Chapter 1
Plan Ahead for Success

If you are planning to implement an education program in boating, fishing, or aquatic resources stewardship, or if you are expanding or enhancing an existing program, this chapter will provide ideas for making the most of this opportunity. The things you do before you contact a single participant literally can be the difference between a program that is effective, engaging, and exciting, and a program that perhaps makes you feel good, but does not achieve its objectives. The time you spend planning will greatly increase your success.

This chapter focuses on initial planning efforts, but the entire *Workbook* is essentially about planning. Programs—even longstanding ones—that follow Best Practices continually plan ahead—for the next year, the next cycle, the next learner.

Table 1 contains a list of Best Practices for program planning. Under ideal circumstances, many of these would be implemented simultaneously. However, it is critical that the first two precede the others. There have been cases where administrators of aquatic resource education programs have selected program tools (curricula, materials, instructors, etc.) before determining program purposes (mission, goals, and objectives).

A hallmark of effective programs is that they determine the program's purpose before doing anything else.

> **Best Practice:** Effective programs are relevant to the mission of the agency or organization sponsoring the program.

Relevance helps justify your program and your funding, prevents the establishment of ineffective programs, and helps make your program more efficient and sustainable. In addition, it helps keep you on track and reminds you and your staff that what you are doing is important to the entire agency and its future.

How do you know if you've hit the mark? For starters, use your agency or organization mission statement. Then look at your agency or organization strategic plan. Programs that follow Best Practices can show clearly how their educational programs contribute to the mission and how they help achieve the goals and objectives in the strategic plan.

A fish and wildlife agency may have a broad, general mission such as "conserve the state's aquatic resources and provide recreational opportunities for the use and enjoyment of present and future generations." In such a case, a stewardship program (with or without

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Table 1: Best Practices for Program Planning

Effective Programs Using Best Practices in Initial Planning:

- Are relevant to the mission of the agency or organization sponsoring the program.
- Clearly define the "Educational Purpose," which includes the program's mission, goals, and objectives, and assures that all are aligned with each other.
- Are based on and shaped by some form of needs assessment and/or logic model.
- Receive adequate support, resources, and staffing to become sustainable over time.
- Plan for program evaluation in the initial stages of planning.
- Rely on experienced, well informed, prepared, and ethical staff to develop, implement, and evaluate programs.
- Provide educational opportunities that are frequent and sustained over time.
- Involve stakeholders and partnerships at all levels of program development.
- Are inclusive of all audiences (accessible/available to anyone with an interest in participating).

fishing or boating components) may be appropriate, although more specific objectives to help you focus your efforts are beneficial. When a broad goal, such as "develop and maintain an effective aquatic and boater education program," is supported by a more specific objective, such as "reach 10,000 new anglers and 10,000 new boaters with a standardized curriculum emphasizing responsible use and stewardship of aquatic resources," you get a much clearer picture as to whether your program is helping the cause. The objectives are the measurable steps that get you to your goal.

Agency/organization administrators can help define goals and objectives best addressed through education. Involve them in development of the mission, goals, and objectives of the education program. This provides them ownership in your efforts and helps them understand the value of the programs that result.

If you have existing educational programs, look at your goals and objectives and consider how well they match up with the mission of your agency/organization and its strategic plan. Also, consider whether other agency/organization objectives or issues could be addressed through education. If you have not clearly communicated the relevance of your educational programs to your agency, plan to do so.

> **Worksheet 1-A**
>
> (Actual worksheet found in *Appendix B*)
>
> List the mission, goals, objectives, and issues of your agency or organization that need to be addressed through educational programs.
> Agency/Organization Mission:
>   Goal 1:
>   Objective:
>   Objective:
>   How does your program help achieve this goal/objective?
>   Goal 2: (repeat)

> **Best Practice:** Effective programs clearly define the educational purpose, which includes the program's mission, goals, and objectives, and assures that all are aligned with each other.

Defining the educational purpose of your program may be the most important step you can take in program planning, yet it is overlooked or not closely considered surprisingly often. Basically, the educational purpose defines what you are trying to accomplish with your program.

What Do You Call It?

There are myriad different terms used to describe the elements that make up educational purpose. Some of the more common ones include: mission, vision, goals, aims, guidelines, strategies, principles, purposes, objectives, and actions. Your agency or organization may have specific terms for these elements that it expects you to use. It's not so important what you call these elements as it is that you consider what they represent, and clearly communicate that with your audience. Picture these terms as layers of a pyramid, and think of them in terms of the questions they answer.

First level (i.e., the mission)

Why is this program in existence? What is it trying to do?

This usually is called the mission statement. It is a broad, philosophical statement about what the program hopes to contribute. It provides overall guidance for program goals and objectives.

Second level (i.e., the goals)

Why are we doing this program?

The answers to this question provide the goals of the program. They help define how the program will help achieve the mission.

Third level (i.e., the objectives)

What, specifically, do we want to accomplish?

These elements are commonly called objectives. Another way to identify objectives is to fill in the blank on the following phrase: "As a result of this program, participants will be able to _____." Objectives should be measurable, and generally—though not always—are set up on a relatively short timeframe.

Sometimes, the differences between missions, goals, and objectives can get fuzzy, especially when you're working in partnership with other organizations. Also, goals and objectives may overlap, which can add to the complexity. At times, you may be tempted to throw up your hands and forget the whole thing. Don't do it!

The thing to remember is this: Regardless of what you call the various levels, it is critical to ask the questions "Why are we doing this program?" and "What do we want to accomplish with this program?" You can create missions, goals, objectives, and whatever other levels you want or need to clarify your answers or meet organizational requirements, but be sure to answer the basic questions.

Worksheet 1-B

(Actual worksheet found in *Appendix B*)

Given the mission, goals and objectives of your agency or organization (as you described them in the previous worksheet), describe for your education program:

Mission (what is its reason for being?)
(e.g., conserve aquatic resources and provide recreational opportunities for citizens.)

    Goal 1 (why are we doing this program?):
      (e.g., increase participation in angling)
      Objective (what, specifically, do we want to accomplish):
      (e.g., have 1,000 people attend a weekend fishing clinic; have 350 people fish again within 6 months of attending a clinic; train 200 volunteer boating education instructors, etc.)
      Objective:
      Objective:
    Goal 2: (repeat)

> **Best Practice:** Effective programs plan for program evaluation in the initial stages of planning.

Most people recognize that evaluation is a critical part of education programs, but many are not aware that, to be most effective, evaluation must begin before a program is implemented. Effective programs build evaluation into the program plan and budget. It is a core part of the program, not something extra funded only in years of plenty.

Effective programs conduct evaluations as they build the program. Far too often, educators think about evaluation only in terms of an after-the-fact judgment as to whether desired outcomes were achieved. This kind of evaluation is critical, but incomplete. Building evaluation into your program from the beginning can help you better develop your program, adjust it over time with stakeholder input, and achieve the end results you are looking for more effectively and efficiently. If you are trying to demonstrate positive outcomes, you have to have a "before picture" to compare with your "after picture."

Chapter 4 is devoted to program evaluation. Be sure to review it before completing your program logic model or program plan.
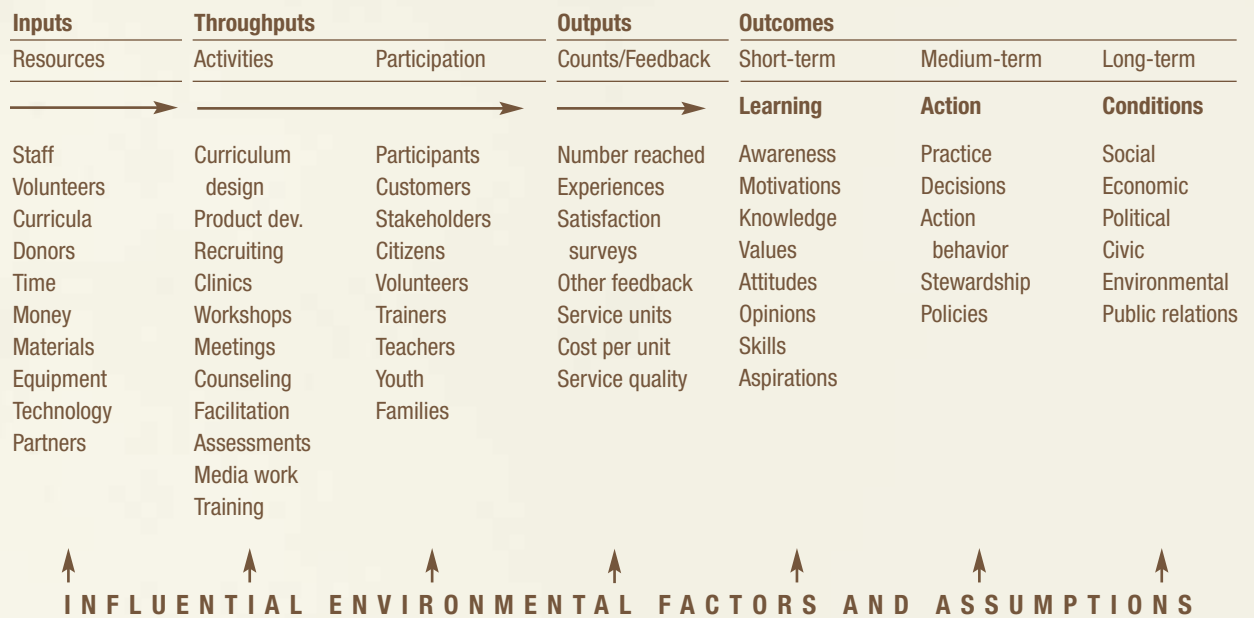
There's an old saying that goes: "If you don't know where you're going, any (and every!) road will get you there." This is certainly true of education programs. If you don't care where you're going, then just start walking! But if you have a destination in mind (goals and objectives for your program), a program logic model is the road map to success.

Don't be fooled by the fancy name. A program logic model is nothing more than a simplified, visual description of how different factors of the program are related. It helps you visualize how factors fit together and relate to each other. It also helps you think of questions you will need to answer concerning program design, implementation, and evaluation.

Do you need it?

The first question to ask, and probably the most commonly overlooked, is "Do we need the program?" Consider this question carefully before you do anything else. Perhaps your agency director, chapter executive committee, or school board said you must implement a program. In this case, the question may be moot.

Figure 1. Conceptual Logic Model for Program Development and Evaluation

Inputs	Throughputs		Outputs	Outcomes		
Resources	Activities	Participation	Counts/Feedback	Short-term	Medium-term	Long-term
				Learning	**Action**	**Conditions**
Staff	Curriculum	Participants	Number reached	Awareness	Practice	Social
Volunteers	design	Customers	Experiences	Motivations	Decisions	Economic
Curricula	Product dev.	Stakeholders	Satisfaction	Knowledge	Action	Political
Donors	Recruiting	Citizens	surveys	Values	behavior	Civic
Time	Clinics	Volunteers	Other feedback	Attitudes	Stewardship	Environmental
Money	Workshops	Trainers	Service units	Opinions	Policies	Public relations
Materials	Meetings	Teachers	Cost per unit	Skills		
Equipment	Counseling	Youth	Service quality	Aspirations		
Technology	Facilitation	Families				
Partners	Assessments					
	Media work					
	Training					

INFLUENTIAL ENVIRONMENTAL FACTORS AND ASSUMPTIONS

Be proactive. Develop a needs assessment. The purpose of a needs assessment is to determine whether the activity you want to do is actually needed. Are other groups already doing this program? Does the target audience want it? Will it accomplish organization goals? Consider what you're putting into the program and what you will get out of it. The logic model on page 1-4 is a great tool to do this. It will show how well the proposed activity fits into the overall education program, how it impacts other programs, and how it impacts budget and staff. Perhaps you'll find the program is indeed a good fit. But even if not, at least the "powers that be" can make an informed decision.

> **Best Practice:** Effective programs are based on and shaped by some form of needs assessment and/or logic model.

A basic program design strategy might ask:
- What are the expected outcomes of the program? These should be based on your objectives identified above.
- What methods are appropriate to achieve these outcomes?
- What resources are necessary to apply the methods?
- In what environment and setting will the program occur?

- How does the program meet the needs/wants of the target audience?

The simple logic model in *Figure 1* includes common program inputs, throughputs, outputs, and outcomes. These are fancy names for simple factors, but it's important to understand them so you can gain the full benefit of the process. Each component is explained below.

The same logic model you develop as a conceptual map for program design also can be used for evaluation purposes (see *Chapter 4*).

Understanding the parts of the model

Inputs are resources you must invest to implement a program. Inputs include staff, money, equipment, facilities, administrative approvals, budget authority, agreements with cooperating agencies, volunteer support, in-kind services, donations, and environmental and community resources. The model links these resources to specific activities designed for your target audiences.

Activities and their participants are viewed as *throughputs*. The term "participants" is not limited to educational program learners, but should include staff, administrators, and others who are themselves learners in training programs and educational briefing sessions.

Program *outputs* include things such as how many people would attend, how many would be reached

or exposed to a message, how satisfied participants would be with their experience, etc. If your program objective is only to provide satisfying experiences for participants or to convey information to the public, this may be all you need to consider.

Outcomes are results of a program beyond simple outputs. Successful outcomes include increased environmental awareness and knowledge, changed attitudes and opinions, or establishment of a foundation for responsible behavior toward the environment. For boating and fishing programs, outcomes can include increased knowledge of boating and fishing, changed attitudes about the value and benefits of fishing and boating to participants or their families, establishment of a foundation of boating and fishing skills (including problem solving and decision making) increased social support for fishing and boating, and increased participation. Measuring outcomes is more difficult than measuring outputs, and it is impossible without carefully planned programs and rigorous evaluation activities.

All model components described above are influenced by *environmental factors* and *assumptions* that can influence development, implementation, and success of a program. Examples include politics, socio-economic conditions, and institutional constraints. The ability to identify and control influential environmental factors (and the costs of doing so) is crucial to program success.

A fully developed program logic model helps you:

- Summarize key elements of your program;
- Clarify relationships between activities and intended outcomes of the program;
- Show cause-and-effect relationships among activities and outcomes – that is, which activities are expected to lead to which outcomes;
- Help identify critical questions for improving program design and evaluation;
- Provide opportunities for program stakeholders to discuss the program and agree upon its description;and
- Link program development and evaluation.

Modeling the bigger picture

You can expand and broaden the simple logic model in *Figure 1* to get a clearer picture of your organization's entire educational program. If your efforts are part of a larger agency or organization educational program (especially resource management agencies) see *Appendix C*.

Worksheet 1-C

(Actual worksheet found in *Appendix B*)

Complete a program logic model like *Figure 1* for your program (see Worksheet 1-C in *Appendix B*). If you are just developing a program, consider starting with the long-term outcomes you want and working backward. If you have a program already, complete the model and review how the pieces fit together and where there might be holes.

Best Practice: Effective programs receive adequate support, resources and staffing to become sustainable over time.

As you plan your educational efforts, make sure all elements of your program (including staff and evaluation) are considered to be core elements in your organization's or agency's budget.

Emphasize to administrators of your agency or organization that educational programs are long-term efforts. They cannot be cut to solve a funding problem, and then be expected to start up again at the same level in a year or two. Most successful educational programs involve partnerships with groups or volunteers that have made a commitment to assist the program. If your organization cuts programs it is involved in, it may lose trust and credibility with partners. It can take years to overcome those losses.

Your program logic model will help you create a budget. Work with your team to identify all the variables you need to consider. Look at what is feasible to fund over the long term and what is not. This will help avoid planning a program that takes more staff or resources than your agency/organization can fund. This process will help make the case that, in order for educational programs to be effective, educational staff must have support of the administration on several levels.

Obviously, financial support is critical. Just as important is that administrators see education as an integral part of doing business and that it is part of the strategic planning process. Encourage staff from education and related fields (fisheries, wildlife, enforcement, boating, information, and others) within the agency to constantly work together to enhance educational programs. Educational programs should be a conduit for resource and law enforcement

programs to attain the mission and goals of the larger organization or agency.

Examples:

1. Provide agency fisheries biologists training in how to effectively communicate the agency's role and efforts in maintaining a quality fishery and an opportunity to present this information in educational classes.

2. Involve conservation law enforcement in the application process of volunteer instructors such as recruitment, background checks, and agency interview processes. Provide opportunities for them to teach in classes about rules and regulations.

3. Involve communications and marketing staff in development of a marketing and communications strategy and in reaching key audiences during a national or local educational campaign.

Worksheet 1-D

(Actual worksheet found in *Appendix B*)

Based on your needs assessment or program logic model, list areas of support you need from your agency/organization.

For each program area that needs support:

Type of support needed (funding, staffing, etc).

Source of needed support.

Specific ways you might seek additional support.

Partners or other stakeholders who can assist you (other divisions within your agency/organization or partners from outside).

Best Practice: Effective programs rely on experienced, well informed, prepared, and ethical staff.

A key ingredient to any successful program is highly qualified, motivated, and well-trained staff (volunteer or paid) that provides leadership and works effectively with teachers/volunteer instructors and/or other learners in a socially supportive situation. You wouldn't hire an accountant to fill a fisheries biologist position. It is just as important to consider the professional background needed for your educational programs. Knowledgeable, committed, and ethical individuals capable of working with diverse groups are important keys to success.

Professional development and support

Effective programs plan ongoing professional development and support for staff. This is critical to sustaining effective programs over time. You may hire the best people when your program begins, but if you don't give them opportunities to keep up to date in their fields, you'll lose ground in the long run.

Clear understanding of agency goals and objectives

Everyone associated with the program must have a clear understanding of agency goals and objectives and how they relate to agency educational programs. If the educational staff is familiar only with the educational goals and not the agency/organization goals, they will not see the big picture. Understanding the big picture helps staff stay on track, be more effective, and carry that mission forward into the training of instructors and teachers.

Worksheet 1-E

(Actual worksheet found in *Appendix B*)

What staff positions impact your education program?

For each position, rate the person who currently holds that position in terms of potential to successfully implement the program:

Knowledge (poor, moderate, good, excellent)

Skills (poor, moderate, good, excellent)

Behavior (poor, moderate, good, excellent)

For each staff position that you did not rate as excellent, what would it take to help that person achieve an excellent rating?

How will you work to help them improve the rating?

In what ways will (do) you provide ongoing professional development for your staff?

Is education part of your organization's strategic planning process?

How would you rate the support that education receives in your organization? (poor, fair, excellent). What would it take to improve that rating?

How do you communicate goals and objectives to your staff?

Best Practice: Effective programs provide educational opportunities that are frequent and sustained over time.

One of the keys to achieving long-term behavior change in boating, fishing, and stewardship of natural resources is to provide opportunities for accessing and practicing new behaviors frequently, in a variety of ways, and over a long period of time. It also helps if the program or information is easily accessible and offered on a predictable schedule.

Newly acquired behaviors require follow-up support to maintain. Research clearly shows that, even when strong, short-term behavioral change occurs, long-term change is doubtful without continued reinforcement. For example, if you teach a group of second-graders about water pollution (or teach them to boat or fish), but then never do anything more with them over time (even if they left your program with new skills, knowledge and motivation) it is not likely they will maintain it without follow-up support. Apprenticeship experiences that the learner shares over time with a personally significant individual are one way (but not the only way) to encourage and maintain that follow-up support.

As you plan your program, consider how you might provide opportunities to reach a given target audience in multiple ways (such as through formal and as well as non-formal learning), as well as over a span of time. Realistically, this can be accomplished only through partnership efforts among schools, agencies, and nongovernmental organizations.

Worksheet 1-F

(Actual Worksheet found in *Appendix B*)

Given the stated goals and objectives of your program, list the different ways you currently reach your target audience with your messages. Then list as many opportunities as you can for expanding your reach (and your effectiveness).

Goals:

Objectives:

Current Efforts

    Formal (in-school):

    Non-formal:

    Partnerships:

Opportunities

    Formal (in-school):

    Non-formal:

    Partnerships:

> **Best Practice:** Effective programs involve stakeholders and partnerships at all levels of their development.

Successful programs bring a coalition of stakeholders and partners together to design, implement, and evaluate a program that meets their mutual needs. Stakeholders are people who have some sort of a stake or interest in the program being developed. They care about a program and are willing to commit to it. Stakeholders might be teachers, sponsors (funding sources), agency supervisors, community leaders, landowners, extension workers, parents, curriculum developers, and/or targeted participants in the program. A careful needs assessment process will help identify potential partners.

Diverse stakeholders lend a variety of perspectives to the program, helping you shape the focus and audience for maximum benefit. Their participation also helps achieve buy-in early in the process, so the program is more likely to be used. Involving participants from your target audience (e.g., youth, women, ethnic groups, persons with disabilities) in the planning stage helps ensure success. During evaluation phases, stakeholders can offer input about what information to gather, how to gather it, and ultimately how to share it with important audiences.

Stakeholders also reinforce a sense of community partnership, ownership, and interest in the program. Research indicates that parental and community involvement in schools improves student learning. Community members and parents can be role models and mentors and serve as an additional layer of support for educators.

Tips for developing a team of stakeholders:

- Think about who will be the ultimate users of the results and try to structure your team so that the results are channeled directly to those end-user groups.
- Use community leaders to help identify groups and individuals to invite to your team.
- After identifying which groups should be represented on the team, select specific individuals to represent each group.
- Select team members who are enthusiastic, who are willing to represent their group, who are willing to commit to the project, and who have opinions but not "axes to grind."

• Strive for diversity among team members. Don't limit members to those holding formal leadership positions within their groups or those who are the "most involved."

Once you have established a stakeholder team, communication is key. Clarify responsibilities early and often. Make sure your team knows they are acting in an advisory capacity and not in a decision-making capacity. Work with the team to identify rules and roles for smooth and effective operation.

Potential Stakeholders/Partners:

American Red Cross

Aquatic resource conservation organizations

Local businesses

Local law enforcement authorities and parks and recreation centers

Local government agencies

National, state, and local park services

National and state associations of health, physical education, recreation, and dance

River authorities

Lifeguard associations

Representatives from target audiences

Schools and church groups

YMCA and local community centers

State environmental education associations

U.S. Army Corps of Engineers

U.S. Coast Guard Auxiliary

U.S. Power Squadrons

Water safety councils/coalitions

Wildlife conservation organizations

Youth organizations

Best Practice: Effective programs are inclusive of all audiences (accessible/available to anyone with an interest in participating).

Making your program accessible/available to all individuals regardless of their race, gender, age, or physical characteristics is an important part of program planning.

Although no individual should ever feel excluded from a program, it is important to target certain segments of the public to accomplish your goal of inclusion. For example, to attract more women, Hispanics, African Americans, and other ethnic groups, it is important to develop elements of your program to specifically address the barriers and constraints these groups face. *Chapter 5* contains information that will help you plan your efforts to reach a diverse audience.

Whether your program is targeted to the general public or a specific segment of the public (women, youth, adults, or an ethnic group), consider the needs of persons with disabilities. You may need to adopt new adaptive technology, hire support staff, and/or provide special services to make your program accessible and welcoming. This is discussed in detail in *Chapter 6*.

Worksheet 1-G

(Actual worksheet found in *Appendix B*)

In what specific ways can stakeholders assist you?

What do you and your program have to offer them?

Who are the end users for your program?

What groups should be represented on your team?

What individuals should be represented on your team?

What are the specific roles and responsibilities of the stakeholders?

Who can act as a facilitator for the team?

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Chapter 2
Building Your Program

This chapter will help you develop the tools, implementation strategy and delivery systems to ensure the program you put in place is top-notch in every respect—to ensure it achieves the goals and objectives you set.

Have You Planned It Out?

Chapter 1 covers important information about initial planning. Defining your "Educational Purpose" and making certain it is relevant to the mission of your agency or organization are important steps that must be completed before you consider the tools to use. Some Best Practices need to be carried out simultaneously. For example, you don't know how large a staff you will need for a program until you identify the delivery system and tools. In addition, you have to consider your budget before a final decision can be made on the delivery system and tools. If you haven't developed a program logic model and completed the planning steps outlined in *Chapter 1*, it will be much more difficult to get the maximum benefit from this chapter.

Best Practices for Development of Programs

Table 2 contains currently recognized Best Practices for program development and implementation. Following the table, each Best Practice is explained and worksheets throughout the chapter help you apply each practice to your own unique situation.

Table 2: Best Practices for Program Development

Delivery Systems

Effective Programs:
- Consider delivery systems and involve stakeholders during program development.
- Are relevant to the mission of the sponsors and to the educational objectives of the audience.
- Align curricula with national and state educational standards when appropriate.
- Recognize the critical role of ongoing professional development.

Developing Tools and Delivery Approaches

Effective Programs:
- Support, engage in, and make use of scientific, social, educational, and other appropriate research.
- Examine existing materials and resources before developing new ones.
- Present accurate and balanced information, incorporating many different perspectives.
- Are planned and carried out in a manner that clearly addresses safety and other regulations, and reduces real risks to everyone involved.
- Are experiential.
- Are relevant to the everyday life of the learner.
- Empower learners.
- Are learner-centered to provide collaborative learning opportunities and development of critical thinking skills.
- Are designed to match the developmental stages of the learners.
- Use multiple teaching methods to accommodate diverse learning styles.
- Use an interdisciplinary approach to help learners develop skills, formulate concepts, and examine issues.
- Consider the social context in which the education takes place and provide avenues to enhance the social support for learners.
- Identify and target one or more outcomes or skills, beyond the subject matter, that are broadly useful to the participant.
- Inventory and utilize a variety of educational resources and environments.

Delivery Systems

> **Best Practice:** Effective programs consider delivery systems and involve stakeholders during program developement.

During initial planning, you identified educational goals and objectives for your program. Before you obtain or develop curriculum materials to meet these goals, you need to select the delivery system. Will the program be delivered at your own facility? Will staff deliver the program directly to learners? Will volunteers deliver it? Will it be delivered through the schools, 4–H, camps, scouts, community centers, churches, parks, or a combination of these?

If your program is going to be delivered by individuals beyond your immediate staff, you should involve key individuals–who will be involved in the administration or delivery of the program–in the planning of program materials and implementation strategies. See *Chapter 1* for more information on involving stakeholders.

Worksheet 2-A

(Actual worksheet found in *Appendix B)*

Where will your program be delivered?
Who will deliver the program? (List all possibilities for each category).
   Schools
   4-H
   Camps
   Scouts
   Youth organizations
How have you involved stakeholders in planning for program delivery?
How will you involve stakeholders you have not involved already?

> **Best Practice:** Effective programs are relevant to the mission of the sponsors and to the educational objectives of the audience.

Relevant to sponsors

If you plan to deliver your program through schools, 4-H, scout groups, community programs, or other outside organizations, you must be able to demonstrate how it is relevant to them. The key to doing this is in finding common ground among your agency or organization's mission/goals/objectives and those of the groups you want to conduct your program.

Based on the mission/goals/objectives you developed for your program in *Chapter 1*, ask the potential sponsor to help identify common ground. For schools, you might ask: "Is the program aligned with national and state education standards? Does it help them meet a need, such as providing a life skills activity, providing positive alternatives and youth development skills for their drug prevention needs, etc.?"

For 4-H or scout groups you might ask: "Does the program help them incorporate youth development or meet project requirements?" For churches or community programs ask: "Does it help bring families together?"

Relevant to educators

Unless you personally conduct the program you are planning, you must make it relevant to those who will be educating your learners. If you cannot convince educators that the program helps them meet their goals and objectives, they will not participate. If your staff is going to deliver the program, then your directive to deliver it may be enough to meet their objective. However, don't miss the opportunity to assess how well the program meets their broader teaching goals and objectives.

In some cases, the sponsors and the educators may be one and the same.

Worksheet 2-B

(Actual worksheet found in *Appendix B*)

Make a list of potential partners and how your program is relevant/beneficial to them.

> **Best Practice:** Effective programs align curricula with national and state educational standards, when appropriate.

There are a large number of national, state, and district standards that formal educators use to guide their curricula. Standards are typically subject-specific; that is, there are standards for science, geography, mathematics, etc. Teachers know about and use standards, so they can help you identify appropriate ones for your program. (Check with your state office of public instruction.)

Guidelines for environmental education also exist. Guidelines/standards have been developed for environmental education materials, professional development, and environmental literacy (see www.naaee.org). Standards have also been established for boating education (see *Chapter 7*). Effective programs take these standards and guidelines into account during program development, regardless of whether the program is formal or non-formal. This will help make your program more relevant to a wider range of potential partners and/or delivery systems.

Worksheet 2-C

(Actual worksheet found in *Appendix B*)

List the education standards and guidelines you have reviewed to incorporate into your program.
   National:
   State:
   District:
   School:
❑ North American Association of Environmental Education guidelines (www.naaee.org/npeee/)
❑ National Association of State Boating Law Administrators (www.nasbla.org) or related national boating education standards
❑ National Academy of Sciences—Science Education Standards (www.nationalacademies.org)

> **Best Practice:** Effective programs recognize the critical role of ongoing professional development.

Teacher or instructor preparation and training is a must to assure the accurate and consistent use of curriculum materials. See *Chapter 3* for more details.

Developing Tools and Delivery Approaches

Most of the Best Practices in this section need to be applied both to the development of the tools and to how the materials are delivered. For example, when developing tools, you need to consider the age, development level, and background of your participants. However, instructors also need to understand how to teach different age groups, developmental levels, and backgrounds. Clarify what you expect from instructors in a manual or during professional development (see *Chapter 3*).

The following Best Practices are not stand–alone principles. They overlap and each one relies on the other to be truly effective. Consider all of them when you are developing tools and delivery approaches.

> **Best Practice:** Effective programs support, engage in, and make use of scientific, social, educational, and other appropriate research.

Best Practices may change over time, and should be challenged continually by research, personal knowledge, and experience. The Best Practices provided in this *Workbook* are based on the best research and experience currently available, but they

should not be considered to be the "final word" on the subject. Effective programs allocate time for staff to follow (or participate in) related research, and provide latitude for program changes based on new information.

> **Best Practice:** Effective programs examine existing materials and resources before developing new ones.

After you have identified the goals, objectives, and delivery mechanism for your program, you can select the tools you will need. Identify and review as many materials already in existence as possible before selecting or developing your own. Don't waste energy re-inventing the wheel. Conducting a needs assessment for tools can help you make more effective use of your money and time.

Worksheet 2-D

(Actual worksheet found in *Appendix B*)

Program Objective #1:
    List kinds of tools that can be used to meet objective.
    Existing tools/packages/materials that help you meet the stated objective.
    First choice of potential existing tools.
    Audience/agency/organization needs not addressed by first choice of existing tools.
    Resources you have to develop to fill these holes (or develop entire set of tools if none exists that meets your needs).
    Final choice of existing tools or description of what will be needed to meet the objective.
Program Objective #2: (repeat)

> **Best Practice:** Effective programs present accurate and balanced information, incorporating many different perspectives.

In previous years, environmental education has been criticized for lacking credibility and accuracy. Detractors claim that children are being scared by misinformation, and that environmental education too often tries to convince learners that their environment is in imminent danger, and they must save it. Some people fear that this can result in a feeling of hopelessness among learners.

In the mid-1990s, the Independent Commission on Environmental Education assessed about 70 different resources for science and environmental education produced by non-profit agencies, government agencies, business and industry, and private individuals. Their assessment, "Are We Building Environmental Literacy?" also challenges the credibility of some environmental education materials, primarily in how the materials treat controversial issues.

In response to this criticism, the National Environmental Education and Training Foundation prepared a report defending environmental educators and programs, pointing out that environmental messages are distributed by many sources with many agendas, and that not all of these should be considered environmental education. Some are simply casual information; others advocate specific issues or political viewpoints, etc.

Guidelines established by the North American Association for Environmental Education (NAAEE) help ensure balance and accuracy. Characteristics for environmental education recommended by the NAAEE's *Environmental Education Materials: Guidelines for Excellence* include:

- Factual accuracy – materials should reflect sound theories and well-documented facts;
- Balanced presentation of differing viewpoints and theories – differences of opinion and competing scientific explanations should be presented in a balanced way; and
- Openness to inquiry – materials should encourage students to explore different perspectives and form their own opinions.

The point to providing this background information is to encourage educators (formal or non-formal), to carefully consider the content and nature of programs and materials, to ensure they are technically accurate and balanced in view.

Worksheet 2-E

(Actual worksheet found in *Appendix B*)

❑ Is your program based on sound science, relying on genuine data collected in rigorous ways and without foregone conclusions?

❑ Are your data above reproach in source, collection methods, and interpretation?

❑ How do you teach learners to use data to guide decision-making?

❑ How do you teach learners to select and evaluate information to make decisions?

❑ How do you use your subject matter as a vehicle through which growth and development of the learner occurs?

Best Practice: Effective programs clearly address safety and other regulations, and reduce real risks to everyone involved.

Effective programs are committed to the safety of participants and staff. Each aspect of the program (activities, facilities, related services) is reviewed and concerns addressed. Liability is also a concern that must be addressed. If you are in a large agency or organization, enlist the assistance of risk managers.

It is impossible to cover this huge topic in detail here. What follows is a very brief overview of issues to consider as you implement your program.

Safety

Safety is not optional in outdoor education. It is a must! Safety of participants and staff members is essential. Safety includes obtaining background information about participants, communicating program curriculum with participants, and having skills needed for the given activity. Staff needs to know the safety protocol of the organization and have written emergency plans accessible at all times. Safety includes training, communication, and preparation of all educators.

Just a few safety considerations for boating, fishing, and stewardship education include:

• Selection and inspection of waterfront sites, piers, break walls and docks

• Weather

• Dealing with cold, heat and sun

• Insects and wildlife (including handling fish)

• Safety in and around boats/motors

• Safety around hooks and casting

• Safety around knives

• Safety around streams/rivers (fast currents, slippery rocks, unexpected deep water)

• Safety around the surf (undertows, tides, large waves)

• Safety around lakes (wave conditions, underwater obstructions)

• Safety on ice (thin ice, weak spots, hypothermia, whiteouts)

• Supervision (two-deep instruction) and background checks on volunteers

• Age appropriateness of activity

• Safe transportation to and from activities

Regulations

Fishing and boating have specific regulations that must be met. These vary by jurisdiction, and must be identified, communicated to participants, and followed explicitly.

Liability

A few of the liability issues that need to be addressed include:

• Personal participant liability

• Personnel issues

• Automobile liability

• General liability and director's and officers' liability

• Liability associated with vulnerable volunteers or instructors (some may have mental, physical or emotional impairment making them unable or unlikely to report problems)

• Equipment and materials

• Accounts receivable

If your agency or organization does not have a risk management coordinator, consider hiring one to help you carefully analyze all risks associated with your program.

Worksheet 2-F

(Actual worksheet found in *Appendix B*)

Who assisted you with risk management assessment of your program?

What were/are the greatest areas of risk associated with your program?

How are you addressing these risks?

Best Practice: Effective programs are experiential.

Experiential learning includes four important elements:
• Concrete experience – learner has a real-world experience relevant to learning outcomes.
• Process information – learner thinks about and reflects on what happened.
• Generalize – learners summarize what they've experienced and connect it to real-world examples (they answer the question "so what?").
• Apply – learners apply what was learned to real-world and personally relevant examples (they answer the question "now what?").

There are two basic types of experiential learning. One is education that occurs as a direct participation in the events of life. It doesn't take place as part of a structured course–it occurs through reflection on everyday experiences. This is the way people do most of their learning.

The other type of experiential learning is related to education programs. It describes the sort of learning undertaken by students who are given a chance to acquire and apply knowledge, skills, and feelings in an immediate and relevant setting. Through practice, people actively learn, then share their experiences, reflect on their importance, connect them to real world examples, and apply the resulting knowledge to other situations.

To fully apply experiential learning, educational programs need to be relevant to the learner, be learner-centered and include other principles covered in this chapter.

Best Practice: Effective programs are revelant to the everyday life of the learner.

Making your program relevant to program sponsors and educators was covered earlier in this chapter. This Best Practice focuses on making it relevant to learners. For example, a program on endangered species would be more relevant to students in Florida if the manatee were used as an example,

rather than the Siberian tiger. This is especially true for younger learners. Children develop the ability to think concretely before they can think abstractly.

When programs move beyond what is relevant and meaningful, learners don't have the chance to build their learning on what they already know, and learning becomes too abstract. When boating, fishing, and stewardship education is taught where they live and through real-world situations, learners' own experiences become part of the education.

You also can make programs more relevant to learners by providing enjoyable learning experiences and locations. Many educators realize the value of learners having direct contact with nature. However, not all students have a comfort level with nature that promotes learning, and not all teachers are comfortable teaching outside the classroom. This is particularly true in multi-cultural contexts. One problem is that many teachers and learners don't have these opportunities. Wild places where people can explore are disappearing, and time to visit them is becoming rare, resulting in what has been called the extinction of experience.

Give learners a real-world experience relevant to learning outcomes.

You can prevent this extinction and increase teacher and student comfort levels by reintroducing them to their local area—exploring and experiencing it; learning about it and celebrating it. By doing so, you help learners develop or enhance a sense of wonder and a sense of place, fostering the awareness and appreciation that motivate them to further questioning, better understanding, and appropriate concern and action.

While enjoyable experiences in nature are a great addition to any program, recognize that they are not the only way to add relevance to the educational experience. Learners in an urban, industrial environment, for example, may become interested in the environment through efforts to create a schoolyard pond or wetland.

Worksheet 2-G

(Actual worksheet found in *Appendix B)*

List the target audience(s) for your program.
How is your program relevant to each audience?
How have you given your program a local context?
What real-world problems or issues does your program incorporate?
How does your program facilitate direct contact between learners and the outdoors?

Best Practice: Effective programs empower learners.

Internationally accepted objectives for environmental education (see Tbilisi Declaration in Appendix A) provide learners an opportunity to gain:

- **Awareness** – to acquire an awareness of and sensitivity to the total environment and its associated problems;
- **Knowledge** – to gain a variety of experiences in and acquire a basic understanding of the environment and its associated problems;
- **Attitudes** – to acquire a set of values and feelings of concern for the environment and motivation for actively participating in environmental improvement and protection;
- **Skills** – to acquire the skills for identifying and solving environmental problems; and
- **Participation** – to encourage citizens to use their knowledge to become actively involved at all levels in working toward resolution of environmental problems.

With slight modifications, these objectives can serve as overall guidelines for boating, fishing, and stewardship education as well.

Education is more than just the presentation of information. It helps learners achieve literacy in issues, working toward attitude and behavior changes in addition to knowledge. It seeks to give people the tools they need to weigh various sides of an issue to make informed and responsible decisions and engage in responsible behaviors. It also empowers them to seek out information and be able to participate in activities like fishing and boating on their own. How do you do this?

Teach them how to think

The key to empowering your learners is to teach them how to think not what to think. Rather than directing learners in a specific course of behavior, help them form the capacity to collect and analyze information, make informed decisions, and participate fully in civic life.

This requires more than the awareness and knowledge of boating, fishing, and stewardship processes and systems and positive attitudes toward them. It requires practical knowledge of how to bring about change, and citizen action skills needed to participate fully in civic life. You can help develop these by providing opportunities for learners to define an issue, determine if action is warranted, identify others involved, select appropriate action strategies, create and evaluate an action plan, implement the plan, and evaluate the results. You also can provide opportunities for participants to build skills in oral and written communication, conflict resolution, and leadership, as well as participate in the political or regulatory process, consumer action, and community service.

The key to empowering your learners is to teach them how to think not what to think..

In short, you can empower your learners by leading them from mere awareness of an issue to informed, responsible action.

The commitment and motivation a learner needs to take action often begins with awareness of the immediate surroundings. Educators can help foster learners' curiosity and enthusiasm, and provide continuing opportunities to explore and discover the world around them. As learners develop and apply analysis and action skills, as they make their own decisions and think more critically about their choices, and as they hear stories of success, they learn that what they do individually and in groups can make a difference. This internal locus of control, or sense that they have the ability to influence the outcome of a situation, is important in helping learners develop a sense of empowerment and personal responsibility— key elements in good education.

How educators present material can have a great impact on whether they are just conveying information or changing behavior.

Worksheet 2-H

(Actual worksheet found in *Appendix B)*

What opportunities do you provide for learners to: define an issue; determine if action is warranted; identify others involved in the issues; select appropriate action strategies; create and evaluate an action plan; implement the plan; and evaluate the results? Outline the opportunities for each step.

What parts of your program provide opportunities for your learners to build skills in:

> Oral and written communication?
>
> Decision-making?
>
> Conflict resolution?
>
> Leadership?

More principles and guidelines regarding the learning process are available at:

> • North American Association for Environmental Education (www.naaee.org/npeee/learner_guidelines.php)

Best Practice: Effective programs are learner-centered to provide collaborative learning opportunities and development of critical thinking skills.

Research from various disciplines suggests that education should focus attention on the learners, rather than on teaching, curriculum and instruction, or on the administrative structure of a school or educational program. But to accomplish this, teaching styles, the curriculum, and instruction itself must be focused on the learner (learner-centered).

In order for boating, fishing, and aquatic stewardship education programs to be effective in an educational sense, they must take into account the ways people learn. Understanding how people learn can help you tremendously in your efforts to build effective programs.

Much more than blank slates

For most of this century, educational practices were based on a model of learning that assumes that students are a blank slate on which the knowledge of others is written. Research since the mid-1970s suggests that learning occurs as a result of dynamic interactions between individuals and physical and social environments. Knowledge is actively built by learners based on their actions in the environment.

This development of knowledge is an ongoing process of construction and reorganization by the learner.

The most important factors influencing learning are what the learner already knows and the context in which he obtained that knowledge. Learning occurs when a learner weighs new information against previous understanding, works through any discrepancies caused by the new information, and comes to a new understanding based on the new and the old. Learning can occur only when the new idea or concept can be integrated into the learner's existing conceptual system.

If the learner cannot integrate the new material with previous knowledge, it is either rejected or rote learning occurs. To be most effective, your teaching methods need to be consistent with how students build knowledge, and the context or content must be relevant. Learning can be improved if you build upon your learners' existing knowledge about a subject, rather than assuming they don't have any. That is, don't start from where you think they are, start from where they truly are.

Researchers have described a three-stage process that can be used to achieve conceptual change:

Phase 1. Preparation – learners begin to think about the new concept, discuss their own explanations, and become aware of the limitations of their naïve explanations.

Phase 2. Presentation – teachers explain or provide and interpret experiences with key principles and theories.

Phase 3. Application and integration – learners apply the scientific principles to new concepts and integrate those principles and theories into their personal knowledge.

Ages and Stages

Following is a generalized overview of developmental stages children go through from kindergarten through high school. Children develop at their own pace and all characteristics will not be observed in all children at the same age or at the same stage of development. However, the order of the stages does not change much. It is important to remember, however, that each child is unique.

Kindergarten - 3rd Grade: Five- to nine-year olds are optimistic, eager, and excited about learning. They have short attention spans. Five-year-olds can sit still and listen for 10-15 minutes; nine-year-olds for 20-30 minutes. They still think and learn primarily by experience. Rather than simply giving instructions verbally, demonstrate the activity. They enjoy doing, want to be active, and are always in motion. They are more interested in working on a project than completing it. Children this age need rules to guide their behavior, information to make good choices and decisions, and consistency once the rule is established. Provide small group activities and lots of opportunity for them to be active.

Grades 4-6: This is a period of slowed physical growth when a lot of energy goes into learning. Children 10-12 years old love to learn facts, especially strange ones, and they want to know how things work and what sources of information are available to them. They still think in terms of concrete objects and handle ideas better if they are related to something they can do or experience with their senses. They are beginning to move toward understanding abstract ideas. They still look to adults for approval and need guidance to stay on task and to achieve their best performance.

They often are surprised at what they can accomplish, especially with encouragement from an adult.

Grades 7-9: Youth 13-15 years of age are in a period characterized by much "storm and stress." Although they look older, most remain emotionally and intellectually immature. Young teens move from concrete to more abstract thinking. They can be very self-conscious, and a smaller group usually is less intimidating. Help them get over inferiority complexes by concentrating on developing skills. They are ready for in-depth, longer learning experiences. They can begin to deal with abstractions and the future. Fitting in with friends is a controlling influence.

Grades 10-12: High school students are future-oriented and can engage in abstract thinking. Teenagers continue to be group-oriented, and belonging to the group motivates much of their behavior and actions. They have more time constraints such as work, social ties, or sports interests. They want to help plan their own programs. Involve them in the planning process. Use the discussion method when working with them. Instead of providing detailed instructions for how to put something together, provide suggestions and several alternatives.

Get learners involved

This process encourages programs that are learner–centered and involve active, experiential learning. This type of education is something students do, not something that is done to them. When learning is an active process, new experiences build upon previous experiences in a positive way, and incorporate interaction between the learner and the environment. Educational materials encourage positive attitudes toward learning by being presented in a fun, appealing, engaging, and challenging manner.

Teachers become facilitators, enabling students to use active techniques, such as experimentation and real–world problem solving to create knowledge. The students' newly created knowledge is based on asking questions, exploring, and assessing what they already know.

Inquiry-based learning (using hands–on and minds–on activities) produces high quality learning experiences in both the classroom and field. Understanding the process by which scientific knowledge is acquired is just as important as what is learned. Your program will be most effective if you provide educators with access to current scientific information and technology and equip them to present science in an active learning environment where the learning process becomes more important than memorization of facts and figures.

Encourage educators to create opportunities for authentic learning based on students' interests, needs, and talents. Encourage them to define their students' intelligence broadly, and use all disciplines (including visual arts, music, and dance as well as science and math) to improve students' understanding of the real world.

In formal education, the concept of service learning (students conducting projects that are beneficial to the community and have direct links to the curriculum) gained attention in the late 1990s. In this technique, the first step is for the students to develop decision–making skills by assisting in the decision about what project should be done, and the consequences of each action. If students have a chance to practice the skills that can lead to environmental quality or protection or stewardship, they gain confidence in using those skills in other situations.

The most effective service learning projects for schools are those where students work closely with the community in a way that benefits the community and provides an education and service opportunity for the students, such as storm drain stenciling, flyers about control of exotic species, etc. The school is a place for learning, and when the school reaches out into the community, others learn too.

Worksheet 2-I

(Actual worksheet found in *Appendix B*)

How does your program incorporate collaborative learning and critical thinking skills?

How do you assess your learners' knowledge on your subject areas before instruction?

How have you incorporated active, experiential learning into your program?

Best Practice: Effective programs are designed to match the developmental stages of the learner.

Until about the 1930s, educators thought children learned in the same ways adults learn—that they differed only in the amount of knowledge they had learned. However, research shows that children think and learn differently from adults. As children develop, they reorganize and reconstruct their base of knowledge, replacing one set of assumptions with another.

This implies that children (or adults, for that matter) cannot learn if they cannot understand what they are being asked to learn. Real learning can occur only when the task is useful to the learner and when he/she is psychologically ready. Teaching is the act of creating environments that encourage learners to move from their current stage to the next–providing learning opportunities at a level just above a student's current cognitive level.

You will have greater success if you develop your program to facilitate stage-relevant thinking that allows students to discover for themselves the logical connections between objects or events. You might consider providing learners with choices about what to learn, because they tend to choose learning experiences appropriate for their cognitive levels. It also helps to provide students with many opportunities to explore the natural world and think about it within their various stages of intellectual development.

Worksheet 2-J

(Actual worksheet found in *Appendix B*)

To what age group(s) is your program targeted? How have you customized your program to that age group/developmental stage?

K-3:

4-6:

7-9:

10-12:

Best Practice: Effective programs use multiple teaching methods to accommodate diverse learning styles.

Learning styles

Researchers have described four major learning styles:

- Imaginative learners perceive information concretely and process it reflectively. They learn by listening, sharing ideas, and social interaction.
- Analytic learners perceive information abstractly and process it reflectively. They prefer sequential thinking, need details, and value what experts have to offer.
- Common sense learners perceive information abstractly and process it actively. They are practical and enjoy hands-on learning, looking for immediate use of what is learned.
- Dynamic learners perceive information concretely and process it actively. They learn by trial and error and self-discovery, being excited by anything new.

Not all students learn the same way. Intelligence is not unchanging, but can be learned, taught and developed. The content, teaching methods and assessment you use in your programs should allow students multiple ways of learning. It also allows them multiple ways to demonstrate what they have learned and can do.

Many teaching methods have been used over the years (lecture, panel of experts, brainstorming, videotapes/DVDs, small group discussion, case studies,role playing, guest speaker, cooperative

learning, experiential learning, Internet, among many others).

Each has strengths and appropriate applications. It is important to consider your learner-centered objectives and the ages and stages of your learners to help determine what teaching methods work best under varying conditions.

Researchers evaluating drug, alcohol, and violence prevention programs have documented the effectiveness of some approaches to character education.

Ineffective practices and strategies:
• Lecturing and moralizing.
• Use of charismatic hero figures to lead and inspire.
• Use of authoritarian teachers/leaders.
• Values clarification.

Effective practices and strategies:
• Small groups where learners help set their own as well as the group's agenda.
• Peer guidance and peer counseling approaches.
• Peer group activities involving problem solving and developing group norms and codes of behavior.
• Focusing on behavioral issues of relevance within the cultural context of the learners and their communities.
• Creating positive and mutually respectful learning climates.
• Establishing adults as participant-learners and guides in the ethics education process.

Teachers can be very effective as guides who help learners reflect on their experience, making it more personal and relevant, and ultimately more powerful and long-lasting. Educators are just beginning to understand the value of constructing meanings and interpreting connections for learners. Hands-on teaching techniques have been used in high quality education for decades. Recently, the term has been expanded to "hands-on, minds-on." The change points out that activity for activity's sake is not the goal, but use of active learning for engaging the mind on a task is the desired outcome. Hands-on techniques are particularly important for fishing, boating, and stewardship education.

More and more youth development educators are advocating strong youth-adult partnerships based on experiential learning. Non-formal educators, like those in Cooperative Extension, may be able to do this more easily than formal educators, for they are not burdened by the formal classroom and state-mandated education standards and accountability

measures. However, it is possible to incorporate these shifts into the classroom as well.

Cooperative learning is a teaching strategy that allows learners to work in small groups to explore a new idea, gather and share information, discuss ideas, apply concepts, and solve a problem. It emphasizes equal participation and accountability among members. Learners become actively involved in content, take ownership of their learning, and learn to resolve group conflicts and improve teamwork skills. Success depends on group accountability and individual responsibility. This approach gives learners the opportunity to gain communication skills, leadership skills, and the ability to work with others-all of which are important in helping them achieve life-long behavioral change.

Shifts in Learning

Researchers have identified eight shifts in learning that have been observed in schools across the nation. These eight shifts have resulted in gaps between how educators currently teach and how kids learn best. These eight shifts in interactive learning include:

• From linear to hypermedia learning – Most text books are written to be tackled from beginning to end. Youth today access information more interactively and non-sequentially as they surf channels and multi-task between many different software programs and websites.
• From instruction to construction and discovery – Try designing your curriculum in partnership with learners, or help learners design it themselves. Most people learn best by doing, especially if they can construct new knowledge based on their experience with abstract ideas and concepts.
• From teacher-centered to learner-centered education – Focus on creating the learning environment and providing resources.
• From absorbing material to learning how to learn – This means learning how to synthe size, not just analyze information.

- From schools to lifelong learning – Learning has become a continuous, lifelong process and really just begins after getting a formal degree or certificate.
- From one-size-fits-all to customized learning – Digital media allow individuals to find personal paths to learning based on their backgrounds, talents, and learning styles.
- From learning as tedious to learning as fun – The learner becomes the entertainer and is motivated, feeling responsible for learning.
- From the teacher as transmitter to the teacher as facilitator – Teachers need to act as consultants to teams of youth, facilitating the learning process by helping youth process the experience, as well as participating as a technical consultant on new media.

Worksheet 2-K
(Actual worksheet found in *Appendix B*)

To what age group(s) is your program targeted?

How have you incorporated the four major learning styles into your teaching methods?

What elements of your program incorporate hands-on techniques?

What elements of your program incorporate cooperative learning techniques?

What opportunities have you given your learners to access information interactively?

Where have you made your curriculum a partnership with learners, or helped them design the curriculum themselves?

How have you made your program learner-centered instead of teacher-centered?

In what ways will you be teaching your learners how to learn (that is, how to synthesize, not just assimilate information)?

How have you made use of digital media to allow every individual to find personal paths to learning based on their backgrounds, talents and learning styles?

How have you incorporated fun into your program?

How have you transformed your teachers from transmitters of information to facilitators of the learning process?

> **Best Practice:** Effective programs use an interdisciplinary approach to help learners develop skills, formulate concepts, and examine issues.

Research shows that providing learners an avenue to explore connections between seemingly different topics and disciplines can improve learning. Boating, fishing, and the environment can be excellent forums for integrating various subjects and curricula to enhance the learning experience. Educating learners about boating, fishing, and stewardship of resources requires consideration of interactions of the atmosphere, hydrosphere, lithosphere, and biosphere, with a broad range of positive and negative human activities. Therefore, your education program will, to some degree, have to have an interdisciplinary approach by its very nature.

Boating, fishing and stewardship can be used to enhance social studies, science, math, reading, physical education, art, literature and drug prevention. Outdoor environments and the local community allow students to construct their own learning, guided by educators using proven educational practices.

Research suggests a correlation between programs that use natural environments and interdisciplinary approaches and learner academic performance. Most children are naturally fascinated with natural settings and processes. This content focus in the classroom can improve students' acquisition of basic skills including language arts and math.

An example of how art can be blended with aquatic resources education is the activity "Downeaster Alexa," part of the Earth Systems Education ACES book (Activities for the Changing Earth System, 1993). This activity is named for a popular song by Billy Joel that describes a declining fishery and its impact on the life of a commercial fisherman. The song is the hook that engages interest in the activity, which deals with fisheries issues and development pressures on Long Island Sound. You could probably develop similar activities using "Big Two-Hearted River," "A River Runs Through It," and "Paddle to the Sea," among others.

Whole-school approach

Teachers in formal education settings may work together in the same building for years, but may have only sketchy knowledge of what is going on in each other's classrooms-especially across grade levels. With a whole-school approach, administrators and teachers coordinate a plan of study across disciplines and grade levels. You could create leadership teams of teachers within the school community to serve as liaisons between your agency/organization and the school. The team could serve as the peer trainer and facilitator of the program within the school. It's very helpful if you can establish strong connections with the school administration, who often are responsible for introducing innovations and who must support team teaching initiatives.

Developmental Assets

External Assets

The first 20 developmental assets focus on positive experiences young people receive from the people and institutions in their lives. Four categories of external assets are included in the framework:

Support - Young people need to experience support, care, and love from their families, neighbors, and many others.

They need organizations and institutions that provide positive, supportive environments.

Empowerment - Young people need to be valued by their community and have opportunities to contribute to others. For this to occur, they must be safe and feel secure.

Boundaries and expectations - Young people need to know what is expected of them and whether activities and behaviors are in bounds and out of bounds.

Constructive use of time - Young people need constructive, enriching opportunities for growth through creative activities, youth programs, and quality time at home.

Internal Assets

A community's responsibility for its young people does not end with external assets. There needs to be a similar commitment to nurturing internal qualities that guide choices and create a sense of centeredness, purpose, and focus. Shaping internal dispositions that encourage wise, responsible, and compassionate judgments is particularly important in a society that prizes individualism. Four categories of internal assets are included:

Commitment to learning - Young people need to develop a lifelong commitment to education and learning.

Positive values - Youth need to develop strong values that guide their choices.

Social competencies - Young people need skills and competencies that equip them to make positive choices, to build relationships, and to succeed in life.

Positive identity - Young people need a strong sense of their own power, purpose, worth, and promise.

By considering how your subject matter can be used to help an individual develop these assets, you strengthen your program's overall impact on the individual's ability to participate in fishing, boating, or stewardship practices. For example, learning decision-making skills is essential to becoming a successful angler, boater, or steward of the resource. Decision-making skills learned through these outdoor pursuits can be applied in many other areas of the participant's life.

Worksheet 2-L

(Actual worksheet found in *Appendix B)*

How does your program incorporate subject areas beyond science/ecology?
If you have a formal education program, how have you involved a variety of teachers, subject areas, and grade levels?

Best Practice: Effective programs consider the social context in which the education takes place and provide avenues to enhance social support for the learners.

Research clearly shows that the social context in which education takes place is at least as important as the methods used to teach the concepts. In fact, the influence of the community within which the behavior will occur may be the strongest force acting on the behavior, regardless of instruction or other treatment. If you do not incorporate the community and cultural context of your learners into your program, it is likely to remain abstract and outside their scope of experience.

Research also indicates that parental and community involvement improves student learning in formal education (schools). Whether your program is formal or non-formal, stakeholders and community groups are critical to help move learners past a mere understanding of concepts—to get them to change attitudes and cultural norms in the community.

Belonging to and identifying with a group or community is important for personal development—especially ethics and values. Community can include family, school, ethnic community, and groups such as 4-H or scouts. Family, peers, and others in the community transmit their attitudes, beliefs, and values to your learners. Group members can positively influence and actually initiate your learners into activities like fishing and boating, and can encourage or discourage stewardship behaviors associated with those activities.

This suggests that, to be most effective, boating, fishing, and stewardship education programs should incorporate relevant issues and active learning, and emphasize peer activities. Mentoring, clubs, and family programs implemented over the long term may build the kinds of communities that facilitate education. Therefore, programs will be most effective in reaching behavioral goals if they are designed to incorporate parents, family, and neighborhood as part of the learning community.

Worksheet 2-M

(Actual worksheet found in *Appendix B*)

What communities or groups do learners belong to?
What are the primary social influences on learners?
How can you enlist these influential groups to help?
How have you incorporated small group activities into your program?
How have you incorporated peer activities into your program?
How have you incorporated action learning into your program?

Best Practice: Effective programs identify and target one or more outcomes or skills, beyond the subject matter, that are broadly useful to the participant.

By providing outcomes or skills beyond the subject matter, you provide skills for participants to develop and learn. These outcomes or skills may come from any source, such as life skills, workforce competencies, or internal assets. Life skills can be particularly important when working with youth who may not yet have developed them. Researchers agree that development of life skills such as goal-setting, decision-making, and problem solving is just as important as the acquisition of subject matter knowledge.

Over the last two decades the phrase "positive youth development" has become ingrained in the language of research and practice. One of the major forces in this movement was the work done by the Search Institute on developmental assets. At the heart of this work is the framework of 40 developmental assets—positive experiences, relationships, and opportunities that young people need to grow up healthy, caring, and responsible. The more assets a young person has, the more likely he/she will make healthy choices and avoid high-risk behaviors.

Worksheet 2-N

(Actual worksheet found in *Appendix B*)

Make a list of lessons within your program and how they include or how they can be modified to include the building of assets or life-skills.

Best Practice: Effective programs inventory and utilize a variety of educational resources and environments.

By inventorying resources in your area, including community resources (such as speakers and offices), and lab and field sites (such as hatcheries, marinas, ponds and lakes), you can more effectively utilize these resources to enhance your program.

Field studies make your program more meaningful and relevant to learners. Schools that use their own outdoor areas or visit parks and zoos report gains in learning. These gains are more permanent if out-of-class activities occur often and spontaneously, if specific tasks in the field are pre-assigned, or if the experience is designed to feed back into ongoing school programs.

Studies suggest that environmental sensitivity is developed through significant, positive contact with the outdoors over a long period of time. By inventorying resources in your area and making program partners/implementers aware of them, they are more likely to take advantage of them.

By making a speakers list or using positive role models as assistants, etc., you provide opportunities for diverse role models and diverse experiences.

Worksheet 2-O

(Actual worksheet found in *Appendix B*)

How does your program incorporate outdoor experiences?
List the locations/facilities you will use to conduct your program.
List community contacts who will help you deliver your program.
List specific activities you will conduct in the field and/or incorporate into later classroom activities.

Chapter 3
Well-Trained Instructors

Programs can expand their capabilities by reaching out to partners and training teachers and other instructors. High quality professional development of instructors goes hand in hand with high quality curriculum materials. One without the other will more than likely lead to failure. The content, scope, and level of instruction may be (and probably should be) different for formal educators (school teachers) than for non-formal educators (agency, staff, volunteers, etc.), but the Best Practices identified in this chapter are concerned with the process of professional development/training, which should be similar for both.

Teacher or instructor preparation and training is critical to assure the accurate and consistent use of curriculum materials. Program evaluations document that curriculum materials go unused unless supported with detailed in-service training and implementation support for users. Simply distributing free materials will not result in their use.

Without training in the use of curriculum materials or recommended teaching strategies, educators may not be able to achieve many of the goals or objectives you have set for your program. Effective training also reduces the possibility of teachers unintentionally misleading learners. Wherever possible, evaluate trainers in the field to ensure they are presenting the material as you intended.

Unfortunately, opportunities for educator preparation in boating, fishing, and stewardship education are limited. Most teachers have no formal training in fishing, boating, and stewardship education, and non–formal educators may have no training in teaching at all. All educators need professional development programs that focus on education processes and teaching methods, in addition to content. There are many ways you might prepare educators, including workshops, in-service training, mentoring, and other forms of professional development.

Lack of educator training is a common cause of program failure. Researchers urge the boating, fishing, and stewardship community to adopt extensive instructor training as a cornerstone of

Table 3: Best Practices for Professional Development

Planning

Effective Programs:

- Establish goals and objectives for training.
- Involve partners in educating/reaching a broader audience.
- Provide several layers of training.

Selection

Effective Programs:

- Recruit instructors with experience and knowledge in appropriate subject areas.
- Screen instructors.
- Inform potential teachers, instructors and volunteers of what will be expected of them prior to training.

Professional Development Workshops/Sessions

Effective Programs:

- Train instructors in education theory and models of good instructional practices.
- Model effective teaching methods during training.
- Incorporate social support into training.
- Discuss settings for instruction so instructors understand the importance of a safe and appropriate learning environment both indoors and outside.

Evaluation

Effective Programs:

- Provide appropriate models of and approaches to program evaluation.
- Include formative, summative, and long-term evaluation of the trainer, the program, and the trainee.

educational programs. The importance of the people who deliver your programs cannot be overestimated.

Table 3 contains currently recognized Best Practices for professional development. Following the table, each is explained, and worksheets throughout the chapter help you apply each practice to your own situation.

Planning

> **Best Practice:** Effective programs establish goals and objectives for training.

What training do you currently provide? What do you want to accomplish with it? Effective programs establish clear goals and objectives for training just like they do for the program in general. Without goals and objectives you won't be able to evaluate whether or not your training activities have any impact on instructors and their ability to deliver your program.

Worksheet 3-A
(Actual worksheet found in *Appendix B)*

List goal(s) for your instructor training.
List specific objectives for your instructor training.
For each objective, list how you assess whether it is achieved or not.

> **Best Practice:** Effective programs involve partners in educating/reaching a broader audience.

Agencies and organizations that rely solely on their staff for instruction limit the scope and potential of their educational programs. Involve staff in the development of partnerships with schools, communities, youth organizations and others, and then train teachers or volunteers to work with these groups to expand the number and diversity of individuals you can eventually reach. The cornerstone of successful partnership programs is professional development of teachers/volunteers

(addressed below) and the cornerstone of professional development is recruitment of qualified and motivated staff. It all works together.

Partnerships are good, but recognize that too much of a good thing can be detrimental. That is, evaluate each potential partnership for how it can benefit your program and the partner. Don't feel obligated to enter into partnerships just because someone makes an offer. Use the worksheet to help determine if the partnership is worthwhile.

Worksheet 3-B
(Actual worksheet found in *Appendix B)*

List partner organizations you work with to increase your instruction capabilities.
For each, how does the partnership benefit your program?
What must you do to maintain the partnership? (What will it cost to keep the partner happy?)
How might the partnership be improved?
List other organizations that might be willing to partner with you.
How might you pursue these new organizations?

> **Best Practice:** Effective programs provide several layers of training.

Training includes basic orientation and exposure to program materials, processes, and mechanics, as well as additional training where instructors can receive in-depth exposure to specific program elements or new curriculum areas.

Effective programs encourage, facilitate, and support opportunities for continuing education. This includes opportunities to review and help update program materials and training procedures.

Consider when thinking about layers of training:

- Include basic and in-depth training modules and avoid brief, one-shot training sessions.
- Offer tiers of training to provide continuing education, gradually increasing learner knowledge and competency over time.
- Provide opportunities for learning to continue over an extended period (e.g., through innovative use of the Internet, list-serves, newsletters, and networking).
- Provide ways to update existing information and

disseminate it to educators and administrators.
- Inspire active, ongoing, lifelong learning by educators/instructors.
- Use experienced instructors and staff as mentors.

Worksheet 3-C

(Actual worksheet found in *Appendix B)*

List the kinds of training you currently provide your instructors (include workshops, newsletters, social events, updates, etc.).
Do these provide different layers of training (basic, in-depth, new areas, etc.)?
List additional levels of training that would help increase instructor effectiveness.

Instructor Selection

The following Best Practices refer to instructors who help deliver your programs, but who are not part of your staff.

Best Practice: Effective programs recruit instructors with experience and knowledge in appropriate subject areas.

You can train an instructor to deliver a simple introductory program to others. However, when you get beyond introductory programs, it's difficult to provide novice individuals the level of training they need to be effective. Recruit instructors with base experience and knowledge, then build on that. This results in more effective instructors and better implementation of your program, with less training time.

Worksheet 3-D

(Actual worksheet found in *Appendix B)*

Identify potential instructors, teachers, volunteers, or others who have experience in:
Stewardship
Boating
Fishing
Natural Resource Management (fish management, aquatic ecology, etc.)
Teaching

Best Practice: Effective programs screen instructors.

Instructors who conduct your programs reflect on you, your program, and your organization. A teacher's knowledge, demeanor, ethics, and background can affect the credibility and even the existence of your program. You are not obligated to use an individual just because he volunteers to be an instructor. Develop guidelines for your program that address the types of instructors you want conducting your programs.

Actively recruit from trusted pools of people to improve your success at finding good instructors. For example, you might recruit from natural resources agencies/organizations (e.g., naturalists, biologists), reputable youth organizations (scouts, 4-H), teachers, etc.

After you identify potential instructors, criminal background checks are recommended where legal. This is particularly important when a volunteer will be working one-on-one with youth. Background checks are handled differently within each jurisdiction. Be sure to determine the laws, policies, and procedures used to conduct background checks on volunteers in your jurisdiction.

Whether or not you can do a criminal background check, it is important to interview instructors for potential motivations, commitment, ethical behavior, knowledge, and the ability to work with diverse groups. See *Figure 2* for a sample volunteer screening form.

Best Practice: Effective programs inform potential teachers, instructors, and volunteers of what will be expected of them prior to training.

You don't want to spend a lot of money training individuals who never use the training, and you don't want people leaving your training feeling they wasted their time. Avoid this by letting them know in pre-training advertisements, mailings, and/or conversations, what you expect from participants, and what outcomes you want to accomplish. For example, you may expect them to:
- Conduct programs after the training to... (this list might include such things as enhance stewardship

Figure 2. Sample Volunteer Application

Name/Contact information: _____ **Date of birth:** _____

Optional information: ❑ Female ❑ Male ❑ Asian Amer. ❑ African Amer. ❑ Caucasian ❑ Hispanic
❑ Native Amer. ❑ Other

Volunteer Level(Mark one)
❑ Sponsor (no training) ❑ Helper (1-2 hr training) ❑ Instructor (6-12 hr training):

Affiliation/Organization:_____
Position within affil/org.:_____ Staff _____ Volunteer _____ Other _____
I would like to work with groups (mark all that apply):
❑ through my affiliation ❑ general audiences ❑ on specific programs

Availability: Check all that apply
❑ Jan ❑ Feb ❑ Mar ❑ Apr ❑ May ❑ Jun ❑ Jul ❑ Aug ❑ Sep ❑ Oct ❑ Nov ❑ Dec
❑ Weekdays ❑ Weekends
❑ Morning ❑ Afternoon ❑ Evening ❑ Other

Skills/Interests: Check all that apply
❑ Art/Display construction   ❑ Writing   ❑ Equipment/Material development
❑ Donation coordinator/Solicitation ❑ Aquatic ecology   ❑ Photography
❑ Environmental issues   ❑ Marketing/Advertising   ❑ Fish recipes
❑ Fishing(type):   ❑ Plant/Animal identification ❑ Water quality
❑ Fish management   ❑ Education   ❑ Other:

Work Preference: Check all that apply
❑ Ages 7-14 ❑ Ages 15-19 ❑ Adults ❑ All

Experience working with: *Check all that apply, list position and year*
❑ Youth ❑ Persons with disabilities (__Hearing __Physical __Visual __Mental)

Volunteer *instructor* applicants only:
Mark appropriate boxes:
Yes❑ No❑ Have you ever been convicted of a criminal offense?
If yes, include mo/day/yr and explanation: _____
_____

Yes❑ No❑ Have you ever been arrested for the use or sale of drugs?
Yes❑ No❑ Have you ever been arrested or convicted of child neglect or abuse?
Yes❑ No❑ Has your driver's license been suspended or revoked within the past 3 years?

References: List two persons, not related to you, who have definite knowledge of your qualifications.
Include complete addresses.

Name: _____ Email: _____
Address: _____ Phone: _____
Name: _____ Email: _____
Address: _____ Phone: _____

I, the undersigned, understand that:
a. The information that I have provided may be verified by contacting persons or organizations named in this application and I hereby release and agree to hold harmless from liability any person or organization that provides information concerning me to the _____ Department of Natural Resources.
b. In signing this application, I swear or affirm that the information that I have given herein is true and correct, and understand any purposeful misrepresentation of facts shall be cause for non-acceptance as a program volunteer.

Applicant Signature:_____ Date_____

Information asked for in this application will be used solely to determine the appropriate placement of you as a volunteer. It is understood that no discrimination is implied and the application will be handled in a confidential manner.

(Sample Screening Form provided courtesy of the Minnesota DNR MinnAqua Program)

Figure 3.   Fish Iowa! Mentor Workshop Application for Participation

Name and full contact information:

Place an "x" on the line next to each statement below to indicate your agreement.

___I will attend the Fish Iowa! Mentor Training Workshop on (date).

___Upon completion of the training session I will assist another mentor with a session or workshop and conduct at least one session or workshop on my own prior to (date).

___I have enclosed a $25 check payable to "DNR" as a deposit to reserve my space. (Note: This check will be returned at the workshop.)

I understand that I (or my agency) will be paid a stipend of $150 to complete the mentor training and will be reimbursed for mileage to the workshop up to $75.00. The Department of Natural Resources will provide meals during the workshop and free lodging will be available at the Conservation Education Center on (date).

Signature of Applicant:_____

(Sample Instructor Commitment Form courtesy of Iowa Department of Natural Resources)

of aquatic resources, enhance families fishing together, enhance youth development skills through fishing/boating/stewardship activities, etc.).

- Teach a minimum number of classes/hours.
- Submit reports (after classes, quarterly, etc).
- Attend additional training (annually/semi–annually, etc).
- Be a positive role model.

Some organizations, particularly those that conduct extensive trainings, have participants sign a commitment form or a job description (see *Figure 3*).

Professional Development Sessions/Workshops

Best Practice: Effective programs train instructors/educators on educational theory and models of good instructional practices.

Many non–formal educators have no formal training in teaching and many formal educators have no training in environmental or outdoor education. It is critical to design training programs to reflect participant needs.

Effective programs are built on sound instructional models that recognize the diversity in any group of learners. They utilize multiple methods of presenting information and incorporate active learning opportunities.

Educational theory and sound instructional practices include making information relevant to the learner, empowering learners, learner-centered approaches, accommodating diverse learning styles, using a variety of teaching methods, understanding developmental stages, and more. These subjects are covered in *Chapter 2*.

For formal and non–formal educators alike, professional development programs should focus on education processes and teaching methods, in addition to content.

Worksheet 3-E
(Actual worksheet found in *Appendix B*)

List instructors who do not have any training in educational theory.

List instructors who do not have any training in boating, fishing, or stewardship education.

How can you provide the appropriate training to them?

Best Practice: Effective programs model effective teaching methods during training.

Trainers at professional development workshops must model effective teaching methods throughout the training session. High quality training must:

- Immerse participants in inquiry, questioning, and experimentation.
- Focus on process instead of content. An inordinate focus on science content only reinforces the inadequacy many instructors feel about their own science knowledge. When the focus is on process, instructors' hesitation to teach science is greatly diminished.
- Engage instructors in concrete teaching tasks based on experiences with students.
- Show instructors how boating, fishing, and stewardship education can be connected to specific standards for student performance or organizational goals (e.g., when working with school, 4-H, or drug prevention instructors, show how boating, fishing, and stewardship education can be used to enhance development skills).
- Be connected to other aspects of school/ organizational change.
- Use attractive and appropriate training materials. Good training starts with good materials. Instructors are more likely to use materials if they are attractive, engaging, and easy to use.
- Provide hands-on exposure to materials to be used in the classroom. Give teachers opportunities to engage in boating, fishing, and stewardship projects, even if on a simplified basis. When teachers engage in projects themselves, they become more fully aware of project requirements, components, procedures, difficulties, and associated evaluation and grading procedures.

Worksheet 3-F
(Actual worksheet found in *Appendix B*)

List the topics to be covered in your training sessions.

For each topic, identify the method to be used in the training.

For each method, identify whether it is instructor-centered or participant-centered (strive for more participant-centered activities so you model the way you expect them to teach).

List ways you emphasize process over content.

Create a brief agenda that shows what you will cover in your training.

Best Practice: Effective programs incorporate social support into training.

Three levels of social support need to be addressed. Two apply to instructors/teachers. If they feel isolated, it is harder for them to stay motivated. The first is the need for social support by the training organization. This could be in the form of site visits to end users after training sessions, and communication through emails, phone conversations, and newsletters—all of which are designed to maintain contact and provide support during their initial trial and improvement efforts.

The second level is for social support among instructors after the training. This type of social support can be advanced by:

- Incorporating peer teaching experiences.
- Providing ice breakers to encourage relationship development.
- Putting participants into teams during training exercises, providing opportunities for peer discussion, and then review during implementation planning.
- Providing opportunities to socialize.
- Requesting that participants come to training in teams, so they leave with "built-in" partners.
- Sharing names and emails of those attending the training and/or those who are conducting similar programs.

Social support among instructors also can be advanced through instructor recognition efforts. Most volunteers are motivated by a need to contribute. Certificates, award banquets, or other recognition may help keep them motivated and involved. Consider what motivations will best meet the needs of your volunteers.

Social support is an extremely important process to help individuals see themselves as anglers, boaters, or stewards of aquatic resources.

These first two dimensions of social support can overlap, such as when a training organization invites teachers and instructors to follow-up sessions intending to provide both work-related and interpersonal interaction and support opportunities.

The third level of social support is for end users. Social support is an extremely important process to help individuals develop to the point where they see themselves as anglers, boaters, or stewards of aquatic resources. Give your instructors examples of how they can incorporate social support into their programs/classes, such as involving family members in the program, developing an after-school club for youth, making adult participants aware of clubs or organizations they can join, or incorporating positive role models.

Worksheet 3-G

(Actual worksheet found in *Appendix B*)

How do you provide social support for your instructors?
List your instructor recognition efforts.
List the opportunities for end user social support.
What type of social support do you require your teachers to incorporate into their teaching?
Are there other ways you could provide support? (Ask instructors!)

Best Practice: Effective programs discuss settings for instruction so that instructors understand the importance of a safe and appropriate learning environment both indoors and outside.

Effective teaching programs identify, create, and use diverse settings appropriate to different subject matter and available resources (e.g., schoolyard, laboratory, swimming pool, stream/lake/pond, community, museums/aquariums, demonstration sites). Hold your training sessions in appropriate, engaging locations to make the instruction more effective and to model this behavior for your participants.

Environmental sensitivity is developed through positive contact with the outdoors over a long time. Direct experience with nature makes the learning process faster, what is learned is retained longer, and there is a greater appreciation for those things that are learned firsthand. Effective programs get instructors/teachers outdoors during training sessions whenever possible. Demonstrate a concern for learner safety in designing, planning, and implementing instruction, especially hands-on experiences that take place outside the classroom. Review safety guidelines for a variety of activities. Discuss liability issues instructors may encounter and how to minimize risks (See *Chapter 2* for more about safety).

Worksheet 3-H

(Actual worksheet found in *Appendix B*)

List learning settings where you conduct instructor training.
List other settings that would be appropriate.
What are the barriers to using these settings?
What steps are necessary to make use of these settings?
List areas of your teacher instruction where you stress the importance of providing hands-on teaching methods in a variety of settings, particularly outdoors.
How do you address safety/liability issues? Do you model use of appropriate safety measures? Do instructors understand their liability?

Evaluation

> **Best Practice:** Effective programs provide appropriate models of and approaches to program evaluation.

Instructors and educators in effective training programs possess the knowledge, abilities, and commitment to assess and evaluate their programs. Provide them tools for assessing learner progress and evaluating the effectiveness of their instruction and other features of the program.

All instructors that you train, whether on your staff or not, reflect on your program and organization, so it is necessary to evaluate and supervise your instructors.

Help instructors understand the importance of tying assessment to learning:

• State expected learner outcomes that are tied to the goals and objectives of the program.

• Identify national, state, and local standards that apply to stated learner outcomes and link assessment of fishing, boating, and stewardship education to these.

• Describe and use means for engaging learners in setting their own expectations for achievement. Discuss the importance of these abilities on learner-centered education and lifelong learning.

Familiarize instructors with ways to incorporate assessment into their programs:

• Make objectives and other expectations clear to students at the outset of instruction.

• Provide examples of and implement specific performance-based assessment such as open-ended questions, oral reports, group and independent research, other types of actual performance-oriented tasks, appropriate projects, and portfolios (collections of a variety of work products).

• Identify and use techniques that assess learners' baseline understandings and skills at the beginning of lessons, units, and other segments of instruction.

• Develop formative and summative assessment tools appropriate to specific instructional segments or projects.

• Discuss the importance of and identify techniques for encouraging learners to assess their own and others' work. Use these assessments to improve their learning experiences.

• Discuss how to organize, interpret, and use the results of differing kinds of assessment to help modify and improve future instruction.

Worksheet 3-I

(Actual worksheet found in *Appendix B*)

How do you ensure that instructors understand the importance of tying assessment to learning?
How do your instructors incorporate assessment into their programs?

> **Best Practice:** Effective programs include formative, summative, and long-term evaluation of the trainer, the program, and the trainee.

One of the most neglected components of education programs is evaluation. Many evaluation efforts rarely report more than program outputs such as the number of participants, participant satisfaction, or information exposure. Conversely, effective programs engage in evaluation of all aspects of the program. Evaluation is seen as a permanent, ongoing part of the education process.

Evaluation of the trainer

It is important that quality be reflected from the start. If your agency/organization trainers are not effective, it will trickle down and decrease the quality of the overall program. Have all training instructors be evaluated by their peers and by teachers/instructors attending the workshops.

Evaluation of the trainee

All instructors that you train, whether on your staff or not, reflect on your program and organization. An instructor's knowledge, demeanor, ethics, and background can affect the credibility of any project, and it is necessary to evaluate and supervise your instructors after they are enlisted and trained.

Even if you have effective training, you may occasionally have an educator or instructor who wanders astray. He or she may utilize other materials or examples that are incorrect or mislead an audience.

During a course given by one of the teacher/instructors, an agency instructor should observe the training and do a subjective evaluation of the instructor's ability to teach effectively. Some points to consider are:

- Did she understand the material well enough to teach it?
- Did he deviate unnecessarily from the lesson plan?
- Was she able to handle questions or communicate effectively?
- Did he stay on time?
- Were there credibility issues, egocentric behaviors, or other characteristics that would detract from the class, the program, the individuals involved, or the agency?

Ask students to fill out a course evaluation at the end of the course. If the student evaluations indicate problems, the agency trainer should discuss these with the instructor.

Evaluation of the program

You'll receive some evaluation from your instructors using the previous Best Practice, but an in-depth evaluation is important. Please refer to *Chapter 4* for details on how to evaluate your program.

Chapter 4
How Do You Know If It's Working? Evaluation!

Probably the most neglected component of all educational programs is evaluation. Far too often programs are based, not on research evidence supporting their effectiveness or on accepted education theory, but only on what another program or agency is doing. And most evaluation efforts rarely report more than simple program outputs such as the number of participants at an event, participant satisfaction, and cost of delivery. What do these simple outputs tell you about how well you are educating your audiences? If you are asked what kind of impact your program is having on the knowledge, attitudes, or behaviors of your audience, how will you answer?

The rarity of formal evaluations of the short– and long-term impacts of education programs is somewhat puzzling, given what evaluation has to offer. Programs that implement formal evaluation are successful (or on their way to success), because the evaluation process shows you what works and what doesn't. By building on what works and changing or removing what doesn't, you continually work toward and/or achieve your program goals and objectives.

Evaluation has an added benefit (as if more benefit were needed) in this day of accountability, as it provides tangible evidence that your education efforts are based on sound educational theory and are accomplishing agency/organizational goals and objectives.

Table 4 contains currently recognized Best Practices for program evaluation. These practices are based on the best research and experience currently available. Following the table, each Best Practice from the list is explained, and worksheets throughout the chapter help you apply each practice to your own particular situation.

More on Evaluation

More information regarding program evaluation can be found at the American Evaluation Association Web site: www.eval.org.

> **Best Practice:** Effective program evaluation is based on program goals and objectives.

Table 4: Best Practices for Program Evaluation

Effective program evaluation:

- Is based on program goals and objectives.
- Is a systematic and ongoing process that begins when a program is being planned and carries through implementation.
- Receives administrative and financial support.
- Is used as a learning tool to support program reflection, decision-making, and improvement.
- Helps identify program outputs, such as number of participants and participant feedback.
- Explores and investigates the program's short-term learning outcomes.
- Explores and investigates the program's long-term benefits and impacts.
- Encourages the use of multiple and varied assessment methods.
- Uses national criteria to select, develop, and/or revise curriculum materials.
- Allows program staff to take advantage of professional development opportunities relating to evaluation.

Perhaps including this as a Best Practice is overstating the obvious, but everything else in this chapter is based to some degree on this simple assumption: In order to evaluate your program, you must have some standard(s) to evaluate it against. Your program goals and objectives are those standards.

Many education programs are conducted because they sound good or because they work well for someone else, without any consideration of their contribution to the agency's or organization's mission, goals, or objectives, or the needs of the target audience. If asked whether such a program was working or not, an educator would simply be giving an opinion based on some set of unspecified standards—a gut feeling. The whole purpose of program evaluation is to put aside gut feelings and get down to what really works (and does not work) to help you meet your goals and objectives.

What if you've been ordered to conduct a certain program that does not contribute to your organization's mission? Armed with the information in this chapter, you can at least demonstrate to the "powers that be" that evaluation is considered a critical component of effective programs and that evaluation is impossible without carefully articulated goals and objectives (for more information on setting goals and objectives, see *Chapter 1*).

Worksheet 4-A
(Actual worksheet found in Appendix B)

What is(are) the goal(s) of your program (immediate and long-term)?

What are the specific, measurable objectives of your program (immediate and long-term)?

How will you measure each objective?

How will you determine whether you have met your objectives and achieved your goals (specific behaviors, knowledge base, indicators of success)?

Best Practice: Effective program evaluation is a systematic and ongoing process that begins when a program is being planned and carries through implementation.

Many people are not aware that, to be most effective, evaluation must begin before a program is implemented. This is called formative evaluation (that is, evaluation conducted during formation of the program). Far

too often, program coordinators only think about evaluation in terms of an after-the-fact judgment as to whether desired outcomes were achieved. This kind of summative evaluation (evaluation conducted as a sort of summary of the program) is critical, but incomplete. A systematic evaluation process can help you build your program correctly, adjust it over time, and ultimately achieve the results you are looking for more effectively and efficiently.

The first step is to evaluate whether the program is even needed. *Chapter 1* discusses program planning in detail, and the following discussion assumes you have already determined that the program is needed, and have developed a program logic model for it. Your model should be similar to (or have similar factors as) the conceptual model shown in *Figure 4*.

Your program logic model is an excellent tool for formative evaluation, because it forces you to quantify all the steps required for delivery of your program. Putting all the steps on paper can help point out where your program may need some adjustment.

Other tools or methods you can use to collect information as the program is being developed include comment or feedback forms, observations, interviews, focus groups, and surveys. These often are collectively called a program needs assessment. Use these with administrators, teachers, students, colleagues, or other stakeholders.

If you are not the only one who will be delivering your program, consider conducting focus groups and surveys of your teachers or instructors.

For example, you may conduct surveys or focus groups to ask:

1. Do you currently teach [topic of interest]?
2. Why or why not?
3. If yes, what resources do you use/need?
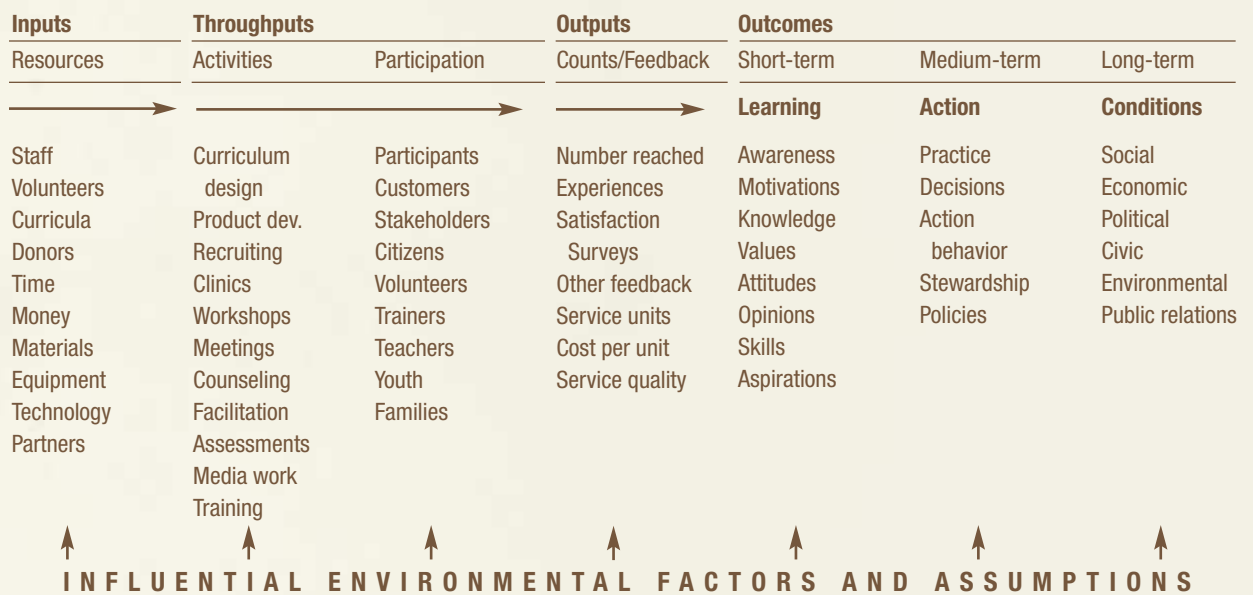4. If not, would you teach it if you had appropriate resources?

Worksheet 4-B
(Actual worksheet found in *Appendix B*)

List the ways that you evaluate your program:
   During the planning stage.
   During implementation.
   Upon completion.

Figure 4. Conceptual Logic Model for Program Development and Evaluation

Inputs	Throughputs		Outputs	Outcomes		
Resources	Activities	Participation	Counts/Feedback	Short-term	Medium-term	Long-term
				Learning	**Action**	**Conditions**
Staff	Curriculum	Participants	Number reached	Awareness	Practice	Social
Volunteers	design	Customers	Experiences	Motivations	Decisions	Economic
Curricula	Product dev.	Stakeholders	Satisfaction	Knowledge	Action	Political
Donors	Recruiting	Citizens	Surveys	Values	behavior	Civic
Time	Clinics	Volunteers	Other feedback	Attitudes	Stewardship	Environmental
Money	Workshops	Trainers	Service units	Opinions	Policies	Public relations
Materials	Meetings	Teachers	Cost per unit	Skills		
Equipment	Counseling	Youth	Service quality	Aspirations		
Technology	Facilitation	Families				
Partners	Assessments					
	Media work					
	Training					

INFLUENTIAL ENVIRONMENTAL FACTORS AND ASSUMPTIONS

Best Practice: Effective program evaluation receives administrative and financial support.

It is a common misconception that program evaluation is or should only be a periodic event. This reasoning suggests that educators should continue a given program as-is for a number of years, and then every once in awhile evaluate it to make sure it is on track. Unfortunately, the real world is not nearly so simple. Nearly all aspects of boating, fishing, and stewardship education programs are in a continual state of flux—educational theory, target audiences, social norms, and environmental conditions. Even the agencies and organizations implementing the programs are growing and changing. Evaluation is most effective—and offers the most benefits—when it is built into the program.

Making evaluation a permanent and integral part of your education program requires support at every level. Use the following points to help build, enhance, or maintain this support within your agency or organization.

Permanent, integral evaluation is:
- The only real measure of program effectiveness.
- The only way to be certain that a program is meeting agency goals and objectives and the needs of target audiences.

- The primary way you can demonstrate the value of the program to those to whom you are accountable.
- A learning tool that allows your program to adjust to changes and maintain effectiveness in the ever-changing world.
- A nationally accepted Best Practice for boating, fishing, and stewardship education programs. (It is a hallmark of "best" programs.)

Your agency or organization may not have the internal budget to fund full program evaluation. However, partners and outside funding sources can help, and indeed, often require evaluation of the projects they fund. Whenever possible, include evaluation components in your outside grant/funding proposals.

Faculty and graduate students at universities can be another source of evaluation for your program. They may be able to provide considerable assistance at low or no cost.

Worksheet 4-C
(Actual worksheet found in *Appendix B*)

Is evaluation included in your program every year?

Do you include funding for evaluation in your annual program budget?

What administrative support do you have for your program?

Do program administrators actively support and encourage the inclusion of and proper budgeting for evaluation in funding proposals you submit?

List the program partners (such as university faculty and graduate students) who might assist with evaluation.

Where is administrative support lacking?

How might you address this lack of support?

> **Best Practice:** Effective program evaluation is used as a learning tool to support program reflection, decision-making, and improvement.

When evaluation is an integral part of your program, it becomes a powerful learning tool that helps you make the program more effective. Imagine the value of receiving specific feedback on your program while it is ongoing as well as at the end of a cycle. You could make changes or adjustments to improve learning and better serve your constituents. You could make curriculum choices and other program decisions based on data, not on opinion. You could continually maximize your program's effectiveness at helping you achieve your organization's goals and objectives.

Here is another place where your program logic model can be helpful. Refer to the model as you proceed through the various steps and phases of your program. Use it to match and align program inputs (e.g., materials, resources) and processes (e.g., activities, services) with the outcomes you expect.

If your program or event is heavy on facts, your participants might come out of it with the short–term outcome of learning, whereas your goal may be action. In this case, you could revise your program to include more hands-on, skill–building, real–world examples that better prepare your students for taking appropriate actions upon completion of the program.

Worksheet 4-D
(Actual worksheet found in *Appendix B*)

What information do you collect through evaluation that can help you in the program decision-making process?

How do you incorporate evaluation results into decisions about your program?

How often do you use evaluation results to guide decisions about your program materials? Delivery system? Other?

> **Best Practice:** Effective program evaluation helps identify program outputs, such as number of participants and participant feedback.

A fault of some programs is that they collect information on program outputs (number of participants, participant feedback, cost per participant, etc.) as their only form of evaluation, neglecting to consider the outcomes, such as knowledge, attitudes, and behaviors. While collection of outputs alone is not sufficient, that is not to say that these measurements are not useful—they certainly are. In fact, in some situations, they can be of primary importance. For instance, if you plan a workshop or event for 50 people and only two show up (or if 300 show up), that alone is a very strong indicator that you need to work on matching your resources with the demand for your program. Likewise, a participant evaluation form distributed at the end of an event can give you a lot of good insight into how well your program met the immediate needs of the audience. This kind of output information is easy and inexpensive to collect, and it is an important piece of the evaluation puzzle.

Worksheet 4-E
(Actual worksheet found in *Appendix B*)

Activity/event:

Date:

Location:

Number of participants:

Cost of event:

Cost per participant:

Participant satisfaction exit surveys:

List other program outputs you collect:

Figure 5. Pre- and Post-Program Surveys

Pre-program Survey

1. Who brought you to this program? Please give relationship, not name (friend, mother, teacher, by self, etc.):

2. Have you ever fly-fished before?
   ❏ No - skip to Question 5.   ❏ Yes - go to Question 2 below.

3. How many years have you fly-fished?
   ❏ Less than 1year   ❏ 1- 2 years   ❏ 3 years or more

4. Who taught you to fly-fish? (friend, relative, learned yourself, etc.):

5. What are two of your other favorite hobbies or sports?

6. Did you know that there were fishing opportunities near your home?
   ❏ No   ❏ Yes

7. Had you heard of Trout Unlimited prior to this program?
   ❏ No - skip to Question 9.   ❏ Yes - go to Question 8 below.

8. Are you a Trout Unlimited member?
   ❏ No   ❏ Yes

9. If you can, name 2 threats to trout habitat.

10. If you can, name 2 actions you or your family can take to help trout.

11. Have you ever done any of the actions you listed in Question 10?
    ❏ No   ❏ Yes - If "Yes", which actions?

12. Have you ever done an environmental project before?
    ❏ No   ❏ Yes

13. Name two older people who are important influences in your life.
    Please give relationship,not name (coach, grandmother, teacher, etc).

Name_____ Relationship_____

Name_____ Relationship_____

Post-program Survey

1. Do you think that you are going to fly-fish again?
   ❏ No   ❏ Yes

2. Are you going to join Trout Unlimited?
   ❏ No   ❏ Yes

3. If you can,name two threats to trout habitat.

4. If you can,name two actions you or your family can take to help trout.

5. Are you going to do any actions you listed in Question 4?
   ❏ No   ❏ Yes

6. Do you want Trout Unlimited to mail you information about the next class or project?
   ❏ No   ❏ Yes - if Yes,please provide your contact info below:

7. Would you be interested in fishing with a mentor from TU?
   ❏ No   ❏ Yes

(Provided courtesy Trout Unlimited)

Assessing Program Outputs

A good way to assess program outputs is through use of pre- and post-program surveys (see Figure 5).

> **Best Practice:** Effective program evaluation explores and investigates the program's short-term learning outcomes.

If your program is oriented toward fostering knowledge gains and/or skill acquisition (as opposed to behavioral change, which often comes over longer periods of time), it is important that this be done at the end of any training or program experience. Many audiences will want to know "What did we learn (or come away with)?" Effective programs determine and periodically assess short-term learning outcomes based on objectives and program experiences.

Short-term assessment can be accomplished with traditional assessment methods such as quizzes and tests, as well as alternative methods, such as journaling and responses to open-ended questions, oral question-and-response sessions, observations of performance, papers and projects, etc.

Worksheet 4-F

(Actual worksheet found in *Appendix B*)

What are the short-term outcomes you want from your program? (Refer to your program logic model.)
What methods do you use to accomplish this assessment?

> **Best Practice:** Effective program evaluation explores and investigates the program's long-term benefits and impacts.

Although collection of program outputs such as number of participants is important, effective program evaluation goes beyond that as well. The conceptual program logic model in *Figure 4* includes sample short-term, medium-term, and long-term outcomes such as knowledge, attitudes, and behaviors that lead to improved social conditions. These specific outcomes will vary based on the goals and objectives of your program.

Educators in effective programs identify the outcomes they expect and continually assess their program's impact on achieving them. A good way to begin this process is to consider all the potential impacts of the program. Then select from this list those that are most likely or plausible. These are the impacts that should be assessed. The methods to be used for assessment will vary from one kind of impact to another (see the following section for more information).

Assessing Long-term Impacts—an Example

In an attempt to assess long-term impacts of an aquatic field experience on the science attitudes of 6th graders, a university master's degree student is asking program participants now in the 7th, 9th, and 12th grades what they remember about the experience and whether it has had any influence on their choices of courses, hobbies, or career plans.

Worksheet 4-G

(Actual worksheet found in *Appendix B*)

What are the possible long-term outcomes of your program?
What are the long-term outcomes you want from your program? (Refer to your program logic model.)
Potential survey questions you could ask your program graduates after completion:
   Have you fished/boated/participated in a stewardship activity (clean-up day, recycling, advocacy, etc.)?
   Have you bought a fishing license?
   Have you purchased your own equipment?
   Have you joined an angling, boating, or conservation organization?

> **Best Practice:** Effective program evaluation encourages the use of multiple and varied assessment methods.

Reliably assessing program outcomes such as the knowledge, attitudes, intentions, and behaviors of participants is difficult. Many methods and techniques are available, and each has strengths and weaknesses.

Not all assessment methods need to be quantitative, or have the rigor of a university research project. Don't be afraid to use less formal methods at times. However, whatever methods you choose, be sure they are based on the systematic collection of data and that the data is credible and dependable. Information gathered randomly or haphazardly will not be useful and may be misleading. You might consider contacting a university or professional marketing firm to help you conduct long-term evaluation.

When you use multiple assessment methods, you gain a much clearer picture of what is actually going on than when you rely on any single method.

Multiple and varied methods increase your confidence that you have a valid and reliable "reading" of what has been learned/acquired. Some learners have high levels of test anxiety and will rarely be able to fully demonstrate what they have learned through testing, while others will test well. Similarly, some learners need to be able to do something to demonstrate what they have learned. In these cases, a test or language-based assessment method will not work well. Multiple and varied methods accommodate the capacity of learners to document or demonstrate what they have acquired.

The same purposes hold true in program evaluation. You may want teachers and content experts to review a piece of curriculum, each with different questions in mind (e.g., usability vs. content accuracy), and then run a field test of this curriculum in a similar setting to determine how well it works in action. These different methods increase confidence that the curriculum is sound and can help learners achieve the objectives (or anticipated learning outcomes).

If you assess or evaluate something using several different methods, you can compare results from these different methods. If the results agree, you gain confidence in them. If they do not, then you can explore why (e.g., a learner doing poorly on a test but performing well in natural settings may indicate test anxiety). The use of two or three separate methods allows you to triangulate results. The methods don't have to be conducted at the same time or in the same way. The use of multiple and varied methods is highly recommended.

Following are some assessment methods commonly used to evaluate boating, fishing, and stewardship education programs. Some are best suited for formal education settings (schools). Others are best suited for non-formal education settings. Some can be used

in either. There may be some overlap among the methods. These methods are not listed in any particular order.

Surveys

A survey is a series of questions to be asked of a sample group of people. It can be conducted by telephone, e-mail, mail, or in-person interviews. On-site interviews are an effective way to gain information such as extent of fishing and boating activity, social group size and composition, and other participation characteristics. However, on-site survey samples exclude non-participants. That is, if you are interviewing people at a boat ramp, you are not likely to include any non-boaters in your survey. For some surveys this may be fine; but often you will want to compare and contrast participants and non-participants.

Population surveys that are national, regional, or statewide in scope can be designed to include subgroups of participants and non-participants. Population surveys allow you to determine specific rates (as percentages of the population) of boating, fishing, and involvement in stewardship activities. Large population studies are necessary for establishing trends and baseline information. The National Survey on Recreation and the Environment and National Survey of Fishing, Hunting, and Wildlife-Associated Recreation are important for this reason.

Note: If you evaluate a program targeted at minority populations in urban, inner-city areas, you will need to adjust the standard survey technique. Minorities in inner-cities generally are regarded as "hard-to-reach" populations with characteristically low response rates.

Testing

Testing is commonly associated with school programs, although it can be used in many settings. Test questions must be specific enough to target some difference that will be measurable and enough students must be involved to find significant differences. Further, to measure the impact of the program, you must be able to compare students who participated in the program with students who did not (experimental and control groups), or compare students' knowledge at two different times—before and after the program (pre-test/post-test). Some programs use both strategies to reduce the problems associated with each. That is, they assign equivalent classes in the same school to be control and experimental; inform teachers of

Information gathered this way can be used to tailor programs to meet needs of particular ethnic communities. Success depends on four factors:

1. Ability of a researcher to establish an identity within an ethnic community
2. Project based on community need rather than agency priority
3. Recognition that relationships are the most important task in the process
4. Remembering that community members are the experts on their culture

(More information on working with diverse audiences is included in *Chapter 5*.)

their role in the evaluation process; carefully select teachers and schools to provide a realistic cross-section of the school situation; and accept that there will be some factors that cannot be controlled.

Focus groups

Focus groups consist of a small number of individuals assembled to discuss a topic of interest to an evaluator or to an agency. Focus groups produce qualitative data through a focused discussion among individuals who may possess some common attributes. Advantages of the focus group method include:

1) allows the interviewer to probe;

2) usually not expensive; and

3) provide timely results.

The major disadvantages are that data derived from the discussion are qualitative and may be difficult to analyze, and there often are problems with logistics—getting individuals together and finding a setting conducive for conversation.

Ethnographic method

Another qualitative alternative to surveys is the ethnographic method. Ethnographic research differs from traditional survey research by placing the researcher inside the community being studied. The advantage of an insider's view is being able to see how a leisure activity, such as boating or fishing, is connected to the daily patterns and routines of an ethnic community. This approach to evaluation holds potential for understanding how members of ethnic communities define fishing, boating, and stewardship in relation to their own culture.

Longitudinal studies

Program evaluations should employ longitudinal designs to track participation over time and to observe long-term changes in behavior. Longitudinal designs rely on panels of participants, a fixed number of individuals who respond to questions over time (weeks, months, or years, depending on study design). In contrast, cross-sectional designs are based on measurements taken at only one point in time. The greatest advantage of a longitudinal design is the ability to examine enduring participation in an activity. Disadvantages of this design approach include the large effort required to recruit and retain individuals. Mortality, in terms of refusals to participate in subsequent measures, change of residence, death, and other factors, also are disadvantages. This approach appears to be most effective for evaluating long-term participation in boating and fishing.

Experimental methods

Experimental methods are arguably the most effective tools for determining whether a specific program leads to a particular outcome. In controlled laboratory experiments, the effect of manipulating an independent variable on a dependent or outcome variable can be observed while the effects of other relevant factors are minimized.

However, many variables of interest such as skill development, attitudes, and program leaders cannot be controlled and manipulated in experimental designs. Tightly controlled experiments are difficult to employ, but field experiments can be conducted in realistic or natural settings. Field experiments appear more suitable for relating the effects of educational program components to boating, fishing, and stewardship outcomes.

Figure 6: Sample rubric for use in evaluating individual student research projects.

Instructions: For each task listed on the left, indicate level of attainment from one to ten. Brief descriptions on scoring are listed to the right of each task.

Task	1	5	10	score
Research Time Utilization	Student needed continual reminders to get back to work. Work may be inappropriate to project.	Student usually on task, but needed an occasional reminder to get back to work. All work appropriate.	Student was always on task and did not need reminders to get back to work.	
Participation in Project	Student does not add an equitable amount of work to the project and does not meet all requirements for the length of presentation.	Student adds an equitable amount of work to the project, but may not meet all requirements for the length of presentation.	Student adds an equitable amount of work to the project and meets all requirements for the length of the project.	
Accuracy of Information During Presentation	Student's information was lacking in content and was not factually correct in many places. Information may not be pertinent to the presentation.	Student's information is for the most part factually correct. Information may not be pertinent to the presentation.	Student's information is factually correct and pertinent to the presentation.	
Clarity of Presentation	Student's work not well planned. Student confused by much of the information. Student not clear in explaining topics.	Student's work is well planned. There seemed to be some confusion or misinterpretation of information.	Student's work well planned and clearly explained. Student showed clear command of information.	
Visual Aid Worksheet, or Simple Demonstration	Device was not used at a timely place in the presentation, had little bearing on the presentation, or was absent.	Appropriate device. Could have been used more appropriately. Design may not have maximized learning.	Use of device was timely and appropriate. Design of the device maximized learning.	

(Source: Mayer and Fortner 1995)

A major advantage of experimental designs is that the variables in question are specified prior to the study. In survey research, it is common to collect large amounts of data and then identify operational definitions "after the fact." Developing definitions prior to testing forces researchers and sponsors to consider what particular outcomes are most relevant for evaluation.

Apart from the technical aspects of program evaluation, having to define the meaning of effectiveness or success may cause agencies and program providers to reflect more deeply on the goals of boating, fishing, and stewardship education. This may serve to clarify an agency's mission with regard to educational practices and may result in a higher level of service for the public.

Portfolios and journals

Portfolios and journals are valuable grading tools that give insight into student growth in thinking and skill development. Journals can be based on the student's ongoing work that leads to a project (a diary of sorts), or on his thinking and pursuit of

information about a subject area. A journal is a work in progress. In rare cases a journal is more personal, with reflections on nature or critical thinking about a class process. This type of journal may be reviewed but not graded; suggestions from the teacher are acceptable.

Portfolios are collections of student work that demonstrate increasing proficiency. A portfolio should be able to demonstrate what kinds/qualities of student work are valued, since the student selects what is included. In the cases of journals and portfolios, attention to the contents and quality of work demonstrated are the basis for evaluation. Rubrics (specific guidelines given to students ahead of time that show how the teachers will allocate points) are critical to the effectiveness of this tool.

Projects

Projects are the most common forms of outcome for cooperative learning. Communication skills for the projects are valued along with the science. The format may vary widely—a display, a videotape simulating a news broadcast, a group presentation with PowerPoint, a lesson for a younger group of students, or other medium prescribed by the teacher or selected by the students. Projects encourage cooperation, working toward a goal, and the importance of clarity of results. Students may be required to defend the information they are presenting as well. Projects are best evaluated with a rubric.

The evaluation technique should be in the same format as the treatment, so giving a multiple-choice test after a cooperative learning exercise is inappropriate. In fact, the most appropriate techniques for evaluation of boating, fishing, and stewardship programs may be the ones considered alternatives to traditional testing. Rubrics can work well if you need to assign numbers to levels of attainment (*Figure 6*), so long as they are based on clear goals.

Typically, the numbers indicate the relative value placed on different tasks within a project. For example, if data use is the main purpose of an investigation, data points might equal 30 of 50, while communication/interpretation skills rate 10 and group interaction 10. A new rubric should be constructed for each project type. Simpler rubrics list only the total points per component, while others break down intermediate steps toward excellence.

Worksheet 4-H

(Actual worksheet found in *Appendix B*)

Check each method you (plan to) use and identify what you will assess with each.

    Surveys (describe)
    Testing (describe)
    Focus groups (describe)
    Ethnographic method (describe)
    Longitudinal studies (describe)
    Experimental methods (describe)
    Portfolios and journals (describe)
    Projects (describe)
    Other (describe)

Have you discussed evaluation procedures with a professional in this field?

Best Practice: Effective program evaluation uses national criteria to select, develop and/or revise curriculum materials.

There is a tremendous amount of curriculum material available on boating, fishing, and stewardship education. How do you know if the materials you want to use are suitable? Review the materials against national standards that have been developed for each area, such as:

- North American Association of Environmental Educators;
- American Fisheries Society;
- National Association of State Boating Law Administrators;
- Other organizations of education experts.

These organizations have evaluated several nationally available materials already, so be sure to check with them before you begin your review.

Worksheet 4-I
(Actual worksheet found in *Appendix B*)

Name of Material.
Source/date/version.
Educational criteria you have assessed the materials against.
Weaknesses or holes identified.
How you plan to address the weaknesses.

Best Practice: Effective program evaluation allows program staff to take advantage of professional development opportunities relating to evaluation.

One limitation of many educational programs is the lack of trained staff that can plan and carry out evaluations. Thus, allowing (and encouraging) program staff (including administrators, coordinators, and instructors) to take advantage of professional development opportunities in the areas of assessment and evaluation builds greater capacity for staff to become directly involved in these activities and applying the results to your program. If your agency or organization lacks this capability, consider building partnerships with institutions, agencies, and consultants with experience in conducting formal evaluations. For much more information on Best Practices in professional development, see *Chapter 3*.

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