagnosis of learning needs. The great importance of this step dictates maximum involvement of participants. Satisfying the self-perceived needs of group members is the foundation of meaningful learning. Two methods of needs diagnosis are presented: Task Analysis and General Needs Assessment. The use of Task Analysis is preferred because it addresses the specific needs created by the undertaking of a particular action project. A General Needs Assessment may be more appealing to groups with experince in community action projects, because of its relative brevity. Even the most experienced groups should participate in some form of needs assessment in order to insure that they have not overlooked a vital skill or a potential weakness.

Task Analysis (adapted from Dale, 1979)

Goal:

To allow the participants to describe their own training needs based on a specific action project and project goal.

Group Size:

Up to fifty

Time Required:

One to two hours

Materials:

For the entire group:

Easel

Newsprint

Markers

Masking Tape

For each small group:

Newsprint

Markers

Physical Setting:

Movable chairs are arranged in concentric semi-circles facing the easel in a room that can accommodate at least five small discussion groups.

Process:

1. The facilitator posts the project goal and action strategy timeline. It will be helpful to briefly review these.
2. The facilitator explains the procedure. The participants form themselves into small discussion groups. Each group chooses or is assigned one task for which they list on newsprint the information and skills needed to perform the task. When the list is complete, they determine what information and skills the citizen group possesses and which are lacking. This is indicated by placing a plus (+) for those possessed and a minus (-) for those lacking, next to each item. This process is repeated until all of the tasks listed on the action strategy timeline have been addressed by one of the small groups. The information and skills that are lacking are the training needs of the group for this environmental action project. Each group chooses a spokesperson.
3. The facilitator calls the participants back together. The spokespersons for each of the groups post their lists and discuss their results. During each

presentation, the facilitator lists the training needs on a separate sheet of newsprint. This list is used by the planning committee to design the group's training program.

Variations:

1. If the final list is more than ten items long, the needs should be prioritized by a straw vote. Each participant votes for five needs that are considered the most critical. The votes are tallied on the needs list for all to see. The planning committee should honor the priorities established by the group.
2. The citizen group may wish to undertake this activity in project teams. Each team would determine its own training needs.

General Needs Assessment (adapted from Dale, 1979)

Goal:

To assist participants in identifying areas in which training is needed.

Group Size:

Unlimited

Time Required:

Fifteen minutes

Materials:

For the entire group:

Easel

Newsprint

Markers

For each participant:

Needs Assessment Worksheet

Pencil

Physical Setting:

Chairs are arranged in concentric semi-circles facing the easel.

Process:

1. The facilitator distributes the Needs Assessment Worksheet to all participants (see Sample Needs Assessment Worksheet). Each person is asked to read the numbered items and add any needs that do not appear. The facilitator asks for additions to be read aloud, so that other participants may add these to their worksheets. There is no discussion at this time. All participants should now have identical lists.

2. The facilitator instructs the participants to place a check next to ten items that seem to be the greatest training needs of the group. Next, the participants are to use a scale ranging from one to five to rate the group's present level of knowledge and skill for each numbered item. This rating should be written on the line next to each item.
3. The facilitator collects the worksheets and asks for a volunteer to compile the results. The number of checks for each item is tallied and the ratings are averaged. These results are posted for all to see.
4. The ten items receiving the most checks indicate those areas in which participants feel training is needed the most.

Variations:

1. In some cases, items which are rated as "inadequate" by a large number of participants may not appear in the top ten. The group may wish to expand the final list to accommodate these items.
2. If the group is large or if time runs short, the final list may be presented at the next group meeting.

Sample Needs Assessment Worksheet

Directions:

1. Place a check in the parentheses next to ten items that you feel are the greatest training needs of your group.
2. Rate the present level of the knowledge or skill for each item using a scale ranging from one to five.
   - 1 - inadequate
   - 2 - less than adequate
   - 3 - adequate
   - 4 - more than adequate
   - 5 - excellent

1. ( ) ___ Fundraising and budgeting.
2. ( ) ___ Information on how local government works.
3. ( ) ___ How to influence legislation.
4. ( ) ___ Discussion methods to explore environmental issues.
5. ( ) ___ Planning and implementing special projects.
6. ( ) ___ How to hold officials or agencies accountable.
7. ( ) ___ Knowledge of local environmental issues.
8. ( ) ___ Knowledge of organizing strategies.
9. ( ) ___ Problem-solving methods.
10. ( ) ___ Knowledge of consumerism strategies.
11. ( ) ___ Methods for gathering factual information and survey data.

12. ( ) ___ Understanding and applying the social, economic and ecological factors related to specific environmental issues when developing projects and goals.

13. ( ) ___ Understanding and utilizing mechanisms for effective citizen participation.

14. ( ) ___ Understanding legal action.

15. ( ) ___ How to run public relations or media campaigns.

16. ( ) ___ Ways of altering individual and family lifestyles.

17. ( ) ___ Monitoring and evaluating the group's performance.

18. ( ) ___ Examining the relationship between human values and environmental issues.

19. ( ) ___ Other.

<u>Preparation of learning objectives.</u> Based on the group's self-determined needs, the planning committee delineates specific learning objectives. These are concise statements of behaviors that participants are expected to exhibit upon completion of a learning experience. In preparing objectives, the committee should strive to satisfy the following conditions:

1. Objectives should be stated from the point of view of the learner.
2. Objectives should indicate a terminal behavior or competence.
3. Objectives should provide specific and measurable criteria of achievment.

4. Objectives should describe the context in which the behavior is expected to occur.

5. Objectives should be reasonable and achievable.

Fulfilling these conditions should result in learning objectives that will clearly guide the selection and evaluation of the group's learning experiences.

After preparing the objectives, the planning committee presents each need along with its corresponding objective to the entire group. Learning objectives will become more meaningful to the group once they recognize and accept the objectives' relevance to their own needs. One method of presentation would be to list the corresponding needs and objectives on handouts which are distributed to each participant. The format might look like this:

Need	Objective
1. To learn to give testimony at a county board hearing.	1. The participants will prepare and present a three minute testimony in a simulated county board hearing. The testimony will include a salutation, the participants name, address, occupation, position on the issue, a factual

	defense of that position and a statement urging the county board to take some specific action.
2. To learn about the potential hazards of dioxin pesticides.	2. In a small group discussion the participants will list three harmful effects of exposure to dioxin pesticides.

If a significant number of the participants feel that an objective is not appropriate, the committee should ask for specific suggestions and revise the objective accordingly.

Selection of specific learning experiences. Learning experiences are selected by the planning committee to assist participants in gaining the knowledge or skills needed to satisfy the learning objectives. The form of the learning experience should be appropriate to the objective. For instance, the sample objective concerning the county board hearing could be satisfied through a simulation. If the topic of the hearing is the aerial application of pesticides, the sample objective concerning dioxins could also be satisfied. A presentation by a resource person followed by a small group discussion would be appropriate for the dioxin example, but would not fulfill the skill requirement of the hearing example. Descriptions of various kinds of learning experiences and procedures for their use appear in Appendix B. It is often helpful to consider several types of learning experiences before choosing one. Here again, the planning committee should present its selection to the entire group in a fashion similar to that used in the learning objectives.

Development of learning evaluation procedures. The purpose of evaluation is to assess the degree to which the learning objectives have been satisfied. The planning committee should develop an explicit form of evaluation to accompany each learning experience. Because these experiences may differ greatly, the most appropriate evaluation procedure for each type of learning experience may also differ. However, the intent of evaluation should always remain the same: to gather information which will be useful in improving the quality of future learning experiences.

Reaction forms are a commonly used evaluation method. They usually consist of a number of statements describing the value of various aspects of the learning experience, e.g., degree to which the objective for this experience was fulfilled, fairness of the facilitator and value of a presentation by a resource person. The participants indicate their feelings concerning each statement by circling one of the accompanying responses, e.g., agree, disagree, excellent or poor. The participant should have a range of responses from which to choose. Open-ended questions may also be used on reaction forms. These should ask for specific information, e.g., "Do you feel confident about testifying at the upcoming county board hearing?" In this way, reaction forms may be used to determine the appropriateness of the learning technique used.

Performance evaluations can be used to determine the degree to which participants have gained particular skills. This type of assessment can be done by other participants during the learning experience. In the case of the simulated county board hearing, the "audience" could rate the "witness" on several criteria. These criteria should be directly related to the objectives of the learning experiences. They might include:

1. Content, e.g., proper salutation and accurate facts.
2. Adequate voice volume.
3. Enunciation and inflection.

After the simulation has been completed, each of the witnesses would be given the written evaluations of their presentations. This type of evaluation may threaten participants, so the facilitator should emphasize that praise should accompany constructive criticism. (Sample evaluations appear in Appendix C.)

Integration of the Action Strategy and Learning Experiences

The planning committee's last task is to schedule the learning experiences for the times when they will be most effective. The meaningfulness of learning should be greatest just prior to the execution of a task that requires the knowledge or skills conveyed by a particular learning experience. For the county board hearing example, the most appropriate time for the learning experience would be within one or two weeks of the actual hearing. The immediacy of the task adds meaning to the learning experience.

The actual scheduling of the learning experiences can be done by writing a short description of the experiences on four by six cards and placing them on the action strategy timeline (see Figure 5). This visual representation will indicate the overall flow of the ELT program.

Because each team has an essentially independent timeline of tasks, it is conceivable that conflicts could arise. Two teams may be scheduled to begin different tasks at roughly the same time. If it has been determined that both of these teams require training, it may be necessary to adjust the action strategy timeline or to provide the appropriate training to each team separately. The probability of such a scheduling conflict will vary with the type of action project and the past experience of the citizen group. The key to resolving these potential conflicts lies in the group's ability to be flexible.

Implementation of the Environmental Literacy Training Program

The citizen group has now completed its preparation. A local environmental issue has been identified and investigated. An action project has been designed. After determining the knowledge and skills that are needed to execute the project, learning experiences have been selected to meet those needs.

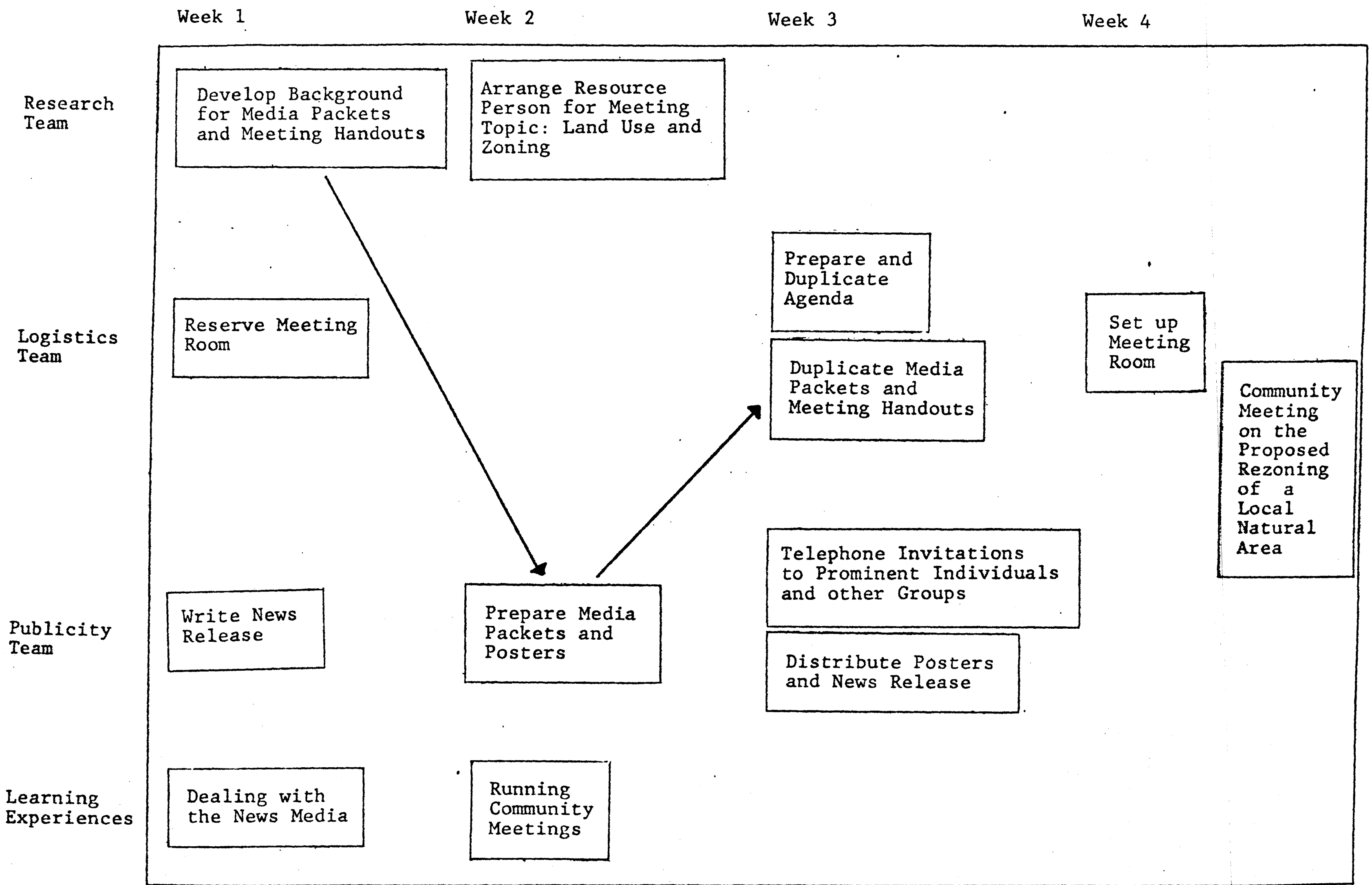

Figure 5. Integration of Action Strategy and Learning Experiences: Community Meeting on the Proposed Rezoning of a Local Natural Area.

The overall ELT program is represented schematically on the action strategy timeline. Teams of participants can see the tasks that must be done, the deadlines for their completion and can rely on timely training in appropriate subjects. The plans have been laid and now must be implemented.

Carrying out the ELT program requires the cooperation of everyone involved. Based on learning needs determined by the participants and objectives prepared by the planning committee, the facilitator and training coordinator develop and execute a series of learning experiences. The environemental action project has been planned by the group as a whole. Teams of participants implement different aspects of the action strategy. Overseeing these efforts is the responsibility of team leaders and the project coordinator. While the learning experiences are separate from the action strategy with regard to organizational structure, they complement one another by creating a diverse and meaningful EE experience with a tangible product.

Evaluation of the Environmental Literacy Training Program

Regardless of the degree to which the citizen group's environmental action project has been attained, an evaluation of its efforts must be done. This component will help the group to identify aspects of the program that must be improved and those that were successful as they were. The group may use this information in developing future action projects and learning experiences. This component consists of a sample evaluation form that can be used as a model. The training coordinator, facilitator, project coordinator and team leaders should revise this evaluation form to suit the efforts and needs of the group.

Sample Environmental Literacy Training Evaluation

I. Rate the value of each component of the ELT program by circling the number which best reflects your feelings.

1 - very valuable
2 - somewhat valuable
3 - marginally valuable
4 - not valuable
5 - not applicable

A. Identification of a local environmental issue.	1	2	3	4	5
B. Investigation of the issue.	1	2	3	4	5
C. Selection of an action project	1	2	3	4	5
D. Design of the action strategy	1	2	3	4	5

E. Design of the learning experiences.

1. Diagnosis of learning needs.	1	2	3	4	5
2. Preparation of learning objectives.	1	2	3	4	5
3. Selection of specific learning experiences.	1	2	3	4	5
4. Development of learning evaluation procedures.	1	2	3	4	5
F. Integration of action strategy and learning experiences.	1	2	3	4	5
G. Implementation of the ELT program	1	2	3	4	5

II. Identify the strengths and weaknesses of the group members who filled these roles:

	Strengths	Weaknesses
A. Training Coordinator		
B. Facilitator		
C. Planning Committee		
__________________		
__________________		
__________________		
D. Resource Persons		
__________________		
__________________		
__________________		

	Strengths	Weaknesses
E. Project Coordinator		
F. Your Team Leader		

III. Please answer the following questions as completely as possible.

A. Was the project goal achieved?

B. What reasons can you give for its success or failure?

C. Which learning experiences did you find the most helpful in executing the action project?

D. Which learning experiences were least helpful in executing the action project?

E. Based on this environmental action experience, would you participate in another action project?

F. Would you use the ELT approach for future action projects?

G. What is your overall feeling concerning the value of the ELT program?

H. Additional comments.

The ELT model is an educational process that is intended to provide guidance to citizen gorups interested in community environmental problems. The model focuses primarily on designing an action project. Learning experiences are developed that are appropriate to the needs of the group for that particular project. The amount of emphasis placed on structured learning will vary greatly with the past experience of the group and the type of project which they choose. This model is intended to be a guide which may be modified to fit the needs of many groups. The essence of learning is experience. The Environmental Literacy Training model is designed to facilitate experiential learning.

CHAPTER IV

SUMMARY AND RECOMMENDATIONS

Summary

The importance and immediacy of environmental issues cannot be overstated. During the period of the next ten years, many critical decisions regarding environmental quality must be made. These decisions may involve trade-offs that affect many aspects of human life. For example, America's quest for energy independence may lead to a greater reliance on domestic coal resources. This decision may contribute to the problem of acid precipitation. The negative impacts of the increased use of coal can be mitigated, if pollution control technology is required. However, the cost of this technology places an economic burden on certain industries and, ultimately, on consumers. Considering the economic, social and environmental trade-offs is an important attribute of environmentally literate decisions.

Presently, many citizens do not possess the capabilities to objectively determine their own positions and to influence societal decisions regarding such complex issues. The Environmental Literacy Training (ELT) model has been proposed here as one means of providing citizens with the opportunity to gain the knowledge and skills necessary to engage in productive environmental action. This program model has been based on "The Goals for Curriclum Development in Environmental Education" (Hungerford, et al, 1980), With special emphasis on Level III-

Investigation and Evaluation and Level IV - Environmental Action Skills. The ELT process itself is a blend of the Andragogical Model(Knowles, 1973) and the Problem-Solving Project Model (Dale & Mitiguy, 1978; Kunofsky, 1981). At the heart of this program model is the concept that citizen groups should design their own experiential education program that fulfills their self-determined needs. It is hoped that the use of the ELT model will stimulate relevant and meaningful learning by focusing on the resolution of local environmental issues.

Recommendations

The value of the ELT model can only be accurately assessed after repeated use and evaluation. Communities, citizen groups and environmental issues vary greatly. It is conceivable that one community project may follow the ELT process to the letter, while another may use only certain components or principles. Therefore, it is recommended that the use of the ELT model be analyzed to determine:

1. The components and principles which citizens perceive as being the most valuable.
2. The types of community projects which have been undertaken.
3. The number of community projects that have achieved their goals.
4. The types of environmental action skills which have been gained.

5. The degree to which these skills have been gained. Based on the results of such an evaluation the ELT model should be modified to increase its effectiveness in terms of facilitating community environmental action and meaningful learning.

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APPENDIX A

ENVIRONMENTAL ACTION METHODS

This ELT program focuses on assisting citizens in gaining the skills needed to influence the ways in which humans interact with their environment. These skills fall into one or more of the categories of action outlined in Chapter II, i.e., persuasion, consumerism, legal action, political action and ecomanagement. Because one intention of this progam model is to train citizens to be effective action-takers, a detailed description of action methods appears below.

Persuasion

Persuasion activities are those directed toward changing human values and actions. Two types of appeals can be made to accomplish this: logical or emotional. Logical appeals consist of factual information that is well thought out and presented in a clear, concise manner. Emotional appeals present a limited amount of information in a dramatic manner that is intended to arouse a person's feelings (Hungerford, et al, 1978).

For either type of persuasion to be effective certain guidelines should be considered. They are:

1. The argument should be easily understood (Hungerford, et al, 1978).
2. Facts should be accurate (Hungerford, et al, 1978).
3. Citing sources of information adds credibility to the appeal (Love,1971).
4. The method of presentation should be consistent with the message being delivered (Hungerford, et al, 1978; Love, 1971).

5. The argument should include an indication of how the desired action fits the values of others (Hungerford, et al, 1978).

These guidelines can be applied to any of the following methods of persuasion.

Printed information published by the group can be an important persuasive tool. Brochures and pamphlets can provide concise information and be widely distributed. Regular newsletters can give continuous updates on the status of the issue. Posters can be placed on community bulletin boards and in local business establishments (Hungerford, et al, 1978; U.S.D.A. Forest Service, 1980).

The mass media can reach many people in the community who may be potential allies (Love, 1971). Some options are free of charge. Public service announcements can be made through local newspapers, radio stations and television stations (LaFollette and Anderson, 1971; U.S.D.A. Forest Service, 1980). The use of public service announcements is generally restricted to meetings and special events. Letters to the editors of local newspapers can generate considerable awareness of local issues Kunofsky,1981; LaFollette and Anderson, 1971). In depth explanations can be provided to large audiences through radio and television talk shows (LaFollette and Anderson, 1971; U.S.D.A. Forest Service, 1980). Listeners are frequently allowed to ask questions or make comments via telephone. This interaction increases the show's relevance. Newsworthy information can be distributed through local news agencies. Press releases should describe timely information, be clearly written, include the most important points in the first paprgraph and list the name and telephone number of a contact person (Love, 1971; U.S.D..A. Forest Service, 1980). For truly major occurances, press conferences may be held (Love, 1971). These five uses of the mass media can provide a solid foundation for persuasive activities.

If funds are available, other uses of mass media may be considered. Buying advertisements in newspapers, on radio and on television are possibilities. Another more expensive option is the production of documentary films. The benefit of films are their ability to tell the whole story. However, it requires a long lead time and a significant commitment of personnel (U.S.D.A. Forest Service).

Personal contact with people in the community is a vital persuasive tactic. Informal discussions with other citizens provide ample opportunity for persuasive action. These contacts are often more meaningful than other methods, because they add to the individual's personal experience. Borton and Warner (1974) reported that personal experience provides the primary foundation for opinions. Personal contact with community leaders may express commitment on the part of the citizen. Even though this method can be time consuming, it can be valuable especially when directed toward influential citizens and community leaders.

An extension of the idea of gaining support from individuals is the forming of a coalition of many community groups. Kunofsky (1981) indentified two types of coalitions: those made up of environmental organizations and those representing a broad spectrum of groups. Broad-based coalitions are generally more influential, because they represent more individuals and more viewpoints. Member groups of a coalition may be: labor unions, health associations, churches, women's organizations, professional organizations, sportman's clubs and civic groups (Love, 1971). Coalitions can be broadened by emphasizing that member groups need only agree on one issue.

Identifying groups that may be interested in that one issue may be done by determining which groups have been involved in similar issues in the past (U.S.D.A. Forest Service, 1980). However, comprehensive coalition building requires enlistment of those groups without a history of involvment in environmental issues. Persuasive activities using coaltitions of citizens groups can be very effective, because the members of these groups tend to be more involved in community affairs (Entine, 1980).

Bell, Fisher and Loomis (1978) described "prompts" as a persuasive method that can be directed toward all citizens, regardless of the degree of their involvment in community affairs. Prompts are simply cues that covey a message. They can moderate environmentally destructive behavior by making social norms more or less pertinent to a given situation. One example is a sign that carries the reminder that littering is not acceptable. Another type of prompt is the role model whose behavior influences the behavior of others (Bell, et al,1978). Prompts could easily be used in addition to other persuasion strategies.

Most of these persuasive strategies may be used individually or in conjunction with other methods. A particular method may reach one segment of the community, while overlooking several others. When designing an overall persuasion strategy, it is important to consider which segments of the community are to be targeted and the methods that can be most effective in reaching them.

Consumerism

The term consumerism describes citizens' behaviors in the marketplace that are intended to ameliorate the negative impacts of selected comsumer products or commercial activities on the environment. Former Chief Justice Warren Burger once said, "Consumers are generally among the best vindicators of the public interest" (Sax, 1971, p. 244). To most private enterprises, satisfied customers are essential to maintain a viable business. Reputable firms will frequently make an honest effort to satisfy consumer demands, but they must be made aware of these demands (Shubow, 1979).

The first task of the consumer is to critically evaluate commercial products in terms of their impacts on environmental quality and one's own need for the product. Hungerford, et al (1978, pp. 155-156) outlined a method of evaluating these aspects of consumer products, which involves answering six questions:

> 1. Is the product made from natural resources that cannot be renewed?
> 2. When the natural resource (or product) is taken from the environment, does it change the environment in any permanent or undesirable way (damage the environment)?

3. If the change (damage) is not permanent and can be repaired, is it being repaired?
4. Does the manufacture, transport and/or storage of the product damage the environment?
5. Does the use of the product damage the environment?
6. Does the disposal of the product after use pose a problem for the environment?

Using the answers to these questions, an overall environmental cost for the product can be determined.

Consumer decisions cannot be made on environmental cost criteria alone. The next step is to determine the need for the product. Again, a few general questions may aid in this determination (Hungerford, et al, 1980, p. 157):

1. Does the product serve a real need? An imagined need?
2. Are there environmentally desirable (or at least less damaging) alternatives?
3. Do you value the benefits of the product more than the costs to the environment?

This cost/needs assessment provides a basis for consumer behavior in the marketplace.

Comparison shopping is fundamental to critical consumerism (Shubow, 1978). Product labels are a ready source of information. Investigating product quality through consumer product testing magazines is another option (Shubow, 1979). Information is also available from various government offices, consumer groups as well as business and industry organizations. Many guides to getting information and resolving consumer problems have been published. One good source is the Consumer Resource Handbook, which is available from the Consumer Information Center, Pueblo, Colorado. These are actions that should be taken before purchasing consumer products.

If the product has already been purchased and is not performing satisfactorily or if alternatives to an environmentally damaging product are not available, a letter of complaint to the appropriate business or industry may be in order (Shubow, 1979). Individual complaints are most effective at rectifying individual consumer problems. Mitigating environmental degradation which results from mass production of certain products may require a more organized consumer effort.

Collective consumer action has often taken the form of direct or indirect boycotts. A direct boycott is the refusal to purchase a specific item which has negative environmental effects. It is intended to make that item more consistent with a high level of environmental quality or to influence its removal from the market. Indirect boycotts are intended to influence action regarding something other than a specific product. For example, Japanese goods have been boycotted to pressure a halt in their whaling activities (Hungerford, et al, 1978). To be effective collective boycotts must incorporate persuasive tactics, such as information dissemination or picketing. Therefore, boycotts may have some important educational implications. However, boycotting the necessities of life can be very difficult (Love,1971).

If a product or service has a high environmental cost as well as a high need, e.g., electricity, consumer conservation may be an appropriate action (Hungerford, et al, 1978). Using products and services efficiently can reduce their potential for negative environmental impact. By the same token, buying durable goods and maintaining them properly can extend product life. This reduces the impacts associated with the extraction of raw materials, manufacture, transportation and disposal of the product (Riendl, 1981).

Individual and collective consumer strategies must be well thought through and implemented consistently if they are to be effective. In addition, actions must be accompanied by communication, so that targeted businesses or industries understand consumer concerns. Without this understanding, there is little hope of productive change.

Political Action

Political actions are those that use representative government as a vehicle of environmental change (Crowfoot & Bryant, 1980). Influencing governmental decisions is an extremely important method of action, because many of these decisions impinge on environmental quality (Hungerford, et al, 1978). Politicians become more accountable as they become more conscious of citizen concerns (Love, 1971). While citizen input through legislative and administrative bodies is a fundamental principle of democracy, it is considered together with other factors, e.g., technical factors and the common good, to arrive at a final decision (Crowfoot & Bryant, 1980). Increasing the influence of citizens' voices would indicate that political action is essentially persuasion ocuuring in a specific context that is often complex and confusing. The use of persuasive skills in this context requires a good understanding of the poilitical decision-making process (Hungerford, et al, 1978). One role of EE is to encourage citizens to participate in governmental processes to resolve environmental issues (WEEC, 1974).

LaFollette and Anderson (1971) suggest that existing citizen groups should be used as a nucleus for political participation. Whether action is taken individually or in groups, some general guidelines should be followed. It is essential that facts be accurate. Serious, logical arguments should be presented along with alternative solutions to the problem. Finally, it should be made clear that the citizens' action effort will continue until their goal is achieved (LaFollette & Anderson, 1971). These general guidelines are appropriate for any specific political action.

Letters to government officials is one of the most common methods of action. While they require little time, they do require careful thought. Letters should be concise and limited to a single issue. The writer's position on the issue should be stated near the beginning. If the letter is written in reference to a specific piece of legislation, the bill's title and number should be included. This correspondence should always be objective and courteous. A reponse stating the official's position should always be requested. Finally, the writer's name and complete address should be provided (Hungerford, et al, 1978; LaFollette & Anderson, 1971; Love, 1971).

The importance of timely, well conceived letters cannot be overstated. They are the most effective means of communicating with government officials for the amount of time and energy required.

Another obvious and relatively easy form of political action is voting (Hungerford, et al, 1978). Since the public seldom votes directly on environmental issues, they must choose a candidate whose position comes closest to reflecting their own environmental values (Edey, 1970). Persuading other voters is also an option. Political campaigns require a major effort. Individuals supporting a candidate's environmental views may wish to offer their services as a campaign volunteer. Citizens can help political campaigns by doing research, soliciting endorsements, raising funds and getting voters to the polls (Love, 1971). Organized environmentalists have proven themselves to be very influential through these kinds of activities during election campaigns (Hungerford, et al, 1978).

Regardless of election outcomes, legislators at all levels must still be receptive to public opinion. Actions taken to influence politicians to make certain decisions are termed lobbying (Hungerford, et al, 1978). These actions may take many forms: letters, telegrams, telephone calls, petitions, personal contacts, demonstrations of public interest or recording legislators' action and votes regarding environmental issues (Hungerford, et al, 1978; Love,1971). Love(1971) indicates that lobbying efforts are most effective during committee action. Direct lobbying is not feasible for most people, but environmental organizations provide an alternative. Legislators recognize that a well organized group is likely to influence votes at election time (LaFollette & Anderson, 1971; Love, 1971). These groups may also have the financial resources to exert informal pressure through paid lobbyists (Hungerford, et al, 1978).

One option for more formal political action is available to all citizens and may not require significant financial resources. This option is testifying at legislative hearings. In most cases, hearings are intended to provide decsion-makers with technical information and an idea of how the public feels about the issue being considered. It is not necessary for citizens to be experts on the issue (LaFollette & Anderson, 1971). All testimony is incorporated into the official record (U.S.D.A. Forest Service, 1980). Some guidelines for hearing testimony are (LaFollette & Anderson, 1971; Lageroos, 1977):

1. A typewritten statement should be submitted to the hearing secretary and each member of the hearing body. This statement may provide detailed explanations along with supporting evidence.
2. The oral statement should be short, concise and sincere.
3. The citizens giving testimony should state their names, places of reisdence, group affiliations, their positions on the issue and what they believe should be done to resolve the issue.

4. After the testimony, the presenters should wait for questions from the hearing body. When questioning has ceased, they should thank the hearing body and leave the podium.

Testifying at hearings is one of the few official opportunities for citizen participation and should not be neglected.

It would seem that actions intended to influence public policy should be directed toward the primary policy making bodies,i.e.,legislatures. However, Eley (1979) indicates that many policy making powers have been delegated to administrative bureaucracies that are not directly accountable to the public through election. Furthermore, because many agencies lack the resources of staff time, expertise and money, they rely heavily on special interest for information on which to base decisions (Dubois & Christensen, 1977). The resulting situation is one in which environmental quality decisions are based on less than the holistic informational foundation which they require.

In an effort to guarantee broader, more holistic foundations for decision-making the U.S. Congress passed the National Environmental Policy Act of 1969 and the Wisconsin Legislature enacted the Wisconsin Environmental Policy Act of 1972. These laws require agencies to consider environmental factors as well as economic pressures regarding "...every recommendation or report on proposals for legislation and other major actions significantly affecting the quality of the human environment" (Lagerroos, 1977, p. 13). Most often Federal and state agencies fulfill this statuatory requirement by preparing an Environmental Impact Statement (EIS). This document is meant only to provide information for decision-making and does not dictate the outcome of the decision. Influencing decision-makers remains the responsibility of citizens (Lagerroos, 1977).

There are three types of opportunities for citizen involvement during the process of preparing an EIS. Letters of comment may be submitted to the agency at any time. These letters would be most appropriate during each of the forty-five day comment periods following the release of the draft EIS (called a Preliminary Environmental Report in Wisconsin) and the final EIS. After the agency has approved the final EIS, it must hold a public hearing, which provides another opportunity for public involvement. Litigation is also an option. If citizens believe that they may become involved in legal action regarding the EIS, a lawyer should be consulted as early as possible in the process: no later than immediately following the hearing. Guaranteeing adequate consideration of environmental factors requires vigilance on the part of citizens throughout the EIS process (Lagerroos, 1977)

Many events in the private sector do not constitute a "major action" by government and do not require an EIS. In Wisconsin, if such an event is viewed as a threat to environmental quality, a minimum of six citizens may file a complaint with the Wisconsin Department of Natural Resources (DNR) under Section 144.537 of the State Code (LaFollette & Anderson, 1971). This Six Citizen Complaint would require the DNR to hold public hearings on the issue in question (Dubois & Christensen, 1977). Two factors make this type of action difficult for citizens.

First, the burden of proof is placed on the plaintiffs, i.e., the citizens (LaFollette & Anderson, 1971). Secondly, complaints of this nature are viewed as criticisms of DNR vigilance and may receive little support from the agency (Dubois & Christensen, 1977). Overcoming these difficulties may require citizens to seek outside cousel.

One source of assistance is the Wisconsin Public Intervenor, who is a lawyer appointed by the Attorney General. The role assumed by the Public Intervenor varies depending on the individual filling the position. In general, the role has been one of advocacy, i.e., promoting a high standard of environmental quality and opposing change in the natural state of the environment. The Public Intervenor must become involved in an issue at the request of certain division administators within the DNR. He may also intervene at his own discretion or upon request from legislative committees or citizens. The Intervenor's principle areas of activity are DNR hearings and court proceedings. In these situations, the Intervenor has statuatory power to "... present evidence, subpoena, cross examine witnesses, submit proof, file briefs or do any other act appropriate for a party to the proceedings" (Dubois & Christensen, 1977). In essence, the Public Intervenor represents the public interest regarding decisions made by the DNR (Dubois & Christensen, 1977).

While representative government is intended to guide society based on the public good, it relies on many sources of input to determine the direction that is to be taken. Citizen opinion is considered along with that of vested interest groups. Effective citizen influence requires a good knowledge of the political process and the skill to work within the political system.

Legal Action

Using the courts to resolve environmental issues is termed legal action. This type of action can be extremely lengthy, laborious and expensive. Although individuals seldom possess the resources for such an undertaking, citizen organizations have used this method effectively.

Legal actions have been effective for a number of reasons. While litigation must not be considered a substitute for legislation, it may focus the attention of elected officials on topics which require legislative attention (Sax, 1971; Wellford, 1970). Administrative agencies are subject to political power struggles to a much greater degree than the courts. Similarly, special interest groups have become skilled in influencing other branches of government; legal proceedings provide more equal terms for citizens. The courts are uniquely suited to resolve, unsentimentally, the adversary positions assumed by those involved in environmental disputes (Sax, 1971). Lagerroos (1977) stated that legal action may be welcomed by public officials, because it relieves them of the responsibility for making controversial decisions. In addition, an organization that is willing to litigate may gain credibility and influence with officials. Finally, widespread knowledge of a group's intention on litigation may facilitate an out-of-court settlement (Lagerroos, 1977). For these reasons, citizen groups should examine legal action as an alternative.

However, other factors must also be considered before such a strategy is selected. Dubois and Christensen (1977) recognized the favorable results of legal strategies, but also noted an inherent weakness: the court "...by convention will not substitute its judgment for that of administrative agencies...except in unusual and compelling cases" (p. V). Aside from the length and expense, Kunofsky (1981) noted several other reasons citizen groups should avoid litigation: the group's power is given to a lawyer and members become passive; laws can be changed at any time; and the public at large learns little about the issue. Despite the drawbacks, legal action must not be ruled out. Rather, it should be used as a last resort (Love, 1971).

Even as a last resort legal action should not be approached in a haphazard manner. Citizens unfamiliar with the legal arena frequently find themselves in a quadary (Sax, 1971). To avoid wasting valuable time with unproductive actions, citizens should consult an attorney at the earliest possible date (Lagerroos, 1977). Public interest law firms or private attorneys acting "in the public interest" provide legal services for a minimal fee or free of charge (Brubaker, 1981; Dubois & Christensen, 1977; Lagerroos, 1977). Timely consultations with an attorney may make the difference between a successful and an unsuccessful legal action strategy.

Ecomanagement

Ecomanagement is described by Hungerford, et al (1978) as "... positive physical action which will improve or maintain some part of the environment" (p. 161). These direct actions may take many forms; from building a bird house to operating a recycling center. Actions falling into the ecomanagement category may be distinguished from other specific environmental actions by their direct relationship with everyday human activities. They focus on actions in and around the home and the workplace. Because listing specific ecomanagement activities would be a voluminous waste of paper, this section will address underlying principles and provide illustrative examples.

Direct physical contact with the biotic and abiotic components of the environment provides many opprotunities for ecomanagement. Farmers can institute soil conservation practices and integrated pest management to lessen the impacts of modern agriculture. All landowners can landscape their property with plants that provide food and shelter for wildlife (Hungerford, et al, 1978). Woodlot owners can harvest their trees according to proper forest management principles. Outdoor enthusiasts can avoid mechanized recreation, e.g., off road vehicles, except in designated areas and begin to explore muscle-powered options,e.g., hiking and cross-country skiing (LaFollette & Anderson, 1971). These examples of ecomanagement can help to reduce negative human impacts resulting from direct contact with the environment.

However, these direct contacts may not be the most far reaching opprotunities for ecomanagement. All aspects of human life, whether urban or rural, have an effect on the environment. For example, consuming a soft drink in an aluminum can requires the use of mineral resources, petroleum products and fossil fuels. The aluminum for the container must be mined, processed, fabricated, filled, delivered and disposed (Hungerford, et al, 1978). Consuming soft drinks in this type of disposable container requires an enormous expenditure of energy and natural resources. Recycling aluminum cans is one way to lessen the negative environmental impact of the everyday practice of drinking soda.

Ameliorating the negative impacts of indirect contacts with the environment requires an investigation and subsequent change in individual lifestyles. Yambert (1980) laments that humans exhibit "...a frustrating lack of evidence that [they] are capable of thinking clearly about remote ramifications" (p. 69.) After examining these remote ramifications, the next step is to alter individual behaviors to reduce the negative ramifications. Leopold's description of the Land Ethic seems to be an equally appropriate description of lifestyling as an ecomanagement technique: "... a limitation of freedom of action in the struggle for survival" (Leopold, 1966, 238).

Phillips (1980) described a college level course which involved the lifestyling aspects of ecomanagement. The objectives of the course were to learn to measure environmental impacts, design strategies to reduce adverse impacts and evaluate the effectivness of the impact reduction strategies. Individuals or family units were the focus of independent projects, which utilized existing monitoring devices, e.g., utility meters and automobile odometers. One project involved monitoring the gasoline mileage of the family's pick-up truck, which was equipped with a removable camper shell. After the mileage was determined, the camper shell was removed and the mileage was calculated again. It was found that the pick-up truck's mileage improved from 21 to 24.5 miles per gallon. When the camper shell was replaced, the mileage decreased to 22.5 miles per gallon. Examinations of this type can be done for many aspects of human lifestyles. Changes in everyday habits or practices based on these examinations could lessen many of the indirect impacts of human actions.

It is important to note that many people may resist sudden and significant changes. Bell, et al (1978) stated that it is easier to make subtle changes in lifestyle. Similarly, society tends to resist dramatic political and economic changes. A series of incremental changes over a period of time may be the most productive strategy for reducing the environmental ramifications of human activities. Citizen groups interested in achieving and maintaining a high level of environmental quality can influence long-term societal change by using these environmental action methods, individually or in combination.

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APPENDIX B

SELECTED LEARNING EXPERIENCES

Because members of the planning committee may not have the background to develop learning experiences, a number of procedures are presented that may be used directly or adapted. These prodeures are grouped as follows:

Information Presentation

Group Discussion

Problem-Solving

Simulations

Values Clarification

The key to selecting a learning experience lies in the compatibility between subject matter and method. For instance, discussion methods are a meaningful way of conveying factual information, but are not appropriate for facilitating the learning of skills, e.g., public speaking. The planning committee should also consider the learning style of the group and select learning experiences that will not threaten the participants. Thorough preparation by the facilitator and training coordinator is an absolute necessity. Careful selection and competent execution will greatly enhance the group's learning experiences.

Information Presentation

Information presentation techniques are best suited to subject matter which contains facts, concepts or basic principles (Dale, 1979). Group members with expertise in the subject area or outside resource persons may employ these methods. Although the participants begin the session as passive receivers of information, an opportunity for active involvement should be provided, e.g., a question and answer period following the presentation (U.S.D.A. Forest Service,1980). In addition, these techniques may be used in conjunction with other training techniques (Fellenz, 1974). Some information presentation techniques are:

1. Short Lectures (Dale, 1979; Fellenz, 1974).
2. Readings (Dale, 1979; Kunofsky, 1981).
3. Panel Discussions (Dale, 1979; Fellenz, 1974).
4. Debates (Dale, 1979).
5. Audio-Visual Presentations (U.S.D.A. Forest Service).

Because of the limited opportunity for participant involvement, information presentation techniques should not constitute a major portion of the ELT program.

Group Discussion

Involving learners in a dialogue is far superior to one-way communication, such as lecture (Dale, 1979). Discussion can be a meaningful learning experience, because it is active and relies on the experience of the learner (Fellenz, 1974). Group discussion can be effective in changing behavior. It allows for interaction with other individuals that hold different values. This provides stimuli that may encourage participants to change their own values, but does not force such a change (Tough, 1971; Verduin, et al, 1977). Similarly, diversity in in membership makes heterogenous groups superior to homogenous groups in finding inventive solutions to problems (Glatthorn, no date).

Successful group discussions require careful planning and a supportive demeanor on the part of the discussion leader. If participants are not familiar with the topic, outside reading may be required (Fellenz, 1974). The discussion leader should not dominate, but facilitate dialogue among the learners (Verduin, et al, 1977). A clear statement of purpose at the beginning and occasional reminders throughout will help keep the discussion focused on the topic (Fellenz, 1974; Kunofsky, 1981; Verduin, et al, 1977). The leader should also encourage conciseness, active listening, reflection and contribution on the parts of all learners (Kunofsky, 1981). Group discussion can be an effective and efficient technique for learning, if it is properly executed.

One very important consideration for successful discussion is group size. Small groups of five or six are optimum. A lower number may threaten the learners and a higher number may result in a sharp decrease in participation (Glatthorn, no date). Because many learning situations attract large numbers of people, a comrpomise may be necessary. Amoebic Discussion Group and Fish Bowl which are described below are two such compromises.

Amoebic Discussion Group (adapted from U.S.D.A. Forest Service, 1980).

Goal:

To maximize individual learners' participation in discussion when the total number is large.

Group Size:

Large group may be up to one hundred, small groups of five to ten

Time Required:

Approximately one hour

Materials:

A handout for each participant which provides the topic and several discussion questions. Each handout is numbered to aid in the formation of small groups, e.g., number one is printed on six handouts and number two is printed on six handouts.

Physical Setting:

A room or rooms which will accommodate all participants in an auditorium-style arrangement and smaller groups in discussion circles.

Process:

1. The facilitator presents the topic of discussion and the procedures to be followed to the entire group. At this time the group also receives the necessary background information, e.g., short lecture, film or printed material, and the handout. The facilitator explains that each small group must generate a response to as many of the questions on the handout as possible. Each group will be expected to report back to the large group.
2. The facilitator designates a meeting area for each small group. The participants join the group whose number appears on their handouts.

3. In the small groups, the participants discuss the questions and attempt to arrive at responses to which everyone agrees. This should be done for as many questions as time allows. Each group selects a spokesperson. The facilitator should check in on each group to insure that their discussion is on track.
4. The facilitator asks the participants to return to the large group. Each spokesperson briefly summarizes their group's discussion and responses.

Variation:

This technique may also be used with task groups. Each small group is given a problem to solve or a task to perform. These problems or tasks may be identical or different for each group. For this variation to be effective, it is essential that the participants fully understand the problem or task and that the time schedule be realistic.

Fish Bowl (adapted from Biagi, 1978)

Goal:

To extend the benefits of a small group discussion to a larger group.

Group Size:

Up to fifty in the outer circle and four to six in the inner circle.

Time Required:

Approximately one hour

Materials:

None

Physical Setting:

Four to six chairs are arranged in a circle in the center of the room. Chairs for the remainder of the group are set in a circle around the smaller circle.

Process:

1. The facilitator introduces the topic of discussion and explains the procedure. All but one chair of the inner circle are filled by volunteers or by persons selected by the facilitator. These persons may be participants, resource persons or both.
2. Those in the inner circle discuss the topic. (Four or five questions which have been prepared in advance may be helpful.) If someone in the outer circle wishes to make a comment or ask a question, they must occupy the empty chair in the inner circle and are allowed to speak immediately. A time limit, e.g., two minutes,

may be set as a maximum that one person may occupy the empty chair at one time.

3. The facilitator recaps the discussion and summarizes any conclusions which have been generated.

Variations:

1. The inner circle may be given a task, while the outer circle observes and evaluates the process. The facilitator may develop an observation form to aid the observers in recognizing key elements in the process and behaviors that enhance or inhibit the performance of the task.
2. The inner circle group may be selected to represent a single value position, two polarized positions or a broad range of values and expertise regarding the topic.
3. The number of empty chairs in the inner circle may be more than one.
4. After about thirty minutes, a different set of participants may occupy the inner circle.
5. Members of the inner circle may be allowed to leave to provide more opportunity for outer circle members to participate.

Problem-Solving

These learning experiences focus on generating solutions to problems, rather than dwelling on the problems themselves. Using problem-solving techniques increases the participants' knowledge of the specific problem and of the problem-solving process in general (Dale, 1979). Addressing a real-life problem, such as one associated with the group's environmental action project, can add more meaning to the learning experience. The experiences described here also provide for substantial participant involvement.

Brainstorming (adapted from Pfeiffer & Jones, 1974)

Goals:

To generate the largest possible number of ideas or solutions to a problem.

To develop skills in creative problem-solving.

Group Size:

No firm limit, although small groups of about six are optimum

Time Required:

Approximately one hour

Materials:

For each small group:

Newsprint

Markers

Physical Setting:

Movable chairs for all participants and a room that is large enough to accommodate all of the small groups.

Process:

1. The facilitator explains the problem to be solved and the rules for brainstorming:
   A. There will be no criticism during the brainstorming phase.
   B. Ideas should be stated as specifically as possible.
   C. Far-fetched ideas are encouraged, because they may trigger more practical ideas.
   D. As many ideas as possible are generated in the allotted time.

   The facilitator announces that ten minutes will be allowed for brainstorming
2. The participants are asked to form groups of about six. Each group selects a recorder, who writes every idea generated by the group on the newsprint. The brainstorming phase begins.

3. When ten minutes have elapsed, the facilitator ends the ban on criticism. Each group is instructed to evaluate and prioritize their ideas. (If there are more than four groups the facilitator may wish to combine groups to save time. These larger groups share their best ideas and produce a single priortized list.)
4. The participants reform one large group. Recorders act as spokespersons and share the best ideas of their groups. The facilitator records these ideas for all to see.
5. Participants explore the possibility of combining ideas.
6. The facilitator asks the group to rank-order the final list of ideas. Each participant may vote for three ideas. The ideas are ranked according to the number of votes they received.

Variations:

1. A sample excercise may be done before the real problem is addressed. An example of a sample problem would be to brainstorm the uses of a flashlight, a rope or a corkscrew. Props may be used.
2. In some cases brainstorming may be used to generate alternative solutions. More elaborate evaluation methods may be used to select one solution to be implemented.

3. Brainstorming can be done in large groups, although participation may not be as great. In this case, the facilitator should actively solicit ideas from less involved participants.
4. The preliminary or final lists of ideas may be categorized to aid in evaluation.

Nominal Group Technique (adapted from U.S.D.A. Forest Service, 1980)

Goals:

To expand participants perceptions of the critical issues within a problem area.

To identify priorities of selected issues within selected problem areas.

To promote balanced participation among group members.

Group Size:

Any number of groups with a facilitator and five to eight participants each.

Time Required:

One to two hours

Materials:

For each group:

Easel

Newsprint

Markers

Masking Tape

For each participant:

Nominal Group Worksheet

Paper

Pencil

Physical Setting:

Tables are spaced to avoid distractions. Chairs are arranged around each table so that all participants can see the easel.

Preparing The Nominal Group Worksheet:

A properly focused question is essential and can be formulated by:

A. Determining in precise terms the objective of the session.

B. Determining the level of specificity of desired outcomes, e.g., technical data or general concepts.

C. Generating alternative questions.

D. Selecting one question that best reflects the objective of the session.

This question is printed on the worksheet which is given to each participant.

Process:

1. Introduction. The facilitator welcomes the group, explains the purpose of the session and briefly describes the process. The Nominal Group Worksheet is distributed and the focus question read aloud. The level of specificity of the outcome is indicated by the facilitator. An example from another topic area that will not influence the outcome of this session may help the participants understand the desired level of specificity.
2. Silent Generation. The participants are asked to write down as many responses to the question as possible in ten to fifteen minutes. These responses should be short and concise. The participants must work silently and individually.
3. Round Robin. The facilitator asks each participant for one of their responses. Each response is recorded on the newsprint. Discussion is limited to the facilitator and the participant who presented the response. This discussion is limited to clarifying and rephrasing the response. The facilitator repeats this process with each participant in turn until all the responses have been recorded. The participants are encouraged to generate and present more responses during this step. It should be emphasized that no responses are to judged in any way during this step.

4. Clarification. The facilitator reviews each response to insure that all are understood. Any participant may offer clarification. Combinations, modifications or deletions of certain responses may also be suggested. However, no judgemental evaluation, e.g., show of support, is permitted. The participant who presented a particular response should not be solely responsible for clarification.
5. Final Prioritized Vote. The facilitator asks each participant to select five preferred responses. These responses should be listed in rank order. The most preferred is given a ranking of five and the least preferred is given a ranking of one. This should be written on a piece of paper and given to the facilitator. The final results are tallied and listed on the newsprint so that the final ranking is evident.

Variations:

1. A statement of support or non-support may be made during the clarification step (#4). This may be done by a secret ballot or verbally.
2. The final results may be further refined by asking each participant to distribute 100 points among the top five priority items. Two items may not be given the same number of points. The results are tallied and listed on the newsprint.
3. If large numbers of participants are expected at the

session, a number of specific sub-questions may be developed. One sub-question is given to each small group. These sub-questions must relate directly to the overall topic of the session. Each small group may report their final rankings to the larger body of participants.

Simulations

Simulation are contrived situations through which participants can directly experience the consequences of their actions in a non-threatening atmosphere (Bottinelli, 1977; Fellenz, 1974). This technique is valuable, because it can help participants learn abstract concepts and it can condense time-space relationships (Swan, 1973). For example, the lengthy process of law-making can occur in a matter of hours. The greatest measurable impact appears to be on learners' attitudes, i.e., greater acceptance of social differences. Simulations are uniquely suited to the areas of decision-making, relational thinking and planning (Bottinelli, 1977). These benefits result from direct involvement of learners and the assumption of differing value positions within a specific context.

Simulaiton

Goals:

To illustrate the many value positions associated with environmental issues.

To provide an opportunity for participants to become more tolerant of value systems different from their own.

Group Size:

Between twenty-five and sixty

Time Required:

From one and a half to three hours

Materials:

For each small group:

Newsprint
Assorted colored markers
Situation descriptions
Role descriptions
Props (optional)

Physical Setting:

Movable chairs are arranged in an auditorium style. The room should be large enough to accommodate small group interaction.

Creating a Simulation (adapted from Dale, 1979):

1. A local environmental issue that is meaningful to participants and a dramatic situation that represents the essence of the issue are indentified.
2. A written scenario which includes a description of the overall issue, the specific situation being simulated and the parties involved is developed. This scenario will be distributed to all participants.
3. The various value positions associated with the issue are identified and a role description is written for each. This description may include:
    - A. Occupation
    - B. Socio-economic background
    - C. Personality
    - D. Organizational affiliation
    - E. Relationship with other parties
    - F. Position on the issue

   One role description is written for a decision-making body, e.g., legislative committee. Caution should be taken to represent each value position equally, in terms of number of groups pro and con as well as the perspective of the written description. These role descriptions will be given to the appropriate groups.
4. Touches of realism, e.g., props and reference material, will enhance the simulation and should be included.

Process:

1. The facilitator introduces the simulation as a re-creation of a real environmental issue and reads the scenario. The participants are divided into groups of equal size, one for each value position. One member of each group reads their role description to all the participants.
2. The facilitator explains that the task of each group is to develop a three or four minute presentation which represents the value position that they are assigned. The presentation is intended to influence the decision-making board. Each group must have at least one visual aid and is given newsprint and colored markers for this purpose.
3. While the groups are preparing their presentations, the decision-making board develops criteria and a rating system to be used in evaluating the presentations and deciding the issue. For example, a one to five scale can be used to rate:

    A. Economic impact of the position

    B. Social/cultural impact of tbe position

    C. Environmental impact of the position

    D. Accuracy of information

    E. Value of visual aids

    The board should also select a chairperson to run the meeting. Twenty to thirty minutes should be allowed for preparation.

4. When preparations have been completed, the participants return to the auditorium style seating arrangement. The board's chairperson calls the meeting to order and asks the first group to give its presentation. One or more members from each group present their cases in the allotted time. The board may question the groups after their presentations. When all groups have finished, the board caucused to make their decision.
5. The facilitator leads a discussion to wrap up the experience. Some possible discussion questions are:
   A. Would someone reiterate the issue and the value positions represented in this simulation?
   B. Are there other value positions that were not represented?
   C. How many people represented a value position with which they did not agree? How did it feel?
   D. Did anyone change their personal position on this issue? Why?
   E. Is this type of citizen involvement in decision-making effective? Why or why not?
   F. What are some other ways that citizens can influence decisions of this type?

Variations:

1. One member of each group may be selected to sit on the decision-making board and represent the position of that group.

2. The discussion may begin while the board is in caucus.
3. A short list of printed values clarification questions concerning the issue could be answered by each participant before and after the simulation These questions and the participants feelings should be included in the discussion.
4. Any situation can be re-created by following the "Creating a Simulation" guidelines. For example, a demonstrator and a passerby could discuss the nuclear power controversy. Simulations need not follow the public hearing format.

Values Clarification

The goal of values clarification is to help the participants through the process of valuing, rather than to instill a certain set of values (Simon, Howe & Kirschenbaum, 1972). To do this a facilitator would (Raths, Harmin & Simon, 1966,p. 38):

1. Encourage participants to make choices, and to make them freely.
2. Help them discover and examine available alternatives when faced with choices.
3. Help participants weigh alternatives thoughtfully, reflecting on the consequences of each.
4. Encourage participants to consider what it is that they prize and cherish.
5. Encourage them to act, behave, live in accordance with their choices.
6. Help them to examine repeated behaviors or patterns in their lives.

With the valuing process as a guide, the facilitator will be able to help participants examine their values and identify inconsistencies between their values and behavior.

Because values are an extremely personal part of one's life, the utmost care should be used in the implementation of values clarification strategies. The facilitator should follow some guidelines to maximize the benefit of these activities. An atmosphere of openness, honesty, acceptance and respect should be encouraged in all participants. The facilitator must never moralize or make persuasive speeches. The participants should be guaranteed the option to pass, if they do not wish to respond (Simon, et al, 1972). Proper use of the values clarification technique can stimulate thought about participants' lifestyles and the importance of various elements of the environment (Harshman, 1978). Five values clarification procedures follow.

<u>Values Continuum</u> (adapted from Simon, et al, 1972)

Goal:

To allow participants to choose and communicate their exact value position between two extremes.

Group Size:

Unlimited

Time Required:

Thirty to forty-five minutes

Materials:

Signs indicating the value extremes

Physical Setting:

A room that allows participants to move freely

Process:

1. The facilitator identifies approximately five issues and two value extremes for each. For example, the extremes for the pesticide issue may be "unrestricted use" and " complete prohibition." These extremes are written legibly on paper and placed at opposite ends of the room.
2. The facilitator gives an unbiased, one sentence description of the issue and indicates that there is

a continuum of values between the two extremes. The participants are asked to carefully consider their position on the issue and stand in a place along the continuum that reflects their position on the issue.

3. The facilitator asks participants in different positions along the continuum to explain their reasons for selecting these positions.
4. The process is repeated for each of the issues.

Value Voting (adapted from Simon, et al, 1972)

Goals:

To provide participants with an opportunity to publicly affirm their values on an issue.

To illustrate to participants the variety of value positions associated with an issue.

Group Size:

Unlimited

Time Required:

Ten to thirty minutes

Materials:

None

Physical Setting:

Although no particular seating arrangement is necessary, one that allows participants to see one another is desirable.

Process:

1. The facilitator explains that a question will be asked and that the participants may respond by raising their hands to indicate an affirmative response, pointing their thumbs down to indicate a negative response or by folding their arms to indicate neutrality. Those wishing to pass simply take no action at all. Discussion should be deferred until all the questions have been read.
2. The facilitator reads five to ten questions that have been prepared in advance. These questions begin with "How many of you..." For example,"How many of you feel that mineral exploration should be allowed in the national parks?"
3. After the voting has ended, the facilitator may wish to lead a short discussion on one or more of the questions.

Variations:

1. The participants may each develop a question to be put to the group.
2. The impact of a training session may be assessed by asking identical questions before and after the session. These questions should be relevant to the topic.

Strongly Agree / Strongly Disagree (adapted from Simon, et al, 1980)

Goal:

To give participants an opportunity to examine the strength of their values.

Group Size:

Unlimited

Time Required:

Ten minutes

Materials:

For each participant:

Strongly Agree / Strongly Disagree Worksheet

Pencil

Physical Setting:

Participants are seated comfortably.

Process:

1. The facilitator develops five to ten statements that represent various value positions regarding one or more issues. These statements are printed on a worksheet.

2. Each participant receives a copy of the worksheet and completes it within the time designated by the facilitator.

Variations:

1. Identical worksheets can be distributed before and after a film, speaker or demonstration to assess any change in the participants' values.
2. Small groups can be formed to discuss each statement. Each group should contain participants who have responded differently to the statement. In other words, each group is made up of individuals with differing values.

<u>Sample Strongly Agree / Strongly Disagree Worksheet</u>

Instructions: Circle the response that most closely indicates the way you feel about the statement:

SA = Strongly Agree
A = Agree
N = Neutral
D = Disagree
SD = Strongly Disagree

1. Burning coal causes air pollution, so we should avoid using it.	SA A N D SD

2. Since coal is so abundant, we do not need to worry about conserving other energy sources, such as oil and natural gas.	SA	A	N	D	SD
3. Solar power can only be effective in the southern sections of the U.S.	SA	A	N	D	SD
4. Wind power, under present technology is a useful supplement to other power sources.	SA	A	N	D	SD
5. There is plenty of oil in the world, if we are willing to pay the price finding, extracting and marketing it.	SA	A	N	D	SD

Baker's Dozen (adapted from Simon, et al, 1972)

Goal:

To help participants examine their values by assigning priorities to aspects of their everyday lives.

Group Size:

Unlimited

Time Required:

Fifteen minutes

Materials:

For each participant:

Paper

Pencil

Physical Setting:

Participants are seated comfortably.

Process:

1. The facilitator asks the participants to list thirteen items (a baker's dozen) in a specific category. The category which is chosen should be pertinent to the session, e.g., electrical appliances or recreational pursuits.

2. The participants are asked to draw a line through three items that they could most easily live without.
3. The participants circle three items that they consider essential and could not live without.
4. The facilitator asks for volunteers to read their circled and crossed out items. The participants should explain their choices.
5. The facilitator leads a discussion. Some questions that may be used in the discussion are:
   A. Why are the circled items important?
   B. If all the circled items were eliminated from your life, how would you overcome the loss?
   C. Under what circumstances would you be willing to do without the crossed out items?
   D. Do you think that people will soon be forced to do without any of the items on your list? Why or why not?

Values in Action (adapted from Simon, et al, 1972)

Goals:

To encourage participants to evaluate their values in terms of actions they have taken or are willing to take.

To provide participants with an opportunity to excercise their values through personal action.

Group Size:

Unlimited

Time Required:

Thirty to forty-five minutes

Materials:

For the group:

Newsprint

Markers

For each participant:

Environmental Action Worksheet

Pencil

Physical Setting:

Participants are seated comfortably.

Process:

1. The facilitator leads the group in a brainstorming session to generate a list of local or regional environmental issues. These are listed on the newsprint and posted for all to see.
2. Each participant chooses the one issue that is of the most interest to them and lists three changes, e.g., governmental, economic, social or personal, that would help to resolve the issue.
3. The facilitator distributes the Environmental Action Worksheet. The participants are asked to place an asterisk (*) in front of actions which they have taken and a plus (+) in front of those which they would be willing to take to support <u>one</u> of the three changes.
4. The facilitator encourages participants to take one or more of these actions, if they are willing, and share the results with the group. It should be emphasized that the participants must be well-informed before taking any environmental action.

<u>Sample Environmental Action Worksheet</u>

Place an asterisk (*) in front of any action that you have taken and a plus (+) in front of any action that you would be willing to take to support a change that would help to resolve the environmental issue that you have chosen.

Persuasion

___ 1. Distribute leaflets.

___ 2. Talk to friends about the issue.

___ 3. Call in to a radio or television talk show.

___ 4. Wear a button with a message concerning the issue.

___ 5. Other.

Consumerism

___ 1. Compare and evaluate consumer products in terms of their connection with the issue.

___ 2. Boycott a product that you feel contributes to environmental degradation.

___ 3. Boycott all products of a corporation whose products or operations contribute to environmental degradation.

___ 4. Conserve products that are necessary, but that contribute to environmental degradation.

___ 5. Buy durable consumer goods and care for them properly.

___ 6. Other.

Political Action

___ 1. Write a letter to a public official concerning the issue.

___ 2. Consider the positions of candidates concerning the issue when voting in elections.

___ 3. Volunteer to campaign for candidates that share your views concerning the issue.

___ 4. Testify at a public hearing concerning the issue.

___ 5. Other.

Legal Action

___ 1. Personally file suit against an individual or organization that you feel is the cause of the issue.

___ 2. Join or support a public interest law firm which specializes in court action on the issue.

___ 3. Other.

Ecomanagement

___ 1. Start or support a local recycling effort.

___ 2. Engage in muscle powered recreation, such as bicycling, hiking or cross-country skiing.

___ 3. Make every effort to conserve water in your home and workplace.

___ 4. Other.

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APPENDIX C

EVALUATIONS:

EXAMPLES AND REFERENCES

Evaluating educational programs is essential to achieving and maintaining high quality learning experiences. Citizens with little training or experience in this subject may find it difficult to design effective evaluations. The intention of this Appendix is to assist in the preparation of program evaluations by providing examples and selected references.

Examples

Three sample evaluations are included. Each sample illustrates one of the following types of evaluations: formative, summative or perfromance. These examples are intended to illustrate the form that an evaluation may take and to provide an idea of the kinds of information that may be sought.

Formative Evaluation

This sample formative evaluation was used at each of nine public education forums which were developed and implemented by the Central Wisconsin Solid Waste Management Forums. This basic format was modified slightly to be appropriate to the subject matter and educational process used in each forum.

Analysis of this type of evaluation should include tallying the number of responses in each category for each statement and listing the general comments. The results of formative evaluations indicate aspects of the process that are strong and should be continued without alteration. Weaknesses are also indicated and these aspects should be improved. Formative evaluations are a valuable tool for improving programs as they progress.

Sample Formative Evaluation

Directions: For each statement below, circle the number which best reflects your attitude toward the statement.

What task force group did you attend?

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	The format of the forum was easy to understand.	1	2	3	4	5
2.	Sufficient explanation of the forum format was provided.	1	2	3	4	5
3.	The moderators were fair.	1	2	3	4	5
4.	The resource persons were helpful.	1	2	3	4	5
5.	I was able to influence task force decisions.	1	2	3	4	5
6.	Prior to the forum I was very familiar with solid waste management issues.	1	2	3	4	5
7.	The introduction by the resource persons increased my understanding of the issues.	1	2	3	4	5
8.	The task group discussions increased my understanding of the issues.	1	2	3	4	5
9.	As a citizen, I feel obligated to take definite citizenship action(s) concerning solid waste management issues.	1	2	3	4	5
10.	As a citizen, I feel I can exercise control over landfill planning and site selection.	1	2	3	4	5
11.	As a citizen, I feel I can exercise control over waste management practices in my county.	1	2	3	4	5

12. Has participation in this forum resulted in any change in your attitude or knowledge regarding area solid waste management issues, and if so, what changes have occurred? If not, why not?

13. Suggestions or comments:

14. How did you hear about the Forum?

Please return to:
Central Wisconsin Solid Waste Forums
Room 231
College of Natural Resources
University of Wisconsin-Stevens Point
Stevens Point, Wisconsin 54481

Summative Evaluation

The sample summative evaluation is provided with the Training Materials on Toxic Substances; Book 1 prepared by the Sierra Club. After using these materials, the participants are asked to complete the evaluation and return it to the developers of the training program.

Summative evaluations, such as this, are often used to indicate the value of an educational program that is already fully developed. Funding agencies and potential users of the program are often very interested in the results. Summative evaluations also provide information that can be used in developing subsequent programs.

Evaluation

(Please return to Toxics Training Program, Sierra Club, 530 Bush St., San Francisco CA 94108)

Name ______________________ Date ______________

Address ______________________________________

City ____________________ State ________ Zip ________

Telephone( ) ____________ Best time to call ____________

1. I reviewed/used the Sierra Club Training Materials on Toxic Substances as a(n) (please check all that apply):

   ____ organizer ____ participant
   ____ facilitator ____ other (please specify)

   ____

2. Overall, how would you rate these training materials? (check one)

   Excellent - I plan to use these materials (again) in projects on toxic substances or other issues, and will urge friends and co-workers to use them.

   Above Average - I learned quite a few things from these materials and will mention them to friends and co-workers.

   Average - The materials were okay, but not much better or worse than others I've seen.

   Below Average - The materials did not meet my expectations. I was disappointed.

   Poor - I definitely did not like the materials and will not recommend them favorably to others.

3. What did you like best about the training materials?

   What did you like least?

4. What additional areas (subjects or skills) should have been covered?

   What areas should have been covered in more detail?

   What areas were covered unnecessarily or in too much detail?

5. What were the best activities? Why?

What were the worst activities? Why?

6. What were the best readings? Why?

What were the worst readings? Why?

7. What project did your task force undertake? Did you accomplish everything you wanted to (i.e. win)?

8. How did you use these training materials (educational course, as help in recruiting new members, as help in running meetings, to design strategy, to learn skills, etc.)? Please elaborate.

9. How involved do you expect to be in the future? (check one)

_____ I expect to spend substantial amounts of time working to solve toxic substance problems during the next year.

_____ I expect to participate in a project to solve toxic substance problems during the next year with a reasonable time commitment.

_____ I would like to participate in a project but it depends on my schedule during the coming year.

_____ I might participate once in a while on a toxic substance project but not on a continuing basis.

_____ I am not interested in working on a toxic substance project at all.

_____ Other ____

____

10. Additional comments:

Performance Evaluation

The sample performance evaluation is used in Environmental Interpretation Methods I at the University of Wisconsin Stevens Point. Students in the class prepare a five minute presentation and are rated by their peers on thirteen criteria. Each of the presenters is given their evaluation forms directly after their presentation. The presenter then averages the responses to each of the criteria to get an idea of the group's overall perception of the presentation.

Performance evaluations may be used with manual as well as verbal skills. A task requiring the skill is devised. The manual operations involved in completing the task are listed. Observers record those operations that are performed satisfactorily and those that are not. A scale similar to the one on the sample can be used to add the quantitative dimension. If participants assume the role of observers, the benefits of performance evaluations are doubled. Not only do those being evaluated get the benefit of constructive criticism, but the criteria of acceptable performance are reinforced in the observers.

Sample Performance Evaluation

Evaluation and Analysis Sheet
"Talks"

Individual Interpreting ______________________________

Evaluator ______________________________

I. Use of Principles	Poor		Average (CIRCLE ONE)		Superior
1. Did the speaker relate to something within the experience of the audience or involve the audience?	1	2	3	4	5
2. Did the speaker reveal the essence of the subject rather than simply provide information?	1	2	3	4	5
3. Did the speaker develop a whole or only parts and attributes?	1	2	3	4	5
4. Did the speaker involve the listeners (emotions, intellect, values, body, etc.)?	1	2	3	4	5
5. Did the speaker provoke (stimulate, inspire) or was he/she simply instructing	1	2	3	4	5

I. Techniques					
6. Did the talk have a provoking beginning?	1	2	3	4	5
7. Did the speaker use active language?	1	2	3	4	5
8. Did the speaker use effective voice inflection and articulation?	1	2	3	4	5
9. Did the speaker use effective questioning techniques?	1	2	3	4	5
10. Was the prop used effectively?	1	2	3	4	5
11. Did the speaker relax the audience and make the talk fun (enjoyable, rewarding)?	1	2	3	4	5
12. Did the speaker have any annoying mannerisms? (Describe)					
13. Did the talk have an effective conclusion?	1	2	3	4	5

Overall Evaluation (circle one)

Outstanding		Very Good		Good		Fair		Poor	
10	9	8	7	6	5	4	3	2	1

References

One difficulty that citizens may encounter in developing evaluations is that each learning experience may be unique and require a substantially different evaluation technique. Time and space limitations do not allow complete delineations of the subtleties of evaluation in this thesis, so citizens may find it necessary to nvestigate the matter on their own. One source that may be used in this investigation is professional educators from community schools or universities. In addition, a search of library card catalogs under the headings of "educational tests and measurements" and " educational accountability" will yield literature that may be useful in developing evaluations. The following references, if available, would be particularly helpful:

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