Environmental education evaluation: Reinterpreting education as a strategy for meeting mission

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1. Introduction

The North American Association for Environmental Education invites people to join its network of “people who believe in teaching people how to think about the environment, not what to think” (naaee.org, 2008) which raises questions about the nature of environmental education, especially as we consider evaluation of education programs in environmental and conservation organizations. Is environmental education a means to an end (desired behaviors from thoughtful decisions), or is it an end unto itself (people who know how to think)? Is environmental education about the individual, or is it about the ecosystem and the impacts of human action on the system? Is the purpose of environmental education program evaluation to drive a program by documenting quality and reach or to document outcomes beyond the program itself?

In agencies and organizations with missions of environmental conservation, preservation, or pollution prevention, many traditional assumptions of learning are strained by at least three challenges: (a) the nature of the learning setting; (b) formal models of assessment of learning failing to capture the value or real outcomes of an experience; and (c) education itself in these organizations being viewed as competing with the environmental or conservation outcomes of the agency or organization. Evaluation of environmental education programs in these organizations is further constrained by the very nature of education and the benefits and baggage accumulated over the history of environmental education programs—if environmental education is to serve an environmental outcome, all these concerns need to be explicated.

The field of environmental education has grown over the past forty years and more recently is assuming the identifiers of an emerging profession (cf: Hyde, 1964; Jackson, 1970; Larson, 1977; Sykes, 1991). It has a significant body of research distinguishing it from its parent disciplines including dedicated journals, its own jargon and professional affiliations, and its own unifying documents such as the collection of Guidelines for Excellence in EE (NAAEE, 2008). Historically, environmental education has been affiliated with conservation education, outdoor education, nature study, education for sustainable development, environmental literacy, resource-based education programs, and other foci. Yet as a field, the purpose of education within conservation, environmental and preservation organizations remains a point of contention. Evaluation has only recently become a prominent component of environmental education (Jacobson, McDuff, & Monroe, 2006; Zint & Higgs, 2008).

The questions in the introductory paragraph and the challenges posed above are a frame to examine educational program evaluation within environmental organizations by first looking at the relationship of mission to education, then examining evaluation issues related to these programs. The
chapter concludes with an attempt to make sense of the questions and challenges asked above.

2. Organizational mission

Most organizations in the ecological and environmental arenas have environmental conservation, protection, sustainability and/or preservation as one, if not all of the primary goals in their mission statement. All the organizations’ activities, including fundraising, policy, and enforcement, along with the field conservation, education, interpretation and outreach efforts must serve this mission (Merriman & Brochu, 2009). Program evaluation should help the organization examine its impact across all strategies including policy/regulatory and social strategies such as economic incentives/disincentives and models, marketing including social marketing, and education. In terms of educational activities of the organization, including outreach, community programs, education, and interpretation, evaluation should be used to obtain or maintain alignment with the specific conservation or preservation efforts of the agency or organization.

But the ways in which mission relates to educational programs must be clarified. A common misconception is that education is about children in school, which ignores the scope of lifespan learning that occurs well beyond school walls. The purpose of environmental education is not primarily focused on improving test scores, although good environmental education (EE) in schools can serve toward this end (see, for example, Angell, Ferguson, & Rudor, 2001; Leiberman & Hoody, 1998). The goals of EE are more explicitly stated in the generally accepted definition offered by the Belgrade Charter (UNESCO-UNEP, 1976):

…to develop a world population that…has the knowledge, skills, attitudes, motivations, and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones.

In terms of education leading to action, even clearer are the goals from the Tbilisi Declaration (UNESCO, 1978) which included the creation of new patterns of behavior in individuals, groups, and society as an outcome of environmental education. Environmental education is ultimately about decision-making, critical thinking, and citizenship, including acting as an environmentally literate citizen which includes adopting actions that reduce environmental stressors affecting some conservation target.

Second, education is limited to neither youth nor schools. Although this will be discussed subsequently, it is useful at this point to note that the “lip service” given to adult, community, and non-school youth educational programs in environmental organizations permeates from the top levels of the organization (Ardoin & Heimlich, 2006). The challenges of understanding how education can serve mission through different audiences including professionals, community activists, community groups, and youth groups vary based on the educator and the environmental, conservation, or ecological scientist or administrator with managerial oversight.

Third, evaluation is, or can be, the primary tool for measuring movement toward mission attainment through education, regardless of the environmental organization’s larger motive that may also include activities of habitat restoration, species preservation, or resource improvement. In most organizations, it is ultimately the conservation action that is central to the work of the agency or organization (Horr, 2007). For conservation- and preservation-based organizations and agencies, such measurement would necessarily include development and implementation of skills, intents, and behaviors as they relate to immediate conservation, preservation, or pollution prevention/abatement actions that can be accomplished by the individual with agency and proximity (Heimlich & Ardoin, 2008).

In the Conservation Measures Partnership open standards for the practice of conservation (see: https://staging.miradi.org/files/miradi_overview.pdf), an action (or strategy) leads to the mitigation of a threat which in turn can ease an environmental stressor leading to improvement of the conservation target. When the threats are human activity, education can be one of the primary strategies used to mitigate the threat by addressing collective and individual behaviors that contribute to the stressor (see the article by Vaughn in this edition and for other examples visit www.rare-conservation.org). Goals of educational programs would therefore be focused on: (1) increasing specific individual activity that positively and directly affects the stressor; (2) reducing or eliminating individual human-based activity which negatively affects the targeted stressor; (3) engaging learners in active remediation, preservation, or conservation efforts led by the organization; or (4) supporting the work of the organization. Simply, the strategy of education focuses on what individuals can do or not do related to the conservation outcome.

Moving people to action, however, is difficult. Kollmus and Agyeman (2002) suggest the factors which shape environmental behavior are so complex as to render any specific framework or model insufficient. Yet general educational models of change such as the Theory of Reasoned Action (Fishbein & Ajzen, 1975), the Theory of Planned Behavior (Ajzen, 1991), the Transtheoretical Model of Behavior (Prochaska, Redding, Harlow, Rossi, & Velicer, 1994), and the Health Belief Model (Sheeran & Abraham, 1996) all explain behavior as a function of behavioral intentions which are affected by factors such as knowledge, attitudes, skills, and self-efficacy. Conative theory proposes that to reach behavior change, it is necessary to address the inputs of knowledge, attitudes, and skills along with the complex interrelationships among those factors which are unique to each individual (Emmons, 1986).

Certainly evaluation activities including reaction and satisfaction level measures, attempting to determine cognitive gain, and examining attitudes and changes in attitudes over time as a result of educational interventions, are important and must be continued. An evaluator viewing education as a means toward the conservation/preservation outcome, however, would also incorporate the higher level, long-term conservation outcome measures into the evaluation effort. Outcomes include considering environmental action not only as a long-term impact, but as a short term, controlled outcome for conservation activity that can be embedded into the learning experience through a project, service learning, or participatory action. Resistance to this position, however, is deeply embedded in the psyche of the field and usually revolves around perceptions of action as advocacy and activism (Disinger, 1982, 2001).

3. Education in environmental organizations

It may be beneficial to explore the possible origins of the resistance to education for action. In the U.S., the common schools philosophy envisioned by Horace Mann remains the dominant view in formal education (Baines, 2006). With its mandate for school systems to educate youth to become future citizens, learning is often distanced from immediate application, and testing is used to ensure that students all have a similar base of knowledge about what is needed as a citizen. This conceptualization of education as future oriented is only functional within the traditional, disciplinary based schooling system. In examining
education’s role within an environmental organization, the mission of the organization would suggest that education, outreach, and communications efforts help achieve short and long-term conservation outcomes (Donaldson, 2005). As the educational philosophy under which an organization operates directly shapes the nature of its educational programs (Petress, 2003), the environmental education programs in agencies and organizations growing from the dominant philosophy of education in our society would likely default to a future focus rather than the desired short term focus. Comments such as “we can’t really have impact for twenty years” or “we need to reach them when they’re young so when they grow up they…” are indicators that the operational educational philosophy are aligned with the formal school mandate.

Most environmental learning in our society occurs outside of schools in parks, museums, nature centers, arboreta, zoos, aquariums and other environmental organizations, and through newspapers, television, movies, agency outreach programs and radio—free-choice environmental learning (Falk, 2005). Learning in non-school settings is often framed in an understanding of literacy broader than that of school settings in approach and across life-span. Stories from elders, cultural practice and models of engagement can have as much impact as the linear, curricular knowledge accumulated through formal courses of study (Heimlich & Falk, 2009). Most people, however, fail to acknowledge, are rarely aware of, and often dismiss as invalid, the ways that learning occurs through continual, natural human action: talking to people, reading, watching how people do things, taking a class and simply figuring things out (Cyr, 1999). This lack of awareness of valid learning contributes to a reluctance to identify outcomes from exposure as “learning,” creating a challenge for evaluation.

Beyond the bias toward holding schools as the primary purveyor of education is another barrier—action is often confused with activism. For many years, environmental education has been reticent to support action as an outcome of educational programs and efforts, although action is at the core of its definition. The perception that advocacy equals activism, and that activism is necessarily a political statement made without critical thought is changing, albeit slowly. Advocacy for the environment or for behaviors that may ultimately achieve the conservation state. It is conceivable that although focusing on one desired behavior rather than the different ways to save the giant panda? is a logical, though likely unvoiced, reaction to an action without proximity. Agency relates to the ability of the individual to actually accomplish the behavior desired. A ten-year-old does not have the agency to make decisions for the family—and even though many educators like to think that we can use children to manipulate their parents, for every anecdotal claim of success, there are many cases of children who cannot, will not, or should not tell their parents to change the parents’ behaviors (Heimlich & Harako, 1994). Using the recycling message above, agency in a school class where the teacher wants to communicate the larger message of waste reduction, might include having students bring in various materials or collect the waste materials generated in the classroom and then have the students determine what could be done in the classroom to deal with the quantities of waste. Defining appropriate behaviors for the agency of the learner is vital to a successful program and may call into question the target audiences for some or many educational programs.

Establishing behavioral outcomes is not a simple process, regardless of how one views the purpose of education. One concern regarding behavior as an outcome relates to the belief that environmental education is primarily focused on teaching individuals critical thinking, or “how to think, not what to think.” As noted above, there is a prevailing and historic sense among many educators that teaching behaviors is aligned with activism or advocacy more than education (Disinger, 1982; Hug, 1977; Zint & Higgins, 2008). An alternative concern held by some educators is that focusing on one desired behavior rather than the different ways to reach the desired conservation outcome is equally wrong (Frick, Kaiser, & Wilson, 2004). The faulty assumption in this case, some argue, is that in teaching a single way to achieve the conservation outcome it is possible to disregard an alternative way of achieving the desired conservation state. It is conceivable that although “[d]ifferent conservation behaviors have different conservation potentials” (Frick et al., 2004, p. 1599), there are many different behaviors that may ultimately achieve the same goal. A difficulty for educators and evaluators is determining the causality of the end or target behavior can be problematic.

One reason for the difficulty in understanding and measuring environmental behavior is that a behavior is a specific action (McKenzie-Mohr & Smith, 1999), while “most environmental activities are made up of several discernible behaviors” (Monroe, 2003, p. 115). Environmental educators desire to know the degree to which their programs have influenced participants or learners in implementing “the behavioral outcome,” meaning there must be a limited set of specific actions and conditions under which the behavior is to be employed. Such limitations deny the inherent complexity of individual interpretation and application of learning.

If environmental education is to help individuals become critical thinkers making good decisions for the environment, then there could logically be a contradiction against the environmental outcome desired by the organization. Individual learning may lead

2 This is not to say that programs designed for parent education, using appropriate structures of children and other sources of information to facilitate parental involvement in behaviors related to a child’s learning are not valuable and useful. The challenge being presented here is the assumption that “it will happen” which is evaluatively a weak link.
to an array of equally beneficial outcomes in terms of the larger environment while not directly serving the accomplishment of the ecological impact desired by the organization. There is a natural tension between directing individuals to a specific action versus allowing them to discover what related actions have valence and application in their lives. For example, in a program on energy conservation, taking shorter showers is suggested and an individual chooses to try shorter showers for the purpose of water conservation. The desired behavior is met with a different motivation, or alternatively another behavior could be implemented by the individual to achieve the same outcome such as the individual considering “I take short showers already, but perhaps I could do something else such as using cold water for my laundry.” This tension between motivation and behavior has tremendous implications for evaluation in terms of level of measurement, who the real audiences and evaluands for the project are, and the definition of impact.

5. Challenges in evaluation

Any evaluator working in environmental education could generate a laundry list of challenges and issues. Likely, there would be tremendous overlap with many of the concerns such as fiscal and conceptual support for evaluation in EE programs, obtaining a representative measure of visitors, developing a cohesive and meaningful evaluation across a complex program in a free-choice learning setting, integrating school audiences toward impact, and others.

There are larger challenges from a meta-conceptual level. A challenge that warrants consideration is utilization focus. Whether for enhanced shared understandings, supporting and reinforcing program intervention, increasing engagement to ownership, or program and organizational development, the primary use of evaluation logic and processes (Patton, 1997) is rarely incorporated into published EE evaluations. Unrealistic expectations of the evaluation can also lead to undesirable disputes, lack of evaluation use, dissatisfaction with evaluators, and dissatisfaction of evaluation (Donaldson, 2001). For counter-examples, see Carlton-Hug and Hug (in this edition), Flowers (in this edition), and Fleming and Easton (in this edition). It is useful to note that any utilization focus in evaluation that is designed to serve only knowledge or affect acquisition would likely distance the role of education from those actions that directly serve the conservation organization’s mission (Johnson, 1998).

Other issues emerge from threats to credibility of the evaluation findings. Some of these concerns include.

5.1. Assumptions of causality

In environmental education, a strong belief remains in the false causality of knowledge or attitude leading to behavior as in “if they understand this, then they will change their behaviors” or “if I can get them to care, then they will want to change their behaviors.” Research has consistently shown that general pro-environmental attitudes or knowledge alone rarely lead to specific behavioral changes (Bell, Greene, Fisher, & Baum, 1996; Monroe, 2003). The ascribed assumption of causality ignores the seminal work of Hungerford and Volk (1990) and others such as Sia, Hungerford, and Tomera (1985), Marcinkowski (1989), and Ramsey (1989) on defining the factors that lead to desired, environmentally appropriate behaviors. Theory of change (e.g. Chen, 1990; Donaldson, 2007; Weiss, 1998) refers to the development of causal linking of program inputs and activities to a chain of intended or observed outcomes and using this model to guide the evaluation. Good evaluation, therefore, would by necessity incorporate an exploration of both complicated and complex behavioral moderators (Rogers, 2008).

5.2. Projection of motivation

Experience and a cursory review of the literature would reveal that many environmental educators base their programs on assumptions of motivations of individual participants. Often these assumptions are based on the motivations of the educator and/or the environmental scientist/expert developing the program with the belief that the learner would act from the same cognitive or affective motivation as do they. Another faulty assumption is that people are motivated primarily by economic factors, or health concerns, or concerns for children. The reality of motivations is complex. Theories of motivation abound and include such things as key predictors of transitions in motivational stages (Armitage, Sheeran, Conner & Arden, 2004; strategies people use to move from different stages of motivation (Prochaska et al., 1994); and the relationships among stages of change, demographic variables, self-efficacy, decisional balance, and processes of change (Cardinal & Ksoma, 2004). Over simplifying assumptions in program design can lead to evaluations measuring the wrong things.

5.3. Lack of theory

Evaluation must be based on solid, theoretical foundations of learning and some approaches to evaluative data reveal the lack of good foundations.3 A prime example is that of attitudes. This is revealed in the ongoing practice of one-shot pre and post-attitude measures for youth involved in a program. Rather than the multiple measures pre/post necessary to find stability in youths’ attitudes, most evaluations assume that a single measure at the start and then another at the end of the program effectively measure attitudes. Then, for adults, a similar pre/post-measure is made assuming that a reaction measure is equivalent to an attitude measure. Such approaches demonstrate a misunderstanding of attitudes in adults who have more stable attitudes and nearly impossible in measuring the volatile attitudes toward those things not core (Bem, 1970) to the youth.

Other theoretical foundations often ignored include the learning concepts of compression, horizontal learning, ascription, and fluidity of real learning. A simple pre-post-measure of knowledge, for example, does not truly test knowledge and the use of this measure reveals a lack of the more complex learning theories at play across settings including one of access for retrieval of information upon entry is more the issue than “learning” the information. Many environmental messages are not new to people—but they may not be able to instantly recall the facts associated with the issue(s). The measurement concern is the claim of learning versus the claim of reinforcing, clarifying, and adding to the cumulative knowledge/awareness of an individual. There is a point at which pre/post-measures become meaningless and suggest that post only with a goal of exit awareness make far more sense for environmental education program. How and when someone learns, the point at which recall and application are established, and all the other conditions of learning across life are important considerations in evaluative claims. Evaluation of environmental education programs must move from school-based knowledge as end-point into a model where measures examine the structure of the program as necessary to lead to action and the appropriateness of the program to the level of evaluation.

No criticism of theoretical weakness would be complete without the acknowledgement of the old “knowledge to attitude

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3 These observations are based on working with scores of environmental organizations over several decades. Some of these observations have been included in evaluation reports which remain proprietary.
to behavior” or “attitude to knowledge to behavior” claims many environmental educators still hold to be true. There is not much consensus regarding how attitudes might affect and predict environmental behavior. In a meta-analysis of more than 100 environmental behavior studies, Hines, Hungerford, and Tomera (1986) found weak links between pro-environmental attitudes and pro-environmental behaviors. Also important were the constructs of locus of control, the individual sense of responsibility, and a commitment or intention to act (Kollmus & Agyeman, 2002). Even so, myriad educators and scientists continue to believe if people just know enough, they’ll change. Or if they feel a certain way, they’ll act differently.

Environmental education programs and the evaluations of these programs are confounded by the scope of missions served by the various programs, the settings and the necessary assumptions for the different settings in which the educational programs occur, and the resources brought to evaluation for the programs. Having raised these issues, what does it all mean?

6. Conclusion: making sense of the questions and challenges

Three questions framed this chapter: (1) Is education a means to an end, or is it an end unto itself? (2) Is education about the individual, or is education about the collective? and (3) Is the purpose of environmental education program evaluation to drive a program or document outcomes?

Both the easiest and the most difficult answer to each of the questions is “yes.” The reality of situating evaluation in what are at times contradictory places forces an evaluator to critically examine personal beliefs and biases, and to push the educators and agency stakeholders to do the same critical reflection. An exciting condition of addressing these questions is, what I believe to be, an inevitable shift from evaluation being used to “confirm the quality” of an educational program, to being a tool that examines the efficacy of education practices leading to conservation outcomes.

One of the potentially valuable roles for evaluation in environmental education settings is to build the capacity of both the individual educator and all the educators across the organization to improve programs through data-driven decisions. Evaluators can help those within environmental organizations understand the various sources of data used in decision-making and how intuition, experience, institutional culture and ideology as well as evaluation information all help contribute to the ultimate determinations (Weiss, 1977).

6.1. Is education a means or an end?

The outcomes measured define whether educational programs are an end unto themselves (knowledge or attitude) or a means of achieving the larger mission of the organization. To justify existence of educational programs, there must be some direct connection of program to the mission. Such connection is not necessarily at the exclusion of future oriented, cognitive based learning, but such a decision is the responsibility of the educator, not the evaluator. It is a role of the evaluator to make explicit the causal linkages and to measure the program progress against the degree to which the program is moving individuals toward specific environmental action leading to desired conservation, preservation, protection, or ecological impacts. It is also, I believe, the role of the evaluator to challenge and push educators to move beyond only the “future-outcomes thinking of the common schools philosophy. Short, medium, and long-term educational outcomes must all be co-aligned with the conservation action of the organizational mission, and the evaluator is in an excellent position to facilitate this movement.

6.2. For whom is education conducted?

Education must be aligned with the organizational mission. Alignment means education must serve directly the behaviors that support what the organization considers to be impacts. In many cases, the beneficiary of the educational intervention is not the learner, but is nature, the environment or the ecosystem. Thus, evaluation of environmental education programs moves from individual as the level of measurement to individual as the source of data for measurement. For example it is not important that an individual knows about water conservation, it is important that water is conserved across the community through individual contributions, and these contributions can be measured.

Ultimately, evaluations must serve to determine how to more effectively assist environmental education programs in moving participants/learners to what is needed in order to achieve the activities that lead to mission and impact. This may require some decisions be made for educational programs to intentionally be selected and designed for highest ecological impact, rather than highest public visibility. Consider a situation in which a few landowners have the access and ability to protect the banks of a highly sensitive stream-bed in a severely eroded area. Intensely working with these landowners in an extended, personal educational approach may eliminate possibilities for some other educational programs in the community such as perhaps a school-based program or a series of outreach programs to community service organizations. Yet, the outcome of the focused effort would, in this case, result in more immediate, measurable environmental benefit which could then support future programs to the secondary audiences. Evaluation must be about the collective, yet the only real way to ensure long-term, desired behaviors is to focus evaluations on the benefits and outcomes for the individual. In every case, evaluation can only determine if the benefits and outcomes are met.

6.3. Should evaluation drive a program?

An important role of evaluation in environmental education programs in the long-term is building the credibility of education toward meeting conservation mission goals. The more immediate term is to build support for EE within and among various agencies and organizations. Whether school, community, intergenerational, senior, or any of the wide array of audiences served, for environmental education programs to justify their existence in many organizations, and to obtain the funding deserved for these programs, programs need to be driven to be accountable against organizational missions. I believe one role of the evaluator should be to help drive programs toward conservation outcomes measurement.

Demonstrating how environmental education programs support the claims of moving the organization toward its goals would likely force a shift in the terms of outcomes of many educational programs. Rather than picturing human behavior as a “long term outcome,” this instead may be immediate or mid-term in achieving some change to the planet. Returning to Bennett’s concept of secondary outcomes, long-term outcomes could even shift to include how individuals engaged in environmental education programs interact with others to further extend the impact of the program.

References
