

# Promoting Health Literacy: Integrating Environmental Health Education into Teacher Training

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## ABSTRACT

*Human activities impact the health of the environment and the environment in turn influences human health. Teachers and schools can play a key role in healthy human development while building capacity for environmental sustainability. Health literacy is essential to equip individuals with the knowledge and skills to be active participants in shaping practices and policies that impact their own health, their community, and which transcend national borders. The responsibilities of academia include the role of university programs to prepare health-literate teachers who have the capacity to access, comprehend, appraise, and communicate health information to engage with the demands of different health contexts in order to promote and maintain good health across the life-course and similarly enable their school communities to do the same. Integrating environmental health education into K-12 teacher training within higher education is not only an opportunity to enhance teachers' health literacy skills, but promotes health and education reform while building capacity for environmental sustainability. This paper focuses on advancing pre-service teachers' health literacy through the integration of environmental health education in professional teacher training utilizing Environment Canada's major environmental issues to guide such efforts.*

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## Introduction

There is growing interest by researchers, educators, practitioners, and policy-makers in health literacy as the critical pathway linking education to health outcomes. University programs must prepare health-literate teachers who have the capacity to access, understand, and analyze functional health information and services as well as the competence to apply such information and services in ways that enable K-12 students to learn health concepts and skills (Peterson, Cooper, & Laird, 2001). Enhancing teacher health literacy skills by integrating environmental health education into K-12 teacher training is an opportunity for prospective teachers to assist with the challenging task of health and education reform within our school systems, while building capacity for environmental sustainability. It is important for all individuals to make informed health decisions, have accountability for their actions, and recognize implications of their actions and features of the planet on a global scale. It takes an environmentally-friendly village to raise an environmentally-friendly village as this link to "Miniature Earth" suggests ([miniature earth.mp4](#)).

There is a connection between environment and health. The biological and physical changes occurring on the planet as a result of human activity impacts on human health (Woodward, Hales, Litidamu, Phillips, & Martin, 2000). Teachers can play a key role in one of the goals of human development, to protect human health during environmental change. This article focuses on advancing pre-service teacher's health

literacy through the integration of environmental health education in professional teacher training.

## What is Health Literacy?

According to the British Columbia Health Literacy Research Team (2008), health literacy is "the degree to which people are able to access, understand, appraise, and communicate information to engage with the demands of different health contexts in order to promote and maintain good health across the life-course." The 2007 Canadian Council on Learning report entitled *Health Literacy in Canada* states approximately 60% of Canadians (ages 16 and older) lack the capacity to obtain, understand, and act upon health information and services to make appropriate health decisions on their own (Murray, Rudd, Kirsch, Yamamoto, & Grenier, 2007). Researchers have argued that enhanced health literacy has a positive influence on an individual's empowerment, intentions to act, and overall health status. Many studies in Canada and across the world suggest that young people's health risk behaviours can be controlled or manipulated through proper school health education programs provided by schools (Canadian Institute for Health Information, 2005; Nutbeam, 1997; St. Leger 2001).

Teachers play an important role in helping students draw connections between the way they lead their lives and the reciprocal relationship between the planet and their health. By strengthening pre-service teachers' knowledge and skills in the environmental dimension of health, an interdisciplinary requisite can be established to improve the quality of life of

individuals and societies. Health literacy could very well be the next sustainable global health solution.

### The Link between Health and Learning

It has long been recognized that there is a link between health and learning. Health is the first of the seven cardinal principles of education. Shane (1976) cited the original 1918 Cardinal principles of Secondary Education that indicated the health of the individual was essential to the vitality of the nation. McGinnis (1981) stated that:

“A student who is not healthy, who suffers from an undetected vision or hearing deficit, or who is hungry, or who is impaired by drugs or alcohol, is not a student who will profit optimally from the educational process. Likewise, an individual who has not been provided assistance in the shaping of healthy attitudes, beliefs and habits early in life, will be more likely to suffer the consequences of reduced productivity in later years” (p. 13).

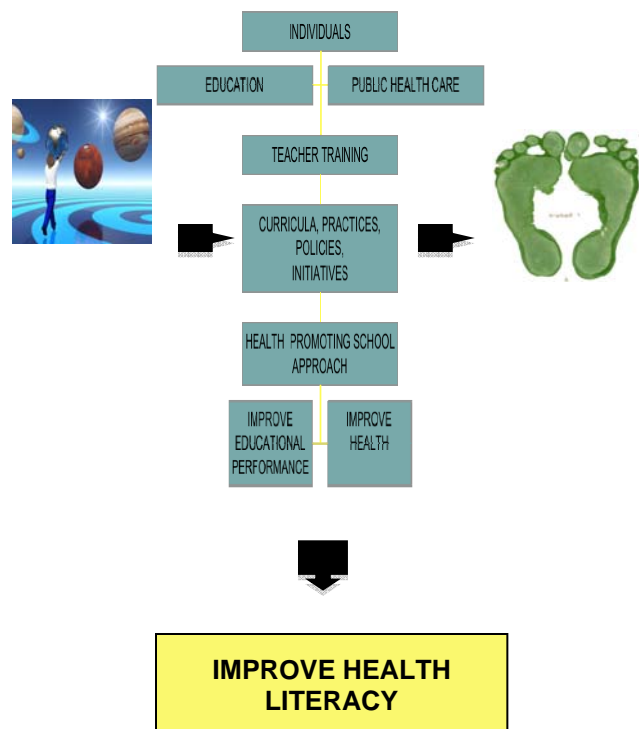
*Role of schools and teachers.* Furthermore, the concept of health education has evolved drastically over the last twenty years in attempting to address overall wellness and its connection to academic achievement and health status. Health educators have the extremely important, yet daunting task of helping students develop health-promoting skills, attitudes, and behaviours that address all 7 dimensions of health consisting of physical, mental, social, intellectual, spiritual, occupational, and *environmental*. Teacher preparation programs can effectively train health-literate prospective teachers and the goal of delivering high-quality health education can be institutionalized. Health and education outcomes are dependent on students achieving health literacy (St. Leger, 2001; Nutbeam, 2000). There is a very close connection between the systematic implementation of a health promoting school (HPS) and the enabling factors in achieving health literacy, whereby teachers’ practices and skills must be addressed in the equation (St. Leger, 2001, Vamos & Zhou, 2007). A template to address the health and learning needs of school communities through the environmental health dimension lens as an example is shown in Figure 1. This figure exemplifies the amalgamation of overarching considerations, which illustrate the relationship between skills-based learning that can contribute to the achievement of educational and health commitments and the health literacy concept as the outcome of health promoting schools. Our Canadian education system has just recently begun to embrace

this notion and initiate cooperation with stakeholders to strengthen collaborative capacities, activities, and actions of health and education through school-based and school-linked programs throughout the nation.

According to the British Columbia Ministry of Education (British Columbia Ministry of Education, 2005), by adopting a health-promoting schools approach and striving to provide effective teaching and learning to achieve the knowledge, skills, and community partnerships contributing to wellness, the B.C. school system has the opportunity to enhance the health and learning of all British Columbians. Currently, no standardized guidelines exist federally across Canada, or provincially within British Columbia that require practicing teachers to receive mandatory training in health education.

Consequently, teachers have received limited coursework and training in the broad discipline of health education. The preparation of prospective health teachers by colleges and universities involve incorporating key concepts and skills into their professional preparation curricula to assist with the challenging task of health and education reform within our school systems. Teacher health literacy is just as important as student health literacy.

**Figure 1. Template to Address the Health and Learning Needs of School Communities through an Environmental Lens**



## **The Link between Health and Environmental Health Dimension**

The link between the environment and health care has been known for centuries. For example, King Edward I of England (1272-1307) recognized that the burning of “sea coal” produced “*so powerful and unbearable a stench that, as it spreads throughout the neighbourhood, the air is polluted over a wide area*” and this was found to be “*to the detriment of their citizen’s bodily health*” and therefore forbidden by direct order of the King (Wilson & Spengler, 1996). More recently after World War II, the link between health and environmental concerns was rooted in vast social changes. A rapid growth in outdoor recreation during the 1950’s resulted in an awareness of and action for air and water pollution and the effects of toxic chemicals on humans and the environment (Hays, 1987).

Today, environmentalism and the obligations of academics are uniting to project forward and develop individual and social capacity for critical thinking. The responsibility of academia in environmental advocacy continues today on campuses across Canada and beyond. With this role comes the dissemination of sufficient knowledge to manage nature and acquire the skills to participate in opportunities and anticipate dangers in promoting global sustainability and a holistic approach in protecting our planet. According to Suzuki (2008), the great challenge for academics is to educate people about the reality of the biosphere within which we all live and derive a living.

Emphasis on the significant importance of the enhancement of the knowledge and skills of individuals is being recognized as sustainable human-centered development (Woodward, Hales, Litidamu, Phillips, & Martin, 2000). This shift in thinking acknowledges human development with emphasis on critical thinking, opportunities for skill building, communication and relationships to pursue positive goals, which aim to improve the quality of life within the environment. This paradigm shift is aligned with the need for advanced health literacy skills.

## **Environmental Health Education to Develop Health Literacy Skills**

In 2002, the Canadian government developed a broad vision for environmental learning in Canada through its *Framework for Environmental Learning and Sustainability in Canada*. Schools are encouraged to integrate environmental learning within all subject areas to promote positive change. The document states that with increased awareness, knowledge, skills, attitudes, values, and motivation, Canadians can become more ecologically literate and

act competently to build a sustainable future for both humans and ecosystems (British Columbia Ministry of Education, 2008). This framework is inextricably linked to the 4 domains of health literacy (access, comprehend, evaluate, communicate information), which are required to positively shape healthy sustainable futures for humans and ecosystems.

Environmental health education spans diverse issues including air pollution and infectious disease, challenges and effects of climate change, preservation of wildlife and natural habitat for biodiversity, conservation efforts and waste reduction, healthy water consumption, and extreme weather events. It is important for vulnerable populations, which include our young school-aged children and youth, to develop the critical knowledge, skills, values, and attitudes, which can lead to healthy decisions relevant to a variety of health-related behaviours and practices. Health literacy has the ability to empower youth; to have the capacity to exercise control over and take responsibility for their health (Nutbeam, 2000). Using environmental health education as a theme to both develop health literacy skills and guide interdisciplinary practice compliments the health and learning link described above. Consequently, it is an investment in our future to train health-literate teachers who in turn can enhance the health-literacy of our students.

## **Teacher Training**

Integrating environmental health education into K-12 teacher training within higher education is not only an opportunity to enhance teacher health literacy skills, but assists with the task of health and education reform while building capacity for environmental sustainability. Pedagogical methods that are based on significant concepts provide opportunities to practice critical thinking skills and active learning, and promote an appreciation of the environment with an ethics of care and citizen and social action.

To support this goal strategies are proposed to address all four domains of health literacy (access, comprehend, evaluate, and communicate information) using higher education as the initial setting, which in turn can be transferred to K-12. The following strategies are classified according to Environment Canada’s 6 environmental issue classification system (<http://www.ec.gc.ca/education/default.asp?lang=En&n=3AD65317-1>), which includes the following: 1) air; 2) climate; 3) habitat and wildlife; 4) pollution and waste; 5) water; and 6) weather.

*Air.* Air particulate matter and ground level ozone are two main pollutants found in smog (B.C. Ministry of Education, 2007). Even low levels of

exposure may pose a health risk and in 2000 the Canadian Council of Ministers of the Environment endorsed Canadian-wide Standards (CWS) to measure achievement objectives and improve air quality. Pedagogical methods that support student engagement and community action and teach both cognitive and affective domains are essential. Educators and students can enter Environment Canada's virtual school (<http://www.ec.gc.ca/education/default.asp?lang=En&n=7DC34C3F-1>) for resources and tools to assist school communities' acquisition of knowledge, skills, and values to prevent, identify, assess and address indoor and outdoor air problems and other environmental issues with minimal cost and maximum action.

*Climate change.* The main cause of climate change is the build-up of greenhouse gases in the atmosphere from human activity and the most recent assessment of global climate change comes from the International Panel on Climate Change (IPCC) that concludes with a high degree of certainty that the Earth's atmosphere is warming (BC Ministry of Education, 2007). Climate change is a new phenomena and detailed analysis of the Earth's complex systems presents challenges to educators. From a health literacy perspective, taking action on climate change may not be as difficult at first glance. Teachers have many interdisciplinary opportunities to explore and address key questions with their students related to global warming while tackling the underlying habits and attitudes contributing to greenhouse gas emissions within society. It is important for teachers to access basic and credible background information to form a starting point to allow students to comprehend key concepts. Inviting students to examine their practices at home, school, and within the community while undertaking positive action to curb greenhouse gas emissions helps to promote an ecological approach. Whether pedagogical practices include political decision-making in English class, planting trees on school grounds in Geography class, and awareness and appreciation of human, plant, and animal adaptations and their impact on climatic conditions in Science class, health-literacy contributes to the achievement of health and educational commitments.

*Habitat and wildlife.* Canada being the second largest country in the world is home to many ecosystems. Human activities resulting in environmental contamination are threats to species and their habitats, which in turn affect ecosystems, health, and biodiversity. The latter encompasses all living things on Earth and their relationship to one another including genes, species and ecosystems (Canadian Biodiversity Information Network, 2008).

Biodiversity is essential to such basic human needs such as oxygen, water purification, and social production, and provides humans with food, clothing, and medicine (Environment Canada, 2008).

To stimulate environmental discussion, initiate research, promote collaboration between university members, and provide educational programs and resources to promote well-being, "Sustainable Campuses" empowers individuals (<http://syc-cjs.org/sustainable/tiki-index.php?page=Sustainable+Campuses>). The Sustainable Campuses concept is aligned with developing health-literate individuals. The aim is to work directly with students to build their skills, enhance their knowledge, and thus, help succeed in institutionalizing sustainability. Sustainable Simon Fraser University (SFU) is a student, staff and alumni run organization although it is open to anyone in the SFU community interested in helping make SFU a more sustainable university. Sustainable SFU conducts research, provides education and awareness resources and collaborates with SFU community members on sustainability related projects. Examples of Sustainable SFU stakeholder groups include: SFU Public Interest Groups (Environmental Action Group; Climate Change Action Group); Student Newspaper – The Peak; Academic (School of Resource and Environmental Management; Centre for Sustainable Community Development; Institute for the Humanities – Citizen and the Environment; Science and Environment Cooperative Education); and Univercity (an international, innovative showcase for approaches to sustainable planning and urban development). These initiatives can empower student leadership and our pre-service teachers have an opportunity to demonstrate active responsibility for experiential, communicative, and contextual environmental learning, which can then be developed into learning experiences for their future students.

*Pollution and waste.* The National Office of Pollution Prevention (2008) has developed several national pollution prevention (P2) fact sheets, activities, and best practices that individual Canadians, schools, companies, and government departments can incorporate into everyday life. The "P2 and You @ School" series (<http://www.ec.gc.ca/nopp/docs/fact/en/p2School.cf>) stresses the importance of wise decision-making in what we buy and how we use products to protect our natural resources and health through conservation and a more efficient utilization of resources. Teachers can offer learners an exploration of waste generation in their school setting (e.g. energy, water, pesticides, and hazardous chemicals). This exercise illustrates causes of pollution in the student's immediate learning environment while promoting an attitude of

'less is best' and promotes and endorses school-wide action to manage ecological footprints from biking to school, or forming a P2 School Team, to advocating school ground plant projects.

*Water.* Accessing, comprehending, evaluating, and communicating information on the effective management of our fresh water resources and the prevention of water pollution is critical to our well-being. Human actions can have a serious impact on the quality of our water supply, such as excessive water usage and improper disposal of toxic chemicals (Environment Canada, 2008). There is a plethora of information stemming from a variety of sources and agendas such as marketing, politics, education, and protest, all of which can produce enviro-confusion, enviro-warriors, and enviro-fatigue. Questions emerging from water-related information include: the consumption of bottled water vs. tap water; showering vs. a bathing; and utilizing a dishwasher vs. hand-washing dishes? Health literacy is an essential component for teachers to first comprehend and analyze the impact of human activity on the health of the environment and the corresponding influence of the environment on the health of mankind and then provide a skills-based curriculum for teaching about the environment.

*Weather.* Weather can have a significant impact human health issues such as migraines, asthma, heart attacks, and depression, as well as affect ecosystems by triggering natural disasters such as floods and forest fires thus, altering wildlife populations (Environment Canada, 2008). It is important for individuals, families, and societies to stay informed and be prepared to lessen the impact of weather and be equipped in the event of specific weather-related emergencies. Environment Canada's Skywatchers ([http://www.on.ec.gc.ca/skywatchers/index\\_e.html](http://www.on.ec.gc.ca/skywatchers/index_e.html)) provides free interdisciplinary weather-related teaching materials, explanations, activities, and experiments with a teaching guide that address learning outcomes in the Pan Canadian curriculum. The Skywatchers initiative in collaboration with Environment Canada's Weather Office promotes environmental learning and assists with the development of health literacy skills early in life. As an example, students and schools are invited to input and retrieve weather observations and track their local weather via virtual or real weather office tours.

## Conclusion

The preparation of prospective teachers by colleges and universities plays a critical role in promoting health literacy. This involves incorporating key concepts and skills into their professional preparation curriculum to assist with the challenging task of health and education reform

within our school systems. Teachers in partnership with their school-communities have the opportunity to promote health literacy, while embracing all things green. Acquisition of teacher knowledge and skills enriched with environmental health discourse is needed before translation to their students. With human actions directly impacting the health of the environment and the environment playing a major role in human health, health literacy should be embraced by schools.

Pedagogical practices play a critical role in the cognitive, affective, and psychomotor development of our students. By combining skills-based health education elements through a framework utilizing Environment Canada's six themes, universities and schools can engage in a focused learning process empowering individuals to exercise and advocate healthy decision-making. Teacher preparation programs can promote and train our prospective teachers to advance dialogue, facilitate experiential student and school community learning, and advocate for action to help lighten their school's ecological footprint. With this responsibility comes a privilege - how we can all improve the health and environment where we live, learn, work, and play.

## References

- British Columbia Health Literacy Research Team. (2008, March). *CIHR school health literacy research symposium*. Symposium conducted at the meeting of the First International School Health Literacy Symposium and Working Meetings, Vancouver, Canada.
- British Columbia Ministry of Education. (2005). *Health-promoting schools. Background paper for health-promoting schools forum*. Vancouver, B.C.: January, 14, 2005, Author.
- British Columbia Ministry of Education. (2008). *Environmental learning and experience: An interdisciplinary guide for teachers 2007*. Retrieved April 28, 2008, from [http://www.bced.gov.bc.ca/environment\\_ed/why.htm](http://www.bced.gov.bc.ca/environment_ed/why.htm)
- British Columbia Ministry of Education. (2007). *Environmental trends in British Columbia 2007*. Retrieved April 29, 2008, from [www.env.gov.bc.ca](http://www.env.gov.bc.ca).
- Canadian Biodiversity Information Network. (2008). *What is biodiversity?* Retrieved April 28, 2008, from <http://www.cbin.ec.gc.ca/edification/whatis.cfm?lang=e>.
- Canadian Institute for health information. *Improving the health of young Canadians*. 2005. [www.cihi.ca/cphi](http://www.cihi.ca/cphi).

Environment Canada. (2008). *Habitat and wildlife*. Retrieved May 6, 2008, from <http://www.ec.gc.ca/education/default.asp?lang=En&n=9AD97E2E-1>.

Hays, S. (1987). *Beauty, Health and Performance*. New York: Cambridge University Press.

McGinnis, J.M. (1981). Health problems of children and youth: A challenge for schools. *Health Education Quarterly*, 8(1), 11-14.

Murray, S., Rudd, R., Kirsch, I., Yarmamoto, K, and Grenier, S., (2007). *Health Literacy in Canada: Initial Results from the International Adult Literacy and Skills Survey*. Ottawa: Canadian Council on Learning.

National Office of Pollution Prevention. (2008). *Canadian centre for pollution prevention*. Retrieved March, 2, 2008 from [http://www.c2p2online.com/main.php3?inc=members/s/members\\_search.php3& ID=72](http://www.c2p2online.com/main.php3?inc=members/s/members_search.php3& ID=72)

Nutbeam, D. (1997). Promoting health and preventing disease: An international perspective on youth health promotion. *Journal of Adolescent Health*, 20, 396-402.

Nutbeam, D. (2000). Health literacy as a public health goal: A challenge for contemporary health education and communication strategies for the 21<sup>st</sup> century. *Health Promotion International*, 15(3), 259-267.

Peterson, F., Cooper, R., & Laird, J. (2001). Enhancing teacher health literacy in school health promotion: A vision for the new millennium. *Journal of School Health*, 71, 138-144.

Shane, H.G. (1976). The seven cardinal principles revisited. *Today's Education*. 65, 57-72

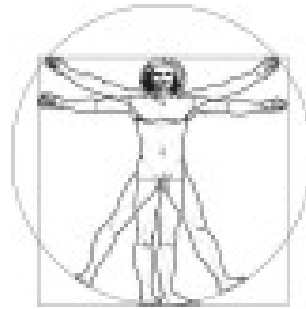
St. Leger, L. (2001). School, health literacy and public health: Possibilities and challenges. *Health Promotion International*, 16(2), 197-205.

Suzuki, D. (2008). Environmentalism and the responsibility of academia. *The Journal of Higher Education*. April/May, 5-8.

Vamos, S., & Zhou, M. (2007). Educator preparedness to teach health education in British Columbia. *American Journal of Health Education*, 38(5), 284-292.

Wilson, R., & Spengler, J.D., (1996). *Particles in Our Air: Concentrations and Health effects*. Cambridge: MA.

Woodward, A., Hales, S., Litidamu, N., Phillips, D., & Martin, J. (2000). Protecting human health in a changing world: the role of social and economic development. *Bulletin World Health Organization*, 78(8), 1148-1155.



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