ADVENTURE TO ACTION

AN OUTDOOR ENVIRONMENTAL EDUCATION PROGRAM FOR PRE-TEENS

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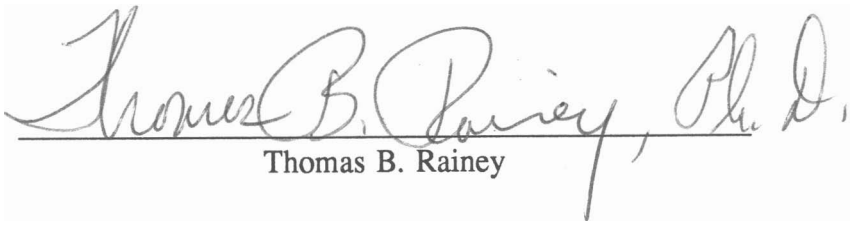

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ABSTRACT

A model is developed to teach 11-13 year olds watershed-based outdoor environmental education for a three-day non-residential day camp. The model synthesizes a challenge program, nature appreciation activities, and environmental problem solving approaches to environmental education. An activity guide based on the model is presented, including a daily schedule, activity descriptions, materials needed and maximum and minimum group sizes. A method of evaluating the effectiveness of the curriculum is also included.

TABLE OF CONTENTS

PREFACE

During the past three summers, the City of Olympia has offered environmental education day camps for 8-11 year olds in Olympia's Priest Point Park. The camps are administered by the City of Olympia Stream Team Program, a public involvement and education program of the Water Resources Division. The camps have been very popular, and have played a vital role in Stream Team's mission of involving citizens in the protection and enhancement of water resources in Thurston County watersheds.

Over the past three years, many parents and children have expressed interest in expanding the camps to include older children. With this in mind, I worked with the Stream Team program to develop this curriculum, Adventure to Action, to be used at day camps for children ages 11-13 beginning Summer 1995.

In Chapter 1, I address how the curriculum fits in with the overall goals of the Stream Team program. A brief review of past Stream Team day camp curricula is provided as well as goals for the pre-teen camp sessions.

In Chapter 2, I provide a theoretical framework for the camp curriculum. The curriculum is based on a synthesis of three approaches to environmental education: a challenge program, nature awareness activities, and environmental problem solving. Each of these models will be discussed and I will argue why each one serves an important role in addressing the camp goals.

Chapter 3 contains a brief summary of the curriculum.

Chapter 4 addresses evaluation. The importance of evaluation is addressed and a strategy for evaluating this day camp program is proposed.

Appendix A contains the Adventure to Action activity guide in its entirety. This section includes a detailed description of the activities including learning objectives, procedures and materials needed.

Appendix B contains the pre-test, post-test and telephone surveys designed to measure the effectiveness of the curriculum.

A project of this nature would be impossible to undertake alone. Indeed, this project would not have been possible without the generous help of many individuals.

I wish to give special thanks to my reader, Tom Rainey, who gave valuable input at each stage of the project.

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CHAPTER 1

INTRODUCTION

City of Olympia Stream Team Program

The City of Olympia Stream Team is a public involvement and education program that was started in 1990 as part of the City of Olympia's Water Resources Program. Stream Team's mission is "to involve citizens in the protection and enhancement of water resources through stream, lake, and wetland monitoring activities and action projects in Thurston County watersheds."[1] The goals of Stream Team are as follows:

- To involve citizens in observing, monitoring, recording, and reporting stream, lake, and wetland conditions.
- To establish a community information exchange that will increase knowledge and public awareness of the effects human activities have on water resources.
- To involve citizens directly in activities designed to improve the quality and habitat of this region's water resources.
- To motivate the public in order to initiate changes in activities that adversely affect water and habitat quality within local watersheds.
- To provide needed data to resource agencies.[2]

Each year Stream Team offers numerous workshops and lectures on water related issues, trains volunteers in Streamwalk, Wetland Walk, and aquatic insect monitoring techniques, organizes volunteer action projects to enhance water quality,

and conducts an environmental education day camp for Olympia's youth.[3]

History of Stream Team Day Camp Curricula

In 1992, the Stream Team program received a grant to write a water quality-based environmental education curriculum to be implemented in a summer day camp program. The resulting curriculum, Forest, Stream and Sound: A Guide to Conducting Water Quality Camps for Children and Families, has been used as the basis of the last three years of Stream Team day camps.[4] The curriculum is designed to be used for a three-day non-residential camp at Priest Point Park for thirty children and three instructors. The curriculum consists largely of nature awareness activities adapted from Joseph Cornell's books and knowledge-based activities from the Project WILD activity guides, organized around a watershed theme. Additionally, the curriculum provides for storytelling, aquatic insect monitoring, and a short environmental action project.

Additionally, in 1993 Stream Team published a supplementary activity guide, More Activities for Forest, Stream and Sound, that provided several new activities to use in place of less successful ones in the original curriculum.[5] The overall curriculum structure has remained in place with each of the three days focusing on forest, stream, and Puget Sound habitats.

Both of these activity guides were designed to be used with children ages 8-11. As noted above, there appears to be strong community support for an additional environmental education camp for older children. This curriculum will fill this need,

as it is designed for children ages 11-13. Beginning in the summer of 1995, Stream Team will offer day camps sessions for 8-10 year-olds with the existing curricula as well as sessions for 11-13 year-olds with this curriculum.

Camp Goals

A critical first step for any environmental education program is to set specific goals that the program intends to achieve. This is essential for two reasons: Goals serve as a guide for curriculum development, and as a yardstick to evaluate program effectiveness. (Despite the importance of this step, many environmental education programs apparently omit this process. A survey of forty-three environmental education camps found that only nineteen had specific goals).[6]

The following are the three goals for the Adventure to Action camp:

1. To foster a personal connection to South Sound watersheds.

2. To increase understanding of human impacts on water quality.

3. To provide the knowledge and skills necessary to positively affect water quality through action projects and personal choices.

Ultimately, the goal of the day camps is to have a positive impact on South Sound's water quality. By achieving the three goals listed above, it is hoped that campers will engage in behaviors that have a positive affect on South Sound's water quality long after their camp experience. In addition, on the last day of each camp session, campers will implement an action project designed to have a positive effect on Olympia's water quality.

NOTES

1. City of Olympia Water Resources Program, "Stream Team Project Updates," (Olympia, Wash: City of Olympia Water Resources Program, 1995).

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3. Ibid.

4. Eva Shinagel and Jana Dean, Forest Stream and Sound: A Guide to Conduction Water Quality Camps for Children and Families (Olympia, Wash: City of Olympia Water Resources Program, 1992).

5. Eva Shinagel and Nikki McClure, More Activities for Forest, Stream and Sound: A Guide to Conducting Water Quality Camps for Children and Families (Olympia, Wash: City of Olympia Water Resources Program, 1993).

6. Sam H. Ham, Randall D. Langseth, and James R. Fasio, "Back to Definitions in Environmental Education: The Case of Inland Northwest Camps," Journal of Environmental Education 16, no. 4 (Summer 1985), 11-15.

CHAPTER 2

ADVENTURE TO ACTION MODEL

The Adventure to Action camp is designed to be a three-day non-residential day camp experience for 11-13 year olds. The name "Adventure to Action" reflects the camp's focus on challenging, adventurous activities and taking action to help solve environmental problems. There are three major components to the program:

1. A challenge program.
2. Nature awareness activities.
3. Environmental problem solving.

The challenge program on the first day of camp is designed to build group cohesiveness and self-esteem so as to make the remainder of the camp experience as successful as possible. The second component, nature awareness activities, is designed to give campers a personal connection to South Sound's watersheds (goal 1). The final component, environmental problem solving, is designed to increase campers' understanding of human impacts on water quality (goal 2) and provide the knowledge and skills necessary to positively affect water quality through action projects and personal choices (goal 3). Each of these three components is based upon a different educational model. This chapter will explore each of the three models and show how each has been adapted to this program. (See Chapter 3 for a summary of each activity in the Adventure to Action curriculum or Appendix A for the curriculum in its

entirety.)

Challenge Program

On the first day of the Adventure to Action camp session, campers will participate in a challenge program. This will consist of various initiative problems such as how to get over a "human ladder" (p. 59) or how to navigate as a group over an obstacle course made of wooden blocks (p. 60). While many of these activities will incorporate an environmental theme, this is not the primary goal of the challenge program. Rather, the challenge program is designed to prepare the campers for a more successful camp experience.

Challenge programs are based on the Adventure Education model. The most widely known application of this model is undoubtedly the Outward Bound Program. Critical elements of the Outward Bound model include problem solving tasks and a small group social environment that promotes individual decision making within an atmosphere of group support.[1] These elements are usually incorporated into a series of outdoor experiences in wilderness settings such as rafting, repelling, or participating in an extended solo.[2]

Challenge programs are based on the same educational foundations of Outward Bound experiences but take place on a smaller scale. For example, instead of navigating a raft through a difficult rapid, participants might be asked to make a 10-person pyramid. While the element of physical risk may be lower in a challenge program compared to an Outward Bound type experience, most other elements of

adventure education remain intact. Starting the Adventure to Action camps with a challenge program will thus serve as an effective beginning of the camp experience for the following reasons:

Challenge programs are a great way for participants to get to know one another. The activities require substantial teamwork. While working as a team, members quickly become acquainted and learn what strengths each person has to offer. This is important because campers will be working closely with one another during the following three days.

Challenge programs increase self-confidence. As Karl Rohnke notes in his activity guidebook outlining challenge activities, "By attempting a graduated series of activities which involve physical or emotional risk, and succeeding (or sometimes failing) in a supportive group atmosphere, a person may begin to develop true self-esteem."[3] Good self-esteem is an important trait for anyone engaging in environmental problem solving, particularly young adolescents. Students with positive self-esteem reportedly participate more and exhibit more pro-social behavior.[4]

Challenge programs increase mutual support within a group. The activities are designed to require the cooperation of group members rather than encouraging competition between them. Challenge programs also develop a sense of trust among the participants. Group cooperation and trust are vital components of a successful action project on the final day of camp.

Challenge programs encourage participants to take reasonable risks. While participants in the Adventure to Action camp will not, of course, be exposed to

physical harm, they will be asked to do things that they may perceive to be socially dangerous. For example, in "Trolley" (p. 58) campers must work as a group to walk on a pair of 4" x 4"s. While this activity poses little physical risk, campers do risk the embarrassment of falling off. Teaching the campers that it is healthy to take reasonable risks is important since the rest of the camp experience will require participants to do activities that they may perceive to be socially risky. Additionally, engaging in environmental problem solving activities after the camp experience will require a willingness to take risks.

Challenge programs set high expectations. Studies have shown that teacher expectations can create a self-fulfilling prophecy for students.[5] That is, if teachers have high expectations of their students, the students are more likely to perform better than if the teacher has low expectations. Thus by challenging campers at the beginning of camp, high expectations are established.

Challenge programs are fun. It is important to set an exciting, lively tone for the camps from the very beginning. As a summer camp, the campers will be expecting entertaining activities. By starting the camps with a challenge program, it is hoped that participants will gain enthusiasm for the rest of the camp experience. As Joseph Cornell notes, people generally decide within a few minutes of a new experience whether they are going to have a good time.[6]

In summary, a challenge program is an excellent way to start the camp with a set of challenging, enjoyable experiences that encourage group cohesiveness, responsible risk-taking, and good personal self-confidence. While several

environmental concepts will be taught, the main goals of the challenge program are to prepare campers to have a successful and rewarding camp session, and to encourage good self-confidence long after the camp session.

Nature Awareness Activities

The second major component of the Adventure to Action camp program is nature awareness activities. As noted in Chapter 1, one of the goals of the camp is to foster a personal connection to South Sound watersheds. While this goal will be addressed in part by activities that teach camp participants about their dependence on water for utilitarian uses, it is also important for campers to gain an appreciation of South Sound watersheds for their beauty and inherent value.

An effective technique for giving children an appreciation of nature is the use of nature awareness activities. These are activities that heighten sensory awareness (particularly non-visual senses), provide guided imagery, or create opportunities for solitary nature experiences.

The environmental educator at the forefront of nature awareness activities is Joseph Cornell. Cornell's nature awareness guidebook, Sharing Nature With Children,[7] has sold over 400,000 copies and has been translated into 9 languages.[8] Cornell's learning model, Flow Learning, provides an effective sequence to nature awareness activities.[9]

The Flow Learning process consists of the following four stages of activities:

Stage 1: Activities to Awaken Enthusiasm
Stage 2: Activities to Focus Attention
Stage 3: Activities that Provide a Direct Experience
Stage 4: Sharing Inspiration

The first stage of the model, "activities to awaken enthusiasm," serves many of the same goals as the challenge program at the beginning of the camp. These are entertaining, active activities designed to break the ice and get children enthusiastic to be out in nature. Since the challenge program will accomplish this, these types of activities will not be necessary.

The second stage of Flow Learning, "activities to focus attention," is designed to serve as a bridge between the active games in Stage 1 and the more quiet, contemplative activities of Stage 3. The activities in this stage generally isolate one of the senses to provide a focused nature experience. Examples used in this guide are "Sound Map" (p. 128) in which participants create a map of natural sounds they hear, and "Scent Hunt" (p. 64) in which campers learn how to increase their senses of smell.

The third stage of Flow Learning, "activities that provide a direct nature experience," is designed to give people deeply inspiring experiences of nature. As Cornell notes:

> Direct experiences of nature enable us to enter fully into the spirit of the natural world. They help us discover a deep, inner sense of belonging and understanding. If people are to develop a love and concern for the earth, they need to have these direct experiences; otherwise, their knowing remains remote and theoretical and never touches them deeply.[10]

Examples used in this guide include "Tree Imagery" (p. 65) in which a narration is read that guides children through an experience in which they imagine they are trees,

and "Solitude Spots" (p. 68) in which each camper chooses a special spot in the forest away from other people and remains there completely quiet for 20 minutes.

The final stage of Cornell's model, "sharing inspiration," provides closure to the Flow Learning session. These are activities that allow participants to share some of the powerful experiences they have just had with each other and also with themselves (in the form of journal writing). An example of this activity is the sharing circle after "Solitude Spots" (p. 68) in which campers share their experiences from their solitude spots.

By utilizing nature awareness activities arranged according to the Flow Learning model, it is hoped that participants will deepen their appreciation of South Sound's watersheds on an emotional level. This is not only a goal of the camps in itself, but serves to set the stage for the more knowledge-based and action-oriented components of the camp that follow. Children who appreciate South Sound's watersheds and care deeply about them are much more likely to want to learn more about them and take action to protect them.

Environmental Problem Solving

A major emphasis of the Adventure to Action camp is to teach campers about human impacts on water quality (goal 2) and how to effectively take action to help solve an environmental problem (goal 3). This is accomplished in two ways: On the first two days of camp, participants will gain knowledge and skills pertinent to water quality and environmental action through activities that teach skills such as watershed

mapping techniques (p. 74) and environmental action planning techniques (p. 80). The second way these goals will be accomplished is through a stream enhancement project which will be implemented on the final day of camp. Campers will do the stream enhancement work itself, conduct on-site water quality monitoring, and publicize their efforts (pp 104-131).

The action project component of the Adventure to Action camp stems from the environmental problem solving approach to environmental education. This section describes the behavioral model on which this approach is based, and discusses how this action project has been adapted from existing environmental problem solving theories.

Form its initial inception, a goal of environmental education has been to create a citizenry willing and able to solve environmental problems. For example, Bill Stapp, a pioneer in environmental education and former executive director of the United Nations Education Scientific and Cultural Organization's (UNESCO) environmental education program, noted this in 1969 when he stated that the goal of environmental education is:

> Producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work towards their solution.[11]

Similarly, UNESCO declared at their conference on environmental education in Tbilisi, Georgia, USSR, that environmental education should strive to develop a population,

> aware of, and concerned about the total environment and its associated problems, one which has the knowledge, attitudes, motivations, commitments,

and skills to work individually and collectively toward solutions of current problems and the prevention of new ones.[12]

While these goals of environmental education are widely accepted, there is considerable debate on what is the most effective way to *achieve* these goals.

Traditional thinking in environmental education is that if educators provide knowledge about environmental issues, students will change their attitudes about the issues and therefore take action to solve environmental problems. This model is represented in Figure 1.[13]

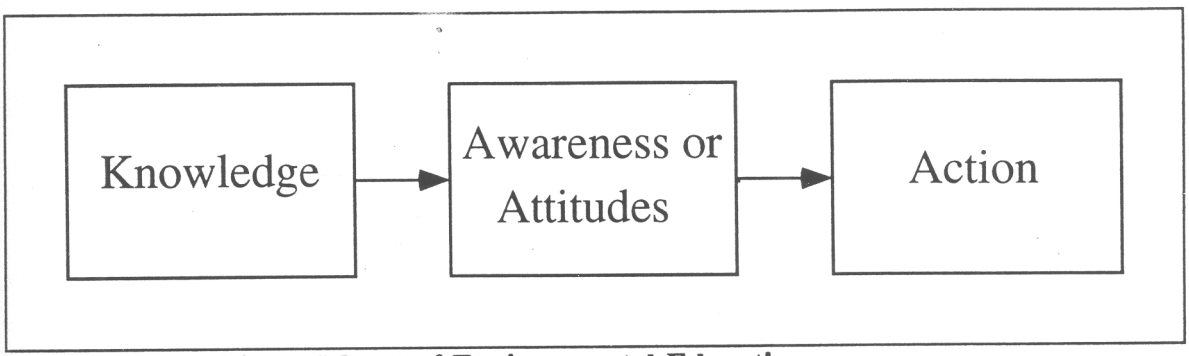

Figure 1. Traditional Model of Environmental Education.

Research does not, however, appear to support this model. For example, in the article, "Issue Investigation and Citizenship Action Training," Winther et al. argue that in addition to knowledge about environmental issues, students need to become skilled in action strategies if they are to take positive environmental actions. They provide a model of behavior change quite different from the traditional model (See Figure 2).[14]

According to this model, a prerequisite for positive environmental behavior is environmental sensitivity, defined as an "empathetic perspective towards the environment." (This is addressed by the nature awareness activities discussed

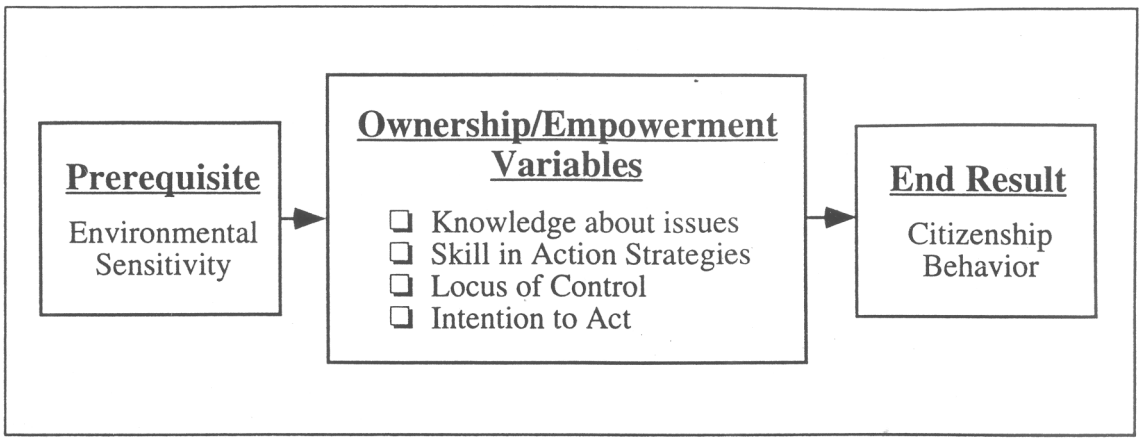

Figure 2. Alternate model of behavior change in environmental education.

previously.) Assuming students have a high level of environmental sensitivity, the role of the environmental educator is to influence some of the "ownership and empowerment variables." In contrast to the traditional model, this includes providing students with knowledge and skills in action strategies. This training is designed to increase students' "internal locus of control," meaning that the student feels that she or he can strongly influence the outcome of a situation.[15]

This behavior model appears to be more accurate than the traditional model of behavior change in environmental education. It makes sense that in order to encourage students to become active in the solution of environmental problems it is essential to provide skills in action strategies. Indeed, at least three studies published in The Journal of Environmental Education comparing an action oriented approach to environmental education with a strictly knowledge-based approach support this conclusion:

John Ramsey and Harold Hungerford report in that seventh-grade students receiving environmental action training for eighteen weeks during their science class

reported more environmentally-friendly behaviors after instruction than a control group receiving instruction solely in physical science.[16]

Similarly, John Ramsey et al. report that eighth-grade students receiving environmental action training for seven months reported participating in greater positive environmental action behavior than students receiving only environmental awareness instruction.[17]

Likewise, James Jordan et al. come to similar conclusions. They report that high school students receiving action training during a six day residential environmental education workshop reported participating in a significantly greater number of environmental behaviors than students receiving instruction solely on environmental issues.[18]

It is apparent that in order to encourage camp participants to take actions that positively affect South Sound's water quality, providing information on water quality issues is not enough; environmental problem solving skills need to be taught. The question then becomes, How should this be achieved?

There are four environmental educators at the forefront of environmental problem solving approaches: William Hammond, director of the Department of Environmental Education at Lee County School District, Florida; Harold Hungerford, professor and coordinator of the Science Education Center at Southern Illinois University; Ian Robottom, chair of the Environmental Education Course Team at Deakin University, Australia; and William Stapp, research director of the Action Research and Community Problem Solving Project and founder of Project GREEN

(Global Rivers Environmental Education Network).[19] While each of their approaches is different, they share six commonalities:

1. Cooperative Learning
2. Student-Centered Issue Identification
3. Skill Building
4. Research
5. Action
6. Evaluation

Each of the four approaches is designed primarily for classroom teachers who typically have an entire semester or school year to complete the process. The challenge faced by the Adventure to Action camp is to create a program that incorporates established theory on environmental problem solving into a three day period. The following section outlines each of the six components and discusses how each has been incorporated into this curriculum:

Cooperative Learning: All four approaches to environmental problem solving emphasize cooperative learning. Hammond, for example, takes his students on a camping trip at the beginning of the school year to encourage group cohesion.[20] In addition to an emphasis on cooperative learning between participants, students in environmental problem solving programs are often encouraged to collaborate with other people in the community. Stapp's approach, for example, encourages students to use such resources as parents, administrators, other teachers, and local agencies.[21]

The Adventure to Action camp also utilizes a cooperative learning approach. The challenge program at the beginning of camp sets the tone for cooperative learning from the start, and cooperative learning is emphasized during the action project as well. An important component of the action project will be time for students to teach

each other skills they have learned through various aspects of the project. Students will also collaborate with members of the community skilled in various aspects of environmental problem solving.

Student-Centered Issue Identification: In a typical school-based environmental problem solving program, students are empowered to choose the environmental issue that will be investigated. Stapp, for example, advocates taking students on a walking and/or bus tour of the local neighborhood, after which students brainstorm environmental issues that need attention.[22] By allowing students to choose an issue to research rather than having an issue imposed by a teacher, students have more ownership over the project and presumably become more motivated to actively participate.

This is the aspect of environmental problem solving that is perhaps the most difficult to adapt to a three-day program. Since campers will be implementing an action project just two days after they arrive at camp, the project logistics need to be established well before the camp session.

In order to encourage as much participant ownership of the project as possible given the time constraints, campers will participate in a project planning session on the second day of camp (p. 96). While the action project was actually planned long before the campers arrived, the planning session is intended to give campers the sense that they are playing a valuable role in the planning process. Additionally, each action team will be given as much flexibility as possible as to how they wish to implement their plans. In this way it is hoped that campers will feel that they are, in some

respects, guiding the action project, rather than having the project imposed upon them.

Skill Building: Environmental problem solving techniques generally include a skill building component. Hungerford's model, for example, teaches students investigation skills such as how to identify variables, questionnaire formulation, survey techniques, and data collection.[23] Hammond takes a broader approach and teaches value analysis, conflict resolution, lobby techniques, and use of mass media.[24]

The second and third day of the Adventure to Action camp will have skill building activities designed to both prepare campers for their roles in the action project as well as teach them skills that will be valuable in their lives after the camp experience. These skills include water quality monitoring, stream enhancement, use of mass media, consensus decision making, and land-use planning.

Research: Environmental problem solving approaches generally include extensive research of the environmental issue in question. Stapp, for example, suggests utilizing newspaper articles, school and public libraries, telephone directories, school computers and personal resources to gain insight into the issue.[25] Robottom takes it a step further by stipulating that students should do *original* research on a local environmental issue.[26]

This is another component of environmental problem solving theory that is difficult to implement in a three-day camp experience. While campers will not have an opportunity to conduct library research, they will be provided with copies of selected newspaper and magazine articles relevant to the action project. Additionally, campers will collect water quality data at a the action project site.

Action: Taking action to help solve an environmental problem is at the heart of environmental problem solving techniques. While the process that leads up to action can be an excellent educational experience, the action itself is often the most rewarding part of the process. Students frequently feel a very strong sense of pride when they take action that positively affects the environment.

Examples of environmental action projects implemented by students in Budd/Deschutes Project GREEN, a local watershed-based environmental education organization based on Stapp's work include: tree planting, storm drain stenciling, stream restoration, water quality monitoring, and testifying on a bill to ban phosphorous in laundry detergents.[27]

The stream enhancement project on the final day on the Adventure to Action camp was chosen for two major reasons: First, it is a project that can be accomplished in one day. Secondly, it is a project that can easily be approached from three angles: direct environmental intervention, public information, and environmental monitoring. Dividing the project into three parts teaches campers that environmental problems are multi-faceted and facilitates cooperative learning.

Evaluation: A final element of the environmental problem solving process is project evaluation. There is a wide range of views on the scale to which evaluation should be conducted. For example, Hammond merely advocates that students should keep journals so they may reflect back on the experience.[28] Robottom[29] and Stapp,[30] in contrast, utilize the Action Research model which sees project evaluation as a central element in the process. In the Action Research model, students create an

action plan, implement it, evaluate it, and then create a new plan based on the evaluation. This series of steps is then repeated (Figure 3).

The importance that the Action Research model places on evaluation is appropriate. It allows students to learn from their mistakes and teaches them the importance of being persistent. Unfortunately, in a three-day camp, participants will not have time to implement a second action project based on what they learned from the first project. Campers *will*, however, be asked to evaluate the effectiveness of their action project and propose what they would do differently next time. Campers will also be encouraged to get involved with Stream Team or other local organizations that engage in environmental problem solving. In this way, lessons learned can be applied to situations after the

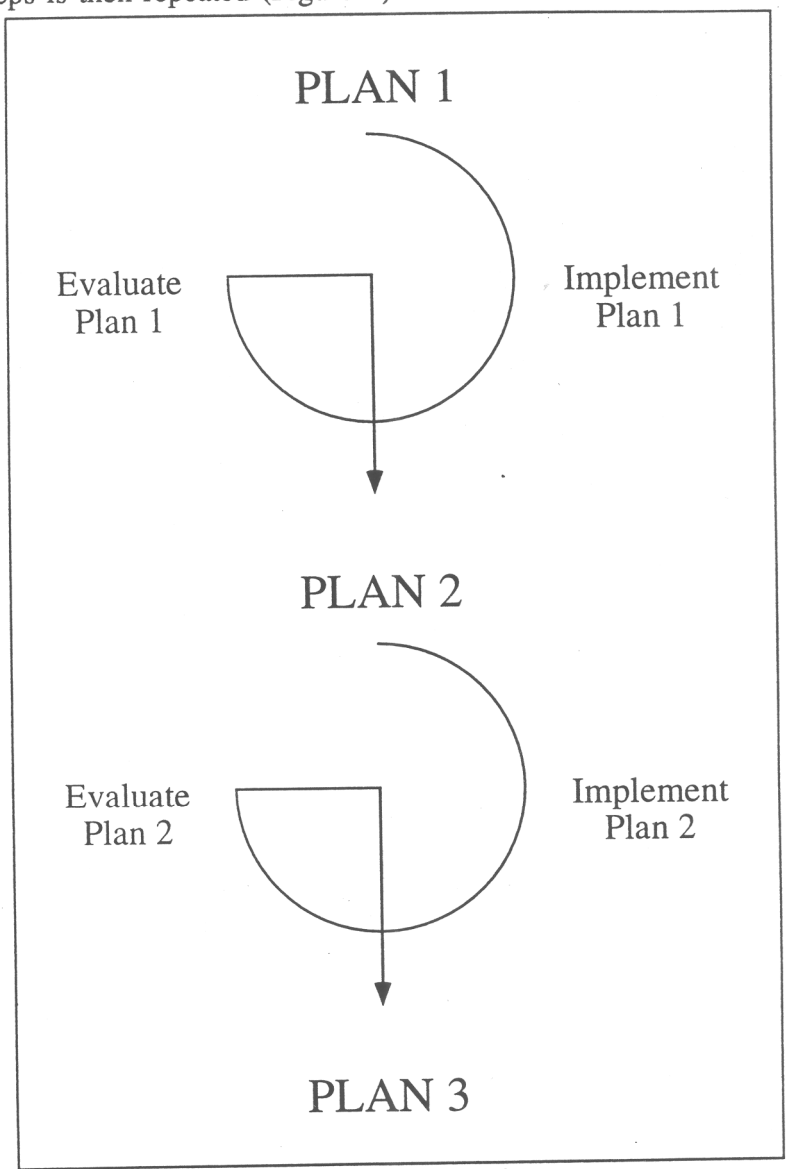

Figure 3. The Action Research Spiral.

camp experience.

By incorporating an action project that utilizes proven environmental problem solving theory modified for a three-day format, it is hoped that campers will have a successful action project experience. Campers will have the satisfaction of knowing that they helped improve South Sound's water quality, and will learn valuable skills that will be applicable to future environmental problem solving efforts.

NOTES

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21. Arjen E. Wals, Almut Beringer, and William B. Stapp, "Education in Action: A Community Problem-Solving Program for Schools," Journal of Environmental Education 21, no. 4 (Summer 1990), 17.

22. Ibid., 16.

23. Winther, 27.

24. Hammond, 57-58.

25. Wals, 17.

26. Ian Robottom, "Beyond the Model/Module Mentality in Environmental Problem Solving," in Bardwell, 74.

27. Budd/Deschutes Project GREEN, "Student Environmental Action Projects 1992/1993," (Olympia, Wash: Budd/Deschutes Project GREEN, 1993).

28. Hammond, 58.

29. Robottom, 78.

30. Stapp, 14.

CHAPTER 3

SUMMARY OF THE ADVENTURE TO ACTION ACTIVITY GUIDE

As mentioned previously, the Adventure to Action camp curriculum contains three major components:

1. A challenge program on the first day.
2. Nature awareness activities on all three days.
3. Environmental problem solving activities on the second and third days.

This chapter will provide a brief overview of the camp curriculum as well as a summary of each of the activities. (For the camp curriculum in its entirety, see Appendix A.)

Adventure to Action Camp Overview

The Adventure to Action Camp is for Olympia youth ages 11-13. The first two days take place at Priest Point Park; the third and final day takes place at Watershed Park. Each three-day camp session is led by three instructors and limited to 24 campers. Three volunteers are also recruited making a ratio of eight campers to each instructor and volunteer. Each day runs from 8:00 a.m. to 5:00 p.m. and contains a mixture of small and large-group activities (See pp. 41-43 for a complete schedule of activities).

Challenge Program

One the morning of the first day of the session, campers will be guided through a challenge program designed to be an enjoyable way to build group cohesiveness, increase self esteem, encourage reasonable risk-taking, and set high expectations. The following is a summary of each of the challenge activities:

The Getting Acquainted Questionnaire: Campers use a questionnaire form to interview each other on questions concerning environmental and diversity issues.

Watershed Partner: Separated blindfolded pairs must find each other in a large field by shouting pairs of watershed-related words.

Habitat Lap Sit: Campers representing habitat components form a "habitat" by physically forming an interconnected circle.

Carrying Capacity: In this active version of musical chairs, campers experience what happens when an area's carrying capacity is exceeded.

Diminishing Load Problem: In a race against time, campers must carry each other across a field.

Human Knots: Campers form and untangle a human "knot" to learn about different approaches to problem solving.

Trolley: Groups of ten campers become a "trolley" trying to walk as a group on two long 4" x 4"s.

Human Ladder: Campers hold wooden dowels at varying heights to form a ladder that other campers climb.

Wetland Hopping: Campers become migratory birds traveling from "wetland" to "wetland" (wooden blocks) while holding hands and trying not to fall off.

Wolf Pack: A group version of "tag" in which teams of campers must work together as a pack to catch their prey.

Nature Awareness Activities

Throughout all three days of the Adventure to Action camp, participants will take part in nature awareness activities. These activities are designed for campers to gain an appreciation of South Sound watersheds for their beauty and inherent value. The following is a summary of each of the nature awareness activities:

Unnature Trail: A walk on short section on trail containing unnatural objects.

Scent Hunt: Campers learn how to increase their sense of smell and explore their immediate surroundings for interesting smells.

Tree Imagery: A guided imagery in which campers imagine they are trees.

Solitude Spots: Campers find a special spot in the forest to spend a brief period of quiet solitude.

Duplication: A nature scavenger hunt.

Nature Drawing: Campers use observations and visualization techniques to draw natural objects.

Sound Map: Campers make a map of the sounds they hear in a forested part of a watershed.

Bird Calling: Groups of campers attract songbirds with a simple bird calling device.

Free Choice Activities: Campers can choose an activity of interest in which to participate.

Environmental Problem Solving

All three days of the Adventure to Action camp focus on environmental problem solving. These activities vary greatly ranging from knowledge and skill building activities on the first and second days, to action project implementation on the third day. The following is a summary of the environmental problem solving activities:

Environmental Inventories: Campers use transects, soil samples, and wildlife observations to learn about forest and beach environments.

Get to Know Your Watershed: Campers learn what a watershed is and locate the boundaries of a watershed on a topographic map.

Mock Environmental Action Planning: Campers read a newspaper article about an environmental issue and work in small groups to create a plan of action to help solve the problem.

Outside Speaker: A community member talks to campers about his or her role in protecting Olympia's water resources.

Water Charades: A game of charades played with campers acting out concepts related to water.

Owls and Crows: An active "tag" game that hinges on true/false statements.

Olympia Land Use Game: A land use simulation game in which campers role-play various interests and present proposals to a mock city council.

Stream Enhancement Project Planning: Campers take part in a planning the following day's salmon habitat improvement project.

Steam Enhancement Team: Campers place gravel in Moxlie Creek and revegetate its eroded banks to enhance coho and chinook salmon spawning habitat.

Water Quality Monitoring: Campers sample Moxlie Creek for aquatic insects, dissolved oxygen, pH, and temperature to determine water quality.

Public Information: A variety of public information techniques are used to inform the local community about Moxlie Creek's salmon population and the stream enhancement project that the campers implemented.

It can be seen that the activities at the Adventure to Action camp vary widely. Some activities are scientific while others are artistic; some activities are active while others are contemplative; and some activities take place in a large group while others take place with small groups or individually. It is hoped that by providing a wide range of experiences, campers with have the opportunity to take part in activities that

are somewhat familiar to them but also be exposed to new experiences as well.

CHAPTER 4

EVALUATION OF THE ADVENTURE TO ACTION CAMP CURRICULUM

Introduction

Evaluating an environmental education program is never an easy task. While it is relatively easy to get a sense of what activities seemed to work well and what did not, it becomes increasingly more difficult as one goes beyond this. For example, some difficult questions that will need to be addressed after the camp sessions are: What did the campers learn from this experience? Did they change their attitudes about the environment as a result of it? Will they now adopt more environmentally-friendly behaviors? The most difficult question of all is possibly the most important: Will water quality in South Puget Sound benefit as a result of this curriculum.

While evaluation is a difficult and time consuming task, it is also an extremely important one for two reasons:

First and foremost, good evaluation is essential for program improvement. It is a means of determining whether the goals and objectives of the curriculum are being met. Any curriculum used on an annual basis, but especially one used weekly such as this, should not be considered a static, unchanging entity; rather it should be flexible enough to allow improvements between sessions. Evaluation is a key component of this, showing what areas of the program can be improved.

Secondly, good evaluation is essential to prove to taxpayers and funding-organizations that the program is worthwhile and deserves funding. A thorough and honest evaluation that demonstrates that the program is meeting its objectives can be a very powerful tool in this regard.

It is with these two objectives in mind that this chapter addresses curriculum evaluation. The bulk of the chapter consists of descriptions of several evaluation techniques to be used during and after the camp session. These techniques are arranged around a structure based on a model developed by Claude Bennett of the U.S. Department of Agriculture Extension Service.[1] The final section of the chapter contains my own conclusions about the potential effectiveness of the curriculum.

Bennett's Model

Bennett provides a simple, logical framework around which environmental education programs can be evaluated. This model has been used by numerous local and regional environmental education programs in evaluation documents.[2] Bennett's model is a seven-step hierarchy of program objectives and evaluative evidence:

1. Inputs
2. Activities
3. Participation
4. Reactions
5. KASA (Change of Knowledge, Attitudes, Skills, and/or Aspirations)
6. Practice Change
7. End Results

For each level of the hierarchy, various evaluative tools are used to determine whether specific program objectives have been met. Bennett's hierarchy is an

appealing organizational framework to use because it addresses the ultimate goals of any environmental education program: a change in knowledge and attitudes, a subsequent change in behavior (Practice Change), and finally a change in the environment (End Results). Bennett's model can be challenging to use, however. Paradoxically, with each increasing level of the hierarchy, evidence of program impact becomes stronger, yet it becomes more difficult and time consuming to obtain evidence.

The evaluation techniques discussed here will address the five levels of Bennett's hierarchy that are directly applicable to the Adventure to Action curriculum: Activities, Reaction, KASA, Practice Change, and End Results. The two levels omitted, Inputs and Participation, are not directly related to the curriculum and thus evaluation techniques for these aspects of the camp program are not discussed here.[3]

Activities

The "Activities" level of Bennett's hierarchy focuses on the most basic level of curriculum evaluation, serving to answer the questions: Which activities worked well? Which did not work as well? Did the activities meet the stated learning objectives? How can the activities be changed to be better next time?

This aspect of the curriculum may be effectively evaluated by daily log books kept by instructors and volunteers as well as a one-day evaluation retreat after the camp sessions:

Log Books

Having camp instructors and volunteers keep daily log books is a critical component of the evaluation process, because it allows instructors to implement changes in activities on a weekly basis. Each day after the campers leave, each instructor and volunteer will spend approximately 10-15 minutes reflecting on the day's activities by writing in a log book. They will go through the day's schedule and answer the following questions:

- What activities worked well today?
- What activities did not work as well?
- Did the activities seem to meet the stated learning objectives?
- Did the campers find the activities enjoyable, exciting, stimulating, and/or useful?
- What can be changed to make next week better?

Between each weekly camp session, the instructors will have a planning meeting in which they use their log books, volunteer log books, and camper feedback to discuss what areas of the curriculum could be improved. They will then make appropriate changes in the curriculum, implement the changes the following week, and once again closely monitor the activities using log books. In this way, instructors will be using an Action Research approach to curriculum improvement, utilizing the basic steps of planning, taking action on the plan, reflecting on the action taken, and repeating this cycle. Just as Action Research is an effective model for taking action on environmental issues, it also serves as an appropriate model for formative evaluation.[4]

Evaluation Retreat

After all four weeks of camp, the instructors, Stream Team coordinator, and

public involvement and education coordinator will have a one-day evaluation retreat. Like the log book process, the retreat will incorporate the Action Research process but on a yearly rather than weekly basis. The group will reflect on the activities using the above questions as a guide, address areas that are need of improvement for next year's session, and propose new ideas that can be implemented the following year. This process was implemented following the 1994 day camp sessions and resulted in excellent feedback.

Reaction

The "Reaction" level of Bennett's model addresses how the campers responded to the activities. There are two basic ways to approach this question: directly by way of feedback from campers, and indirectly by way of observations of instructors and volunteers. Both of these techniques will be used:

Camper Feedback

At the end of the last day of camp, participants will be asked to take a post-test. This test serves two functions: to measure change in knowledge and attitudes (see below), and to get feedback from campers' reactions to activities. Campers' reactions to camp activities will be solicited through the following three questions on the post-test:

- What activity did you like the **most** this week?
- What activity did you like the **least** this week?
- What should we do differently next year?

Log Books and Evaluation Retreat

Since the "Reactions" and "Activities" levels of Bennett's model are similar, it is appropriate that similar tools should be used to evaluate each level. As mentioned previously, one of the questions addressed by the log books and evaluation retreat concern camper reactions to the activities (Did the campers find the activities enjoyable, exciting, stimulating, and/or useful?). By combining these two techniques with feedback directly from campers, Stream Team should have a good sense of how the campers responded to the activities.

KASA (Change in Knowledge, Attitudes, Skills and Aspirations)

The "KASA" level goes a bit deeper than the "Activities" or "Reaction" levels focusing directly on how the activities affected campers' knowledge, attitudes, skills and aspirations. This level lends itself well to a pre/post-test format that will yield quantitative results that can be statistically analyzed. The questions on the pre- and post-tests focus primarily on knowledge and attitudes and are derived directly from the learning objectives stated at the beginning of each activity (See Appendix B). Data from the tests will be tabulated into "Knowledge" and "Attitude" categories and statistically analyzed. In this way it can be determined whether the camp had a statistically significant impact on camper knowledge and/or attitudes.

Practice Change

The "Practice Change" level of Bennett's hierarchy addresses the question of

whether the Adventure to Action camp had an impact on campers' behavior. Since one of the goals of the camps is "To provide the knowledge and skills necessary to positively affect water quality through action projects and personal choices," this is an important component of the evaluation process.

Like "KASA", "Practice Change" is best measured in a pre- and post-test format (See Appendix B). Environmental behavior questions are thus included in the pre-test administered at the beginning of the camp session. Due to the short duration of the camp session, and the likelihood that campers would not have a chance to institute behavior changes during this time period, the "post-test" will take place approximately one month after the camp sessions in the form of a telephone interview of 20 randomly selected campers. Like the Knowledge and Attitude components, this data will undergo statistical analysis.

End Results

The ultimate aim of the Adventure to Action day camp, as noted in the goal statement, is to improve water quality in South Puget Sound. It is hoped that this will occur by way of campers making personal choices and taking action to positively affect South Sound's water quality long after the camp experience.

Attributing any changes in water quality in the South Puget Sound area to campers' behavior change is, of course, impossible. The one end result that *can* be directly attributed to campers is the stream enhancement project implemented on the final day of camp. Unfortunately, long-term trend data on salmon populations in

Moxlie Creek do not exist, so even this task will be difficult. Nevertheless, Stream Team will make observations of salmon spawning activity in Moxlie Creek to determine if the stream enhancement project appeared to be effective.

By utilizing a multifaceted approach to evaluation organized around Bennett's model, Stream Team will be able to get a good sense of curriculum effectiveness. The evaluation techniques described above will show what specific aspects of the curriculum need to be modified for the following week or year. In this way, the Adventure to Action camp curriculum can constantly improve to meet the needs of Olympia's youth.

Conclusion

The Adventure to Action curriculum aims to achieve a great deal in just three days of camp. Fostering a personal connection to local watersheds, teaching how these watersheds are impacted, and providing the knowledge and skills necessary to protect them is not a task easily accomplished in an entire school year, let alone in less than one week. Indeed, many of the activities in this curriculum would greatly benefit from being expanded. Unfortunately, time constraints make this prohibitive.

Nonetheless, the Adventure to Action curriculum provides a good educational framework from which youth can build. For example, the challenge program on the first day not only prepares campers for a productive week at camp, but hopefully will help build strong self-confidence. This is an important trait for those interested in

taking action to help protect Olympia's water resources.

Likewise, providing campers with opportunities to have positive experiences in nature is intended to contribute to a lifetime of nature enjoyment. For example, campers can use their nature drawing skills and poetry writing skills and apply them to other natural environments. In this way, the nature appreciation activities can have long lasting effects.

Finally, campers at the Adventure to Action camp will learn some of the skills necessary to take action to help solve environmental problems. From learning how to write press releases to how to monitor water quality, these skills will be useful in many situations encountered after the camp experience.

While it is unlikely that the Adventure to Action curriculum will transform every participant into an environmentally responsible citizen, it *will* provide campers with a framework from which to build positive behaviors. Additionally, a solid evaluation process will ensure that the curriculum is not static, but rather improves over time. In this way the Adventure to Action curriculum will become an increasingly effective tool in protecting and enhancing Olympia's water resources for years to come.

NOTES

1. Claude F. Bennett, How to Analyze Impacts of Extension Programs (U.S. Department of Agriculture Extension Service, 1974).

2. See, for example, Northwest Watershed Education Alliance, Summary of Process and Results from the Budd/Deschutes Project GREEN Assessment Retreat, May 1993 (Seattle: Northwest Watershed Education Alliance, 1993); Margaret Tudor, Evaluation of Project Wild: The State of Washington, 1984-1992 (Olympia, Wa: Washington Department of Wildlife, 1992); and Peggy Britt and Rhonda Hunter, Developing and Evaluating Environmental Education Programs (Olympia, Wa: Washington State Department of Ecology, 1994), 30-37.

3. Bennett's "inputs" and "participation" level are broader levels that relate more to the Stream Team day camp program in general than to this curriculum specifically. For this reason, these levels should be evaluated in the Stream Team coordinator's annual day camp evaluation.

4. Ian Robottom, "Evaluation in Environmental Education: Time for a Change in Perspective?" Journal of Environmental Education 7, no. 1 (Fall, 1985), 33.

For Appendices to this work

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