Developing Habits of Environmental Thoughtfulness Through the In-Depth Study of Select Environmental Issues

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Abstract

As the range and complexity of global environmental issues has broadened, and the scope of environmental education has expanded, demands have increased to cover more environmental topics and concepts in the school curriculum. However, if students are to develop enduring habits of environmental thoughtfulness, then a focus is needed, not on the broad coverage of many topics, but on the in-depth and authentic study of a few environmental issues. In this paper, after offering a rationale for in-depth study, I examine the problems and possibilities of constructing curricular and pedagogy with such a focus by describing the beliefs and practices of teachers who have emphasized in-depth study as a means to promoting student thoughtfulness.

Résumé

En raison de la complexification des questions environnementales globales et de l'élargissement de la portée de l'éducation relative à l'environnement, les demandes se multiplient pour intégrer au curriculum scolaire davantage de concepts et de contenus environnementaux. Toutefois, s'il importe d'aider les étudiants à développer des habitudes durables de réflexivité environnementale, il convient de s'intéresser non pas à l'augmentation de la quantité des contenus traités, mais plutôt à la qualité d'une authentique étude en profondeur de quelques questions environnementales choisies. Dans cet article, après avoir développé un argumentaire en faveur d'une approche en profondeur, l'auteur analyse les problèmes et les possibilités d'un curriculum et d'une pédagogie axés sur une telle approche. A cet effet, il décrit les croyances et les pratiques d'enseignants

qui ont exploité l'étude en profondeur comme moyen de favoriser la réflexivité des étudiants.

Some environmental educators have perceived pressures from two sources as demanding a considerable expansion in the environmental topics and concepts studied in schools. First, environmentalists who are concerned about the increasing variety and complexity of environmental problems facing both local communities and our global planet have advocated that more facts and concepts related to these concerns should be covered in the school curriculum (Milbrath, Hausbeck, & Enright, 1991). Second, the contemporary concept of environmental education articulated by international policymakers and academics seems to have been interpreted by many teachers as requiring a similar response. For example, several studies in different countries have indicated that teachers of environmental education programs focus on broad information about the environment (Ham & Sewing, 1987/88; Spork, 1992; Yantzi-Sammel, 1996). Yet a focus on the broad coverage of many environmental facts and topics is, I believe, a misplaced educational response.

Given that little attention is given in school programs to "investigating and clarifying environmental viewpoints" (Spork, 1992, p. 150), such a focus suggests that environmental problems are superficially treated with students developing little understanding of the complexities involved and little capacity for thoughtful decision-making on environmental issues they may encounter. The broad coverage of many topics, in whatever subject or field of study, represents the traditional resolution in schools of the age-old curriculum dilemma of breadth versus depth of content coverage. In this paper I argue that to promote enduring habits of environmental thoughtfulness in students and to develop their capacity for making informed decisions and taking intelligent actions on environmental issues, a focus instead is needed on the in-depth study of a few (rather than many) environmental issues (rather than topics).

I begin by briefly tracing the historical evolution of conceptions of environmental education in order to illustrate its consistently broadening scope during the course of this century. Then I discuss the nature of the curriculum dilemma that the current scope of

environmental education poses for teaching at all levels: whether to focus on the broad study of many environmental topics (or issues) or the in-depth study of only a select few issues. After advocating a need to move more toward the second alternative, the problems and possibilities of developing curricular and pedagogical practices that focus on the in-depth study of environmental issues are examined by drawing on two projects: an environmental education teacher development project in Europe and a research study on the teaching of higher order thinking in social studies in the United States. In particular, I focus on the pedagogical beliefs and practices of teachers in these projects who emphasized in-depth and authentic study with their students.

The Broadening Scope of Environmental Education

The origins of environmental education in North America can be traced, first, to the promotion of nature and outdoor study, essentially in primary schools, and later to the conservation movement and outdoor education. The primary purpose of nature study, which gained prominence through the publication in 1891 in the U.S. of Wilbur Jackman's *Nature Study for the Common Schools* (Stapp, 1974), was (and remains) to develop an understanding and appreciation of the natural environment through first-hand observations. The conservation movement introduced a concern for the preservation, initially, of single species and later of areas of natural significance through sound management. So conservation education, which was first introduced into public schools in North America in the late 1920s, broadened the scope from studying natural resources to also developing an understanding and a concern for managing those resources.

These movements, along with outdoor education, were rooted in liberal-progressive educational philosophies (Robottom, 1985) and had modest environmental and educational goals. None challenged the dominant socio-economic and political structure of Western industrialized societies (Stevenson, 1987). Reviews of school programs indicated that their goals of developing knowledge and appreciation of the natural environment were commonly included in elementary and high school science and social studies curricula (Childress, 1978; UNESCO, 1977).

Then in the 1960s came warnings from environmental writers (e.g., Carson, 1962; Ehrlich, 1968) of imminent ecological disasters and the emergence of the environmental movement. A call for educating present and future generations to take action to alter the current habits of misuse of the environment gave rise (following the United Nations Conference on Human Environment in 1972) to a third developmental phase of education relating to the environment, now widely termed "environmental education." The Belgrade Charter (UNESCO-UNEP, 1976) and the Tbilisi Declaration (1978), which were products of conferences sponsored by UNESCO's International Environmental Education Program, introduced three additional dimensions into the concept of environmental education. First, the term "environment" was expanded beyond the natural to include the built and beyond biophysical factors to consider social, cultural, economic, and political aspects. Second, local environmental issues were framed within a global or "spaceship earth" consciousness (as exemplified in the popular motto, "think globally, act locally"). Finally, educational aspirations went beyond developing students' knowledge and awareness of environmental concerns to active involvement in investigating and working toward the resolution of environmental problems. Thus, the goals of environmental education were to provide opportunities for students to actively participate in maintaining and improving the environment through the critical appraisal of environmental situations and issues, the formulation of an environmental ethic and the development of the motivation and skills to act on one's values and commitments (Stevenson, 1987). A number of writers also argued that, in order to be able to act upon their environmental awareness and values, students need to develop knowledge of the political process and skills in political advocacy (Huckle, 1986). Thus, as well as the concept of "environment" expanding, for some educators the scope of knowledge, skills and values for understanding and investigating the environment had broadened beyond environmental literacy to include political literacy.

A fourth phase of reconceptualizing and broadening environmental education emerged in the context of international attention to the notion of sustainable development. Although environmental education reports in the 1970s, such as the Belgrade Charter (1976), recognized that issues of social justice are closely

linked to environmental decision-making—a relationship that is exemplified, for example, by the concentration throughout much of the U.S. of hazardous waste disposal sites in communities of color—this issue became more central. For example, the Brundtland Report of the World Commission on Environment and Development (1987) focused on the single theme that "many present development trends leave increasing numbers of people poor and vulnerable and at the same time degrade the natural environment" and concluded that "humankind required new, more ecologically sustainable and socially just approaches to development" (Fien, 1995, p. 22).

Peace education also was given central prominence when the *World Conservation Strategy* for the 1990s argued that education has a vital role to play in ensuring that people learn, accept and live by the principle that "living sustainably depends on accepting a duty to seek harmony with other people and with nature" (ICUN, 1980, p. 8). In other words, improving the quality of life for everyone demands building communities of trusting, caring people who can co-exist peacefully throughout the globe. Put simply, the imperatives underlying the concept and processes of sustainable development have created a new agenda for environmental education that forges a close connection with development education (Fien, 1995). Thus, education for sustainability has been conceptualized as linking not only conservation and development education, but also peace and human rights education (O'Donoghue & McNaught, 1991). The introduction of these aspects of sustainable development has further broadened the scope of environmental education.

To summarize this potted history, environmental education can be viewed as having broadened on several different dimensions in progressing from nature study (with its focus on knowledge about natural systems), through conservation education (and its concern for understanding and appreciating the management of such systems) and environmental education (which addresses understandings, values and action skills related to the biophysical, sociocultural, economic and political factors that affect our use of the environment) to education for sustainable living for all people on the planet (with its concern for socially just and peaceful approaches to development).

An important caveat should be added. The history of environmental education presented here represents this writer's construction of the international discourse among policymakers and academics and is not necessarily recognized either in practice or by all policymakers and writers. Although I believe a strong argument can be made for the appropriateness of the broad conception presented here, environmental education is a contested concept and conceptualizations certainly vary. For example, some people hold one of the earlier conceptions that have been outlined or have an apolitical focus regarding the scientific aspects of environmental problems. Nevertheless, current readers of major journals in the field, such as *Environmental Education Research*, the *Australian Journal of Environmental Education*, and this journal, will recognize that many contributors, at least implicitly, frame their work within the broad conceptualization that has been outlined.

Although the objectives of nature study and conservation education could be relatively easily accommodated in the goals, curriculum and structural organization of schools, the broader concepts of environmental education and education for sustainability present a more formidable challenge. Incorporating their multiple dimensions in school programs is proving to be a challenging task for educators. For example, an interdisciplinary approach to the study of real problems is demanded, yet school curricula emphasize the discipline-based study of abstract problems.

One Response: A Call for the Broad Coverage of Environmental Topics

One response to addressing this broad conception of environmental education is to increase the number and variety of environmental topics, problems and concepts that are included in the school curriculum and to expand the interdisciplinary perspectives from which these topics and problems are studied. Numerous sets of curriculum materials on a wide range of environmental topics and problems have been produced, especially in the United States, to encourage teachers to include such topics in their curriculum planning (e.g., Project Learning Tree, Project WET, Project WILD). State/provincial and/or district curriculum policymakers tend to

take a conservative middle course and acknowledge the significance of environmental concerns but identify only some very general, widely recognized global environmental problems, such as pollution or extinction of wildlife, in their subject area curriculum guidelines. In other words, curriculum documents include relatively well-defined and commonly accepted environmental problems that do not generate substantial or controversial disagreement, at least in the community in which the school is located. This emphasis on abstract, global (rather than actual, local) problems contributes to a situation in which many teachers include broad environmental topics or problems by independently covering discrete elements of knowledge (e.g., facts, concepts, events) about the topic or problem.

These responses by educational policymakers and teachers, I would argue, are based on what has been termed "an addiction to coverage," an addiction to trying to teach everything we consider important and worth knowing (Newmann, 1988). Human-environment interactions then are viewed as one of many significant areas of human experience that should be squeezed into the school curriculum. The vast quantity of knowledge that has been accumulated about these interactions is set alongside the immense wealth of knowledge generated in other domains to compete for space in the curriculum.

This addiction to coverage is based on two erroneous assumptions. The first is that we can keep up with the knowledge explosion and select a comprehensive representation of all the valuable knowledge that has been produced (Newmann, 1988). The second assumption is that exposure to information and ideas equates with learning (which is further assumed to produce changed attitudes and behaviors). For example, there seems to be a common belief that merely exposing children to more environmental subject matter will result in their better understanding and appreciation of our environmental problems, despite research to the contrary (Gayford, 1996; Hungerford & Volk, 1990; Jordan, Hungerford, & Tomera, 1986).

The consequence of these assumptions is that knowledge is reduced to trivial, fragmented bits and understanding is confined to the simple and superficial. Learning, therefore, becomes defined as the mindless acquisition of information that remains inert or unused (except for short term recall for quizzes and tests) and, therefore, is

quickly forgotten. A grade 11 student expressed this concern rather eloquently in describing his social studies class:

> A lot of time it's a total skim; it's very bad. A classic example is this course in European history. We covered 2000 years. Every week we had a 30 page chapter due. We had 50 dates a week to memorize. The pity of it all is that now I don't remember anything. I worked so hard, and now . . . there's like maybe five dates I remember, when I probably learned three or four hundred dates all year. I can't even remember a lot of the major guys we studied. (Newmann, 1988, p. 346)

A focus on the extensive coverage of many topics pressures teachers to gloss over the complexities and nuances of concepts and to omit alternative and opposing viewpoints on problematic issues: crucial omissions in environmental education which is full of inherently difficult and complex concepts that are abstract, fluid, and subject to different interpretations (Jickling, 1992).

In the rush to include as much information as possible, teachers also tend to synthesize material for students instead of requiring them to construct their own understandings. Little time is available for students to engage in careful and sustained thought about the assumptions, evidence and inferences underlying knowledge claims;[1] to analyze the values underlying particular viewpoints; and to explore the personal or social significance of a topic or issue. The superficial treatment of environmental topics may result in better players of an environmental version of *Trivial Pursuit*, but is unlikely to produce individuals who are able to thoughtfully and critically appraise environmental situations, to formulate their own moral code in relation to these situations, to act rationally and responsibly on their value choices (Stevenson, 1987).

The Alternative: An Emphasis on In-Depth Study of Select Environmental Issues

An alternative to the broad coverage of environmental topics is the in-depth and authentic study of select environmental issues. The term "issue" is used to refer to any problem about which there is significant disagreement among people affected by the problem as to the appropriate solution.[2] An "environmental issue" has been

defined as "a socially or ecologically significant problem, somehow related to the environment, about which there are differing human beliefs and values" (Ramsey, Hungerford, & Volk, 1989, p. 26). Environmental policy issues usually involve three types of questions: moral or value questions, questions of definition, and questions of fact and explanation (Oliver & Newmann, 1970). Disagreements can arise over the answers to any or all of these types of questions. For example, experts may (or may not) agree on the factual question of how much soil erosion and vegetation damage is caused by trail bikes in a national park, but resource managers or citizens may not agree on the value question of whether or not a high impact recreational activity is appropriate in such an area. "In-depth" means that students spend a sustained period of time examining and debating these questions, while "authentic" signifies that students, through systematic inquiry, construct their own meaning and produce knowledge that has an immediate social value in making a judgment on a specific issue that is real and meaningful to them (Newmann & Wehlage, 1995). Therefore, in an in-depth, authentic study of an environmental issue students: identify an issue within their local environment that is meaningful or significant to them; conduct a sustained, interdisciplinary inquiry or investigation into that issue; and by constructing their own understandings and values, develop a defensible position on the issue, and make judgments about appropriate actions that should be taken.

Why should in-depth study of only selected environmental issues be emphasized? First, studying a real issue rather than a topic is not only more meaningful and motivating to students, but provides a focus and direction for contextualizing and connecting information and ideas and thereby reducing the likelihood of fragmented and superficial treatment of subject matter. Second, intensive, in-depth study is much more likely to involve students in analytical and critical thinking, to enable them to develop deep and sophisticated understandings of environmental issues (including the value positions underlying such issues), and to cultivate habits of environmental thoughtfulness. The development of these capacities and habits of thoughtful inquiry and moral deliberation on environmental issues is, I would argue, a more important and more enduring outcome than merely acquiring discrete content knowledge about the environment.

Developing such habits, however, requires time not coverage: when a sustained amount of time is devoted to the study of a single topic or issue, complex explanations, alternative and opposing viewpoints and subtle nuances can be examined. But merely spending more time on a single issue does not guarantee that students will be involved in careful and complex thought. For example, you could survey all the major environmental issues, in a boring, non-critical, non-thinking way or you could focus on the water quality of a local creek in a boring, non-critical, non-thinking way. If the intensive study of specific issues is to be justified, then students must go beyond the acquisition of environmental information as presented by the teacher or text and be challenged to construct their own understandings by analyzing and interpreting that information (Newmann, 1989). Depth for the sake of depth is no more valuable than coverage for the sake of coverage. The time needs to be used for students to be involved in experience-based learning that "is not a matter of the children simply taking in the principles of environment-friendly behavior without thinking; they need to discover the environment, study situations and carefully seek solutions" (Axelsson, 1993 cited in Elliott, 1995, p. 22).

Thoughtful, in-depth analysis of an environmental issue does not mean a neglect of content, but in fact demands in-depth knowledge of subject matter, as well as skills in processing information and attitudes or dispositions of thoughtfulness (e.g., being reflective, open-minded). Rather than teaching specific content or process objectives one by one, however, various understandings, skills, and dispositions are developed by students as the need for them is encountered during the process of in-depth study. In other words, they are acquired in the context of a specific inquiry, although sometimes particular information and skills may be needed prior to an investigation.

There is, of course, a downside or negative consequence to emphasizing the intensive or in-depth study of a few select issues and that is that many significant environmental facts and concepts are likely to be omitted from the curriculum. The dilemma is to find an appropriate balance. However, the predominant resolution of this dilemma at all levels of education, especially at the secondary and post-secondary levels, has been on the side of coverage (see Newmann, 1988; Sizer, 1984; Stevenson, 1992). A

change in emphasis from coverage to depth requires a paradigmatic shift or conceptual change from teachers transmitting other people's environmental knowledge, beliefs and values to students constructing their own understandings and clarifying their own value positions. The question of how some teachers manage to make this change is the final subject of this paper.

Beliefs and Practices for Promoting Environmental Thoughtfulness

How is it possible to emphasize the in-depth study of environmental issues in schools? What beliefs or perspectives lead some teachers to emphasize in-depth study? How do some teachers promote thoughtful habits of mind in their students? An environmental education teacher development project in Europe and a five year research study on the teaching of higher order thinking in high school social studies in the U.S. shed some light on these questions. The findings from these two projects are examined within the framework of three criteria that can be synthesized from the literature as essential for an authentic in-depth study. These criteria emerge from work on authentic student achievement (e.g., Archbald & Newmann, 1988; Newmann & Wehlage, 1995), student perspectives on in-depth study (Stevenson, 1992), and guiding principles for environmental education (Tbilisi Declaration, 1978; Elliott, 1995) and the study of public issues (Oliver & Newmann, 1970).

An authentic, in-depth study of an environmental issue should involve:

- an issue that is meaningfully and significantly connected to students' lives;
- a process of interdisciplinary inquiry that examines the empirical, definitional and value questions underlying the issue; and
- student construction (rather than acquisition) of environmental understandings and values.

These criteria are consistent with the principles emphasized in the OECD Project on Environment and School Initiatives (ENSI). This project attempted to establish a link between the dual aims of

developing students' understanding of the complex relationships between humans and their environment and fostering a teaching/learning process which develops dynamic rather than static qualities in students (Elliott, 1991). These aims were intended to be achieved by engaging students in interdisciplinary inquiry into real environmental problems within their locality. Not surprisingly, the teachers from 11 countries in the first phase encountered some problems in attempting to achieve these aims. Many of these problems were directly related to the criteria that have been described for an authentic, in-depth study, including:

- implementing inter-disciplinary enquiry in schools where the curriculum is predominantly organised in terms of discrete subjects;
- handling the values-issues by students' active involvement in improving the environment in their local communities;
- handling the complexity of evidence about the effects of human beings' interactions with their environment. (p. 3)

Initially, in the first phase of this project, little support was provided to help participating schools address these problems. However, in the second phase a professional development support structure was established to introduce teachers to the use of action research as a means of systematically addressing these problems and improving their own educational practices and their understanding of those practices.[3] This approach to professional development was seen as enhancing teachers' autonomy and capacity to develop practices that most effectively engage students in sustained in-depth inquiry into selected environmental issues (Elliott, 1991).

As a result of conducting action research, the Swedish teachers in the project discovered that "simply involving students in environmental action projects which they, teachers, believed desirable," did not lead to students developing a sense of personal agency in the environment or to valuing environmental action in their lives (Elliott, 1995, p. 17). Environmental issues in general, they reported, were not important to Swedish students who tended not to put any effort into work they judged unimportant. Instead, they found through observations and interviews that students need to reflect "on aspects of the environment which they judge to be important and significant for their lives" (p. 17). These findings

were reflected in a number of other national reports that concluded "involving students in action projects which reflect other people's environmental values and beliefs does not develop their environmental understanding in a form which enhances their capacity for intelligent and responsible action in the environment" (p. 18). These experiences in engaging students in interdisciplinary inquiry into real environmental issues indicate that an issue should be selected that relates to what students value in their environment.

Teachers in the ENSI project also gained some insights into using interdisciplinary inquiry, the second criterion for an in-depth study, for promoting student thoughtfulness on environmental actions. Interdisciplinary inquiry was acknowledged to be complex work. For example, the resolution of environmental policy issues requires going beyond technical representations (concepts/images) and solutions provided by scientific disciplines to also consider the social and historical conditions that have shaped these concepts and solutions (Elliott, 1995) and the definitional and value questions about quality of life involved in such issues (Stevenson, 1993). The process of inquiry therefore necessitates not only developing complex empirical understandings, but also raising value issues and engaging students in substantive discussion of different values, the points of view that underlie them, and the dilemmas confronted in choosing between conflicting values. The Italian teachers in the OECD project argued that:

> when environmental education is viewed as a process of looking at problems from different points of view, students come to realise how people's values enter into the selection and interpretation of the facts of the situation. In this context disciplinary knowledge constitutes a resource for analyzing environmental issues from particular points of view. The teacher's role is to represent the disciplines as methods students can employ to analyze what one Italian teacher calls "the positions in the field." (Elliott, 1991, p. 23)

The facilitation of interdisciplinary inquiry in environmental education, therefore, implied three tasks for these Italian teachers: "(i) respecting diverse value positions; (ii) refraining from promoting environmentalist values; and (iii) using interdisciplinary methods for analyzing a range of positions" (p. 23). Teachers also must accept responsibility for maintaining critical standards in

discussion-based inquiries, such as demanding that arguments be based on evidence and sound reasoning (Elliott, 1991).

Environmental educators can meet the third criterion of facilitating students' construction of their own environmental understandings and values by engaging students in higher order thinking (through interdisciplinary inquiry). The kinds of instruction that engage students in such thinking were revealed by the study of high school social studies departments and their efforts to promote higher order thinking in their students. A part of this study involved identifying the thoughts and practices of the five teachers who were observed to be the most outstanding at promoting classroom thoughtfulness (and comparing them with five who were less than outstanding) (Onosko, 1990; Onosko, 1989). Each of the outstanding teachers shared a common instructional goal and perspective: they viewed the promotion of student thinking as equal to or more important than student exposure to topics and events. Furthermore, they had a more sophisticated conception of what promoting student thinking entailed (i.e., they could articulate a framework or model of thinking). Despite external pressures, these teachers recognized the negative effect of broad coverage on promoting student thinking and were more willing than other teachers to reduce content coverage and explore with students issues and ideas in greater depth. One of the outstanding teachers explained one of his reasons for limiting content coverage:

> One of my big advantages as a teacher is that I don't know much. I know a few general principles. I don't know much to tell the kids so I always ask questions. I don't remember any anecdotes so I don't have much to say. And that's one of the things that makes me a good teacher. The more a teacher knows, the more important it is that the teacher have an effective pedagogy to hold the information in restraint. (Onosko, 1990, p. 185)

This teacher is, of course, jesting in part. The point is not that teachers do not need knowledge to promote student thinking, but that a different kind of knowledge is required. Instead of knowing many isolated facts about the subject matter, a substantive knowledge of key concepts and principles in the domain of study, as well as pedagogical knowledge and skills of engaging students in higher order thinking, are demanded. Some studies have

suggested that such expertise, unfortunately, may be lacking in many teachers (Newmann, Onosko, & Stevenson, 1990; Onosko, 1990).

Specifically, the effective pedagogy that distinguished the outstanding teachers included: leading focused discussions; posing challenging questions and tasks; pressing students for reasons and explanations in support of their statements; engaging students in Socratic dialogue; modeling thoughtfulness, particularly by sharing his/her reasoning and complimenting students on their thinking; and revealing competing views among authoritative sources (Onosko, 1990). These kinds of classroom practices provide guidelines for teachers wishing to promote students' thoughtfulness about environmental issues.

Obviously there are many barriers to deep inquiry in environmental education where students are involved in critically analyzing selected environmental issues. Therefore, it is particularly important that teachers critically analyze their own curriculum and teaching practices in trying to facilitate students' environmental inquiries. However, it is also crucial that the conditions that inhibit teachers from effectively engaging students in more sustained in-depth study of environmental issues are addressed. John Elliott (1991) has described how action research was used as a vehicle or mechanism for conducting inquiries at these three levels within the OECD project:

> Students undertake action-research into how to improve the quality of their environment, while teachers undertake action-research into how to pedagogically improve the quality of students' curricular experiences. However, there is also a third level of action-research which focuses on the problems of providing support for the professional learning of teachers. At this third level action-research constitutes the means by which a support system is developed by those responsible for providing it. (p. 4)

In other words, action research offers a systematic process for students to monitor their actions in carrying out an environmental inquiry, for teachers to monitor their pedagogical actions in facilitating student inquiries, and for teacher support personnel to monitor their efforts to help teachers use action research for understanding and improving their teaching of environmental education. Experiences in the two projects which have been

described suggest that, irrespective of the process or methodology used, developing students' habits of environmental thoughtfulness and teachers' appropriate beliefs and practices for promoting such thoughtfulness demand several important commitments. First, there is the need for teachers to articulate, question and debate (both privately and publicly) their specific environmental education goals and their beliefs and assumptions about how students (and they themselves) learn to think deeply about environmental issues. Second, practices that best facilitate such learning and thinking, such as those outlined, need to be continually monitored and critically examined. Finally, a collective commitment is required to develop organizational arrangements that enable teachers to engage in dialogue about goals, beliefs and practices and to pursue actions that reflect the most thoughtful and effective practices for fostering environmental
thoughtfulness.

Conclusion

In struggling to construct appropriate environmental education curricula, we should begin by acknowledging that not all facts and concepts will remain with students, but habits of mind will endure over the long term. Therefore, we should focus not on teaching an extensive body of environmental knowledge, but on developing habits of environmental thoughtfulness. As environmental issues change and our knowledge of human-environment interactions changes, future citizens will need a disposition to carefully and thoughtfully analyze new evidence and new concerns in order to make informed decisions that will sustain and enhance the quality of life on our planet. This task demands not only individual actions, but also the collective efforts of communities to move societies toward that goal. Such efforts, in keeping with the contemporary concept of environmental education with which this paper began, require active participation in democratic decision making processes. Preparing environmentally and politically informed citizens for such participation must be a central goal of environmental education: a goal that can best be achieved by engaging students in the in-depth study of select environmental issues.

Notes

[1] I wish to acknowledge Joseph Onosko of the University of New Hampshire for contributing this idea about the limitations of a coverage emphasis.

[2] I am also indebted to Joseph Onosko for clarifying this definition.

[3] Different interpretations and versions of action research have proliferated in recent years. Some versions focus on solving local problems by following the usual procedures of traditional research, but on a sufficiently small scale for practitioners to use. Other versions of action research, such as in the ENSI Project, emphasize practitioners using and constructing their own knowledge of practice in systematically studying and improving their work. A common methodology involves a spiral of recursive cycles of planning, acting, observing, and reflecting to address a particular concern or situation. Instead of collecting data in order to decide what actions to take later, the action researcher is studying the intentions, consequences and circumstances of actions he or she has taken, as well as using the information to influence further actions (Stevenson, 1995).

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