

# Framing Experience on *Haida Gwaii*: An Ecological Model for Environmental Education

David B. Zandvliet & David R. Brown, Simon Fraser University, Canada

## **Abstract**

*This paper describes an ecological framework for environmental education and uses the example of a recent summer institute for teachers conducted on Haida Gwaii to describe how the framework can be enacted. In our description, we use a narrative approach to “tell the story” of how this framework can organize experience with/in environmental education. Our model is grounded in an “ecology” which emphasizes the embeddedness of human societies and cultures (and their technologies) within physical communities. The model describes a range of ecological, socio-cultural, and technical influences that influence educators’ experiences with, and interpretations of, formal curriculum. In this paper, we explore the model within the context of “island” communities on Haida Gwaii, where we apply the framework in specific ways, contributing to both professional discourse and teacher development.*

## **Résumé**

*Ce texte décrit une démarche écologique pour la formation à l’environnement et utilise l’exemple d’un récent atelier d’été pour les enseignants sur les Haida Gwaii afin de décrire comment on peut adopter ce cadre. Dans notre description, nous utilisons une approche narrative pour « raconter » comment ce cadre peut mettre à profit l’expérience de/dans l’éducation écologique. Notre modèle est fondé sur une « écologie » qui met en évidence l’intégration de sociétés et de cultures humaines (et leurs technologies) dans des communautés physiques. Le modèle décrit une variété d’influences écologiques, socioculturelles et techniques qui agissent sur les expériences que des éducateurs retirent de curriculum réguliers et sur leur interprétation de ces mêmes curriculum. Dans cet article, nous étudions le modèle dans le contexte de communautés « insulaires » des Haida Gwaii, où nous appliquons le cadre de façon spécifique, contribuant à la fois au discours professionnel et au perfectionnement des enseignants.*

**Keywords:** environmental; ecological education; teacher education; place-based education; environmental education

## Preamble

This is the story of our<sup>1</sup> experience on *Haida Gwaii*, but it is only a small part of a larger story to be told and we do not attempt to speak for the

Haida who live on these islands. Our story instead describes selected accounts of experiences in a special place, one which aids us in describing an ecological framework for environmental education used for our teacher education programs. Other stories (such as personal experiences with the Potlatch and other complex ceremonies) are better left to be told by the Haida themselves.

### *Haida Gwaii*

A recent teacher development institute in environmental education was held in this “place of the Haida” on the northern extremity of the west coast of Canada: an archipelago which embodies our “island metaphor” for ecological and environmental education. The Haida have an archaeological case for occupying these islands that dates back 10,000 years and as such, the southern portion of the island group has been recognized as a UNESCO World Heritage Site. Sadly, the UNESCO designation effectively limits access for the Haida to their historical (read *abandoned*) village sites, despite the joint management plan put in place.

Before continuing the story, a geographic orientation may be in order: *Haida Gwaii* is shown on maps as the westernmost extremity in Canada, about 1200 kilometres north of Vancouver and separated from the British Columbia mainland by the turbulent Hecate Strait. The archipelago was originally named for a monarch who never saw them: Sophie Charlotte von Mecklenburg-Strelitz, the wife of the Mad King of England, George III. The British called her Queen Charlotte, hence the more common moniker, the Queen Charlotte Islands (Reid & Bringhurst, 1984). There is deep irony (and deep offense taken) in the knowledge that this remains the official name on government maps of the area, despite the Haida community’s deep connection to these magnificent and ecologically significant islands.

Throughout *Haida Gwaii*, the Hemlock-Sitka spruce zone dominates (say ecologists), though on the eastern fringe of the islands mountain hemlock and alpine tundra vegetation zones appear at higher elevations. Elsewhere, cedar, pine, and western hemlock are seen in a variety of the island’s micro-climates. This diversity of environments on *Haida Gwaii* has caused the same naturalists to dub these the “Canadian Galapagos.” The *Gwaii Haanas* park web site (Parks Canada, 2006) states this about the natural history of the area:

The distinct island flora and fauna have evolved over thousands of years. The species here often differ from those found on the mainland. Many common continental species are not found on the islands at all, or have evolved into unique subspecies such as the black bear and the pine marten (both larger than mainland cousins) ... (p. 2)

An estimated 1.5 million seabirds nest along some 4,700 km of shoreline on the Islands from May through August .... Many are burrow-nesters, such as the rhinoceros auklet, ancient murrelet, tufted puffin, horned puffin .... Because the islands are situated along the Pacific flyway, dozens of species of migrating birds stop here in spring and fall. (p. 3)

The seas around Gwaii Haanas teem with life. These waters are home to salmon, herring, halibut, rockfish, mussels, crab, starfish, sea urchin and octopus, along with numerous other species. Haida Gwaii is also on the spring migration route of the grey whales which spend their summers in feeding grounds in the Bering Sea. (p. 4)

### Our Story on *Haida Gwaii*

For the non-islander (indeed, most of us), our “migration” to *Haida Gwaii* translates into a ferry from Vancouver to Vancouver Island, then a six-hour road trip up the northern part of Vancouver Island, then on to a 16-hour voyage by car ferry to the northern port city of Prince Rupert. The journey culminates with a lengthy (and frequently delayed) day trip by car ferry to the final island destination. While the entire trip can be made easily in one hour by plane, it is prohibitively expensive to do so. Despite this obvious economic disincentive for our students to fly, we also make a point of encouraging students to travel by other means as we believe the process of “slow travel” assists students in determining the “lay of the land” and a deeper sense of the community in which they will eventually participate. To this end, many students accompanied us on our voyage to *Haida Gwaii* as part of a pre-course road trip and ferry adventure. Indeed, since most islanders travel to and from the islands by the ferry system, our cultural immersion in island life began to occur on the ferry immediately as it left Prince Rupert.

Early on in our time on the islands, we further attempted to develop in our students a spiritual and ecological sense of place by organizing our first excursion: travelling on foot for two days through *Naikun* (or Rose Spit in Naikoon Provincial Park). At *Naikun*, an island can be seen to grow out of the sea, as new land is formed literally out of the shifting currents and sands of Hecate Strait. Here, ecological succession is handily referenced near the shore (in human scale) as the sand, grasses, and herbs give way to the majestic cedar used for the massive canoes and poles that the Haida people still traditionally carve. *Naikun* is most importantly the site of the Haida’s well-known creation story, whereby men were said to be released by Raven from their watery prison “within a cockle shell” washed ashore on these shifting sands. Later, Raven caused the meaty “red chitons” to merge with the men, creating the female form. As we read these stories, here in *this* place, we contemplated the Haida’s deep social and cultural connections to their island home. This connection embodies our ecological framework. We imagine the Haida

padding around these islands, founding villages, raising families: the very social make-up of community embedded in the physicality of the place.

An integral part of the experience for students in our course is back-packing (notable as another form of slow travel). This practice takes a lot of organization and planning long before a pack is hoisted onto the shoulders. Still, after a short van trip from our base at the local school, we arrived on a stunning 12-kilometre stretch of sandy beach. Six hours later, and with tired feet, we began to set up camp where there were still a few trees for shelter from the wind. After setting camp, we walked the final kilometres through grassy fields, then along a beach to arrive at the northernmost tip of *Haida Gwaii*. *Naikun*, the northern tip of the islands, alludes to the rich spiritual mythology of the Haida. Similar to many cultures, mythic stories of the creation, its creatures, and their adventures instructed, informed, and entertained the members of Haida society. One of those creatures is Raven: central to many stories as both a trickster and a troublemaker. This story at *Naikun*, then, was a natural reading to help capture the essence of this sense of place. Now, with the help of the (imaginary) sound of waves lapping in the background, here are some excerpts from *The Raven and the First Men*, the story we read aloud in that place:

The great flood which had covered the earth for so long had at last receded, and even the thin strip of sand now called Rose Spit, stretching north from Naikun village lay dry. The raven had flown there to gorge himself on the delicacies left by the receding water, so for once he wasn't hungry. But his other appetites—lust, curiosity and the unquenchable itch to meddle and provoke things, to play tricks on the world and its creatures—these remained unsatisfied .... He gave a great sigh, crossed his wings behind his back and walked along the sand, his shiny head cocked, his sharp eyes and ears alert for any unusual sight or sound ... he found at his feet, half buried in the sand, a gigantic clamshell. When he looked more closely still, he saw that the shell was full of little creatures cowering in terror of his enormous shadow.... Their skin was pale, and they were naked except for the long black hair on their round, flat-featured heads. They were the original Haidas, the first humans. (Reid & Bringhurst, 1984, p. 26)

The story progresses by relating how the first Haida were male and how, with the help of the Red Chiton, Raven turned some into women. The story ends with this quote:

They were no timid shell dwellers, but children of the wild coast, born between the sea and the land, challenging the strength of the stormy North Pacific and wrestling from it a rich livelihood. ... For many generations they grew and flourished, built and created, fought and destroyed, living according to the changing seasons and the unchanging rituals of their rich and complex lives. It's nearly over now. Most of the villages are abandoned, and those which are not entirely vanished lie in ruins. The people who remain are changed. The sea has lost much of its richness, and great areas of the land lie in waste. Perhaps it's time the Raven started looking for another clamshell. (Reid & Bringhurst, 1984, p. 30)

In retrospect, 20 years had passed since this retelling of Raven's story and our recent environmental experiences on *Haida Gwaii*. In the intervening time, there has been a progressive rebirth of the Haida Nation and a strong sense of place has re-emerged, both culturally and politically among its people. The Haida here have an ancient saying: "when the tide is out, the table is set." This literal interpretation bears true today as it is possible to subsist here on the incredible intertidal marine life, and it is not difficult to consider the Haida "literally" constituted from this easily gathered (and calorie-rich) food source. Even the local black bear has demonstrated this cultural adaptation by growing fat and large on a steady diet of crabs and other invertebrates. Later on, after our own rich meal of hand-caught Dungeness crabs (scooped from the receding tides), we contemplated this in a fully embodied state. With such little effort needed to collect their food, it is easy to conceive of a member from the *Bear* (or other) clan developing the characteristic deep and broad carving strokes of a master Haida carver. So here at *Naikun*, watching the shifting sands, telling stories, and feasting on Dungeness crab, we thought *just maybe*, the tide on *Haida Gwaii* had turned.

### An Ecological Framework

The preceding narrative account of experience on *Haida Gwaii* belies the consideration of an alternative framework for environmental education. Our ecological approach offers a critique of the mainstream organization of curricula, while at the same time makes a case for alternative *place-based* pedagogies which allow teachers to interpret curriculum in a way that focuses learning within the context of physical community. Our story gives just one example of what this approach can look like in teaching practice. Teaching with/in an ecological framework focuses teaching on attempts to improve the quality of life within communities while at the same time, assists students and teachers to develop a sense of "their place" within them. While others make arguments for place-based or community-based models of learning, our practice attempts to take this further by describing the need for critical/embodied approaches in their implementation. Central to this is the idea that an ecological framework for education identifies many taken-for-granted assumptions about teaching. These are best enacted when our actions are deeply embedded with/in the complexity of real environments and communities.

The notion of a place-based education has been well-described by Sobel (1993, 1996) and related ideas have been expanded on by others (Gruenewald, 2003; Hutchison, 2004; Orr, 1992, 1994; Thomashow, 1996; Woodhouse & Knapp, 2000). The difficulty in describing exactly what would constitute a place-based education becomes clouded, partly due to the multiple and interdisciplinary nature of the literature where this notion seems to reside. Gruenewald (2003) writes that the idea of place-based

learning connects theories of experiential learning, contextual learning, problem-based learning, constructivism, outdoor education, indigenous education, and environmental education. To the more academic critic, this might indicate that the idea of a place-based pedagogy lacks a theoretical framework. However, to the pragmatic and community-minded practitioner, the idea of place-based education might gain greater currency as it has arisen independently in a variety of different academic discourses.

Gruenewald (2003), in arguing for what he describes as a critical pedagogy of place, writes that our educational concern for local space (community in the broad sense) is sometimes overshadowed by both the discourse of accountability and the discourse of economic competitiveness to which it is linked. In our opinion, place becomes a critical construct to its opponents not because it is in opposition to economic well-being, but because it challenges assumptions about the dominant “progress” metaphor and its embedded neo-conservative values. This point is particularly true in the case of the Haida people, where progress initially came at the expense of their local community and cultural values. An ecological framework would seek to discard this one-sided view of progress by taking as its first assumption education “about” and “for” defined communities. Ecological education denotes an emphasis on the inescapable “embeddedness” of humans and their technologies in natural systems. Rather than seeing nature as “other,” ecological education involves the practice of viewing humans as one part of the natural world, and human societies and cultures as an outgrowth of interactions between our species and particular places (Smith & Williams, 1999).

### *Environmental Change and Society*

Realistic interpretations of the kind of environmental and organizational change experienced by the Haida and other communities can be attributed to a balance of influences. Goumain (1989) states that due to the pace of change we are often forced to cope reactively, adapting to changing environmental conditions only when they become intolerable. Gardiner (1989) describes a framework for thinking about these pressures consisting of three spheres of influence which he described as, respectively, the *ecosphere*, *sociosphere*, and *technosphere*. Gardiner’s *ecosphere* relates simply to a person’s (or group’s) physical environment and surroundings, whereas *sociosphere* relates to an individual’s net interactions with other people within that environment. Lastly, *technosphere* is described as the total of all person-made things (present and future) in the world. Gardiner notes that for many organizations, the influence of the *technosphere* often drives the dominant changes in our society at the expense of other mediating influences, including local geographies (*ecosphere*) and the influence of local cultural and social norms (*sociosphere*). Hutchison (2004) writes:

The technological shifts that are occurring just now are already altering our notions of place, community and selfhood. Contemporary notions of place which for centuries have been grounded in the physical experience of neighborhoods and local communities now face serious challenges. (p. 10)

While the adoption of technical tools and technological perspectives can blur the lines and identities of communities, we maintain that it can also obscure our desired community focus for environmental education. This is evidenced by the increasingly close association of environmental education with the sciences. Bowers (1999) states:

The effect of this categorization is that the other areas of teacher education and graduate education continue to ignore the connections between the values and ideas they promote and the cultural behaviours now overwhelming the viability of natural systems. (p. 161)

The concept of an ecological model lies at the nexus between a “science education” which emphasizes particular forms of knowledge construction conceived of and implemented outside of “authentic” communities, and an “environmental education” which juxtaposes this knowledge with other socio-cultural and values-based constructs which could be described as an environmental ethic.

Our developing framework promotes an understanding of scientific and environmental issues in the wider context, and in particular, provides a model for the interpretation of curriculum in a broad range of communities. To facilitate this, we must look outside the routine of curriculum and continue to adopt socially relevant strategies that will make scientific issues readily accessible to the public. McBean and Hengeveld (2000) write: “Society in general, accumulates and processes knowledge through experience, perception and intuition. Thus new information and facts are best understood and assimilated if these are placed within the context of the existing knowledge and past experience of the individual or community” (p. 5). In this effort, we must make a concerted effort to include the notion of community (even islands) within this discourse. Figure 1 introduces our ecological model for environmental education.

### *The “Island” Metaphor*

We have chosen an island metaphor to communicate this framework for a variety of reasons. Islands are a powerful metaphor in everyday speech as well as in several academic disciplines, and we use them here primarily as an attempt to clarify our meaning of community. Importantly, beyond the metaphor, islands have played a major role in the realm of knowledge construction: for example, descriptions of isolated gene pools in the Galapagos archipelago were seen as instrumental in the development of Darwinism as

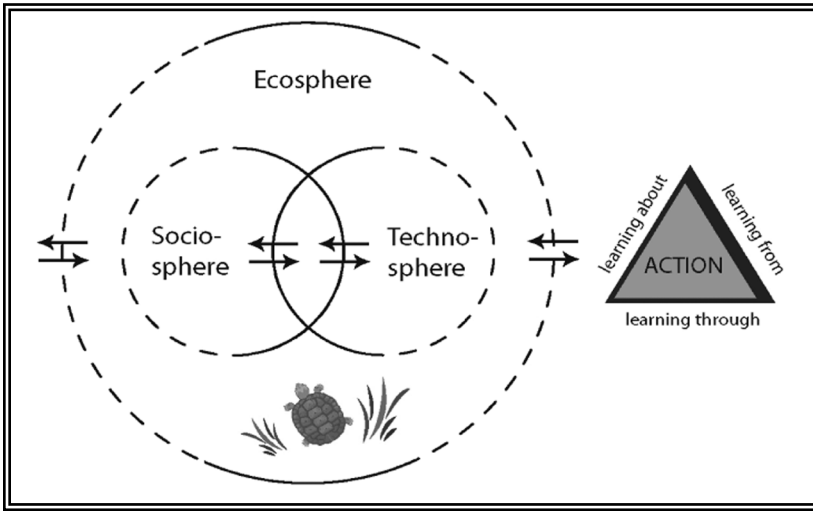


Figure 1. An Island metaphor for community and place.

a scientific theory, and these same processes can be described as part of the micro-evolution taking place on the islands of *Haida Gwaii*. Social anthropology also uses islands implicitly in the description of isolation and boundedness in cultural systems (Eriksen, 1993). In the case of *Haida Gwaii*, this insularity is first and foremost a strong descriptive metaphor.

Geographically speaking, islands can be said to be mountains that emerge from the bottom of the sea to tower above the water. Lehari (2005) writes that the structural similarity of the phenomenological order between such types of landscape as an island in the middle of the open sea, a mountain in the middle of an open country, or an oasis in the desert allows for the similarity of metaphorical meanings for an island, mountain, or oasis. The precondition of an island's metaphorization is its existence in environmental experience. Put simply, an island is not an island until you *go there*. Once you are there, an island becomes closed in both a temporal and spatial sense because the obstructed movement away from the island considerably changes the temporal structure of island life. The relation between outer and inner, working and free, everyday and festive, physical and mental time is different "on island" (Lehari, 2005).

The island metaphor retains our most basic relation with nature because its limits are clearly defined and we "see" where community might begin and end. Still, an island can be characterized as having what Lehari (2005) terms a "closed openness." The phenomenon of "island" is created by an essential ambiguity of environment, wherein individuals experience a dual-place identity. The basis of this paradox is the opposition between the experiences of sight and body. While you can "leave" the island in the physical



sense by boat, ferry, or raft, the coastal water line is the border for a walker, whereas the border for the viewer is on the horizon. An islander (when they are on the island) has the experience of two simultaneous borders.

The act of “visiting” an island in both a literal and metaphorical sense is seen as an enhancement to our ecological framework and as the most essential tool for community engagement. The conception of *direct experience* with/in communities is seen as central to the act of interpreting curriculum. This is referenced in Figure 1 as an action triangle where students may learn *through*, learn *about*, and learn *from* their community action/experience (McClaren & Hammond, 2005). In essence, the action triangle represents what it means to “visit” or be transformed by “the island.” The model also blurs the lines among Gardiner’s spheres of influence, though it is clear that the realms of technosphere and sociosphere are clearly embedded within our island ecology (ecosphere).

### Framing Experience

Importantly, in the description of any environmental education framework, it is necessary to describe how we “frame experience” for our students both on *Haida Gwaii* and elsewhere. Our methodology (or process of experiencing) is informed by socio-constructivist ideas about teaching and learning, merged with elements of the experiential learning cycle (see von Glasersfeld, 1995; Shapiro, 1994). Our experiential model describes learning as a socially mediated process through which teachers teach and students learn. Features of a place-based, constructivist perspective for interpretation of curriculum are as follows:

- Knowledge of the environment consists of not merely facts and theories, but also the ability to use the information in meaningful ways.
- The purpose of knowing about ones’ environment is not to discover an external reality, but rather to adapt to one’s own changing experiences.
- The role of the learner in any experience is not passive, but should be to participate actively in the construction of new meaning.
- The role of the teacher is not simply to present information, but rather to guide and facilitate students’ new experiences and their personal constructions of meaning.

Throughout the experiential learning process of our students, we model these methods and stress that we view teachers and students as co-constructors of knowledge, rather than reproducers of others’ (expert) knowledge. The premise here is that students’ new experiences are received through their existing knowledge structures (termed *assimilation* by cognitive scientists) and that these structures must sometimes be reshaped to accept new experiences

(a process termed *accommodation*). The learning cycle methodology we use to frame experience in this teaching includes (a) the selection of an appropriate experience embodying the concept to be taught, and (b) students attempting to explain this experience and evaluating each other's concepts against other students' ideas and with original experience (see for example Shapiro, 1994).

We further assert that through sustained reflection (and critique) of peers' ideas and concepts, new and experienced teachers develop what could be described as a personal "teaching style" that embodies their current beliefs about teaching and learning related to important environmental topics and issues. Throughout the summer institute we encourage students to consider multiple models for teaching and learning, and these are demonstrated in complex portfolios presented at the culmination of the summer institute. In their lesson planning assignments, we also ask students to design or refine a variety of different lesson styles including traditional didactic (teacher-centred) styles, constructivist (student-centred) styles, and finally, problem-based (concept- or research-centred) styles.

### *Conceptualizing "Environment"*

While we believe that direct experience with local communities and environments provides unique opportunities for learning, students process this new information by reflecting on their current and past experiences. Social engagement with other (multiple) perspectives on environment can help to expand and inform students' conceptualization of environmental issues. As a way of focusing this type of curriculum inquiry, we draw on what we believe to be key principles of environmental education. These principles include a consideration of complex systems, aesthetic appreciation, responsible action, and the practice of an environmental ethic (BC Ministry of Education, 1995). Briefly, through a consideration of these principles of environmental education, teachers come to understand that experiential programs can examine the *complexity* of natural systems and how humans interact with, and affect, those systems. They also learn that holistic forms of environmental education can help students to develop a sense of respect and appreciation for the natural world. An *aesthetic* appreciation, along with a scientific understanding of nature, encourages students to learn and act to protect and sustain the environment, and can contribute to self-awareness and personal fulfillment.

Through the community service projects we engage in during our teacher development institutes, teachers also come to understand that *responsible action* is integral to, and a consequence of, environmental education. We believe that as educators, we need to facilitate students' understandings of what constitutes responsible action toward the environment and help students to practice it in their personal and professional lives.

Importantly, these actions are influenced by belief systems and personal limitations (physical and cultural), and so this action can and must take many different forms. Finally, we assert that the study of environmental issues can enable students to develop what has been described as an *environmental ethic* (BC Ministry of Education, 1995). Responsible action requires an examination of values, and a consideration of environment should provide opportunities to question cultural assumptions that give rise to social conflict and environmental crises. In a holistic and ecological model for environmental education, teachers should encourage their students to make decisions based on an understanding of the issues, as well as their personal values and the sometimes-conflicting values of other community members.

## Conclusion

Through the development and presentation of this ecological framework for environmental education, our assertion is that grounding learning in a sense of our physical and cultural environments is an essential component to a balanced view of environmental education. We contend that the dilemma posed between scientific and environmental models for education is resolved as follows: in the first instance, the (hegemonic) scientific perspective is centrally included in a more holistic model where its cultural meaning is not allowed to dominate and is set beside other forms of knowledge common to critical pedagogy or environmental education approaches (e.g., ethical, cultural, legal, political, aesthetic). Further, those perspectives inherent in a critical environmental education framework resist becoming marginalized as our framework takes the form of an epistemology rather than a curriculum implementation strategy.

Through the development of this model, we have had considerable success in the implementation of teacher professional development activities in a number of Canadian contexts including *Haida Gwaii*, the Yukon, and the Okanagan Valley. We are beginning with distinct “island” communities where the boundaries of the community (physical and social) are quite distinct—and where we apply the framework in specific ways. These cases will contribute to the professional development of teachers in what we term “islands of discourse,” ultimately informing the development of ecological models in a variety of communities (indigenous and other) for the purposeful interpretation of curriculum. Our intent is to continue to develop the framework through a number of case studies and in this way, give greater detail to the model so that others may provide further discussion and critique.

## Note

- <sup>1</sup> We wish to be clear that the use of “our” and “we” throughout this paper refers to the two of us as authors.

## Notes on Contributors

**David Zandvliet** is an Assistant Professor in the Faculty of Education at Simon Fraser University. An experienced teacher and researcher, his interests lie in the areas of science, technology, and environmental education. David's research focuses on the study of learning environments in diverse settings. He currently teaches and coordinates SFU's Summer Institute in Environmental Education. **Contact:** Room 8642, Faculty of Education, Simon Fraser University, 8888 University Drive, Burnaby, British Columbia, V5A 1S6, Canada; dbz@sfu.ca

**David Brown**, a former teacher and principal, has been teaching in the Summer Institute in Environmental Education at Simon Fraser University for seven years and also is involved in teacher education. His interests are diverse and include environmental education, consulting, graduate programs, and international development work. **Contact:** Room 8642, Faculty of Education, Simon Fraser University, 8888 University Drive, Burnaby, British Columbia, V5A 1S6, Canada; dbrown@sfu.ca

## References

- Bowers, C. (1999). Changing the dominant cultural perspective in education. In G. A. Smith & D. R. Williams (Eds.), *Ecological education in action: On weaving education, culture and the environment* (pp. 161-178). Albany: State University of New York Press.
- British Columbia Ministry of Education. (1995). *Environmental concepts in the classroom: A guide for teachers*. Retrieved November 6, 2003, from [http://www.bced.gov.bc.ca/environment\\_ed/](http://www.bced.gov.bc.ca/environment_ed/)
- Ericksen, T. E. (1993). Do cultural islands exist? *Social Anthropology*, 1. Retrieved October 21, 2005, from <http://folk.uio.no/geirthe/Culturalislands.html>
- Gardiner, W. L. (1989). Forecasting, planning, and the future of the information society. In P. Goumain (Ed.), *High technology workplaces: Integrating technology, management, and design for productive work environments* (pp. 27-39). New York: Van Nostrand Reinhold.
- Goumain, P. (1989). Changing environments for high-technology workplaces. In P. Goumain (Ed.), *High technology workplaces: Integrating technology, management, and design for productive work environments* (pp. 1-23). New York: Van Nostrand Reinhold.
- Gruenewald, D. (2003). The best of both worlds: A critical pedagogy of place. *Educational Researcher*, 32(4), 3-12.
- Hutchison, D. (2004). *A natural history of place in education*. New York: Teachers College Press.

- Lehari, K. (2005). *Island*. Retrieved October 21, 2005, from [http://www.eki.ee/km/place/pl03/Place3\\_Lehari.pdf](http://www.eki.ee/km/place/pl03/Place3_Lehari.pdf)
- McBean, G. A. & Hengeveld, H. G. (2000). Communicating the science of climate change: A mutual challenge for scientists and educators. *Canadian Journal of Environmental Education*, 5, 9-25.
- McClaren, M. & Hammond, B. (2005). Integrating education and action in environmental education. In E. Johnson & M. Mappin (Eds.), *Environmental education and advocacy: Changing perspectives of ecology and education* (pp. 267-291). New York: Cambridge.
- Orr, D. (1992). *Ecological literacy*. Albany: State University of New York Press.
- Orr, D. (1994). *Earth in mind*. Washington, DC: Island Press.
- Parks Canada (2006). *Gwaii Haanas National Park Reserve: Haida heritage site*. Retrieved November 6, 2003, from [http://www.pc.gc.ca/pn-np/bc/gwaiihaanas/natcul/natcul2\\_E.asp](http://www.pc.gc.ca/pn-np/bc/gwaiihaanas/natcul/natcul2_E.asp)
- Reid, B. & Bringhurst, R. (1984). *The raven steals the light*. Vancouver: Douglas and McIntyre.
- Shapiro, B. (1994). *What children bring to light: A constructivist perspective on children's learning in science*. New York: Teachers College Press.
- Smith, G. A. & Williams, D. R. (1999). *Ecological education in action: On weaving education, culture and the environment*. Albany: SUNY Press.
- Sobel, D. (1993). *Children's special places*. Tucson, AZ: Zephyr Press.
- Sobel, D. (1996). *Beyond ecophobia: Reclaiming the heart in nature education*. Great Barrington, MA: Orion Society.
- Thomashow, M. (1996). *Ecological identity*. Cambridge, MA: MIT Press.
- von Glasersfeld, E. (1995). *Radical constructivism: A way of knowing and learning*. London: Falmer Press.
- Woodhouse, J. & Knapp, C. (2000). *Place-based curriculum and instruction*. (ERIC Document Reproduction Service No. EDO-RC-00-6.)