Evaluating the Effectiveness of Conservation Education

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Abstract: Conservation education is an area of increasing emphasis and priority in state wildlife agencies throughout the United States. Where programs involve elementary and secondary school students and teachers, there are a set of responsibilities and expectations coming from that education community which in turn affect the state wildlife agencies. In addition, under any ground rules, state wildlife agencies have their own goals, and want to be able to assess their effectiveness in accomplishing those goals. This paper addresses a few of the major ways in which the effectiveness of school-oriented conservation education programs offered by state wildlife agencies can be measured. These suggestions are not comprehensive; they are simply examples of respected, credible, and useful approaches which can be used. For sake of example, methods for evaluation employed with Project WILD will be used as illustrations.

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Education may be defined as a process by which an individual or group of individuals acquires knowledge, skills, attitudes, and experiences for use in life. Conservation and environmental education may be defined as a process by which learners of any age acquire and develop awareness, knowledge, skills attitudes, experiences, and commitment to result in informed decisions, responsible behavior, and constructive actions affecting the environment.

The process of education, by its nature, is difficult to evaluate with precision and accuracy. That is one reason that various approaches to evaluation are recommended. The most important outcomes of education are long-term, evidenced throughout a lifetime. As a result, efforts to evaluate the effectiveness of education programs designed for school audiences must be factored into school curricula where teaching about wildlife is not a priority. The effectiveness of accomplishing the real goals of conservation education cannot be assessed easily on short-term bases; therefore, measures need to be taken on a continuing basis, looking at a variety of indicators of effectiveness.

These remarks are focused on programs developed for teachers of elementary and secondary students; however, many of the components of these suggested strategies can easily be applied and used with programs for other audiences.

Even within constraints of limited budgets, it is important to view monitoring and evaluating conservation education programs as a continuing necessity. It is recommended that at least a minimum plan, structure, and process for ongoing evaluation be put in place from the earliest stages of any conservation education program. Use of the approaches described below does provide a wealth of information—useful for program management decisions as well as credible to the principal intended audience, school personnel. Ideally, even more approaches to evaluation formal and informal—are recommended.

Developing Instructional Materials[1]

Expert Review

Expert review is a conventional and respected process by which to gather evaluative information. It is simply a process of having materials reviewed in writing by a range of people having expertise in the given area. Reviewers typically include those who can read for technical, e.g., scientific accuracy; educational validity; appropriateness for target audience; etc. With educational materials designed for use in public schools, it is also important to have reviewers check for balance and fairness in treating potentially controversial topics. This is important for a variety of reasons; for example, many school districts today have policies whereby instructional materials must be inherently balanced, or else the use of any one set of materials must be balanced by use of materials with another point of view. (The Project WILD Conceptual Framework, the Project WILD Activity Guides, and the questionnaire used in the 1986 Project WILD Survey of Use were all subjected to extensive expert review before preparation for the next phase of evaluation, pilot testing. The Project WILD Aquatic Education materials have been in this phase since July.)

Pilot Testing

Pilot testing is a process for trying out materials to see if they accomplish what they were intended to accomplish. This approach is used with instructional materials. It is also recommended for use with other materials, including surveys, questionnaires, and films. Feedback is systematically gathered. Changes can be made in materials to improve them. In the case of questionnaires used for research purposes,

[1]Educational materials, by definition, include a process for instruction. They are not simply informational materials. State wildlife agencies develop and distribute a variety of instructional materials associated with conservation education programs, although informational materials may also be used and useful within conservation education programs. Examples of informational materials are 1-page fact sheets about wildlife species in the state; booklets on specific management practices; posters showing species and their distribution. Examples of instructional materials for conservation education are the National Wildlife Federation's *Class Project;* the *Project WILD Elementary and Secondary Activity Guides;* the Pennsylvania Game Commission and Pennsylvania Bureau of State Parks' *Kids, Wildlife and Their Environment: An Elementary Teachers' Guide to Wildlife Activities;* and the materials used in the Missouri Department of Conservation's educational programs. Instructional materials for use in conservation education programs must meet standards for effective education if they are to be used by and with teachers of elementary and secondary students.

the instructor wants to know whether the questions actually measure what was intended, whether the language is clear to the reader, etc. With instructional materials, the instructor wants to know if the stated objectives are accomplished, whether directions to the teacher are clear and adequate, etc. (Every instructional activity in the Project WILD Activity Guides was tested with students and teachers to see whether it accomplished its stated objectives; with what age students; etc. The new Project WILD Aquatic Education activities will be subjected to this testing process in classrooms from January–April 1987. The actual questionnaires used in the 1986 Project WILD Survey of Use were pilot-tested with representative Project WILD workshop participants before they were made final.)

Field Testing

Field testing is a more rigorous step. It typically requires independent evaluators. It is usually statistically based, often using a traditional "experimental/control group" design. This approach is used with instructional materials to see what their overall impact is on the intended audience; for example, do students learn when their teachers use these materials—and what do they learn? (In addition to Expert Review and Pilot Testing, the Project WILD instructional activities were formally field tested with students and teachers in urban, suburban, and rural areas. Differences in student learning were assessed comparing experimental and control groups. The experimental groups were subdivided into two groups—teachers who received the Project WILD materials in a workshop; and teachers who received the Project WILD materials without a workshop, e.g., through the mail.)

Additional and Replication Studies

Additional studies—limited as well as large in scope—are valuable. Longitudinal studies are exceptionally valuable; they are also difficult to undertake for a variety of reasons, including costs and permission for access to people to study for many years. (We encourage a variety of additional studies of aspects of Project WILD, including additional measures of student learning, wherever possible. For example, a study of student learning where teachers use Project WILD activities was conducted in Ft. Myers, Florida in 1985; overall, the results were consistent with the results of the major field test of the Project WILD activities and student learning which was conducted in 1982–83.)

Monitoring and Evaluating a Program

Once instructional materials are available for conservation education programs, they should be used and used effectively. A variety of methods can be employed to monitor and evaluate this use, all of them with some limitations. Here are a few examples.

Workshop Proposals

Where instructional materials are typically implemented through a workshop approach, advance planning is the first step toward quality control. Where volun-

teers actually conduct many of the instructional workshops, these volunteers are asked to submit a workshop proposal or plan indicating their anticipated agenda. This gives a person coordinating all of these workshops advance information and an opportunity to forestall many problems by ensuring that the proposed agenda meets minimum guidelines. (This approach is typically used with Project WILD Workshops.)

Participant Evaluation of Workshops

Participants in workshops are asked to complete a brief written evaluation before departing the workshop. These evaluation forms are standardized, including questions that can be interpreted statistically as well as room for informal, written comments and suggestions. Use of data from these workshops evaluations makes it possible to continually monitor the workshop quality. Data can be analyzed in a variety of ways—for example, looking at variables such as who led the workshop, whether participants volunteered or were required to attend the workshop, and workshop length. (A copy of the Participant Survey Form used with Project WILD workshops is attached; the questions on this form are standardized; however, states may add additional questions and typically have the form typeset and add their own address, etc. Data is accumulated from state and national levels.)

Facilitator Evaluation of Workshop

The person who conducts a workshop is called a facilitator. The facilitators are typically asked to complete a reporting form following a workshop. They send their completed form with all of the completed participant evaluation forms to their program coordinator. The facilitator reporting form asks for their program assessment of the participants' response, an outline of their final agenda, and other information including in-kind contributions of costs, materials, and services which can be useful from a budget analysis point of view. (This evaluation is typically used in Project WILD workshops where the facilitator is a volunteer.)

Survey of Use

A workshop is only a way to introduce people to instructional materials. After the workshop, it is up to the people who attended to determine whether they will actually use the information, materials, and/or strategies provided them. There are a variety of approaches which can be taken to provide this kind of evaluative information. Mail surveys have limitations; however, they are typically the most cost effective and least expensive way to gather useful data of this kind. Rate of response is a frequent problem although techniques can be used to increase the rate.

Any survey of use which involves a questionnaire should be developed according to the methods briefly described, including expert review and pilot testing. Minimum steps in developing and conducting a survey of use include: 1) developing the questionnaire, including testing; 2) identifying a valid sample of people to survey; 3) mailing the survey, ideally with first class postage and a personal letter enclosed as well as a prepaid return for the completed questionnaire; 4) sending a

postcard reminder to the person being surveyed. When possible, a second questionnaire should be sent to those who have not yet responded, with a second personal cover letter. Finally, individual telephone calls—at least to a random sample of those who have not yet responded, to give you a profile of apparent reasons for non-responses—is recommended. (The Project WILD Survey of Use conducted in the spring of 1986 was a mailed questionnaire sent to a stratified random sample of teachers who had participated in Project WILD workshops from the fall of 1983 through the winter of 1986. The questionnaire was mailed with a form cover letter at bulk, non-profit rates, since the cost of personalized first class mailing was prohibitive. One postcard reminder was sent. A second questionnaire and cover letter was sent following the postcard to those people who had not yet returned questionnaires or to those who returned questionnaires anonymously. The overall rate of response was 49%. There was no means to update and correct mailing addresses for all those on this national Project WILD list, so some questionnaires were non-deliverable. The actual number of non-deliverables is not known, since a return postage and an address correction request would have been prohibitive economically. In addition to providing information about actual use of Project WILD materials, with how many students, under what conditions, etc.; this study provided a variety of additional information, including data about teacher perceptions of the effectiveness of student learning from Project WILD.)

Ongoing Numerical Goals and Analyses

A simple measure of one aspect of a conservation education program's effectiveness is to set numerical goals against which to measurre success. (Numerical goals are obviously only one measure, and they ought not to be considered more important than qualitative goals.) For example, goals can be set for reaching a certain number or percentage of the teachers in any state over a multi-year period; and then additional goals can be set for re-involving a percentage of those teachers in aditional programs in ensuing years, consistent with the characteristics of educational change as a long-term process. (Such figures are kept on state and national levels for Project WILD—indicating numbers of participants in workshops, numbers of school-age students these teachers will reach annually, etc.)

These are just a few examples of ways to evaluate the effectiveness of instructional materials and methods of implementing conservation education programs. A variety of methods can and should be used. Each approach has limitations. Informal avenues are recommended as well as the more formal approaches which have been described here.