

THE CASE FOR CHET BOWERS' ECOJUSTICE PHILOSOPHY IN SCIENCE EDUCATION

Michael P. Mueller, The University of Georgia
assistant professor of science education and philosophy of education

Abstract

This philosophical research argues that Chet Bowers' ethical theory of ecojustice should play a vital role in science education to renew and revitalize the commons.

Introduction

Education during these times of ecological uncertainty will challenge science teachers to help students mediate the inherent tensions between their cultural ways of knowing and various forms of cultural and environmental enclosures. In this regard, Chet Bowers' (2001, 2004a, 2006) ecojustice philosophy plays a vital role in my intellectual pursuits, helping me to see the significance of conserving students cultural knowledges. Today, there are many distractions that come between individuals and an understanding of who they are and where they live. Without opportunities to analyze cultures with others, we may not understand why different views help us to make informed decisions. Diverse perspectives are influenced by many factors: shared views, fundamental beliefs and values, expectations, personal experiences and narratives, which enlarge our views. Learning to appreciate this diversity, prospective teachers are more likely to work to conserve their students' place-centered knowledges and to foster intergenerational skills (e.g., cooking, repairing, gardening...) that could be lost when youth are so consumed by modern technology. As Earth's climate abruptly changes, intergenerational knowledges and skills will be indispensable for the rapidly increasing population that will need to adapt to fewer agricultural and natural resources. Unfortunately, with more people and a lack of sufficient resources on the horizon, the population may be prone to an inevitable collapse (Diamond, 2005; Morrison, 1999). A successful strategy for minimizing the consequences of population collapse is fixing environmental problems when they are small. The idea is that smaller problems are less difficult to work, on a precautionary basis, than if they escalate to levels beyond control. Now, more than anytime before,

youth will need to be prepared to share with and rely on others. I want to argue that ecojustice should play a major role in renewing these relationships in science education.

Chet Bowers' Ethical Theory of Ecojustice

Chet Bowers (1993) notes that some cultural beliefs, passed on through schooling, may be responsible for worsening ecological degradation. These cultural assumptions are carried forward through the cultural memories of peoples, similar to the environmental memory effect of global warming that continues even if every polluter is stopped. Cultural memories are encoded by people who live during that period of culture; these memories are lived and passed on. Root metaphors likely are inculcated in and further support these memories; they are evident in, and even stabilized by, vernacular language. Similar to an acorn that grows into an oak, the metaphorical nature of language carries cultural meanings through the memories of many generations of people that can be traced back to the ancient rootstocks. Cultural memories can reinforce the thinking patterns that emphasize structures and reduce others. For example, the cultural patterns of thinking that legitimizes “what counts” as the dominant narrative of science has been historically upheld by root metaphors, including individualism, anthropocentrism, scientism, and technological change equated with inherent progress (Bowers, 2001). That some metaphors are upheld means others are marginalized. More and more scholars are writing about the root metaphors historically associated with women, the poor, ancient peoples, and non-Westerners that have been delegitimized, deemphasized, and devalued (Martin, 1985; Seigfried, 1996; Shiva, 1997, 2005; Thayer-Bacon, 2000, 2003).

My philosophical work is focused on Bowers' (2001, 2003, 2006) ethical theory of ecojustice and critiques of the Western cultural views (or ideologies) of science. These assumptions are particularly interesting because of my work with science teachers. Because science teachers work with students to understand the natural world, they need opportunities to think through the ideologies that are encoded and reproduced through language, which provides a frame of reference for viewing the natural environment. Science education has not historically provided these kinds of opportunities for science teachers and students, and yet these metaphors legitimize educational practices that may be responsible for deemphasizing or ignoring the ecological realm (Bateson, 1972/2000).

Bowers (1995, 1996, 2001) argues that notions of “ecological crisis” challenge the fundamental beliefs and values of every cultural group. He makes the case for shifting toward *ecojustice education* by making explicit Western cultural views of science which deemphasize the importance of cultural diversity and devalue human-nature relationships. His main thesis is that the commons should be strengthened by education that revitalizes the non-commodified aspects of cultural life and the environment that were once available to all people. He advocates that what needs to be conserved and sustained should be framed by the local authority of the community and the needs of ecosystems. One might argue that Bowers suggests a romantic vision into the past. Bowers contends that some previous traditions are oppressive and should never have been reproduced. These traditions should be changed without accelerating the rates of ecological decline.

The terms, cultural and environmental *commons* are used often in ecojustice scholarship (Bowers, 2006). The cultural commons consists of traditions, for example, intergenerational knowledges ranging from gardening, arts, crafts, and ceremonies. The environmental commons are characteristic of the Earth’s natural systems. Today, the commons means those things which people hold in common, or which should be shared between all people and the needs of natural systems. By conserving cultural diversity and by protecting human relationships within the cultural commons (and by reducing our reliance on the marketplace), we contribute to sustaining the Earth’s plants, animals, air, water, and soil. We all have an ethical responsibility to renew and revitalize the commons and protect cultural diversity for future generations. Science teachers and students work to protect the local commons from various forms of enclosures by framing conversations of science education around the needs of the local community and ecosystems. The main goal for science teachers interested in integrating ecojustice into their science courses is to provide opportunities for students to participate in strengthening their local commons.

Situating Bowers’ Ecological Philosophy

Bowers’ (2001, 2006) ecojustice philosophy is situated amongst other environmental philosophies (Zimmerman et al., 2001), educational philosophies (Gruenewald, 2003; Noddings, 2003; Orr, 1994, Smith & Williams, 1999; Sobel, 2005; Thayer-Bacon, 2003), and the musings of naturalists (Carson, 1962/1994; Leopold,

1949/1968; Williams, 2004; Wilson, 2002, 2006). Although other scholars share a love for the Earth and provide many interesting perspectives, ecojustice remains an appealing prospect for renewing and revitalizing the commons, and helping teachers and students to confront assumptions linked with science education. Ecojustice emphasizes people's place-centered awareness, intergenerational know-how, face-to-face conversations, mentoring relationships, ceremonies, the arts, and ethical reasoning in scientific work. The focus of ecojustice is revitalizing neighborhoods and the local ecosystems, which prompts science teachers to ask questions typically considered outside the scope of science teaching. Ecojustice renews human-nature relationships and is responsive to the needs of diverse geographic places. Educational success is measured by the revitalization of cultural pluralism and the renewal of biodiversity rather than adequate yearly progress.

EcoJustice and Philosophical Problems

Because ecojustice is an emerging focus area in science education, the distinctions between Bowers' (2001, 2006) ecojustice theory and other theories are becoming convoluted in science education research (Glasson, Frykholm, Mhango, & Phiri, 2006; Lim & Calabrese Barton, 2006), which is not to take away from these contributions to an expanding ecojustice literature. Theories in science education are generally used to develop cohesive frameworks for empirical investigations and they are seldom critiqued. Some scholars (Abd-El-Khalick and Akerson, 2006) have noted that in science education, theoretical frames are rarely supported by the research literature spanning hundreds of reviewed studies. The underlying and problematic assumptions are inadvertently perpetuated and privilege similar kinds of outcomes. The philosophical frameworks offered by Bowers continue to remain blurred and have not been supported by empirical research studies in science education. Likewise, efforts to bridge ecojustice and other theoretical perspectives, such as Critical Pedagogy of Place (Gruenewald, 2003a, 2003b) and Revolutionary Ecologies (McLaren & Houston, 2004), is a step in the right direction, however, there are cultural assumptions that may remain unresolved in these other theories that have yet to be examined and further developed. As science education needs to be well-guided by theories that reduce human impacts on the Earth's natural systems, the distinctions between ecojustice and other theories ought to be carefully considered.

Ecojustice takes seriously the concerns of extreme weather patterns associated with global warming, fossil fuel dependency, human illness and death associated with synthetic chemicals, the loss of jobs and a vital food source with the decline of marine ecosystems, the loss of tens of thousands of species, and the loss of twenty billion tons of topsoil yearly. Ecojustice mediates the increasingly consumer-dependent lifestyle in the U.S. and takes seriously poverty at a local level, the resistance of environmental injustices by marginalized communities, the necessity of intergenerational knowledges, the value of renewing marginalized talents and skills, and the relationships between the family, the community and natural environments. Bowers (2001, 2006) equates these conditions with the presumed “ecological crisis”—a position, which may be problematic in science education, and environmental and ecological philosophy, in general.

Interestingly, the certainty of a deepening “ecological crisis” has been promoted in ecological philosophy while the environmental sciences underpinning ecological declines are highly uncertain (International Panel on Climate Change [IPCC], 2001; National Research Council [NRC], 2001, 2002; Pollack, 2003/2005). My concern is that science teachers and their students will uncritically accept the notions of certainty that come attached to the cultural myth of ecological crisis, which reinforces contentment with learning scientific facts and concepts needed for the next exam and, consequently, the lack of focus on knowing people of the local community or the flora and fauna of the surrounding natural systems—taking an interest as potential stakeholders. If there is an ecological crisis, it is most often contextualized when people think of human crises. People think-in-places and, most crises are position-dependent, indeed, located somewhere. Adversely, Bowers (2001, 2006) proposes that all educational reforms be framed by the deepening ecological crisis, which challenges people’s beliefs and values. But, it can be argued, that the ecological crisis is not dependent on anyplace, because if it were, the crisis would be compromised by nonhuman species. Consider the thoughts of E.O. Wilson (2006), who postulates that without humans there would be ecological bliss! Bowers’ presumed ecological crisis is a category mistake and it is too simple of an explanation for why teachers and students should be engaged in environmental activism.

Digging deeper into the ecological crisis supposition reveals that Earth’s natural history and evolutionary processes built of change, complexity, and uncertainty, are

deemphasized or ignored. The ecological crisis marginalizes people who may be assumed to think with less certainty, for example, theists, women, the impoverished or the family. Moreover, the crisis favors certain perspectives over others, such as the immediacy of scientific information over traditional lifestyles of Indigenous peoples, partly because of a sense of urgency implied. Likewise, the ecological crisis is not externally coherent with ecologists and other environmental scientists, who seldom, if ever, use the term in scientific publications. While ecojustice illuminates some underlying assumptions for science education, ecojustice does not go far enough to address these counterarguments.

EcoJustice and Uncertainty Thinking

The aforementioned problems for ecojustice are candidates for further theoretical considerations and will continue to be examined by science educators and other scholars. Ecojustice should not be discarded because of philosophical problems; the central focus of Bowers' ecojustice—to strengthen communities and ecosystems—is worth the pursuit. The goals of cultural conservation and the protection of Earth's biodiversity and habitats are justified by the ways in which environmental scientists now work with uncertainty. As ecologists and policymakers have worked together to evaluate ecological forecasting, ecological vulnerabilities and intended outcomes, they have discovered that multiple knowledges and skills, beliefs and values, personal expectations and narratives must be consulted to make choices about ecological tradeoffs that result in any given number of consequences. These consequences are now projected with some confidence (Brewer & Gross, 2003) because of the influences of multiple stakeholders with diverse knowledges. Who will advocate for a wildflower (Aslaksen & Myhr, 2007), for example, which does not have economic worth? Part of my theoretical contribution is showing that there are benefits to preparing science teachers and their students to think with uncertainty in mind. Ecojustice and uncertainty thinking provides many new directions for science education.

REFERENCES

- Abd-El-Khalick, F., & Ackerson, V.L. (2006). On the role and use of “theory” in science education research: A response to Johnston, Southerland, and Sowell. *Science Education*, 91(1), 187-194.
- Aslaksen, J., & Myhr, A.I. (2007). “The worth of a wildflower”: Precautionary perspectives on the environmental risk of GMOs. *Ecological Economics*, 60(3), 489-497.
- Bateson, G. (1972/2000). *Steps to an ecology of mind*. Chicago and London: University of Chicago Press.
- Bowers, C.A. (1993). *Education, cultural myths, and the ecological crisis: Toward deep changes*. Albany: State University of New York Press.

- Bowers, C.A. (1995). *Towards an ecological perspective*. W. Kohli (Ed.). *Critical conversations in philosophy of education* (pp. 310-323). New York: Routledge.
- Bowers, C.A. (1996). The cultural dimensions of ecological literacy. *Journal of Environmental Education*, 27, 5-10.
- Bowers, C.A. (2001). *Educating for eco-justice and community*. Athens: University of Georgia Press.
- Bowers, C.A. (2003). The environmental ethic implicit in three theories of evolution. *The Trumpeter*, 19(3), 67-86.
- Bowers, C.A. (2004). Revitalizing the commons or an individualized approach to planetary citizenship: The choice before us. *Educational Studies*, 36(1), 45-58.
- Bowers, C.A. (2006). *Transforming environmental education: Making renewal of the cultural and environmental commons the focus of educational reform*. Ecojustice Press. Retrieved December 24, 2006, from <http://cabowers.net/pdf/TransformingEE.pdf>
- Brewer, C.A., & Gross, L.J. (2003). Training ecologists to think with uncertainty in mind. *Ecology*, 84(6), 1412-1414.
- Carson, R. (1962/1994). *Silent Spring*. Boston and New York: Houghton Mifflin Company.
- Diamond, J. (2005). *Collapse: How societies choose to fail or succeed*. New York: Penguin Books.
- Glasson, G.E., Frykholm, J.A., Mhango, N.A., Phiri, A.D. (2006). Understanding the Earth systems of Malawi: Ecological sustainability, culture, and place-based education. *Science Education*, 90(4), 660-680.
- Gruenewald, D. (2003a). Foundations of place: A multidisciplinary framework for place-conscious education. *American Educational Research Journal*, 40, 619-654.
- Gruenewald, D. (2003b). The best of both worlds: A critical pedagogy of place. *Educational Researcher*, 32(4), 3-12.
- International Panel on Climate Change (2001). *Climate change 2001: The scientific basis. Contribution of working group I to the third assessment report of the International Panel on Climate Change*. United Kingdom and New York: Cambridge University Press.
- Leopold, A. (1949/1968). *A sand county almanac*. London, Oxford, and New York: Oxford University Press.
- Lim, K., & Calabrese Barton, A. (2006). Science learning and sense of place in a urban middle school. *Cultural Studies of Science Education*, 1(1), 107-142.
- Martin, J.R. (1985). *Reclaiming a conversation: The ideal of the educated woman*. New Haven and London: Yale University Press.
- McLaren, P., & Houston, D. (2004). Revolutionary ecologies: Ecosocialism and critical pedagogy. *Educational Studies*, 36(1), 27-43.
- Morrison, R. (1999). *The spirit in the gene: Humanity's proud illusion and the laws of nature*. Ithaca and London: Cornell University Press.
- National Research Council (2001). *Climate change science: An analysis of some key questions*. Washington, DC: National Academy Press.
- National Research Council (2002). *Abrupt climate change: Inevitable surprises*. Washington, DC: National Academy Press.
- Noddings, N. (2003). *Happiness and education*. Cambridge: Cambridge University Press.
- Orr, D.W. (1994). *Earth in mind: On education, environment, and the human prospect*. Washington, DC and Covelo: Island Press.
- Pollack, H.N. (2003/2005). *Uncertain science . . . uncertain world*. Cambridge: Cambridge University Press.
- Seigfried, C.H. (1996). *Pragmatism and feminism: Reweaving the social fabric*. Chicago and London: University of Chicago Press.
- Shiva, V. (1997). *Biopiracy: The plunder of knowledge and nature*. Boston: South End Press.
- Shiva, V. (2005). *Earth democracy: Justice, sustainability, and peace*. Cambridge: South End Press.
- Sobel, D. (2005). *Place-based education: Connecting classrooms & communities*. Great Barrington: The Orion Society.
- Smith, G.A., & Williams, D.R. (Eds.). (1999). *Ecological education in action: On weaving education, culture, and the environment*. Albany: State University of New York Press.
- Thayer-Bacon, B.J. (2000). *Transforming critical thinking: Thinking constructively*. New York: Teachers College Press.
- Thayer-Bacon, B.J. (2003). *Relational (e)pistemologies*. New York: Peter Lang.

- Thayer-Bacon, B.J., & Moyer, D. (2006). Philosophical and historical research. In K. Tobin & J. Kincheloe (Eds.), *Doing educational research: A handbook*. (pp. 139-156). Netherlands: Sense.
- Williams, T.T. (2004). *The open space of democracy*. Great Barrington: The Orion Society.
- Wilson, E.O. (2002). *The future of life*. New York: Vintage Books.
- Wilson, E.O. (2006). *The Creation: An appeal to save life on earth*. New York and London: W.W. Norton & Company.
- Zimmerman, M.E., Callicott, J.B., Sessions, G., Warren, K.J., & Clark, J. (Eds.). (2001). *Environmental philosophy: From animal rights to radical ecology*. New Jersey: Prentice Hall.