

Environmental Education and Political Engagement: Teaching for Sustainability

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Abstract

Looming environmental problems are confronting our society, some potentially catastrophic and others more mundane, such as our children's growing disconnect from the outdoors and nature. Environmental education has long been a two-pronged system of thought, with one branch dedicated to teaching survival and leadership skills in an outdoor setting and the other branch remaining classroom-bound and largely science-based. In order to address the growing political issues that our ecological problems will create, we need to educate our students in both schools of thought, and attempt to integrate them into a model that will work for students in urban and suburban public schools. In this thesis, a model is proposed for educating students that will teach not only the tools of dynamic group problem solving, individual leadership, and respect for nature, but will also emphasize the science, traditions, and history of humans' interactions with nature. Fundamental to this new visioning of environmental education is a grounding in democratic participation by administrators, teachers, and students, so that democracy becomes integral to schools and children learn early on how to solve real-world problems and become true citizens in society. This system of education will be accomplished by making administrative and curricular changes in support of environmental education at the district, school, and classroom levels, and by emphasizing support for teacher training and involvement. Environmental education is a pedagogical platform "that allows for the promotion of socially responsible values, interdisciplinary learning, democratic involvement, and the importance of learning to learn."¹

¹ Betancourt, Verónica (April 30, 2006). Personal communication.

Chapter One

What is environmental education, and what can it be?

"Awareness of the deep principles of academic disciplines should enable us to design intellectual practices for the young that are stepping stones to mature understanding ... For example, in the domain of ecology and environmental science, we realize that contemporary understanding of the underlying biology would necessitate a ready familiarity with biochemistry and genetics that is not within the grasp of young students. Instead of watering down such content to a strange mixture of the biological and the biochemical, as to textbooks for the young, we invite young students into the world of 19th-century naturalists, scientists who also lacked modern knowledge of biochemistry and genetics. The idea is that by the time students are introduced to contemporary disciplinary knowledge, they will have developed a thirst for that knowledge..."
Brown and Campione (1996). Pp 306-307.

Conceptions of nature

In polls, most of us Americans and other citizens of developed countries say that we want our governments to help the environment.² And yet, despite our good intentions and desires, why do we exploit that upon which we depend? How can we want to save the whales and yet pollute the ocean? How can we point fingers at 'evil' logging companies and yet build enormously energy-dependent homes? How can we subsidize multinationals to exploit the labor and natural resources of the developing world, and then send the World Health Organization in after them to clean up?

Our hypocrisy points to a disconnect between the conservation values we profess as a society and the consumerist values that we practice. In America's short-attention span, media-driven culture, we have a hard time focusing on the present and a larger reality and we seem to find it difficult to expand the reaches of our personal worlds of caring.³ It requires deep and critical thought to attach the same value to a human life halfway around the globe that we do to our neighbor at home, and even deeper thought to value the life of an endangered bird, or a community of species, or even a weather pattern. So while we may all claim to be environmentalists when pollsters call, we as a culture do not practice environmentally-oriented politics,⁴ and therefore we cannot

² Yale University School of Forestry and Environmental Studies (2005).

³ Singer (2002).

⁴ Barber (1984) writes a wonderful definition of politics in the context of a "strong democracy": One can understand the realm of politics as being circumscribed by conditions that impose a necessity for public action, and thus for reasonable public choice, in the presence of conflict and in the absence of private or independent

have a real impact on environmental issues. We cannot even have much of an open discussion as a society, because our behavior rarely reflects true environmental values—and how can people develop informed opinions if they never see a set of values put into practice to evaluate them?

As Westerners, we have had a long and ambivalent history of evolving attitudes towards nature, affected by the dominant philosophies and religions in Europe and its spheres of influence. As we have adapted our ideas of nature from the inherent and essential quality of ‘everything’ (back when we made no distinction between ourselves and nature) to the essential quality that is ‘the world around us,’ to religious personifications, literary inspirations, scientific mechanisms, savage wastelands, and finally to our ‘Spaceship Earth’ life-support system, we have conditioned our responses to each of those perceptions. We as humans view ourselves as separate from an abstract Nature, and yet we as environmentalists recognize that we depend upon it and build our societies and structures in parallel to all the other inhabitants of this world.⁵

We as a society see Nature as something complex, something separate and abstracted from ourselves, and yet we build societies, groups, dynamics, and balances among ourselves just as the rest of the non-human world does.^{6,7} For as long as we’ve had language and curiosity, we’ve tried to understand our world, tried to make sense of the complexity around us. Whether transcendental, medieval, druid, aboriginal, biblical, or zen, our mythologies are our framework for viewing the world and we cannot be separated from them any more than we can ever hope to truly understand our identification with them.⁸ The long history of myth-making in all cultures around the world reflects the fact of our engagement with nature, and underscores an evolutionary need for that connection. We can, however, ignore that need, bury it, lose

*grounds for judgment...*This formulation suggests that the ultimate political problem is one of action.” (120-121, italics original).

⁵ Williams (1980).

⁶ I am in New York City as I write this, and today I rode in a car across and throughout the highways that link the incredibly complex parts of this huge hive. As we passed under overpass complexes and over bridges, I couldn’t help thinking, “this is humanity. In some way, precisely because this breathtaking mess of steel and asphalt is what we make when we all come together like this, it’s just what we should be making and doing.”

⁷ Williams (1980).

⁸ Abram (2006).

it under layers of modernity and technology—our myths may not evolve fast enough to keep up with us, and thus may become quaint and no longer useful as world-explaining tools. We are left adrift, lacking metaphors for our involvement with one another and the world around us, and we retreat into our shells and our TV lounges.⁹

Some authors present opposing views, and conceive of humans as different from autonomous non-human nature, especially when we see nature as wilderness. If all environmentalists were farmers, they'd see that nature as 'wild-ness' is hostile to humans, and is nowhere near as Romantic as the escapist, Rousseauian myth we city-dwellers have.¹⁰ By treating wilderness and nature as an ideal, we judge ourselves in civilization by that ideal. When we do that, the destructiveness of our human foibles will inevitably fall short of the complexity and functionality of nature. The frustration this failure causes is what leads to the incredible disconnect modernized humans tend to have from nature, our alienation from natural history and the cookie-cutter housing we choose for ourselves, no matter in what part of the country. We see nature as Other and thereby cannot even recognize that we have a place within it, and so we blind ourselves to how we can improve that place. We evade our responsibility, not only to truly care for our relationship with nature, but also our responsibility to care for one another with respect to nature—environmental justice.¹¹

There are these and many, many more reasons why we ought to pay more attention to the world around us and our connection to it, some of which will be described in the next chapter. With humanity's present exponential growth rate and ever-increasing resource use, there will be little left to give our coming generations in terms of useable materials and space, and potentially even less in terms of beauty. If for no other reasons, these two should be enough for us to want to slow or stop our self-destructive "progress," and change the cultural practices, and therefore politics, of the Earth's current dominant nation—the United States of America.

⁹ Putnam (2000) and Louv (2005).

¹⁰ Throughout this paper, the assumed "we" is a Western audience, accustomed to living in cities and suburbs and analyzing policy from that perspective. I wish I could include rural American and third-world perspectives in my work, but I have little personal experience with either area and have not focused much on the topic in terms of research.

¹¹ Cronon (1995).

Conceptions of education

Public education is the backbone of American society. For the past 150 years, every American child has been educated in some similar way, and for the past 50 years the national conventions have grown so standardized that generalizations can be made for every student in the country since then.¹² We trust public school to teach our children values, educate them in citizenship, socialize them to common standards of behavior, provide them with job skills, and assimilate them if they come as immigrants. Education is oft credited with producing our political and spiritual leaders (in the long tradition of the Harvard Divinity School, those leaders often had significant role overlap), nurturing our all-important business leaders, shaping the styles and messages of our arbiters of entertainment and news. Education permeates American society, and it has a deep and often-unnoticed power to shape the opinions of each successive generation that passes through school. All education, therefore, is political, in that it teaches the ways and means for citizens to connect with one another and share knowledge across common ground, and this connection is also the fundamental root of politics.¹³

Knowledge shared, while often ostensibly little more than a set of facts, is tied up with the belief system, morals, and values that shaped or created those ideas and understandings. Schools have always been about teaching children values, and over time, the thrust of those values has shifted and morphed.¹⁴ Schools have never been about just reading, writing, and arithmetic—community values such as democratic participation, obedience to authority, moral virtue, religious piety, good hygiene and nutrition, and placement within dominance structures have and continue to be a large part of the fabric of schools.¹⁵ In my opinion, such socialization is perhaps the primary

¹² Bernard & Mondale (2001).

¹³ I do not here wish to argue that all education is *politicized*. This might be an easy misinterpretation of my use of the term “political,” but I am referring to the act of education itself, to the cultural structure and grounding that allows us to have formal processes by which to transmit knowledge between generations. The politicization of education in the form of governance elections, technocratic “experts,” and divisive school-board hearings is a different subject, which is not in itself the subject of this paper.

¹⁴ Noddings (1988).

¹⁵ Tyack & Cuban (1995).

reason for state-sponsored education, so we must not overlook the primacy of teaching values in school. The values have been more or less explicit over time, but more recently (as with the most recent reauthorization of the Elementary and Secondary Education Act, known as No Child Left Behind) the public dialogue surrounding schooling has shifted from explicit approval of values education to strong critiques of any overt attempts to deviate from a testing-focused curriculum. Our current test-driven curriculum is certainly not values-free or –neutral, but the concept is no longer outwardly approved of or discussed. There is no point in hiding (or pretending to hide) such a fundamental aspect of public education, and so, perversely, despite the increased clamor for standardization, there may be space in education today for a renewal of a values-driven movement. Despite appearances, the time may be ripe for introducing environmental education into our urban and suburban public schools.¹⁶

In this paper, I will examine the long history of environmental education, and the short history of its modern incarnation. I will discuss why it is urgently needed, where it can best be used, and how to teach for environmental engagement. Most of all, however, I will place environmental education within the political realm, as a human activity that has the potential to affect the way we interact with one another and with the entire world. When practitioners and educators recognize the power of the work they do in environmental education, they will be able to expand their focus and goals to take in the politics of the environment and of ecosystems, and teach children (and adults!) to relate to and care about a wider community. If this can be accomplished, if people can be taught to connect and to care, if their values can be changed at a fundamental level, then their behavior will follow. And when enough citizens behave with an environmental consciousness, they will affect their communities via interaction and evangelism, and create a new cultural consciousness that will translate into a politics of sustainability.

¹⁶ As mentioned above, I will only be referring to urban and suburban schools. I hope that some of my conclusions and ideas might relate to rural education, but I simply do not have enough academic experience with the study of rural America to make any such claims.

Environmental education past and present: Theories and examples

Studies of the environment have become one of the fastest-growing fields in higher education, according to Louise Rosen, at Columbia University's prestigious Earth Institute. Competition for admissions to professional programs at the Earth Institute and other similar schools has jumped dramatically in recent years, and more and more undergraduates are seeking out an environmentally-oriented program of study.¹⁷ Clearly, many young adults are interested in becoming environmentally educated, and this trend is an excellent thing. However, would it not make more sense to extend such opportunities to younger students, to those still in public grade schools, in order to extend the impact of this kind of education? Environmental education need not be a fringe choice for college students—it can have a deep and lasting impact upon America's educational system as a whole.

Many writers have attempted to define environmental education, concluding with such vague statements as “[environmental education will be] nothing less than the re-education of human kind,”¹⁸ “environmental education is the development...of a...system by which man interacts through culture on the biophysical environment to advance human welfare,”¹⁹ and “environmental education studies...a spectrum of intrarelationships spanning human and nonhuman environments.”²⁰ Unfortunately, while the theory and research behind each of these authors' ideas is real, they convey an impression of tree-hugging, self-righteous, earth-worshipping vegetarianism, an image that has proven eminently unpalatable in our current ideological climate. Daniella Tilbury²¹ spans these definitions and goes farther, arguing that the goal of environmental education is sustainability, underlain by the relevance and immediacy of the need for sustainability and ecological systems theory, a widely recognized and respected way of looking at the environment. Tilbury considers sustainability to be the ultimate purpose of environmental education, and that therefore environmental

¹⁷ Rosen, Louise (10/26/2005). Personal communication.

¹⁸ Orr (1996).

¹⁹ Stapp (1969).

²⁰ Colwell (1997).

²¹ (1995).

education for sustainability is not a separate subject or topic, but rather an integrative platform that can and should be combined with all other currently taught disciplines.

Environmental education has often been characterized as divisible into three categories: *in*, *for*, and *about* the environment.²² Education *in* the environment is often termed experiential education, and is the oldest form of education—considered in a pure form, it is all education, the passage of knowledge from one generation to the next about how the world works. We are always *in* our environment, so in some sense, all education is environmental education.²³ However, in the past century this definition has shifted to be more specific, and often refers to “outdoor education,” or taking students into some form of nature and guiding them to interact with it and each other. In terms of traditional subject matter, this kind of learning may be most conducive to the study of natural history, but educators are sometimes quite adept at using the unfamiliar setting to broaden their students’ perspectives on a whole range of subjects, from cooperation to mathematics. Education in the environment can be transformative, difficult, and expensive, and is often viewed by the mainstream as a manifestation of that back-to-nature “hippie” ethos.

Education *for* the environment encompasses many of the political and cultural realities that higher education addresses, including the study of environmental politics and management, recycling education programs, environmental engineering (think dam-building and forestry) and so forth. On its own, it can be very removed from real-world issues, and does not necessarily have an impact on a student’s values and beliefs. The same can be said for education *about* the environment, the strand most commonly found in schools. Biology, geography, physics, and so on are all examples of education about the environment, and they are all often taught in dispassionate, scientific terms, despite their incredible potential for connecting students with the relevancy of the material and their uses of its knowledge.

The ultimate goal of environmental education is to develop politically literate and engaged individuals. Achieving this goal depends on the teaching of real,

²² Tilbury (1995).

²³ Orr (1996).

reflective knowledge about the environment, critical thinking skills, democratic skills and values and engagement, and experience of the day-to-day and overarching processes of environmental politics²⁴. In other words, tomorrow's environmental education somehow needs to encompass all three of yesterday's strands—education *in*, *for*, and *about* the environment. We need to use the pedagogical platform of environmental education to teach the interdisciplinary concept of the “earth system”²⁵ and situate ourselves as humans within our environment, ultimately breaking down the barriers between nature and culture.

Working for democracy: Environmental citizenship

Ecological problems are and will become political problems. Global climate change, changing availabilities of fresh water, and toxic emissions are all issues that are individual concerns when they are of limited impact but that grow to become governmental issues when they affect the regional or global commons.²⁶ Therefore, citizens need to become aware of the issues and of their own potential to be agents of democratic change, a knowledge set that public schools are uniquely positioned to provide. Learning to think critically in the context of political engagement will become increasingly important in the coming years, as environmental problems are likely to grow out of control and major interventions, both governmental and cultural, will be needed to ensure the continued quality of life for humans and other members of our closed system (Earth).²⁷ These problems will be so dynamic and surprising that schools involved in such an educational project cannot simply set their sights upon a new set of facts or an environmental science curriculum—they will need to transcend such content knowledge and teach for argumentation,²⁸ for the form and structure of learning that enables citizens to adapt and respond to political pressures.

²⁴ Tilbury (1995). 205.

²⁵ Colwell (1997).

²⁶ Hardin (1968).

²⁷ Bullard (1993).

²⁸ Knain (1999).

Environmental education is inherently interdisciplinary, and some might go so far as to say that *all* education is environmental education.²⁹ Whenever we teach students about the world, we are teaching them about their places within it, teaching them a method for interacting with their environment. Thus, the environment serves as an interface in education, and can be valuably used in such a fashion to teach about almost any content area. Environmental literacy is a major component of environmental education conceived of in this manner, especially as it can shape a sense of connection to the environment and lead to a sense of care for other living things. In order to reach this level of teaching and learning, in which values can be incorporated into an in-school education, students and teachers must become deeply engaged with their learning. Engagement is a multi-step process, beginning with an initial “hook” triggered by the student’s interest in a new material or process.³⁰ Building upon this hook results in a “powerful learning environment,” which is as antithetical to the current standardization movement as any type of education can be. Such a powerful learning environment involves students and teachers directly in one another’s educational environments, and is deeply dependent upon community-based problem-solving, bringing us full circle back to the essential validity of environmental education in teaching for democracy.

An empowerment project: Bringing the outside in via policy changes

Democratic school governance is a precursor to democratic participation in society, and environmental education has a strong opportunity to underlie that relevance. Reorganization will be necessary to achieve the desired curricular focus on the environment, both natural and societal; especially as getting children to connect with the environment is such a quintessentially local and place-based activity.³¹ Therefore, schools should be reorganized such that curricula is locally-driven, with input from all parties (administrators, outside experts, teachers, parents, and students),

²⁹ Orr (1996).

³⁰ Hidi & Renninger (2006).

³¹ Louv (2005).

and with the final aim of site-based management such that schools have the freedom to pursue their own visions while still adhering to high standards of educational quality. The process of such reorganization would be an opportunity for all members of the system to participate in an activity with real-world consequences, which is central to the aims of both environmental education and teaching for democracy. Students and teachers will be empowered by being made active participants in the structure of their overall system, and can be encouraged to seize that sense of empowerment and bring it into their curricular choices and the learning environments they create.³²

This reorganization would embody one of the grounding principles of environmental education, which is that the pedagogy and values of an environmentally focused ideology are just as important as the scientific or historical content. In order to bring such a sense of context to their teaching, however, teachers will need a great deal of district and administrative support and training. Sensitive administrators will model the kind of participation that teachers would hope to achieve in classrooms by similarly inviting teachers to participate in administrative decisions, and by hosting spirited political debates that teachers can mirror in their classrooms with a focus upon environmental issues and problem solving. Democratic involvement in the school governance and decision-making process has been shown to have the potential to imbue students with a deeper understanding of and connection to the politics of the wider world.³³ Adults and children alike will respond when given the opportunity to take a larger stake in their education, and as such, school is a logical starting point for a wider program of citizen involvement. ‘Getting back to nature’ in schools, then, is

³² Such projects would be expensive, but we already have an expensive project that has brought deep systemic reforms to our schools: No Child Left Behind. NCLB is very costly, but it has a time limit—by 2014, according to the law, “all students...[must] reach state standards for proficiency in reading and math.”³² In 2014, according to the law, every single child in this country will have reached state standards of proficiency! Not only is this quite unlikely and statistically impossible, it is expensive and burdensome for schools, and a number of states have made efforts to opt out of the law (with no success). The political pressure against NCLB is strong enough that by the time its deadline is up, it will go the way of most school reforms. However, by that time, state budgets will have expanded dramatically, and I predict a backlash towards learner-centered theories of education in response to the standardization of NCLB. 2014 is a perfect time to move all that no longer needed money away from testing and towards environmental education—and until then, individual teachers, students, and parents can work to prepare the ground. When the time comes, they will be ready to step up and make their voices heard as they engage in the dynamic forum that is educational policy.

³³ Stroupe & Sabato (2004).

about much more than simply spending time outside—it is about providing the opportunity for people to make connections with one another, with their environments, and with their societies.

The process of environmental education incorporates two key components: (a) the skills of community engagement and participation, extending to activism, and (b) environmental literacy, or an awareness of environmental issues and the societal values that relate to them. The fusion of these two aspects of environmental education can lead down wonderful, and ideologically risky, paths, and a very natural one is towards a thoughtful kind of environmentalism. To bring this sort of interdisciplinary knowledge to schools, when the usual power in outdoor education stems from its separateness from the mundane, will require a redefinition of “Nature” so that it’s not always so far away from where we are right now. This challenge has the potential to excite teachers and bring together educators from across disciplines,³⁴ raising the social involvement of all actors in the school and creating new sparks to generate interest in powerful learning environments.

Environmental education in the classroom: Building a knowledge community

Much of what we know about the environment comes from the world of science. While scientific language and dialog may seem excessively complex and unreachable from the world of the classroom, teachers (even social studies teachers!) can study and then pass on the overarching structures of how to understand and interpret science.³⁵ While ecological content knowledge is important, this pedagogical relationship with science lays the foundation for a lifetime of understanding as citizen-scientists and is essential to understanding the environmental problems that come before public debate. Science relies on models to interpret and analyze complex abstract ideas, and the skill set of understanding and creating models is applicable across many different cognitive domains—especially those involved in argumentation, a key skill in environmental decision-making and scientific evidence assessment. As students progress from basic to

³⁴ Mascia, Brosius, Dobson, Forbes, Horowitz, McKean, & Turner (2003).

³⁵ Jenkins, E.W. (2003).

complex modeling skills, they develop more concrete skills that essentially mirror their development and educational progression over time.

To appropriately teach all these seemingly divergent concepts, a teacher should be capable of appealing to both cognitive and emotional learning capacities—essentially, recognizing and teaching to the many different learning styles that students exhibit.³⁶ Teaching the tools of modeling and scientific evidence-sorting should start at an early age, as children are more open to shifting their beliefs at that point in their development. Science can be taught not just as a set of facts, but as a decision-making tool and as a way of understanding the world.³⁷ Teachers considering incorporating such curricular ideas need a great deal of support from their schools and from their colleagues, not the least of which should be time to create and develop lesson plans for their classrooms. No pre-planned activity or single field trip can ever be wholly satisfying to a teacher or a class deeply engaged in local environmental issues, but with some forethought and planning commercially available materials can be adapted by asking open-ended questions, allowing student work to direct discussion and assignments, and being attuned to the curiosity of the group as a whole. As students participate more in their own curriculum building, they learn group decision-making skills that lead to learning more about personal and group responsibility.

From beliefs to practice: A model for sustainability

Group responsibility is about more than working together to achieve a goal—it includes an aspect of self-monitoring, of being aware of the conditions of each group member. It is exceedingly difficult to teach this caring, but if students can be taught to care for one another, they can extend that capacity towards caring for the environment. Education so often implies sophistication and urbanism, both of which tend towards encouraging an ideological split with the land.³⁸ Aldo Leopold³⁹ has suggested a two-pronged approach to teaching his famous “land ethic,” depending upon the type of

³⁶ Knain (1999).

³⁷ Kolstø (2000).

³⁸ Booth (1998).

³⁹ (1949).

student—scientists who are trained in detail, certain of success, and divorced from the consequences of their actions need to be encouraged to ground their abilities in their early ethical and social contexts; and “bleeding-heart” environmentalists need to be shown realities and given scientific focus.⁴⁰ With this in mind, educators can know their students and recognize the best direction to guide them in—a relatively simple sorting process; even pressed-for-time public school teachers know who in their class is more analytical and who more philosophical.

A case study of a city in England provides valuable lessons for communities seeking to education their citizens for environmental sustainability.⁴¹ Ian Roberts, a former oil industry manager, led an experiment in Leicester to put the town on a track to sustainability with the ten-year Leicester Environment City initiative. Its findings, in addition to specific ways to drastically reduce urban resource use, include a great number of insights into how to rally a large and disparate population around a driving environmental goal. Eventually, Leicester’s city council got the majority of its constituents interested in the initiative, and citizens donated time and effort to not only reducing their own resource use, but also to helping the city find innovative ways to reduce public impact and to teaching their neighbors to do the same. In the case of Leicester, the educators sought community-level education, but the situation is analogous to introducing a large-scale program change into public schools. Environmental education, in addition to enhancing environmentalism and a sense of care for the environment, is a powerful tool for learning across all disciplines and can teach for environmental citizenship, the component most used in Leicester. Roberts, in hindsight, divided the time span into three phases: *partnership*, *participation*, and *governance*.⁴² Each phase had to be completed before the city could move on to the next, because consensus-building was so important in a project that required the participation of a critical mass of citizens.

⁴⁰ Ibid.

⁴¹ Roberts (2000).

⁴² Ibid. 9.

In this sense, environmentalism is evangelism. Traditional environmentalism is often dependent upon confrontation, an emphasis on exposing problems, and a single-issue focus, but an environmental ethos engaged with present-day reality expands to include partnership, an emphasis on solutions, and a broad systemic or holistic focus.⁴³ By using such persuasive community-building language and ideas around environmental issues, Leicester was able to mobilize its populace in support of what seemed at first to be an unpopular idea. In many ways, this sort of consensus-building is education, and it is also conversion. By sustained conversation and dialogue, many of Leicester's previously indifferent inhabitants were converted to the cause of lowering resource use.

In Summary

This paper is divided into five chapters, each focusing on an aspect of the relationship between environmental education and civic engagement. In chapter two I look at the theory behind teaching for political awareness and involvement, and what aspects of environmental education hold potential for addressing that issue. With chapter three I examine some of the pertinent school structures currently in place and consider how to update them to provide a wider space for environmental education. In chapter four I turn to classrooms, making suggestions for how teachers can shape the learning environments of their students and welcome multiple forms of literacy. In chapter five I discuss the evolving nature of environmental education as it relates to the increasingly popular concept of sustainability, and consider how a newfound political awareness in relationship with the environment will allow society to grow more just and sustainable.

⁴³ Roberts (2000).

Chapter Two

Environmental citizenship: How environmental education can be the precursor to an education for democracy

“Practical environmental management cannot be implemented in the absence of comprehensive environmental policies and legislation, well-defined responsibilities and action plans, cooperative environmental auditing and monitoring authorities, and, most importantly, proficient local expertise, such as environmental scientists, engineers, economists, and administrators.”
Sermjian, El-Fadel, Zurayk, and Nuwayhid (2004). P 175.

Tools our students need: Issue awareness and policy engagement

Everywhere you look, the news seems bad: “the great, largely contiguous forest blocks of Amazonia and the Zaire basin will by 2050 be a thing of the past.”⁴⁴

Extinctions are accelerating at an alarming rate, pollution is being dumped into third-world countries and behind our poorer neighbors’ homes, national parks and wilderness areas the world over are being encroached upon, greenhouse gases are rising, the Arctic is melting, the fish are all gone from the oceans. What must children imagine when they hear this news? Some authors⁴⁵ propose that as American children are turned away from the outside world, they are spending their time inside, playing games, passively absorbing media, and growing physically unhealthy and psychically deeply disconnected from themselves. Can we blame our children for shutting themselves in, shutting their imaginations off? However, “despite these changed existential realities, many schools appear dedicated to insulating students from awareness of social issues rather than communicating a sense of urgency in regard to understanding and acting on them.”⁴⁶ We are handing our children a poisoned world, and we feel obligated to protect them from it.

We cannot protect our children. For better or worse, young people are growing into the Earth that they have, and they need powerful tools to see that world for what it is and to find ways to help solve its problems. By necessity, those ecological problems will manifest themselves as economic and political issues, and so in addition to teaching our students about ecological functioning we need to teach them to recognize and

⁴⁴ Jenkins, M. (2003).

⁴⁵ for example, Louv (2005).

⁴⁶ Baker & Hornberger (2001). 303.

respond to economic arguments, and to engage in the political process to seek change. Such teaching will require both a long- and a short-term view of effects and rates of change, encouraging kids to look towards their futures as political players but also challenging them to become involved now, at any age, and to turn the intense creativity of childhood onto solving environmental and social problems on local scales. Policy engagement, critical thinking, and active learning are all tools for awareness, methods by which educators both in schools and out can counter their students' disaffection and give them a means by which to seize an interest in the world around them.

American public schools have considerable sway over the psyche of this nation—the standardization of school culture and curriculum is such that all children educated in our schools share a common background in many respects. School reform is often proposed as a panacea for the many ills of this country, but rarely has sweeping change affected the solid bureaucracy of the system.⁴⁷ To truly create change within the structure that has such immense influence on our children, a multi-part revision is required,⁴⁸ and today's economic climate of global upheaval and power struggles may be the push to propel such change forward. Rather than focus a school reform upon curriculum, testing, or grade structures, schools need to be pushed to become flexible players, open to new ideas and not stifled by national regulations while at the same time keeping the overarching culture of American common schooling that does so much to tie our communities together.

In this chapter I will address the reasons behind the educational and political needs for education to turn outwards and focus on the world beyond itself, on the environment and on society's interactions with the environment. I will address the many negative ways that we as a society interact with and teach our children to interact with environmental problems on all levels, and propose that this interactive structure is a societal problem linked to other phenomena such as the rise of standardization in

⁴⁷ Tyack & Cuban (1995).

⁴⁸ One of the major reforms that will be needed to bring a semblance of equity to our public schools will be financial. The funding inequities that exist in this country are intolerable, and no matter how workable I make my recommendations, no poor, struggling school will be able to implement them with openness and creativity. Such schools are far too focused elsewhere in struggling to make ends meet. School finance reform, however, is a topic for an entirely different thesis.

education and the growing disconnect between public perceptions and scientific expertise. I will discuss the notion of citizenship and urge schools to take seriously one of the missions of their founding: educating students for democratic participation. I will use Outward Bound and other programs like it as an exemplar throughout this chapter and the rest of the paper, identifying the positive aspects of experiential, outdoors learning that may be available to transfer into schools and classrooms to enhance learning and engagement.

Environmental literacy: Society interacting with nature

Environmental literacy seems to be lacking among people who no longer have intense place-based connections with their surroundings. The term “environmental literacy” may be defined as “the capacity to perceive and interpret the relative health of environmental systems and take appropriate action to maintain, restore, or improve the health of those systems.”⁴⁹ While this definition is fitting, I would go further and move the concept of environmental literacy more squarely into the realm of education, and will discuss this further in the next chapter. Environmental literacy, much like scientific or verbal literacy, is a skillset that reflects very positively upon its possessors and is not only useful for understanding events but also essential for following the rapid pace of change in humanity’s interactions with its environment.

By ‘environment’ I do not just mean “the biosphere” or an ecosystem—the environment is, quite simply, “the surroundings in which a person, animal, or plant lives or operates.”⁵⁰ Because of the term *environment*’s broadness, any use of it generally implies an unstated (conservation-oriented) secondary assumption, as discussed in the previous chapter. Due to this ambiguity, the term *environment* can operate on all levels, referring to complex concepts such as the biosphere and urban asphalt, but also taking into account the interpersonal interactions and visual qualities of a home that surround people on a day-to-day basis. These many levels make wonderful teaching tools, and allow the environment to be used as a lens to explore almost any topic. Environmental

⁴⁹ Roth (1992), as quoted in Cardwell (2005). 113.

⁵⁰ Oxford American Dictionary

literacy, then, is a major component of environmental education—it's the knowledge layer that is shaped by and informs a sense of passion or connection to the environment. Two lenses that might be used to explore, enhance, and assess environmental literacy are the pressing current issues of global climate change and the value and loss of biodiversity.

These two very broad issues are intensely debated, not only among the scientific community, but in the popular media as well. Scientists in these arenas are just beginning to realize that they can have strong effects upon policies, and they are learning how to disseminate their information and theories to have (sometimes unforeseen) public impacts.⁵¹ One consequence of this involvement is that scientists have found themselves used as political tools. It is commonly accepted within the scientific community that global warming exists, is well documented,⁵² and will soon result in an accelerating rate of climate change. However, minority opinions, such as the possibility that human-induced climate change is not currently occurring, are often given equal weight in the media alongside this scientific reality. This tendency of the press to give equal time to contrasting opinions, no matter where the weight of the evidence falls, has allowed vocal business interests to interject a sense of doubt among the public as to the reality of global warming. By attempting to undermine the science, opponents of proactive change are succeeding in a stall tactic, delaying movement upon the issue and preventing the U.S. from joining such international initiatives as the Kyoto Treaty. Here is an opportunity for citizens to study the science for themselves, to relate their intuitive "street science"⁵³ knowledge that cities are hotter these days than they

⁵¹ Jasanoff (1996).

⁵² The United Nations' Intergovernmental Panel on Climate Change has released the definitive documents in this field, drawing together evidence of rising tidal means, ground-level temperatures, greenhouse gas concentrations, Arctic ice core explorations, melting glacial ice, etc., to create scenarios for future temperature and weather patterns with variation based solely on human fossil-fuel emissions. This means that an international panel of the world's top scientists believe that the climate is drastically likely to change within the next 50-100 years, and its rate of change is almost exclusively linked to human activity. For charts and images, see the UN's Environment Programme Vital Graphics web site: (<http://www.grida.no/climate/vital/19.htm>).

⁵³ Corburn (2005).

used to be to the evidence-based concept of the “heat island effect.”⁵⁴ By merging the intuitive with the scientific, citizen-scientists can bring the whole concept of global climate change closer to home and examine how it affects their own health, well-being, and enjoyment of place, thus giving an impetus for supporting such politically controversial ideas as emissions caps and the changing of toxic business practices.

Not all controversies are quite so clear-cut as the overwhelming scientific evidence for global warming, however: for instance, it is genuinely debated as to whether or not global warming will have a positive or negative overall *influence* on humanity and on agriculture production. The value of conserving biodiversity is another example of a hotly debated scientific controversy, and as articles on the debate itself are published in such mainstream newsmagazines as *Science*,⁵⁵ scientists are realizing that they are also political actors. They are already well aware of the loaded connotations related to the word ‘biodiversity,’⁵⁶ and a bias towards conservation is assumed every time the word is used. Briefly, while most scientists agree that “biodiversity” in the specific sense of succession patterns, niche complementarity (when having more different species means that the total available “jobs” in the ecosystem are more efficiently filled), and crop biomass production is a positive thing, the particular sticking point is which value of biodiversity is the most useful in biological management. Management is a concept that is near and dear to the hearts of many politicians and the public itself, in no small part because of the enormous taxpayer investment in public (and therefore publicly managed) lands, but also because of the benefits to humans that these lands provide. Managers need to balance the conflicting values of the present, *utilitarian* value of biodiversity in crop production, the *serendipic* value of encountering things like useful medicinal compounds in rare species, the *intrinsic* value placed upon biodiversity by many traditional cultures, and the *functional*

⁵⁴ The heat island effect is a phenomenon by which urban areas, due mainly to their tar roofs, asphalt streets, and other black, heat-absorbing surfaces, are a number of degrees hotter than surrounding rural areas.

⁵⁵ Martin, J. (2003).

⁵⁶ Gaston & Spicer (2004).

value of biodiversity to the natural ecosystems themselves in terms of maintaining functions such as biogeochemical cycling and stability against invaders.⁵⁷

The political awareness to spot the fault lines between science and politics in arguments such as these is a vital skill for connected citizens, as well as for scientists. Learning to think critically in the context of political engagement is a well-researched area of educational theory,⁵⁸ and one not always welcomed in school districts struggling with disciplinary problems but otherwise comfortable with the status quo. Many writers direct their recommendations towards Cummins' theory that "a major reason why schools try to maintain a façade of innocence...is that such issues invariably implicate power relations in the domestic and international arenas. Promoting a critical awareness of how power is wielded at home and abroad is not a task that society expects educators to undertake."⁵⁹ Others argue that traditional civic education as it has historically been taught in schools is only appropriate for the weakest kinds of democracy, and that to have a true participatory, "strong democracy" means that

Genuine public judgment simply cannot be developed sitting in a room by oneself. It is the product of civic interaction and requires a capacity for imaging oneself in the situation of others that is possible only where a public is assembled. It is best taught by permitting students to interact together as a group over a question of common concern in a setting where the participants are empowered to make real decisions.⁶⁰

The trouble is that while educators have far too much on their plates to really be expected to teach such power relationships, that essential role as the impetus for participation is not being taken up by the rest of society. Only 70% of eligible citizens registered to vote in 2000 (and this was an unprecedented high turnout year), and only 60% of those registered voted:⁶¹ we have a genuine problem of a lack of participation in community government. Authors such as Putnam⁶² and Harwood⁶³ have written extensively about the problem. In many ways, the underlying tenets of "citizen

⁵⁷ Swift & van Noordwijk (2004).

⁵⁸ Hanrahan (2003), Haury (2001), Hildreth (2003), Smith (2004), and Warren (2003), for instance.

⁵⁹ Baker & Hornberger (2001). 303.

⁶⁰ Barber (1989). 356.

⁶¹ http://www.census.gov/Press-Release/www/releases/archives/facts_for_features/001643.html.

January 6, 2004. [April, 2006]. Additionally, only 88% of the population as a whole was even eligible to vote in 2000.

⁶² (2000).

⁶³ www.theharwoodinstitute.org (2005). [April, 2006].

science” and those of citizen democracy are very much the same, and teaching about one can mean great strides towards learning about the other: both are social processes grounded in some form of consensus, both require strong underpinning evidence, both use models that seem universal but are actually context-bound and local, and both require a critical attitude based on the skills of argumentation and persuasion.⁶⁴

Out of school learning: Citizenship in action

Extracurricular activities provide a new space for teenage identity exploration, extending the moratorium of adolescence beyond the adult-sanctioned realm of the schoolyard.⁶⁵ In these settings, students are presented with the choice of how to use their free time, and thus can exercise agency over themselves and their surroundings. What motivates young people to choose the activities and foci that they do is an area of fundamental relevance to the question of how well environmental education might function in schools, for intrinsic to the success of an EE program is that it inspires a passion for continuance in its teachers and students. Human motivation can be intrinsic, stemming from a natural urge to enjoy oneself and autonomously seek out engaging experiences, or extrinsic, due to some external force or persuasion or as a means to a goal. At the level of cognitive development where most school-aged children function⁶⁶ they are not especially capable of exercising a sense of intrinsic motivation (as per Piaget and based upon their personal, overriding passions), and so external motivations, such as peer pressure, positive results, praise, and a sense of mastery are likely to be more important in terms of both initial motivation to take part in an activity and also in sustaining interest. External motivations may function as cognitively desirable disequilibriums, forcing the mind to adapt by developing a new cognitive structure⁶⁷ and moving to the next level of motivation (intrinsic).

If so much research has been done on the huge potential for learning and actively engaging with new material in out-of-school activities, can't those findings be brought

⁶⁴ Kolstø (2000).

⁶⁵ Dworkin, Larson, & Hansen (2003); Ericson (1968) as quoted in Muus (1996).

⁶⁶ Baldwin & Caldwell (2003).

⁶⁷ Piaget (1972).

into the classroom? Students spend the bulk of their days in school, where society claims to have a vested interest that they learn to be strong civic participants and learn actively in order to engage in a competitive economy. The “powerful learning environment” in extracurricular activities is produced via a wielding of agency in making relevant decisions, a community dynamic centered around a rich, deep problem, and the collaboration that community problem-solving gives rise to.⁶⁸ This environment can be moved indoors, into schools, if attention is paid to maintaining those three key characteristics.

Environmentalists typically get their ideological starts outside of school: “most environmentalists attributed their commitment to a combination of sources: ‘many hours spent outdoors in a keenly remembered wild or semi-wild place in childhood or adolescence, and an adult who taught respect for nature.’”⁶⁹ That relaxed, respectful interaction with nature leads to a sense of “ecophilia,”⁷⁰ or love of the natural world. In some respects, this type of interaction is a form of citizenship—the interactions between humans and nature often involve mutually influential decision-making, and we can hope that young people who bond with nature will later return ready to defend it to society.⁷¹

Citizens are those who *do* participate in democracy—they are not just the masses. They act, engage, work, and participate in the realm of politics and they must be free to make their own choices. Voters, therefore, are not automatically citizens if they do not have free choice or are discriminated against or manipulated in some way that prevents them from operating independently. To be a citizen, one must have received some form of civic education, which can “take at least three pertinent forms: formal pedagogy (institutional schooling in civics, history, and citizenship); private-sphere social activity; and participatory politics itself.”⁷² As children age and mature into their voting rights,

⁶⁸ Renninger, K. Ann (4/6/2006). Personal communication.

⁶⁹ Sobel (1999), quoting Chawla (1988).

⁷⁰ Sobel (1999).

⁷¹ While I hate to politicize even the play and exploration of young children within the framework of creating environmentalists, I fear there is no option. While it will be politically difficult for the education establishment at large to work with the goal of raising environmentalists, individual adults are free to have such agendas and ought to go about fulfilling them in the best ways they can find.

⁷² Barber (1984). 233.

most of the useful things that they are likely to learn about public participation and social interaction will happen outside of school, because schools as they are currently conceived are so un-democratic. Opening schools to democracy, however, would create a space whereby those who *don't* receive informal training in citizenship outside of school can learn those skills and mindsets. Schools are not inherently anti-participatory; they just tend to work out that way in practice. In chapter three I will examine how schools might bring the outside in, allowing the richness of societal interactions as well as environmental complexity to inform participatory education.

Outward Bound in the classroom: Turning education outwards

There is a branch of education already devoted to teaching a sense of dynamic interaction with the rest of the world that has the potential to increase environmental literacy, educational attainment, and leadership capabilities, with a focus on science, the politics of land use, and the self-confidence to interact as a leader with others. That branch is outdoor or experiential education, an expensive school of thought most famously exemplified by Outward Bound, the National Outdoor Leadership School (NOLS), and other such international non-profits, but well represented at more local scales as well. Instructors lead students through a course of expeditionary learning, during which the students encounter problems that exist without having been artificially made up (a river to cross), grapple with the politics of group dynamics, and follow their own areas of interest to become specialists and teach the rest of the group. Many problems can only be solved by working within the group (putting up a group shelter on a windy evening), and participants learn to tap the expertise of all members in order to best address challenges.

Outward Bound and its cousins function, in large part, via a psychological process somewhat akin to transference.⁷³ Instructors encourage students to view their challenges in totally unfamiliar settings as analogous or metaphorical to those in every day life. For instance, a student who is shy and reclusive in the company of a loud

⁷³ Bacon (1983).

family at home may find herself functioning comfortably as the navigator in a group, and may come to see herself as the wise family “navigator” at home. The sense of confidence engendered in such a parallel experience is likely to imbue her with a new understanding and appreciation of her role at home, as well as the ability to think critically about it and adapt the role as needed. Another student might subconsciously view the challenge of climbing up a hard crack in a rock face as a metaphor similar to that of doing better in school or of overcoming obstacles when meeting new people. These students are developing political efficacy and learning the language of public talk⁷⁴ as they come to rely on one another for physical and moral support, and they are developing those skills as they simultaneously learn to appreciate nature.

Outdoor education programs work, and often work well. They do so in part because of their inherent isolation—students are forced to learn to rely on one another when they are stuck together with no outside support for a day, a week, or a month at a time. They are able to present opportunities and events totally outside the norm for most people, and encourage and teach writing, meditation, and reflection practices such that students can transfer the lessons learned in those situations back to everyday life. Students are held accountable, not to some unrealistic or arbitrary standard, but to the standard of ensuring their own and their companions’ comfort, safety, and enjoyment. They face seemingly impossible obstacles that, when new skills are learned and applied, become surmountable. Can these programs serve in some way as a template for transforming schools into active learning centers?

The flexibility and problem-solving toolkit, as well as the sense of care engendered by such an approach can be very powerful, especially when coupled with an awareness of scientific and political issues. Tronto argues that “care is the work of citizens...we [might hope to] define citizens as people engaged in relationships of care

⁷⁴ Barber (1989). Barber defines public talk as including “four important characteristics. First, it entails listening no less than speaking. Second, it is affective as well as cognitive. Third, its intentionalism draws it out of the world of pure reflection and into the world of participation and action. Finally, it is a public rather than a private mode of expression and this depends on participation in communities of engaged citizens.” (355)

with one another.⁷⁵ Care is fundamental to the functioning of a true democracy, as citizens hoping to openly participate must be willing to subvert their own desires for the larger public good, which is a form of selfless caring for the community at large. Outdoor education is also moving in the direction of political and scientific awareness, but still often falls short and has difficulty leaving its “touchy-feely” image behind. As the concept goes through these changes, however, it is at the same time becoming more and more appreciated by the traditional education establishment. Some schools and districts, such as the Philadelphia Public Schools, send groups of students on one-day, one-week, and multi-week expeditions throughout the year, at little to no cost to the students themselves.⁷⁶ Others bring expeditionary learning into the schools, with programs running the gamut from simple challenge rope courses to in-depth, all-day inquiry-based classrooms such as Radnor Middle School’s Watershed⁷⁷ and Soundings programs. All of these options, however, are expensive, and as such are very difficult to extend to more than a few select students, when the district can afford them at all.

Bringing it all together: A call for interdisciplinary learning

What, then, is an educator or politician to do? Faced with the very real challenges of environmental degradation and political and population pressure, perhaps convinced of the energy that children and students can bring to such problems, but too cash-strapped to send them all on peak learning experiences such as Outward Bound, an educator might examine the goals and functions of outdoor education and bring the best of those into the classroom. One way to consider this dilemma is to think

⁷⁵ Tronto (2005). 131.

⁷⁶ The school district partners with Compass Outward Bound, an urban affiliate of the national program, to provide these trips at no cost to the students. Recruitment is done via word of mouth and individual teachers’ applications on behalf of their classes. (Pastuszek, Katie, director, Outward Bound Philadelphia. Personal communication, December 12, 2003).

⁷⁷ Springer (1994).

⁷⁸ Watershed is an “integrative learning” classroom contained within but separate from an average-sized suburban middle school, and each year it draws some lucky seventh graders out of the regular program and into their own little community. The program is in very high demand, and its students participate in a very powerful form of education. They take field trips about once a week, and work together at the beginning of every year to set directions and goals for the learning they will do. Students complete complex individual and group projects, and the entire class is organized around the history, physical properties, cultural legacies, and natural communities of the Brandywine River watershed. Science is integrated with English and math with history.

of the environment as an interface in the micro-world of education, just as it is in the real world. It is in the reality of our environment that citizens, ideas, and problems come together, the man-made and the “natural,” government and ungovernable entities like animals, rivers, outer space, or libertarians. This coming-together occurs in the interface of many different facets of our lives, all of which take place in our physical environments. Therefore, the environment as a whole⁷⁹ functions as an interface in the real world, while the environment in the classroom (Nature and the study of it) can serve as an interface to join together many different academic disciplines.

We all participate jointly in a messy commons that we think of as home, and as the environment is both fundamental to and the setting of this commons, it can be thought of as an interface for all other ideas and opportunities. Just so in education: teaching and learning about “the environment” can be a jumping-off point for almost any topic or direction in education, once the zeitgeist has been shifted to allow for it. Richard Louv introduces dozens of examples of education happening in the environment, about the environment, and using the environment to teach most any subject. For instance, “at Huntingdon Area Middle School...students collect data at a stream near the school. Teacher Mike Simpson uses that data to teach fractions, percentages, and statistics, as well as to interpret charts and graphs. ‘I don’t have to worry about coming up with themes for application problems anymore. The students make their own,’ says Simpson.”⁸⁰

Bearing this perspective in mind, one can conceive of environmental education as inherently interdisciplinary, and also as an inherently critical form of education, because it teaches a structure of thinking that bridges gaps and makes connections on all levels⁸¹. Modern ecology is trending in this direction as well, transitioning from the old natural history lens to a new framework of examining complex, multitrophic food webs and relationships across all levels of complexity. Similarly, in the relentless newness of our current economy and technological progress, it doesn’t matter so much

⁷⁹ Here I mean the physical space that humans utilize and in which we interact, not necessarily any one conception of “wilderness” or any given ecosystem.

⁸⁰ (2005). 205.

⁸¹ Sermjian et al. (2004).

what we know as that we know how to learn, and how to make connections across levels and disciplines. Flexible, dynamic learners are becoming and will continue to be the drivers of a globalizing economy, and to play in such a world, our students will need to know how to communicate, lead and follow, innovate, and plan.⁸² This is not to say that traditional subject matter, such as history, mathematics, literature, etc. should be scrapped in favor of a vague holistic process. Instead, educators can translate all those knowledge bases into ways of knowing and learning. Brown and Campione argue that “awareness of the deep principles of academic disciplines should enable us to design intellectual practices for the young that are stepping stones to mature understanding...the idea is that by the time students are introduced to contemporary discipline knowledge, they will have developed a thirst for that knowledge.”⁸³ If those deep principles are taught within the framework of the environment, we may be one step closer to Orr’s goal of “ecological literacy for all students”⁸⁴ that can lead future developers, politicians, workers, and a whole generation of adults to approach their jobs and lives with bioregional sustainability in mind.

Children have proved time and again that they can be real movers in the political arena across the world, even without voting enfranchisement. “What keeps diverse groups of young people together is the realization that they have common experiences caused by the failure of certain social and political ideals—justice, equality, democracy—to be fully realized.”⁸⁵ Young people are often outraged that decisions are regularly made regarding their futures without any constituent participation, and a few work tirelessly to be involved. Many others, however, may be sufficiently aware of political or environmental issues to know that they should, for instance, take short showers to save water, but as a group of Chinese teenagers have been described, ‘they generally consider the actions of others irrelevant and would not throw away litter already on the street.’⁸⁶ In China as in the United States, environmental activism has not

⁸² Friedman (2005).

⁸³ (1996). 306-307.

⁸⁴ Quoted in Louv (2005). 220.

⁸⁵ LISTEN, Inc. (2000).

⁸⁶ Wang, He, Ya, He, Wang, & Jue (2004).

yet attained the salience that it needs to top the political agenda—and issue salience stems directly from individual citizens’ involvement with and energy dedicated to the problem or solution. Young people may be aware but not active, and too often just as disengaged (if not more so) from the “big idea” public and intellectual discourses as their parents are.

Despite the general disaffectedness that policy makers and activists complain about in relation to kids, when youth do mobilize themselves into action, they can have striking success. The term “poster child” is not meaningless—children are a great bet for galvanizing the public’s attention to a cause, but more importantly, children can and often do become part of the cause themselves.⁸⁷ There is already a body of literature on youth civic engagement, as described above. This corpus largely deals with the transition from interest to activism, however, and engagement really needs to be dealt with as a two-step process, constituting a first “hook” of getting students interested before they’re ready to be involved. This is the role that schools can play, if they’re willing to look beyond “the list of facts that every American must be *discouraged* from knowing.”⁸⁸

In the next two chapters I will posit some specific recommendations for how to encourage this sense of openness in schools and classrooms, focusing upon the secondary levels. As we begin to work through those recommendations, however, it is important to keep in mind the assessment of Haury, director of the ERIC educational materials clearinghouse: “teachers wanting to include environmental education in their classrooms face...formidable challenges...These challenges, however, afford a unique opportunity for informed teachers and schools; they have enormous latitude in

⁸⁷ Recently I was in Washington, DC to visit some of the museums on the National Mall with two friends, entirely unaware that it was the anti-abortion March for Life day. From accents and styles it was clear that many of the participants had traveled from all around the country to attend the rally, and a fair number brought their children with them. Kids ages 4-16 were with their parents, waving signs about the personhood of fetuses that “don’t CHOOSE to die.” It was a very moving experience to see all these young people wholeheartedly supporting a cause that they clearly, as children, identified closely with. I’m sure many of them were well aware that any photos taken of them during the rally would be media-worthy, and that simply by being young and at a pro-life march they were doing a great deal to support their cause. If they weren’t aware of that then, I hope they are some day.

⁸⁸ Baker & Hornberger (2001). 304. Italics original.

deciding what is to be taught and how it is to be taught.”⁸⁹ In other words, this paper is aimed strongly at school leaders, teachers, and students—not at policy-makers or legislators. Standardizing environmental education would be a contradiction in terms, as the world is certainly not a standardized place. Politics have an enormous part to play in gaining support and understanding of this more rounded view of education, but politicians and their top-down mandates are likely to frustrate the tentative engagement of disaffected students, teachers, and other educators.

⁸⁹ Haury (2000). 22.

Chapter Three

Bringing the outside in: Policy changes in school administration to support teaching for values and the environment

“Engagement is defined as the state of being committed, meshed, embedded in. Engagement is that state...which long distance hikers often realize after several weeks on the trail; that alpinists realize after passing the point of no retreat on a particular climb; and that soldiers realize once the first shot of a battle has been fired. Generally, wilderness engagement occurs as a state contrasting with one’s normal urban affairs, and psychologically, is achieved in the greatest degree of depth when the awareness and perception of risk (not necessarily real risk) is heightened and barriers between the urban life and the wilderness life are maximized... Maximizing engagement increases adrenaline response and endorphin release, contributing to the natural high well-known by endurance athletes, adventure racers, long distance hikers, and mountaineers, and remains as one of the greatest rewards of the wilderness experience.”
Jordan (2005).

As they age, children are far more consistent in how they learn than in what they know,⁹⁰ and this powerfully simple principle, so long ignored by content-focused curricula and standards, may be a key to opening new doors to school organization and curriculum writing. Environmental literacy has the dual function of being both an outcome goal on its own and simultaneously being a mechanism by which engagement with learning can occur, making it an ideal tool for schools seeking to improve the educational opportunities available to their students. Many (although certainly not all) children are intensely curious and exploratory about themselves and the way they fit into their wider world, so teaching them about the environment would seem an ideal way to stimulate involvement in schooling. I would like to propose three key components of environmental literacy that, when combined with a focus on learning for its own sake, can also serve as goals for educators:

- Knowledge about the environment, in any and all disciplines,
- Investment in the environment and in the knowledge-getting process,
- Ability to critically examine humans’ biological and political interactions with nature.

Some of these components are easy to teach, in that we’ve been teaching them all along (i.e., science as content knowledge). However, educators have the capacity to move on from that basic beginning point, and teach side-by-side two schools of thought that are rarely, if ever, presented to children in school: the pedagogy and the values underlying

⁹⁰ Siegler (2006). 13.

the material they are learning. The structures and inquisitive orientation of environmental education are far more important in building the social and civic health of a student community than the content knowledge ever could be, but interesting material about the way the world works is a wonderful hook for getting students involved. It is also a wonderful hook for teachers, as they are the backbone of education but have in many instances been stifled in their teaching styles or allowed to burn out prematurely.

There are a number of good curriculum packages that offer easy-to-use, cooperative, and integrative lesson plans for teachers to utilize, such as Project Learning Tree and Projects Wet and Wild that offer a holistic, thematic approach that is more likely to connect with students' interests and trigger teachers' imaginations than traditional, textbook- and individual-work oriented curriculum units.⁹¹ That said, teachers should have the time for, and not be frightened of, designing their own lesson plans based on analyzing the motivations, results, and consequences of human activities in relation to the environment. In the next chapter I will explore some of the ways in which such a lesson plan might come together, but those ideas can never be practical unless teachers are given the time and professional respect to have the confidence to use them. On Outward Bound courses, the instructors are the ultimate leaders, with no supervision while in the field and with the trust of their organization to represent the policies, lessons, and values of Outward Bound. The secret to the strong role of instructors on Outward Bound programs is their in-depth training in *pedagogical content knowledge*:

- (a) knowledge of ways of representing and explaining a subject to make it comprehensible; and
- (b) knowledge of students' thinking, in particular, knowledge of the conceptions, preconceptions, and misconceptions students bring to the learning of a subject that make it easy or difficult to learn.⁹²

The training given Outward Bound instructors is pedagogical content knowledge and content knowledge heavy, while traditional teachers tend to receive more training in pedagogy. Environmental education is dependent upon teachers forming strong

⁹¹ Warren (2003).

⁹² Carpenter, Fennema, & Franke (1996). 4.

connections with their students. There is no reason why teachers, as professionals, cannot fill those same roles for students, as long as schools give them the space and additional training to do so.

This chapter will examine the structures that underlie the powerful instructor-student framework, and show how educational and learning theory would indeed allow such a framework to operate in a rethinking of the context of America's urban and suburban schools. I will show the link between a democratic school governance and an education for democracy, and the critical role that environmental education and environmental literacy have to play in bringing about such a link. All these structures, however, are based on one underlying assumption—that we stop telling our children that education is only for them and only for their future job potential, and that we start believing ourselves that education is valuable for its own sake and for that of society.⁹³ This is a point that Dewey,⁹⁴ the father of experiential education, made long ago but has gotten lost in our increasingly frenetic economy. There is a need to embrace the knowledge and passion of environmental literacy as we turn towards examining this structure and its underlying metaphor. The school metaphor, from top to bottom, is a constructed one, where the goal is to create a “workplace environment” where tasks always need to be done. Bringing environmental literacy into the classroom creates a “learning community of scientific inquiry,”⁹⁵ where learning tasks are performed for their own sakes, or for the direct outcomes that they produce. This is a much more relevant and education-oriented metaphor for schools to shoulder. The increased emotional engagement⁹⁶ resulting from successfully carrying out those tasks will lead to an increased investment in the processes itself. Only then will we all have a sufficient stake in our schools to see their potential as the building blocks for a democratic, environmentally literate society.

⁹³ Delpit, Lisa (March 1, 2006). Lecture at Swarthmore College.

⁹⁴ (1899).

⁹⁵ Roth (1992) as quoted in Hanrahan (2003).

⁹⁶ Fredericks, Blume, & Paris (2004). 63.

Rethinking the context of schooling

Anderson and Smith⁹⁷ write the following with students learning science in mind, but it applies equally well to the educators who seek to provide such meaningful learning experiences, as teachers rightfully are learners alongside their students:⁹⁸ “They simply cannot add new knowledge to what they already know. Instead they must abandon habits of thought that they have used successfully for many years in favor of new, more complex, and often counterintuitive thinking.”⁹⁹ A great deal of counterintuitive thinking might be necessary to counter a number of age-old assumptions about schooling. For instance, why do we keep restructuring school districts and testing and re-testing the same students who fail each time? Rarely does such a policy change result in increased achievement for long, particularly because it costs so much money to sustain such a program. Education policy makers seem to operate in a single-loop feedback mechanism, always trying the same approach for a problem and assuming that if the problem is not solved, the approach must be tried again, only even more so the next time.¹⁰⁰

The same phenomenon may be seen in many aspects of schooling—those who think all governance problems have to do with organization either advocate for increased centralization or decentralization, and when the governance problems are not solved, they simply advocate for a greater transfer of power in either preferred direction, often that direction which most benefits them personally.¹⁰¹ If the administrators, teachers, and parents were to embrace the utility and rationale of environmental literacy, this could lead to a structural reorganization based on the principles that curriculum should be locally driven¹⁰² with a focus on the local environment. Why not separate the powers, devolve those that are best exercised democratically and concentrate those that are best accomplished via efficiencies of scale? Or, implement a radically different system that breaks away from the old

⁹⁷ (1987).

⁹⁸ Renninger (1998).

⁹⁹ Anderson & Smith (1987). 90.

¹⁰⁰ Riise, Torben (April 12, 2006). Personal communication.

¹⁰¹ Berliner & Biddle (1995).

¹⁰² Darling-Hammond (1997).

dichotomous mold to involve teachers and administrators together in all aspects of decision-making, perhaps via an elected organizational body that focuses on issues of equity, curriculum development, and democratic processes?¹⁰³ This concept is known as site-based decision making or management, and it has many clear strengths in terms of connecting parents and teachers, involving all parties in the curricular process, and overall energizing a stultified school or district. It has not, however, always worked out well in practice—perhaps due to the fact that in most instances in which site-based management has been tried, the power devolved to the site level tend to involve decisions like, “which programs should be cut on our smaller budget?” Benign neglect from a central administration can also cause these plans to short-circuit.¹⁰⁴

The examples above may seem to be just that—examples. They are something more, however, for their expressions represent the underlying stagnation in educational reform. Reformers are not stagnant in the sense of not having energy or impact with their ideas, but rather they continually recycle old ones, never really consciously changing their goals or methodologies. What I propose is that teaching for environmental literacy can lead to a radical reorganization by its very nature—that environmental education has the potential to not only educate and awaken our children, but to breathe new life into our schools. If teachers wish to provide educational experiences that are open to wonder and exploration, administrators will have to let go of a degree of curricular control and standardization, a release that can open the doors to teachers and students getting involved in the very fabric of their day-to-day school structures.

Democracy in Schools

Schools don't have to try to be models—they already *are* models. They do, however, need to take responsibility for the modeling that they do. In many respects, schools function as microcosms of American government, and they certainly serve as

¹⁰³ Such an assembly would have to steer carefully around issues traditionally reserved for the teachers' unions, or that impact manager-staff relations. However, it could have potential as an advisory body with a mandate to open up involvement in school decision-making, thus extending the sense of purpose and responsibility that I propose we teach our children to the teachers who are charged with educating them.

¹⁰⁴ Travers, Eva (April 18, 2006). Personal communication.

outreach arms of American culture. Higher-level students may recognize this, and students at all levels can be taught to view school as a model for other structures in the world—an exercise full of critical thinking and transference applicability that helps students understand the way institutions work¹⁰⁵. Setting up an expectation of engagement, participation, and responsibility early on, and consistently, will leave students moving on to each new level with the belief that all classes are similarly democratic,¹⁰⁶ and the cycle will become self-sustaining—they will come to expect and demand participation.

Throwing schools open to the possibilities of democracy would turn them into laboratories, active teaching aquaria¹⁰⁷ in which every participant is both a teacher and a learner, one of the major positive components of outdoor education programs. It is in this setting that environmental education could thrive, and such a setting is not inconceivable in public schools. Louv¹⁰⁸ documents dozens of schools engaged in such restructuring activities, which turn our notions of “schooling” on their heads and take us “forward to square 1,” in a manner of speaking,¹⁰⁹ where we can refocus our notions of education to concentrate on learning and literacy with the world as a classroom. Hildreth¹¹⁰ taught such a class at the college level, and wrote up the lessons the students reported they learned from an open classroom with democratic decision-making in terms of evaluations, instructional methods, and grading procedures. The undergrads, after taking the class and mentoring civic leadership clubs at local schools, changed their personal definitions of politics from being just governance to being the actions people take in response to public problems; they reported a transference of problem-solving skills and attitudes to other venues; found themselves able to ask better questions; paid more attention to group dynamics; and considered how activism is

¹⁰⁵ Grosslight, Unger, Jay, & Smith (1991).

¹⁰⁶ Smith (2004).

¹⁰⁷ In addition to innovative teaching and learning, one of the highlights of laboratory schools is their openness to visitors, guests, and the outside world at large.

¹⁰⁸ (2005).

¹⁰⁹ Levine, Daniella (March 8, 2006). Co-chair of Imagine Miami. Lecture.

¹¹⁰ (2003).

often a product of privilege. By examining the role of problem solving and diplomacy in their own lives, students may be on the path towards political engagement.¹¹¹

Such a format would engage one of the last, and easily the most important, transformative elements of programs such as Outward Bound: the eventualities of real-world experiences and consequences. In the wilderness, a wrong turn at the top of a mountain can lead to a steep and dangerous descent, with very real feedback (sprained ankles, etc.) marking the navigational error. Likewise, a group that cooperates to carry the packweight of an injured member and makes it to a landmark anyway has learned the true value of caring for a community member—without that caring, the member would have had to be left behind! While legalities and common sense would never allow such risky decisions to be made in a school setting, transparency in outcomes can be an immediate trigger for higher levels of emotional investment in schooling, a substantial step towards increased learning and social engagement. Such outcomes should not be artificial, either—for instance, a pizza party for achieving the desired goal is not effective for promoting long-term dedication and cooperation. What might be more effective, though, would be genuinely asking all levels of classrooms to draw up land-use plans for a school about to renovate or re-landscape, having a joint faculty-administration-student panel review the plans, and implementing the best one based on clear and pre-existing criteria. Actively involving students in such major decisions is a big jump for schools, an even bigger leap of faith than giving teachers freer reign over their curriculums and input into school planning—but how can we expect students to be involved with school if we don't make an effort to invite them in?¹¹²

¹¹¹ Hildreth (2003)

¹¹² Transient students (immigrants, migrant workers, students needing to support their families, etc.) pose a dilemma to this concept. It is difficult to engage students fully who have only a limited amount of time in a particular school or district, and they have traditionally been some of the first to fall through the educational cracks. Unfortunately, this plan may not work for those students who have such enormous barriers to attending school consistently—other methods will be needed in order to reach them. Investing students with responsibility for their own learning, however, as in the context of EE, may well keep at-risk kids from dropping out completely if they have any sort of option to tie their identity to a solid, stable structure (see Heath, 1995).

Teaching the Teachers

Teachers must be completely engaged with the act of teaching in order for their passions for the subject matter and the action to show through, and schools and districts can very concretely support that process. They can begin by allowing hiring *and firing* decisions to be conducted at the school level, by the principal and an advisory committee, who can seek out and train dynamic, committed, intelligent teachers, without the burden of seniority and with some flexibility in pay scales.¹¹³ Teachers need support to develop the kind of pedagogical content knowledge they will need for this work, so not only can districts offer preservice and inservice education components on the subject, they can offer them modeling the style that the teachers themselves should use in the classroom. Just like their students, teachers learn more from the pedagogy and structure of the lessons they participate in than they do from the content knowledge itself, if it is presented without inspiration. Teachers may, however, also lack that content knowledge of environmental science and broader ecological topics, which a well-formatted series of professional education modules will allow them to glean and bring back to their students.

Districts can set local budgets and allow their schools to manage them completely, with budgetary advice available from a central office but with each school having the power to choose the mechanisms of its own financial governance. This will allow faculty and staff to have true decision-making ability within their domains, and as they grow comfortable with the concept, they can begin to introduce students into governance decisions. This is the key to a democratic structure that works for all—all must have a real and valued voice, from central administrators to children and parents.

¹¹³ This particular proposal will, I'm sure, not be well received by teachers' union advocates. To address those concerns, I do not recommend doing away with seniority for the purposes of assignments and internal school affairs, nor do I believe that younger teachers are inherently better. Far from it! But my proposals are not context-blind, and teachers and their unions need to take into account the competition that globalization brings. White-collar jobs, teaching included, are by no means immune from outsourcing—video conferencing and easy travel mean that the potential teacher pool will quickly be expanding internationally (see Honawar, 2005). Charter schools are showing that many teachers will happily trade labor rights for the more intrinsic value of actually helping to run their school, and while the extreme decentralization of the charter movement is not necessarily something to be emulated, it is proof that labor relations in teaching are on the verge of undergoing a massive change. Something has to give.

Students spend almost half of their waking hours in grade school for up to thirteen years, and the lessons they learn there are among the most powerful—not just the content lessons, but the examples set by their understandings of how an organization runs itself and assigns meaningful tasks to its constituents.

Passion: The knowledge and value of environmental literacy

If schools are evolving models, then what they can learn from the writers of outdoor education is the value of separateness, of being completely away from the world of urban distractions in order to engage fully with both the self and with nature. It is certainly much easier to bond with a traditional conception of nature when the evidence of humans' presence is nowhere near to be found, but must that be the only way? There is a broad spectrum between the extremes of wilderness expeditions and clinical, dissociated chemistry (for instance), all of which involve the study of nature and human interaction with it. By inviting students into a world of real-world learning, decision-making, and consequences, we are inviting them into a world of risk, one in which they will be forced to deploy new strategies to solve problems. Siegler¹¹⁴ used microgenetic analyses of students doing learning tasks to show that "high initial variability of strategy use often predicts substantial later learning...pauses, vagueness, false starts, talking to oneself, tapping the table, and verbal disfluencies all have been demonstrated to be positive predictors of learning."¹¹⁵ These behaviors are the sort of actions that can be brought on by risk-taking, by new situations, and it is those risk-taking situations that are the powerful driver behind Outward Bound's learning environments.

Risk

Risk-taking, that major component of outdoor education, can be incorporated into an in-school environmental education program to teach environmental literacy and engagement—and more importantly, a passion for continuing to pursue environmental awareness. Outward Bound teaches environmental literacy very explicitly—its

¹¹⁴ (2006).

¹¹⁵ 31-32.

students travel through unknown country under their own power, and while they spend plenty of time learning about leadership and problem-solving, they are also continuously learning about the land they are a part of. Sometimes those lessons are overt, such as when an instructor teaches a class about the local food webs, while others are more implicit, such as the new knowledge about what a sunrise looks like coming up between two specific mountains. Each of the three components of environmental literacy (knowledge about, investment in, and an examination of humans' interactions with the environment) requires that teachers, parents, and administrators be allowed and encouraged to allow students' passions to be expressed—and the only way to do that, I would argue, is for teachers to be passionate themselves. Of course teachers cannot be commanded to be more passionate, nor would anyone want to do so. However, they all, I'm sure, are passionate about *something*—some interest, developed over time, and nurtured into an importance that is fundamental to their characters.

This expansive understanding of passion also requires that schools extend the definition of “environment”—it does not have to be exclusively the province of far-away Nature. Our daily environments are rich in contextual clues, navigational challenges, emotional risks, and leadership challenges on a regular basis (particularly those of adolescents!). If transference works by taking risky, outdoors situations and using them as metaphors to solve socio-emotional issues in students' personal lives, why can't the reverse be true? Lisa Delpit¹¹⁶ suggests starting with the natural, pent-up romantic energy of schoolchildren to teach adolescents history from the point of view of love stories, rather than wars. Along those lines, preschoolers are spending their time curious about how their bodies function, so that would be a good starting point for a younger-aged group. These ideas make use of the subject the students are spending all of their time thinking about anyway (instead of their classwork), and allows their pre-existing passions and obsessions to inform the framework of historical lessons.

¹¹⁶ March 1, 2006. Lecture at Swarthmore College.

Interest Development

Transferring Delpit's idea to the venue of environmental education, we might find a biology teacher beginning a lesson on evolution by discussing mating habits, or spending lots of time teaching little children about the overwhelming positive values of poop in an ecosystem, and what happens when manure gets out of hand (for instance, at giant hog-processing plants). There might be some anthropomorphizing involved in such an approach, if, say, a math teacher encourages students to think about degrees of relatedness among their own family members and compare that to animal phylogenies in order to introduce pattern-analysis tools such as fractal geometry and factorial counting, but would that anthropomorphizing really be so bad? Sobel,¹¹⁷ in fact, suggests that children's identification with and anthropomorphization of animals is an important indicator of later concern for the environment, and large sections of those most passionate about the environment hold "mother-Earth" theories, and we already spend a great deal of time getting our children to bond with teddy bears and stuffed monkeys. Such mutual identification, or social-relatedness, breeds caring, and caring (which is just another term for a deep and abiding interest) breeds passion.

As people move through life, our attention is caught by various situations and ideas that catch our interest, which are called *affective triggers*. By themselves, these triggers might inspire a fleeting glance or a second look, but rarely do we become deeply fascinated by something that has merely caught our attention. However, if an external motivator (such as an educator) kept our attention on that idea, we might develop a *maintained situational interest*. It is at this point that the idea or situation begins to become meaningful, and we are able to engage with it on our own terms—at this point, Delpit's students would begin to recognize that Romeo and Juliet is not just about a far-off land and a far-off time, but also about the eternally contemporary themes of love, war, and disguised identity. If this level of stimulation continues, the mind builds upon the experience, tying the new situation to other past experiences that hold similarities in some way or another. This is the process of identification and

¹¹⁷ (1999).

transference that Outward Bound¹¹⁸ builds heavily upon to relate completely new ideas to familiar ones that the students have already internalized. At a certain point, a person is able to develop an *emerging individual interest*, and becomes his or her own self-motivator to pursue the interest further. Eventually, the person may reach the level of *well-developed individual interest*, and by this time, the original trigger has become a self-sustaining passion.¹¹⁹

Outward Bound finds that this process happens easily in nature, or even in relation to nature, because students have fewer distractions to draw their attention away during the early stages of interest development and because they are so immersed in their surroundings that they cannot help but identify with them. An important point to note, however, is that the maintenance of this passionate level of interest does require support, often external. Praise, success, and meaningful interactions on the topic of interest are essential to maintaining that inner motivation, and the ethos of outdoor education has largely taken these needs to heart. Classroom teachers are already well aware of the value of their praise, but might consider providing opportunities for the students to praise one another, and enjoy each other's successes as well as their own.

Political Literacy

One might say, what about those who would rather not have their children taught to make comparisons between food webs and family income patterns, who find that too exploratory or who think "environmentalism" is a bad word? Here we find ourselves back in the domain of associating the environmental with the political. A politically situated discussion, in which students are encouraged to debate the merits of federal pollution regulations or zoning restrictions (with all the material and convictions their parents can help them muster), has the opportunity to open an intelligent and passionate debate within schools about our interactions with the environment. This, at the very least, ensures that the environment will not be *ignored*, which is one of the worst things that can happen to any constituent in the political¹²⁰ (or

¹¹⁸ "Transference" will be discussed further in chapter four.

¹¹⁹ Renninger & Hidi (2006).

¹²⁰ Stone (1996).

educational, for that matter) arena. These are risky activities, with real social consequences, and by focusing them specifically upon matters related to the environment that reverse transference has the possibility to take effect.

All of the above ideas and goals tie into and support the three components of environmental literacy I listed at the beginning of the chapter: knowledge about the environment, investment in the environment, and ability to critically examine humans' interactions with the world around us. By titling this skill set "literacy," we are able to legitimate those who come into the world of school with such knowledge but with fewer reading or numeracy skills, as do many children from non-dominant cultures and classes.¹²¹ This gives them more opportunity to learn and participate: "The selection of a knowledge unit should support diversity, that is, it should afford students with multiple talents, or intelligences if you will, a way into peripheral or full participation. One obvious way to do this is to provide material that ranges widely in the degree of literacy skills needed for their access."¹²² By investing legitimacy in *environmental literacy*, we open the doors for learning to those children who are skilled observers, who study human interactions with their surroundings, but who may not know how to read or write well.

Play

Often students who lack classroom or "basic" skills are playful, and by moving away from a utilitarian focus on education as the key to job success we can incorporate play learning as a literacy skill as well, which is especially important (and even utilitarian!) as "play may provide the generalized ability to adapt to environmental novelty."¹²³ I address play here as an essential component of teaching environmental literacy because it is an ideal means of learning about the world via doing, what so many students crave and where the richness of environmental education can be brought to the fore. Play can pique a student's *triggered situational interest*¹²⁴ simply by being fun and engaging, and once triggered, the interest level has the opportunity to

¹²¹ Howley (2003).

¹²² Brown & Campione (1996). 312.

¹²³ Fagan (1992) as quoted in Diamond (1996).

¹²⁴ Hidi & Renninger (2006). 112.

deepen and be sustained in a direction concurrent with the student's existing interests and whatever push towards the environment is given in the situation. For example, many outdoor education programs incorporate trust games into their curricula, some of which involve activities like students leading one another blindfolded over rough terrain. By the very virtue of having their eyes covered, and without even realizing it, the students are learning to listen closely to the environment and to walk softly. Successfully navigating such an activity gives the student a sense of accomplishment at having succeeded, and wonder at the newness of the experiment, and may inspire some to re-create that exploratory relationship with nature.

"Play" can be defined in various ways. For some people, notably experts in their fields, what seems near-impossible and infinitely hard work to a layperson comes easily, playfully. People operating at their peak level of capacity are having flow experiences, concentrating their undivided interest upon the subject at hand, and can't help but enjoy themselves and delight in their own mastery. Rathunde¹²⁵ found that adolescents engaged over the course of several years of schooling who reported deep involvement with an activity of choice (math, science, music, athletics, or art) also reported feeling great excitement and openness in the course of their work. Their work had become play because of their deep involvement with it and ability to tie it to other important parts of their lives.

The relationship-examining and imagination-stretching aspects of play are part and parcel of ecosystem theories of learning, by which knowledge is conceived of as going beyond a set of facts. In ecosystem theories,¹²⁶ knowledge is the sum of our cultural and historical circumstances—therefore it's about more than conscious cognition; it's also about tacit and instinctual memory and problem-solving skills.¹²⁷ Play teaches those, and therefore encouraging play is an encouragement of learning *how*

¹²⁵ (1998). 369-370.

¹²⁶ "Ecosystem" theories of knowledge are of course relevant to environmental education, but not quite so obviously as the name might imply (they have little to do with biology per se). Ecosystem theory posits that knowledge is more than the set of facts transmitted from one person to another. Rather, knowledge is the cultural context that imbues that particular set of facts with meaning; the framework of implied nuance that accompanies the transmission of facts; and the assumed uses to which those facts will be put.

¹²⁷ Hanrahan (2003).

to learn, an advancement of the “investment in the knowledge process” component of environmental literacy—for both students and teachers.

Finding the Wild: Environmental literacy in the classroom

After proposing reforms to open schools to democracy and classrooms to inquisitive, playful learning with an emphasis on environmental knowledge, we’re left with the fundamental sticking point of any comparison with outdoor education programs—how much “nature” is needed in the classroom to make students’ connections really stick?¹²⁸ Obviously, there’s no magic formula here. The ultimate level of depth in environmental education is certainly considered to be a high level of access to green spaces, but this is not generally feasible, especially in urban schools. Different students will have easier or harder times dissociating themselves from their normal paradigms and placing themselves in a risk-taking reality that allows them to build connections on all levels, and there is always the danger that in pursuing place-based or civic-engagement focused education that the focus on the environment *per se* will be lost. This should not be a problem for wealthier or suburban schools, which are likely able to take students on more field trips and have more natural areas within easy access.

For privileged suburban youth, private school students, and underserved students in budget-strapped, urban schools alike, however, creating an environment in which that visceral sense of connection with the environment can be manifest can be difficult at best. Many teachers have tried such personal measures as bringing in plants or small pets to the classroom, but those only present a limited approach to the problem. Plants and rodents don’t inspire very much risk, and therefore little opportunity for developing passions. But what if, as inner-city schools age and require renovation, they’re not just patched up for business as usual? What if renovation funds

¹²⁸ It should be known that my personal belief is that classrooms are little more than safe places from thunderstorms—there should be no real need for them. Clipboards can serve as flat surfaces for writing, diagrams and headings can be drawn with chalk on the sides of walls and on sidewalks, with sticks in the dirt, or with dry erase markers on portable whiteboard tablets. Classroom walls exist mainly as liability and convenience containers, but have zero positive effects upon learning for most children.

were channeled into a re-visioning effort, one in which students imagined what their ideal school might look like and adults made every effort to incorporate green spaces and surprising corners into the design? Green roof gardens, water collectors for sewage systems, and garden space that could provide vegetables for the school cafeteria (tended by the students) are all possibilities that have been enacted in various urban schools around the country, and over time they all both provide endless educational opportunities and save the school money in a variety of ways. Districts capable of long-term planning might reduce their planned payments on future utilities bills and instead provide the money for up-front efficient and innovative green building projects. Urban playgrounds need not look like asphalt parking lots—why not dig graded pits and mulch mountains, plant native shrubs around the perimeter, allow trees to grow for shade? Children use the edges, the broken spaces, the in-between and imperfect areas for their most creative and valuable play,¹²⁹ and those sorts of places should be much less expensive to create and maintain than shiny playground sets under a glaring sun.

Openness to New Ideas

The impetus for such a set of changes would likely have to come from the bottom—from an interested or concerned group of parents, students, or teachers, in the form of a petition to the district. In that way, an in-school environmental education program would start small, beginning with one specific project that the instigators are already passionate about and committed to. As they expand and explore, their parents, schoolmates, teachers, and bosses will find themselves proud and intrigued. This interest must be sustained, as it is the community buy-in that will allow such an innocuous program to gain a foothold and reinvigorate itself once its founders have moved on. It is very unlikely that such buy-in will result from putting in place the plans of an outside green architect, for instance—district support for community-generated ideas is essential. As support and demand widen, other policies that would build structure around the concept of environmental education include, for instance:

¹²⁹ Louv (2005).

- a district curriculum structured such that students take required or elective environmental studies classes; or an overt requirement that ecological principles coupled with decision-making skills be taught in primary grades;
- a state standard such that teachers complete a segment of ecological theory and practice prior to certification;¹³⁰
- and the formation of student issues committees, with delegates representing all levels of students and geographic areas, that meet with local stakeholders to provide input into school environmental decision-making and are involved with larger-scale activities as well.

The process is likely to be costly up front, as any teachers involved will likely need content-area or process-related continuing education if the projects sought are far beyond the scope of traditional schooling. Changing curriculum drastically is usually expensive at the outset due to the needs of writing new plans and purchasing new materials. However, imagine the learning environment that could be created if teachers, students, and parents jointly created and followed through with a course of study for themselves? I certainly think it would be worth the price. Cost, however, is indeed an issue, in any educational reform. The publicity around the supposed high costs of education is largely an overstatement, for we as a country could certainly afford to spend far more on our school system.¹³¹ Be that as it may, we are loathe to increase school budgets, and so I hereby propose that any additional money required to implement an environmental education program be taken out of the massive checks sent to standardized test-creation companies, when No Child Left Behind peters out. Teachers and districts know that NCLB is more often hurting the education of the least advantaged than it is helping, for its scoring categories are too basic and its requirements too broad and expensive.¹³²

The structure of learning and acquiring wisdom holds the same across all ages, so that structure is really the essential ingredient that students need to know before they leave school. Such a teaching strategy, to focus on form and let the content sort itself, is premised on Bruner's "central conviction: that intellectual activity anywhere is the

¹³⁰ Pennsylvania until recently required this as a content standard for all certified teachers. (Travers. April 18, 2006. Personal communication.)

¹³¹ Berliner & Biddle (2000).

¹³² If I only had the space and direction to analyze the failures of NCLB...For a comprehensive discussion of what teachers and other educators think of the law, I recommend the newspaper *Education Weekly*.

same, whether at the frontier of knowledge or in a third-grade classroom.”¹³³ The beautiful thing about teaching for form is that once students get the hang of creating their own structures and asking good questions, teachers can become guides and co-learners. They can spend more time in examining their values and practices than in sustaining the unequal power dynamic that results when the teacher is the distributor of facts, and they can teach students to analyze the reasons for building structures of learning and their usefulness in adult and everyday life. In short, teaching for structure and form allows students and teachers together to examine what underlies the transmission of knowledge, and thus society, and they are surely likely to come upon *caring* as one of the human activities that keep societies functioning.¹³⁴

We have gone too far on a great many fronts—too much carbon dioxide in the atmosphere, too many dioxins in the soil, too much processed foods in our diets, too much biodiversity lost. We are on our way to going too far away from our connections with wild places, too far from the roots of leadership and cooperation as evolved qualities for confronting natural challenges, too far from being able to teach our children about where their food comes from because they have no understanding of growth and death. The answer to the question, “how much wilderness should there be in the classroom?” will always be “more.” For now, we can teach for engagement, for excitement, for knowledge, for care, and for passion, and we can seize any opportunities we get to incorporate those approaches into building a sense of environmental literacy for its learning opportunities and for the communities it can help build.

¹³³ Bruner (1960). 14.

¹³⁴ Tronto (2005).

Chapter Four

Lessons: What a model for environmental education for sustainability might look like in the classroom

“Known-answer question-and-answering games have no home in this environment. Respect is earned by responsible participation in a genuine knowledge building community.”
Brown and Campione (1996). Pp 313-314.

‘The shared pursuit of learning invests children in the knowledge process.’

Statements like this one sound eerily like telling a teacher that she must be able to read the minds of her students. How, after all, does a teacher go about relinquishing control over the answers? And what is the knowledge process? In this chapter I will attempt to shed some light on these questions mostly from a theoretical point of view, as well as propose that science education may be the key to furthering an education for sustainability (as well as the most politically viable pathway). I will conclude by offering a sample lesson plan based on a current controversy, the loss of biodiversity, as a way of engaging students with both the learning process and with the environment.

Building a knowledge community

I have already put forward a number of recommendations, in the preceding chapter, for specifically involving students in the process of democracy in schools, and proposed that this democratic process is a fundamental learning tool in of itself. While that remains true at the macro-level, the internal student-teacher interactions situated within the more traditional imparting of content knowledge remain to be addressed. If the goal of environmental education is to impart students with an understanding of the way the world works and their place within it, as outlined by the components of environmental literacy, a good place to start would be with a model. Models break down enormous schema and provide us with something consistent that we can understand and then use to reference back to the original system in question—an eminently useful tool. Many students, however, are “truly lacking the notion that one’s understanding of phenomena can be tested by comparing the implications of the model

to actual measurements or observations.”¹³⁵ This is a dangerous trend, for it means that students are uneducated in observing and testing patterns, an essential skill for understanding the relevancy of environmental concerns, as well as for the complex tasks of everyday community life. A teacher might easily quiz students on how they think of models, and then develop lesson plans to move them to a higher-order understanding such that they internalize that “first, the model is now constructed in the service of developing and testing ideas rather than serving as a copy of reality itself. Second, the modeler takes an active role in constructing the model, evaluating which of several designs could be used to serve the model's purpose. Third, models can be manipulated and subjected to tests in the service of informing ideas.”¹³⁶

Viewed from a theoretical lens, a solid conceptual understanding of models is essential to critical-thinking skills. It allows students to view themselves as actors within a larger society, and by building and expanding upon the complexity of both classroom and internal models, teachers can show that “understanding the part played by components in a system involves understanding that no environmental or even internal factor is ever a cause of change in the organism; the most it can be is a trigger for a chain of events whose outcome will depend on the structure and functioning of the system which itself will depend to some extent on the presence of other elements in the organism's environment.”¹³⁷ Indeed, children develop with a built-in orientation towards the use of models: “initially, they use physical objects or pictures to model the problem, but over time they abstract the modeling to use more efficient counting and derived-fact strategies.”¹³⁸ Extrapolating the process of modeling further, it becomes evident that complex modeling skills underlie a progression of knowledge frameworks that might be described as the pinnacle of educational goals.

Adults, especially well-educated adults, and especially teachers, follow this progression without realizing it, but just think of how often we've heard the phrases

¹³⁵ Grosslight, et al. (1991). 815. Data from a survey conducted of middle school students, high school students, and experts in a variety of fields.

¹³⁶ Grosslight, et al. (1991). 818.

¹³⁷ Hanrahan (2003). 9.

¹³⁸ Carpenter, et al. (1996). 13.

“learning to learn” and “you know you know it well when you can teach it.” These phrases are examples of our internalized understanding of this modeled progression, a level of knowledge that students rarely attain while still in school and that some feel cheated of when they grow to realize its potential. The progression moves from a knowledge of subject matter (where schools traditionally begin and end) to a knowledge of pedagogy, to something called pedagogical content knowledge (discussed in the previous chapter): knowing not just the material, or how to teach in general, but being so immersed and invested in both that the actor knows *how to teach that body of knowledge*.¹³⁹ In essence, pedagogical content knowledge is knowing how to create models for other people that will explain concepts and ideas to them. Once students have reached that level of understanding (and there is little reason why such a progression cannot be taught to school-age students if the teacher employs transparent teaching¹⁴⁰ in the same way that Outward Bound employs overt instruction) they can begin to see knowledge as “tentative, changeable, and significant only within an interpretive framework.”¹⁴¹ Finding this interpretive framework that furthers the spread of ideas brings us back full circle. This is politics, this is an understanding of the world that we live in and of politics as a means of acting within that interpretive framework that we call culture. Cultural conservatives take note—this modeling of ideas is *not* relativism. Rather, it is pluralism (“a willingness to tolerate and utilize a diversity of ideas and approaches”¹⁴²); for it means accepting and valuing the controversies that opposing viewpoints bring to the table, not unquestioningly accepting them all.

Argumentation is the true work of creating new knowledge, for which learning to model abstract ideas is an essential prerequisite. By internalizing rational argument strategies, students learn life-long skills related to analyzing and presenting persuasive evidence, as well as how to be persuaded.¹⁴³ It is, however, very difficult to teach these

¹³⁹ Carpenter, et al. (1996). 4.

¹⁴⁰ Hanrahan (2003).

¹⁴¹ Lehrer and Schauble, as summarized by Carey, Jay, Honda, Evans, & Unger. (1989).

¹⁴² Siegel (1989). 8. As quoted in Knain (1989).

¹⁴³ Knain (1999).

argumentation and critical thinking skills, particularly when the skills come as part and parcel of a lesson that contains information the students must reject as inconsistent with their cultural worldview (as is often the case with science).¹⁴⁴ This is why some authors suggest that “children should be taught to ignore or look behind particular content to focus on structural relationships”¹⁴⁵ (ie argumentative strategies), something that may be difficult for children to learn at first but should be easily acquired with practice.

Science education: the missing link?

Science education is one of the most conservative with regard to the cultural and social capital it requires for literacy, something that teachers are rarely aware of.¹⁴⁶ Science is situated in the world of the so-called rational, and its conclusions are often deeply divergent from our intuitive, irrational, gut instincts on how the world works. Few people have the high levels of social capital necessary to understand the paradoxical paradigm (science as a human enterprise that pronounces “facts” while at the same time surrounding them with doubt and challenge) that science is embedded within, and therefore find it threatening to their very worldview, their individual cultural frameworks. In that sense, true scientific literacy, just like language literacy, can be quite life-changing and thus threatening—and to deal with this threat, students often either discard scientific information or manage to memorize it without believing it.¹⁴⁷

Those individual perceptions (worldviews, frameworks, beliefs, etc.) are what drive our behavior, and in a sense, “culture” is simply the set of perceptions held by the group—and then those perceptions drive our collective practices.¹⁴⁸ Mass movements, and traditional political bludgeoning via regulation, typically seek to change collective practices. By working backwards through this hierarchy of behavior, we can see that

¹⁴⁴ Mestre (1994) succinctly sums up this issue: “The knowledge that we already possess affects our ability to learn new knowledge. If new knowledge that we are trying to learn conflicts with previously constructed knowledge, the new knowledge will not make sense to use and may be constructed in a way that is not useful for long-term recall or for application in a variety of situations” (?).

¹⁴⁵ Lehrer & Schauble (2006). 30.

¹⁴⁶ Hanrahan(2003)

¹⁴⁷ Knain (1999).

¹⁴⁸ Roberts (2000).

starting with this traditional “top-down” mode of change is a predictably futile attempt to alter outputs, when it makes far more sense to alter inputs in order to produce a desired cultural shift (i.e., placing higher values upon environmental systems and cycles). The way to do this is via education, specifically environmental education, with an emphasis on the power of science to shift worldviews.

Science education, in the hands of a skilled teacher, can bring about fundamental conceptual change. Mestre, in analyzing this conceptual change, points out that “four conditions need to be present in order for students to undergo [it as they assimilate a new scientific concept]:

- 1) Students must become dissatisfied with their existing conception [usually as the result of learning new, contradictory information in a meaningful way]...
- 2) Students must possess some minimum understanding of the scientific concept...
- 3) Students must view the scientific concept as plausible...
- 4) Students must view the scientific concept as useful for interpreting or predicting various phenomena.”¹⁴⁹

Students guided through this kind of fundamental change in their scientific thinking can become “citizen-scientists,” able to process and assess evidence in order to incorporate scientific thought into their own worldviews—and so much of environmentalism, in addition to being values-driven, is science-driven. As we teach young people the methodologies of science, they will hopefully bring that analytical ability to bear on the real environmental problems that we face now and in the future. Incorporating science into an education framework in this way will anchor it in a subjective worldview so that its perceived rationalism can be compared with the students’ other “ways of experiencing the world: emotionally, intuitively, [and] sensually, for instance.”¹⁵⁰ Lay people often make scientific decisions in their everyday lives, such as which competing land-use model to vote for or which household chemicals present unacceptable toxic risks to their children, and so a finer understanding of science as being more than “that which the experts say is right” is necessary.¹⁵¹

¹⁴⁹ Mestre (1994). Pg unknown.

¹⁵⁰ Knain (1999). 23.

¹⁵¹ Kolsto (2001).

Teaching science in a way that opens students to fundamental conceptual change is a process with a few distinct pedagogical goals in mind that may be helpful for teachers to follow. As belief underlies a person's worldview and involves both the cognitive and irrational domains of thought, and it is necessary to teach children to believe in science as a method and a model, a teacher must appeal both to the students' cognitive and emotional learning abilities.¹⁵² To do this, teachers should practice a wide variety of teaching strategies and approaches designed to tailor with different learning styles, a capability that is essential for teaching the many different skill sets needed in outdoor education.¹⁵³ When students are taught in accordance with their learning styles (i.e., kinesthetic, visual, auditory, tactile, etc.) they build positive attitudes towards science¹⁵⁴--and again, those positive attitudes predispose students to a belief change and therefore to a behavior modification in terms of environmental awareness. Teachers may focus on content-transcending knowledge that presents information *about* science, not necessarily the hard science itself, as this may prove to be a confidence-builder for children who are nervous about facts or about rationality itself.¹⁵⁵ Alternatively, and as a parallel goal, it is essential that students be scaffolded into the ability to pose and answer their own scientific questions, and to begin to understand the world around them in terms of its scientific underpinnings. While these two goals (content-transcending knowledge versus the skills of scientific inquiry) might seem to be in conflict, they are simply two sides of the same coin. The value of research and deep understanding of natural phenomena is important for all educated people, but the ability to analyze the arguments surrounding scientific claims is the most important for citizen-scientists. Argumentation is the key to building the critical attitude that underlies a full understanding of and respect for the uncertainties inherent in science, so encouraging and promoting open discussion in class that allows students to fully explore their beliefs is a powerful learning tool for teaching about science. The

¹⁵² Knain (1999).

¹⁵³ Richardson & Simmons (1996).

¹⁵⁴ McManus, Dunn, & Deing. (2003).

¹⁵⁵ Kolsto (2001).

rationality of science is found in a commitment to evidence. Thus, controversy doesn't threaten this rationality, it constitutes it.¹⁵⁶

Cognition theorists find that children make choices between competing theories along quite consistent lines: the more appealing theory is the one that can “account for more observations in a domain;” the one that is least ad-hoc, i.e., it doesn't propose “auxiliary assumptions which are not independently testable;” and that is most consistent with the children's existing beliefs and empirical evidence.¹⁵⁷ This evidence seem to show that children's knowledge systems are innately compatible with scientific evidence-sorting at a young age, but that later, beliefs seem to take precedence over scientific thought. The challenge to the secondary-level teacher, then, is to weigh all belief systems equally, neither ridiculing nor denying the gut feelings and past events that we all carry with us and use to make common-sense decisions, and attempt to integrate them into a coherent whole. Providing new material and stimulating questions is a first step towards challenging students to confront or change their beliefs, but too many people simply retreat into their shells at this sort of stimulation. Working across boundaries, both the students' built-in mental barriers and the segregated structures learning in schools, may prove a more powerful inducement to expand beliefs than direct challenge.

It is true that schools are set up to be disciplinary, and the truly interdisciplinary language of environmental science will be difficult to translate to such a setting—but by providing students with the tools to weigh and assess evidence and create linkages among belief systems, students can have access to science as a decision-making tool. Teachers must also teach the limitations of science, and in the world of environmental science, it is especially important not to teach the material as an ultimate truth. People often perceive of science as having failed at solving environmental problems in the past, and that important perception must not be glossed over.¹⁵⁸

¹⁵⁶ Knain (1999). 10.

¹⁵⁷ Samarapungavan (1992). 5-6.

¹⁵⁸ Jenkins, E.W. (2003).

The loss of biodiversity: business as usual or cause for concern?

Ecology is the cornerstone to the environmental world, as living processes are both accessible and underlie most issues policy makers are interested in. Teaching biology can utilize both children's natural predilections towards liking animals and their visual-based thinking.¹⁵⁹ While "biodiversity" is a much-debated term that refers to all classes of life, from microorganisms to plants and animals, and potentially even genetic material, it may be easiest to approach students (especially young children) with examples of biodiversity loss from the animal kingdom. All students, however, can be given age-appropriate interpretations of scientific research, available from culling a few standard textbooks and popular science journals, and asked to think about whether it is important for humans to place a premium upon protecting biodiversity. A professor¹⁶⁰ offers the rather macabre suggestion that young children be encouraged to think of biodiversity as analogous to the wide variety of friends that they have in school, and to consider biodiversity loss as similar to the loss or removal of one of those friends. What is likely to happen to that group of friends, in terms of its functioning? How are the remaining children going to feel?

As they delve deeper into the issue and learn more about the scientific controversy (most of the research about the value of biodiversity to an ecosystem's processes has been done on plants, most has been done in and on grasslands because of the availability of agricultural research funding, there is no consensus on a definition of "stability," etc.), students will find the loss of biodiversity to be a rich topic for debate. For instance, there is a very high price in the form of human opportunity costs at the very least in preserving, say, a wetland—perhaps mixed-income housing can never be built there, nor could a mall that would supply goods, recreation, and employment. Students can discuss (perhaps going back to the example of losing their friends one at a time) at what cost is it worth protecting the wetland, and at what point destroying it? Can there be compromises?

¹⁵⁹ Lu (2004).

¹⁶⁰ Machado, José-Luis (4/25/2006). Personal communication.

A sample unit: biodiversity and human interactions.

A unit such as this would be suitable for a high-school biology class, a middle school life sciences class, or in a simplified format, an elementary school classroom. Even a social studies, English, or history class might tackle it, as it explores the interactions between humanity and nature—a recurring theme in written literature!

Local article search: students read their hometown newspapers or listen to TV news shows for a week and bring in either articles or written-down summaries of any stories pertaining to human interactions with nature. They read them, analyze them, and might illustrate them to keep in a scrapbook. Students could use the articles as inspiration to write their own journalism or journal pieces about human-nature encounters, either on a personal (i.e., encounter with a cougar in the woods), community (i.e., a local environmentalist organization’s fight to preserve a forest from demolition), or global (i.e., population pressures in poor countries leading to bush-meat harvesting) scale. To get students thinking about this concept, teachers might want to also assign a tried-and-true children’s literature classic about humans living in the wild such as Jean Craighead George’s Julie of the Wolves series or Gary Paulsen’s Hatchet.

Sample questions for discussion might include:

- When we interact with nature, do humans always win?
- How is death portrayed in these articles and stories? Is animal or plant death ever considered to be equal with human death? Do you think that an animal or plant dying is the same as a person dying? Why?
- How should we best protect animals and plants? Do you think national parks do a good job?
- Many poor people around the world work as hard at surviving from day-to-day as do the characters in these books. Should they be able to kill or use whatever animals and plants they need, even if it means a loss of diversity in their areas? Would it make a difference to what you think if they used the animals and plants for themselves (i.e., for food) or if they sold them for money?
- Which do you think is more important for people: using trees to make wood houses, or using the dirt in the forest to decompose our waste? A question like this might provide the opportunity for an interdisciplinary segue into the role of decomposition in maintaining ecosystem processes and human life.
- What is nature? For older students, this starting point could be a great departure for many different readings in English class—Thoreau, Walden, Muir, and Whitman come immediately to mind, but American Indian conceptions of nature would certainly be included as well as a look at how

the different religions represented within the school see Nature in their writings and culture.

Assigned reading: two to three short articles over the course of a week outlining the issues in biodiversity research. See table 1, below, for some recommendations for students of different age levels. These articles are all from 1-3 pages, and are rich in jargon but not in technical details, making them ideal candidates for teaching *about* the language of science as an introduction to a biodiversity unit for high school students or as a research assignment for interested middle schoolers. The entire class might read the articles one at a time, circle and look up words they don't know, and then come to class prepared to first analyze the articles and then have a continued brainstorming session to list all the facts and opinions they know about biodiversity loss.

Field trip: The traditional beginning and end of environmental education, a field trip can be a valuable tool to further learning. After researching local issues and reading about scientific opinions and knowledge structures, students can plan and organize a field trip to a location actively involved in land-use, habitat conservation, or biodiversity protection *or loss* activities. Some students might wish to see a housing complex under construction at the edge of town to see which animals and plants can hang on in a devastated habitat, others might want to explore a local wetland and count the species they identify, and still others might want to petition for a trip to the zoo or wildlife preserve to see species from different habitats. In this case, the teacher can present the class with a challenge: \$400 (or whatever amount the teacher finds budgeted from the school for the purpose of class trips) is available to take the class to one of these locations. The students interested in each idea should research their chosen destinations and give a presentation to the rest of the class based on the scientific data they hope to gather at the trip site, the scientific and academic reasons they're interested in visiting the site, a description of the activities available and the nature of the potential site, and an accounting of the price involved. The teacher can provide information on bus rentals, etc., and hopefully assist the students in gathering specifics if they don't have access to the internet, but most basic information on public areas and events is available in local newspapers.

Becoming the educators: Much of environmental education stops with a field trip, which, if it involves outside professionals (as at an environmental center), many teachers treat as a much-deserved day off from planning curriculum or enforcing discipline. Not caring while *in* nature sends the message to kids that it's all right to not care *about* nature. A teacher must do more than this—teachers, by their actions, tell students all the time what they should be caring about and what they should be ignoring. An excited, invested teacher, happy to explore habitat issues, count bugs, or accompany a group of students to a planning board meeting is one that inspires passion in his students. More important than that, though, is encouraging passion.

The next step is to do more than hallway displays of comparative essays that nobody reads. Students can use inexpensive disposable cameras and art supplies to create interactive educational displays about what they've learned about biodiversity—its values for a functioning ecosystem, the services that ecosystems provide to people, the ways and means of conserving it, and the opposition that biodiversity conservation has in the form of subsistence farmers, biotech companies protecting their intellectual patents, and scientists who think it's neither worthwhile nor practical. How about taking those newspaper articles the students wrote before, expanding them, and photocopying them for the rest of the school? Or planting a garden plot with native vegetation and introducing invasive species one by one to see how they alter the composition of the plot over a year?

The key here is to *go further than the field trip*. Great memories may be inspired by a one-day visit to a pond, but the lessons learned are so much more valuable if they are coupled with an in-depth, cross-disciplinary look at how humans interact with nature and what impacts we have on biodiversity (as well as what impacts biodiversity has on us!). The core of the impact of outdoor programs such as Outward Bound comes from an emphasis on an *expeditionary learning* model. In expeditionary learning, students are aware of the fact that they're going on a giant field trip, of course—but they are so much more involved than that. They have to help plan food supplies, routes, and skills they want to learn. They develop the ability to model their new experiences for others, and

by doing so, immerse themselves in pedagogical content knowledge. They become the educators, and thus find that they are more empowered and their learning is immensely enriched. They learn to actively engage in the process of taking responsibility for themselves and an interest in the group around them because they quickly discover that those are the only mechanisms by which anything gets done.

The political implications of environmental education

Very few of the recommendations put forth in this paper are new. They are all old ideas, some of them dating from the origins of formal education, but what I hope to do is combine them into a coherent whole—to legitimize environmental education as a way of teaching and learning that has a rightful place within our dominant mode of public schooling. There will, of course, be objections to such a plan. While we all might wish it otherwise, education has always been a politicized endeavor in America, from the segregation that so long accompanied it to the hope that schools would serve to fuel the American Dream to *A Nation at Risk* and *No Child Left Behind*. Environmental education, as I have outlined and recommended it, is indeed a radical notion of schooling. While Spring¹⁶¹ and other libertarian educators make careful distinctions between the evils of schooling and the wonderful, eye-opening expanse of *education*, we need to recognize that schools are not especially likely to simply bow out of the American educational picture. While it's always powerful to have radicals working at inventing completely new structures, it is essential that some of us remain within the school system and attempt to bring some of the best new ideas to those who cannot leave their public school buildings. Modern environmental education springs from a radical movement, with all its associations with libertarians, hippies, and survivalists, but it is increasingly being recognized as applicable for all children. Wilderness therapy programs are often very successful with deeply troubled children simply by introducing them to one of the oldest forms of education: the prolonged study of natural history, via immersion in the field.

¹⁶¹ (1998).

Questioning societal structures and the forces that allow things like pollution and biodiversity loss to continue unchecked can be daunting, for both teachers and students. With school and administrative support, a class can more freely work through such issues communally, but without it, the teacher especially might feel subversive or pressured. Just as giving kids agency in their lives and education is a political decision that affects the way they think about school and community, a teacher taking agency for him or herself is also a form of political engagement. Allowing oneself to lead a group of students in examining issues of justice, access, equality, and equity in relation to the environment is a courageous action, and a strong positive role model for the students. If all these things happen at the same time—curriculum working for environmental literacy, students learning to build community, and teachers stepping out to test their own sense of direction and agency, a complex system is formed. All the actors involved must increase their stake in the process and in the outcome if they want to trust one another and engage in real learning, and vice-versa, so the built-in complexity becomes self-fulfilling. Learners and educators once involved in such a set of activities learn to model it in their future educational paths, and by word and deed spread their understanding of community-building to bring powerful learning environments to others.¹⁶²

I end with a caveat: “Overemphasis upon activity, instead of upon *intelligent* activity, leads to identification of freedom with immediate execution of impulses and desires [*italics original*].”¹⁶³ Environmental education in schools is not about continuous field trips, nor does it benefit from a purely field-based curriculum. Keeping this in mind, and being deliberate about limiting the goals of a project or an inquiry problem, will go a long way towards being beneficial for all involved parties. If, for instance, students get caught up in uncovering environmental injustices but find themselves stuck in a top-down oriented, frustrating larger community, they may become discouraged if their initial plans had involved, say, complete local regime change (to state an obvious extreme). This may result in a cognitive dissonance for previously

¹⁶² Renninger, K. Ann. April 6, 2006. Personal communication.

¹⁶³ Dewey (1938). 69.

committed students (and teachers!) who begin to question the value of their engagement and feel tempted to retreat back into their shells. This difficulty, in fact, presents us with an excellent opportunity to analyze the way in which such a radical form of education as environmental education might fit into the conformist norms of traditional schools—we have to start with baby steps. It may be almost as dangerous for the group’s future learning if a teacher allows the students to get too far ahead of themselves and face crushing disappointment as if they had never undergone such a project at all. Teachers who chafe under the restrictions of NCLB and students who don’t even know what they’re missing in the great big world of education need to start by taking things easy, setting small, workable goals, enlarging their stakes in their own education, and inviting others into their world of inquiry.

Table 1: recommended articles for teaching about biodiversity and conservation, with an emphasis upon scientific and policy debates.

<p><u>Articles for younger students</u></p>
<p>Biodiversity helps keep ecosystems healthy. (1994, February). <i>Science News</i>, 145(6), 84-85. Retrieved April 26, 2006, from Research Library database.</p> <p>Biology - What is biodiversity, anyway? (1993, June). <i>Science News</i>, 143(26), 410. Retrieved April 26, 2006, from Research Library database.</p> <p>Milius, S. (2002, April). Climate upsets. <i>Science News</i>, 161(15), 230. Retrieved April 26, 2006, from Research Library database.</p> <p>Schubert, C. (2001, September). Life on the edge: Will a mass extinction usher in a world of weeds and pests? <i>Science News</i>, 160(11), 168-170. Retrieved April 26, 2006, from Research Library database.</p>
<p>Articles for older students</p>
<p>Adams, WM; Aveling, R; Brockington, D; Dickson, B; Elliott, J; Hutton, J; Roe, D; Vira, B; Wolmer, W. (2004). Biodiversity conservation and the eradication of poverty. <i>SCIENCE</i> 306 (5699): 1146-1149.</p> <p>Dirzo, R; Loreau, M. (2005). Biodiversity science evolves. <i>SCIENCE</i> 310 (5750): 943-943.</p> <p>Grime, JP. (1997). Ecology - Biodiversity and ecosystem function: The debate deepens. <i>SCIENCE</i> 277 (5330): 1260-1261.</p> <p>Rosenzweig, ML. (1999). Ecology - Heeding the warning in biodiversity's basic law. <i>SCIENCE</i> 284 (5412): 276-277.</p>

Chapter Five

Sustainability as praxis: Environmentalism as an outcome goal

“A genuinely ecological approach does not work to attain a mentally envisioned future, but strives to enter, ever more deeply, into the sensorial present.”

Abram (1996).

Building a model for environmental sustainability

Having come to this point, it is incumbent upon us to ask, “what is the overriding goal of environmental education?” Let’s begin with what it’s not: it’s not a cure-all for American public schools. It’s not a hippie-era holdover that promises to change the world. It’s not to teach a generation of students survival skills for the environmental apocalypse. It’s not to brew up trouble and pit innocent kids against world-destroying adults. The true goal of environmental education, in my view, is to teach for environmental sustainability. That nebulous term, ‘sustainability,’ refers to: “(a) the need for reconciliation between economic development and environmental conservation; (b) the need to place any understanding of environmental concerns within a socio-economic and political context; (c) the need to combine environment and development concerns.”¹⁶⁴ In layperson’s terms, ‘sustainability’ is the result of a set of behaviors performed with the intention of never removing from natural systems more than is put back, by natural or human renewal processes. This definition encompasses a great deal of human activity, as almost everything we do interacts with the environment in some way that generally only marginally benefits the environment, if at all. Notice, however, that both definitions of sustainability do not specify an end result—“living in harmony with nature,” for instance, is not a key feature of environmental sustainability, for the practice of striving for zero impact is more attainable than actually planning on achieving that goal. Taking notice, however, is a part of sustainability. So understanding problems and seeking solutions. In practice, ‘sustainability’ means that all citizens both preach and practice environmentalism in their daily lives.

¹⁶⁴ Tilbury (1995). 197.

Sustainability, tied as it is to both environmental resource use and economic growth and development, is necessarily a concept that bridges many realms. It is a political concept that can inform regulations and decision-making, and it is a personal concept that can be internalized by a culture, or not, as the case may be. ‘Sustainability’ is not a neutral term, in that it represents maintaining the present values of things (especially natural resources, including other biotic species) for future generations of humans—it is, at its essence, a selfish term. That doesn’t mean that sustainability will be easy—at the rate that we are degrading the status quo, it will take a great deal of effort just to conserve the resources that we currently have. Likewise, our understandings of nature are never neutral, which isn’t a problem if we recognize that neither society nor nature actually exists except in our constructs: they are both just two aspects of reality. In this framework, sustainability is based on social norms of what we want to be sustained. In terms of resource and environmental sustainability, we have to turn inwards to create change, work on our norms and behaviors, because the physical processes of how the environment functions are beyond our control.¹⁶⁵ Think back to the introductory chapter, and the progression from values to behavior to culture to societal practice.¹⁶⁶ Section two of this paper addressed environmental values, while sections three and four addressed problem-solving skills and strategies for building a classroom and school culture of teaching for sustainability. The only thing that’s left is practice, which might be conceived of as the opportunity on a large scale to put personal and community values into action—the structures that allow for an individual group’s cultural practices to stand as part of the medley of practices generally approved of and adopted by the larger community. Once America reaches that point, I will be satisfied that it has achieved my definition of ‘sustainability.’

Building consensus: Sustainability is risky

Up until now, I have been striving to bring the most effective tools of outdoor education (*in the environment*) into the more traditional, classroom-bound conception

¹⁶⁵ Hartmann (1998).

¹⁶⁶ Roberts (2000). 21.

of environmental education (*about* the environment). Those two worlds are not parallel ones: destined to work along similar lines but never to meet. Rather, they can and do reinforce and inform one another, via processes such as emotional transference and the opportunity for students to plan activities with actual consequences and execute them in the outdoors. I would like to propose, however, an underlying mechanism by which the methods of outdoor education and the intellectual grounding of environmental literacy come together to support sustainability. The skills of problem-solving, communication, navigating, and risk-assessment are essential ones in a world moving towards sustainability, but the mindset of environmental literacy is the motivation by which those skills may be put into practice. This is a causal relationship: with the support of peers and teachers that is learned (and earned) by confronting challenging situations and implementing creative solutions, a knowledge community can be built in which students feel their intellectual interests are supported and valued, and thus greater confidence and trust is built again. This supportive environment creates a dynamic way of teaching and learning, the sort of cycle that is evident in seemingly chaotic classrooms where the students are continually engaged in new projects and the teachers seem never to be in control. Potentially frightening, yes, and risky, but it is in the risk-taking that meaning-making happens, both for students and for their teachers.

At this point in time, in this country, sustainability is risky, largely because of the economic expense involved. It may be a politically-correct buzzword, but trends are not showing much improvement on the sustainability front: for instance, technologies designed to allow cars to be more fuel-efficient are instead being utilized (and purchased) to get faster acceleration and higher top speeds.¹⁶⁷ Again, we come back to baby steps—just because cars are capable of getting 60 miles to the gallon of gasoline, or running on entirely different fuels, does not mean that those should be the initial goals. First, students of sustainability might focus on incremental changes, perhaps organizing public forums to generate ideas for lower-impact cars that are still economically desirable, or learning and then disseminating the science behind such cars. The skills

¹⁶⁷ Wald (2006).

involved in such consensus-building are the very foundation of outdoor education, and by using environmental literacy to focus them towards a sustainable present, students can see real impact from the knowledge they gain in schools. An added bonus for educators, besides seeing students learn valuable skills and knowledge and become inquiry-oriented, is that when students and teachers work together to solve tough problems, success leads to very high levels of satisfaction for all involved. And wouldn't that be something to look forward to for our overstressed teachers?

Making the transition: Environmental citizenship in action

There are no two ways around it: ecological problems are now and will increasingly become political problems. This year's oil shortages reflect our reliance upon natural resources, and politicians are increasingly growing to recognize the need to shift consumption to other forms of energy.¹⁶⁸ Global climate change is also quickly becoming a major problem,¹⁶⁹ with international solutions like the Kyoto Protocol being some of the most commonly accepted (except by the United States federal government) means of managing greenhouse gas emissions. We urgently need citizens capable of weighing the tradeoffs of political interventions in such scientific controversies, and those citizens will need an education in environmental literacy and environmental citizenship in order to help them make the best decisions. Schools can become the training ground for today's students to learn and practice those skills, enabling students to be confident participants in environmental decision-making at all levels.

By receiving and participating in an education that is not standardized or driven by multiple-choice tests but is instead focused on issue engagement and community participation, students will blossom in a world where a variety of choices are possible and only their own critical thinking skills will help them choose the best one. They will put their understanding of the forms and structure of learning to good use in analyzing complex problems and political processes, to which few adults have prior exposure. They will care for one another and for their ecosystems, understanding that care for

¹⁶⁸ Associated Press (April 30, 2006).

¹⁶⁹ Kluger (April 3, 2006).

others in an interdependent world is effectively the same thing as care for self. Most importantly, their background in environmental literacy and problem-solving will allow these students to become true political actors, not just thinkers, who will get involved with local and regional politics and actively push their fellow citizens to make positive environmental change.

Schools as microcosms for society: Bringing the outside in

All these outcomes will not happen by magic. They will be the result of deliberate changes made at all levels of school governance, especially those that allow teachers curricular freedom to explore the educational theories that they are trained in. Teachers will need modeled support to bring real-world consequences and experiences into their classrooms, but once they do, their students will get the experience they need to become leaders in environmental citizenship and activism. The passionate debates that environmental issues tend to spark, in homes, communities, and classrooms, if treated respectfully, are invaluable learning experiences for would-be citizens interested in how people see and relate to new ideas. Students can learn to analyze and change their own beliefs and those of others, and put that knowledge to work in convincing fellow citizens to support the cause of environmental sustainability. The example of democratic school governance is crucial to young people learning how to become responsible and effective stewards of the environment in a multi-issue democracy, but is a high barrier to entry. However, effective education for sustainability can be pursued without massive initial governance changes, if teachers are given quality training and the latitude to incorporate the pedagogy of environmental education into their classrooms.

Individuals working for change: Lessons from classrooms

Just imagining an environmentally sustainable community requires creating a new mental model, for such a thing hardly exists and has no standard feature set. Incorporating model-making into the standard school curricula, at multiple levels of

complexity, will help students confront the scientific questions that inevitably come with the search for sustainability. Science as a decision-making tool in public policy should not be taken lightly, for science has the ability to overrule and sway people's deeply-held beliefs and values that would otherwise (and anyway often do) inform policy decisions. The ability to assess scientific evidence and combine it with argumentation is extremely important for tomorrow's environmental leaders, as well as for today's young citizens as they seek to understand their relationships with nature and with society. Only by truly analyzing these relationships, preferably in the structured context of a classroom open to new ideas, can students begin to see ways in which their own and others' lifestyles might change to incorporate the concept of sustainability, of thinking for the future.

Leicester, England: A model for community education for sustainability

In 1990, Britain designated the city of Leicester as its first "Environment City."¹⁷⁰ The original goal of the designation was to reward and enhance environmental preservation, but over time the city and its leadership shifted to working for sustainable development. For ten years, the city went through multiple stages, led initially by NGOs but soon taken up by the city government itself—community groups were formed to solicit input from a wide swath of residents, problems were identified, and solutions proposed. The solutions relied as much upon the individual behaviors of citizens as upon top-down regulation and corporate stewardship, and in order to implement the ideas, residents made extraordinary efforts to reach one another. They held outreach meetings in minority neighborhoods, visited elderly people in their homes, and created school initiatives to involve the city's youth.¹⁷¹ While numerous large-scale projects were developed, involving combinations of regulations and community campaigns to achieve goals such as lower emissions and higher recycling rates, the organizers continually asked themselves how they could influence the behavior of individuals, both those that were easy to reach and those for whom direct

¹⁷⁰ Roberts (2000).

¹⁷¹ *Ibid.* 16.

education was difficult or impossible (i.e., home-bound people or those who work multiple jobs). They developed a diagnostic tool to assess the progress of individuals towards sustainable behavior: individuals begin with unconscious unsustainable behavior, have a “wake up call” or key conversation that makes them conscious of the undesirability of their behavior, determine that they would like to act sustainably and consciously attempt to do so, and eventually reach the point of habitual behavior where they unconsciously incorporate sustainable thought and action into their daily lives.¹⁷²

While Leicester’s model developed from a top-down initiative that eventually came to embody a whole host of participatory goals and ideals, its structures and end products can serve as admirable goals for any community seeking to work towards sustainability. The final planning structure that Leicester built had four components: focus on the issues and needs of local people and organizations, ensure that decision-makers act locally and respond to those needs, win hearts and minds for the project of sustainability, and develop highly visible projects with real value that local people can identify with.¹⁷³ These elements are the result of ten years of hard work for Leicester, but a successive group or initiative (or student-led campaign!) can and should incorporate those four goals right from the start. In fact, the elements of local governance are highly scalable—not only can mayors and town councils use them in addressing municipal issues, but also teachers can structure their classrooms with the principles in mind, and school administrators treat their community of employees with respect for the concepts of local governance.

Focus on youth: Stop discounting the future

We can see from the Leicester example that the ultimate goal of the pedagogical platform of environmental education for sustainability (EEFS) is to develop politically literate and engaged individuals. Success depends on the teaching of real, reflective knowledge about the environment, critical thinking skills, democratic skills and values and engagement, and experience of the day-to-day and overarching processes of

¹⁷² Ibid. 23.

¹⁷³ Ibid. 24.

environmental politics.¹⁷⁴ This bigger-picture view ties in well to the vision of classrooms as powerful learning environments, filled with self-discovery, skill-building, and interest-based research. Students who have agency, who work on rich, deep problems, and who collaborate around those problems are participating in powerful learning environments¹⁷⁵ that will reverberate throughout their futures. Environmental sustainability is especially important for young people, who in their future adult lives will be confronted with the manifold ecological problems left by preceding generations.

As many of those students are young people, one issue to keep at the forefront is our tendency to use future-heavy economics. We often heavily discount future potentialities and expenses, thus indebting ourselves both morally and financially through a lack of foresight and delaying responsibility for economic costs and environmental harms to future generations. The framework of sustainable development rests on sufficiency, equity, and quality (not quantity). This fact would imply a reframing of economics in terms of equity, a new value upon the environment, and a concern for future generations. It would also imply a concern for equity between and among generations, a political issue that is currently being played out around the world as the population in developed countries ages and requires a great deal of support from younger generations. Our current time preference when confronting problems, waiting until later to decide what to do, encourages consumption because it is almost always much more expensive to respond to than to anticipate a problem. Anticipating problems on a global scale helps account for the effects of uncertainty and surprise if preliminary plans are already in place.¹⁷⁶ This, again, is the structure of sustainability—not an outcome so much as a process, a system of decision-making that takes more and different variables into account than we commonly do today.

¹⁷⁴ Tilbury (1995). 205.

¹⁷⁵ Renninger (2006). Personal communication.

¹⁷⁶ Twine (1994).

Decision making: Choosing a vision for environmental education for sustainability

That open structure and process of decision-making is a tool that can be but is not always taught in schools. Traditionally, it is a fundamental tenet of outdoor education. We come back again to the skills of decision-making and critical thinking in reference to environmental literacy, and I want to encourage teachers to see these ideas not as onerous teaching burdens but as opportunities to ignite passion. As they may take tentative steps towards changing existent classroom structures, teachers need a “why” in addition to a “how” or “what.” Teachers need to feel agency in order to teach for it, and so I hope that the proposals in this paper have not been merely didactic hot air that alienates career educators. Instead, I hope that teachers, as they confront and engage with their own visions of EEFS, see it as a complex system to be understood, not a set of rules and recommendations for classroom management. EEFS is not a separate subject or topic, but rather an integrative pedagogical platform that is wonderfully available to be combined with all other currently taught disciplines.¹⁷⁷ We can all consider environmental education a success when it shifts our paradigm from passive interest to active involvement in environmental and societal issues.¹⁷⁸

¹⁷⁷ Tilbury (1995).

¹⁷⁸ Yan (2004).

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