Why Environmental Education Should Heed Open-Access Technologies

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Open-access technologies cannot be denied their powerful impact on public knowledge and democratic education. These technologies include, but are not limited to, examples such as Google Earth, Wikipedia, Google Books, blogs, and open-access e-journals. Presently, open-access technologies permit students and educators the means to extend their education and enhance their democratic participation through open-access knowledge (Willinsky, 2002). Internet users can engage in educational activities previously unimaginable: students and educators can tour three-dimensional representations of natural wonders such as the Grand Canyon and Tanzania's National Gombe Park (Google Earth); they can read any of Wikipedia's 4.6 million entries (including entries for the two previously mentioned natural wonders); they can preview Aldo Leopold's writings on Google Books (along with David Orr); they can consult blogs by famous environmentalists such as David Suzuki and the Goodall/Gombe Chimpanzee blog; and, finally, they can access e-journals such as *First Monday* (one of the first Internet peer-reviewed social science journals) and, in environmental education, the only open-access peer-reviewed journal, the *Canadian Journal of Environmental Education*.

Educators and educational researchers cannot ignore multimedia technologies' powerful impact on youth culture and, as importantly, youth's democratic take-up of these technological tools to voice their concerns, ideas, and cultural contributions. From the memorization of 300 + species of Pokemon (Blamford et al, 2002) for video games such as the Nintendo best-seller *Pokemon Pearl* (with one million copies sold in five days), to visualizations of environmental apocalypses and dystopias (Anime/Manga classics such as *Nausicaa* [Miyazaki, 1984/2005] and *Green Legend Ran* [Saga & Yamamoto, 1992]), to collections of local environmental data by youth (e.g., the long-standing Race Rocks project at the Lester B. Pearson College of the Pacific), to culture-jamming alternative video-clips on YouTube (e.g., "Keeping it Green!: Saving the Environment by Riding the Bus"), youth are culling and incorporating these new technologies into their social lives in critical, selective, inventive, active, and imaginative ways.

Environmental education researchers may be great scholars, but they often resist rather than embrace digital open-access technologies: they are losing opportunities to communicate and advocate an environmental education agenda in the public realm, weak at entering the multimedia arena of political and image-based public discussions, and recalcitrant at enticing youth to participate in environmental education through popular cultural media forms. Open-access technologies are being missed or avoided by many

environmental education researchers and the environmental education world, due to a long history of technological distrust or technophobia from Wendell Berry (1996), C. A. Bowers (2000), and Neil Postman (1993), to recent columns by Lowell Monke (2005) and Sarah Karnasiewicz (2005). Ironically, it was environmental education research that directed me to educational technologies. I had not planned this shift, but during research in the Science World Museum exhibit, *Mine Games* (Korteweg, 1996), the power of video games and multimedia technologies were stunning in their educational and social impact. It was the curatorial use of these educational technologies to communicate anti/environmental messages quickly and effectively, and it was the students' abilities to grasp these messages almost intuitively, that made me realize that something was missing in conventional environmental education. It was the technologies' abilities to frame (environmental) knowledge and extend media messages through game-based rules and videos/images that permitted students to actively gain geological knowledge and enjoy mineral exploration science that had both been esoteric and inaccessible only minutes before their museum entry.

When we witness the public response to Al Gore's documentary, *An Inconvenient Truth* (Bender & Guggenheim, 2006)—basically a PowerPoint presentation on film—and the continuing controversies and media coverage of global warming (e.g., *Globe & Mail's* web coverage—Globe & Mail, 2007), logically there should be a commensurate amount of media and public attention on environmental education as part of a solutions-agenda. However, environmental education messages are currently being circulated within relatively small groups of academics and practitioners inside journals and associations (e.g., the Special Interest Group of the American Education Research Association, Environmental and Ecological Education, has a membership of 33, compared to the Critical Educators for Social Justice's membership of 144). Sadly, in North America, where *An Inconvenient Truth* has garnered awards and mass audiences, environmental education has no national platform or significant official curriculum. The amount of public attention, media hits, and government support has remained consistently small even in this time of high public interest. In Canada, the debate on climate change and global warming has reached the point where scientists are stating that any scientific debate or controversy on whether or not we are experiencing global warming has ended. The real controversy concerns what we need to do, and when we need to do it (Curry, 2007; Mcilroy, 2007). In the arena of politics and public change, it is education that is often wielded by politicians as the action-plan answer for social change. Now is the moment for environmental education to take its rightful place as one of the most important public education movements. Given the environmental crisis' ongoing media and now political spotlight, how can environmental education remain ignored or marginalized in the media or to the public in this time of open-access technologies?

Open-access technologies permit open-access publishing and commu-

nication that would permit open-access environmental education. Technologies such as Google Books, Wikipedia, blogs, and open-access e-journals have the ability to publicize and democratize environmental education in a manner that could assist environmental education research to make a difference. Open-access technologies can make environmental education more of a public concern, a public good, and a public service. And the *public* here is really a post-national or global public, as we know the environment has no borders and environmental education has no bounds in its potential impact.

To determine how and where environmental education could flourish through open-access technologies, I decided to first consult the "free encyclopedia that anyone can edit": Wikipedia (www.wikipedia.org). I wanted to quickly scan the world's largest encyclopedia (available in 100 languages) to determine what body and size of research in environmental education the global public can access. When I searched Wikipedia for "Environmental Education," I found one entry and due to its small scale, I quote it here below.

> Environmental education refers to organized efforts to teach about how natural environments function and, particularly, how human beings can manage their behavior and ecosystems in order to live sustainably. The term is often used to imply education within the school system, from primary to post-secondary. However, it is sometimes used more broadly to include all efforts to educate the public and other audiences, including print materials, websites, media campaigns, etc.
>
> See also
> - Environmental psychology
> - Environmental science
> - Learnscapes
> - Natural environment
> - Outdoor education
> - Science, Technology, Society and Environment Education
>
> External links
> - Canadian Network for Environmental Education & Communication
> - The Centre for Environmental Education
> - Massachusetts Environmental Education Society
> - North American Association for Environmental Education
> - Second Nature / Education for Sustainability
> - Wadi Environmental Science Centre (WESC)
> - Starting Early: Environmental Education during the Early Childhood Years

Figure 1. Wikipedia's "Environmental Education" entry, May 2007 (Wikipedia, 2007a).

There concludes the full entry to environmental education on Wikipedia. It is comprised of one paragraph definition, a list of six internal links in Wikipedia, and seven external links on the Internet. Luckily, the first exter-

nal link, the Canadian Network for Environmental Education & Communication, does list and connect directly to one open-access journal, the *Canadian Journal of Environmental Education*. But ideally, all other environmental education journals should be open-access and listed with direct links on the environmental education Wikipedia entry.

Compare the "Environmental Education" Wikipedia entry to the Wikipedia entry for "Science, Technology, Society and Environment Education":

Contents
- 1 Historical context
  - 1.1 Science technology and society (STS)
  - 1.2 Goals of STS
  - 1.3 Scope and emphasis
- 2 STSE education
  - 2.1 Improving scientific literacy
  - 2.2 Rationale and goals
  - 2.3 Curriculum content
  - 2.4 Summary table: Curriculum content
  - 2.5 Opportunities and challenges of STSE education
  - 2.6 Summary table: Classroom practice
- 3 See also
- 4 References
- 5 External links and resources for STSE education
  - 5.1 Websites
  - 5.2 Samples of science curricula
  - 5.3 Books

(Wikipedia, 2007b)

Figure 2. Wikipedia's "Science, Technology, Society and Environment Education" entry, May 2007 (Wikipedia, 2007b).

Listed above is only the table of contents for the Wikipedia entry of "Science, Technology, Society and Environment." Each numbered title has its own section in the entry. This comprehensive Wikipedia entry outscores the "Environmental Education" entry in its breadth of content and number of references. Out of 27 references (#4 section of References), this Wikipedia entry includes only 1/27—one—e-journal (peer-reviewed) article, compared to its own list of 26 closed-subscription-only references.

I decided to continue to explore Wikipedia's potential by comparing both the "Environmental Education" and "Science, Technology, Society and Environment" entries to the two listed under #3's **See Also** internal links to "Climate Change" and "Global Warming." The "Climate Change" and "Global Warming" Wikipedia entries each have hundreds of links and references, including open-access articles (downloadable PDFs from the site), articles from media agencies such as the BBC and New York Times, as well as links to open-access databases of scientific data. The "Climate Change" Wikipedia connects

to 30 other Wikipedia entries, but it does not include links to the "Environmental Education" and "Science, Technology, Society and Environment" Wikipedia entries.

The Wikipedia site for *An Inconvenient Truth* has an Educational Response section, but it does not include any links or references to the environmental education Wikipedia page or to an environmental education article. But, this "Inconvenient Truth" Wikipedia has 68 directly linked references to notable newspapers, such as *The Wall Street Journal*, *The Guardian*, and the *New York Times*.

The "Global Warming" Wikipedia page has 64 references of direct links to scientific e-journals or PDFs of scholarly articles. It also has 30 direct links to many journal articles for "Further Reading" on the topic—all of them hyperlinked; therefore, open-access. It also includes four links to educational groups working on "Global Warming," but none of them are environmental education or K-12 related, rather, they can be understood as educational products concerning global warming.

Educational

- What Is Global Warming? Simulation from National Geographic
- The EdGCM (Educational Global Climate Modelling) Project free research-quality simulation for students, educators, and scientists alike, with a user-friendly interface that runs on desktop computers
- Daily global temperatures and trends from satellites Interactive graphics from NASA
- The Pew Center on global climate change

Figure 3. Educational links on Wikipedia's "Global Warming" entry, May 2007 (Wikipedia, 2007c).

If environmental education journals and associations were free and open-access (much in the same way that "Climate Change" and "Global Warming" scientific research are available through Wikipedia and the Internet), then there will be more of a chance by the media, politicians, and environmental NGOs to take environmental educational research and positions into serious account. Environmental education will become more of a media player where black-boxed political discourses of "sustainability" will be exposed to contention and opened for the public's critical scrutiny (Walsa & Jickling, 2002). We know that environmental education researchers have been unable, as yet, to deter the monopoly of "sustainability" as the political policy for an environmental education solution (Reid, 2007). My argument is that open-access environmental education can help expose and shift contentious issues of what environmental education should be, and what public actions are needed, for multiple stakeholder audiences: policy-makers, politicians, teachers, parents, NGOs, and students.

Talented, committed environmentalists are campaigning hard to communicate environmental information that gains more public exposure and motivates social change. Many environmental NGOs (e.g., Greenpeace, Suzuki Foundation, Forest Ethics, Rainforest Action Network) are employing technologies such as Wikipedia, blogs, YouTube, Flikr, and regular websites to reach the public and educate youth. They are contributing to the best common good we have through technologies: a public knowledge commons on the Internet (Willinsky, 2007). Environmental education is probably one of the greatest public educational concerns that needs or deserves the greatest distribution and local implementation. Not only do we need more environmental education, but we also need it communicated and accessed in such a way that it becomes more of a public good and accessible contribution. Much more can be done to enrich and enhance media representations of environmental education knowledge (i.e., findings, research, questions, outcomes). And much more can be done to better educate the public and engage youth. Such a venture is possible, tenable, and practical to environmental education. The main obstacle or deterrent appears to be a long-standing antagonism or underlying historical resistance towards technologies, digital or otherwise.

The question that I hope the *Canadian Journal of Environmental Education* and other environmental education journals will dwell upon is whether or not environmental education scholars are making use of online, open-access technologies to contribute to the public global environmental cause. If so, is it the most effective use of these technologies, based upon the Wikipedia evidence? And if not, why is environmental education underusing open-access technologies?

My interest is not only in the possible uses of open-access technologies such as YouTube, e-journals, Wikipedia, open databases, virtual exhibits, etc., but also in how these popular technologies engage a younger public (children, youth) to put their technological talents and interests to the global environmental good (the public knowledge commons). My position is that environmental education researchers could do more to become active players to impact public discussions (media), as well as do more to encourage and engage youth in environmental education through digital tools (Resnick, Rusk, & Cooke, 1998). At issue in both these factors is a growing public need to understand the environmental crisis and relearn socio-cultural behaviours, in parallel development with the socio-cultural engagement of younger, technologically adept generations in environmental education.

I encourage environmental education researchers to begin to explore and assess the ways (and the degrees) in which they could use their scholarly and communicative talents to take advantage of open-access technologies, to launch their positions into the public commons, and make their scholarly impact more accessible for the public good. Youth have the means through their multimedia, digital talents to culture jam and shift socio-cultural behaviours through participation in a public e-knowledge commons. Now is the time

for environmental education researchers to open their imaginative possibilities as to what would happen if we meld environmental education research with youth's digital talents and open-access technologies. I believe we could change the world for the better.

Notes on Contributor

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References

Blamford, A., Clegg, L., Coulson, T., & Taylor, J. (2002). Why conservationists should heed Pokemon. *Science*, *295*(5564), 2367.

Bender, L. (Producer), & Guggenheim, D. (Director). (2006). *An inconvenient truth* [Documentary]. United States: Paramount Pictures.

Berry, W. (1996). *The unsettling of America: Culture and agriculture*. San Francisco: Sierra Club Books.

Bowers, C. A. (2000). *Let them eat data: How computers affect education, cultural diversity and the prospects of ecological sustainability*. Athens, GA: University of Georgia Press.

Curry, B. (2007, January 27). Global warming leaves MPs on the hot seat. *Globe & Mail,* A10.

Globe & Mail. (2007). *Climate change: Extensive web coverage*. Retrieved May 15, 2007, from http://www.theglobeandmail.com/climatechange

Karnasiewicz, S. (2005). Do today's kids have "nature-deficit disorder"? *Salon.com*. Retrieved June 2, 2007, from http://www.salon.com/mwt/feature/2005/06/02/Louv/index.html

Korteweg, L. (1996). *Mining the curriculum: Comparing the form and content of the museum exhibit* Mine Games *with other mining curricula*. Unpublished master's thesis, University of British Columbia.

Mcilroy, A. (2007, January 29). Are scientists evolving into climate crusaders? Warnings of warming dangers have become increasingly dramatic. *Globe and Mail,* A4.

Miyazaki, H. (Director/Writer). (1984/2005). *Nausicaa* [Anime]. United States: Disney Pictures.

Monke, L. (2005, September/October). Charlotte's webpage: Why children shouldn't have the world at their fingertips. *Orion Magazine,* 24-31.

Postman, N. (1993). *Technopoly: The surrender of culture to technology*. New York: Vintage Books.

Reid, A. (2007, April). Indicators for sustainable development: Perspectives, challenges, and progress in relation to education. Presented at the American Educational Research

Association (Ecological and Environmental Education Special Interest Group), Chicago.
Resnick, M., Rusk, N., & Cooke, S. (1998). The computer clubhouse: Technological fluency in the inner city. In D. Schon, B. Sanyal, & W. Mitchell (Eds.), *High technology and low-income communities* (pp. 266-286). Cambridge: MIT Press.
Saga, S. (Director), & Yamamoto, Y. (Writer). (1992). *Green legend ran* [Anime]. Japan.
Walsa, A. & Jickling, B. (2002). "Sustainability" in higher education: From doublethink and newspeak to critical thinking and meaningful learning. *Higher Education Policy, 15*, 121-131.
Wikipedia. (2007a). *Environmental education*. Retrieved May 10, 2007, from http://en.wikipedia.org/wiki/Environmental_education
Wikipedia. (2007b). *Science, technology, society and environment education*. Retrieved May 10, 2007, from http://en.wikipedia.org/wiki/Science%2C_technology%2C_society_and_environment_education
Wikipedia. (2007c). *Global warming*. Retrieved May 10, 2007, from http://en.wikipedia.org/wiki/Global_warming
Willinsky, J. (2002). Democracy and education: The missing link may be ours. *Harvard Educational Review, 72*(3), 367-92.
Willinsky, J. (2007, April). Assessment and technology: Identifying the current trends and issues. Presented at the American Educational Research Association (Technology as an Agent of Change in Teaching and Learning Special Interest Group), Chicago.